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NUCLEAR WASTE TRANSPORTATION SAFETY ACT OF 1979

GOVERNMENT

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HEARINGS

BEFORE THE

SUBCOMMITTEE ON

SCIENCE, TECHNOLOGY, AND SPACE

OF THE

COMMITTEE ON COMMERCE, SCIENCE,

AND TRANSPORTATION

UNITED STATES SENATE

NINETY-SIXTH CONGRESS

FIRST SESSION

ON

S. 535

TO REGULATE COMMERCE BY PROVIDING FOR THE SAFE
TRANSPORTATION OF NUCLEAR WASTE AND RADIOACTIVE
NUCLEAR REACTOR FUEL, AND FOR OTHER PURPOSES

JULY 18, 19, AND 20, 1979

Serial No. 96-52

Printed for the use of the
Committee on Commerce, Science, and Transportation



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CONTENTS

Opening statement by Senator Heflin	1
Opening statement by the Chairman	2
Opening statement by Senator Schmitt	28
Text of S. 535	5
Agency comments:	
Comptroller General	16
Council on Environmental Quality	17
Department of Energy	18
Department of State	19
Department of Transportation	20

CHRONOLOGICAL LIST OF WITNESSES

JULY 18, 1979

Dugoff, Howard, Administrator, Research and Special Programs Administration, Department of Transportation; accompanied by Ken Pierson, Deputy Director, Bureau of Motor Carrier Safety, Federal Highway Administration; and Lee Santman, Director, Materials Transportation Bureau	37
Prepared statement	51
LeGassie, Roger, Deputy Assistant Secretary, Planning and Analysis, Energy Technology, Department of Energy	79
Prepared statement	89
Questions of the committee and the answers thereto	91
List, Hon. Robert, Governor of Nevada; accompanied by Dr. Ralph DiSibio, director, Nevada Department of Human Resources	22
Mayer, Charles H., vice president, nuclear division, Tri-State Motor Transit Co. ..	71
Reynolds, William, coordinator, Nuclear Transportation project, American Friends Service Committee	59

JULY 19, 1979

Hendrie, Joseph M., Chairman, Nuclear Regulatory Commission; accompanied by Bill Dircks	93
Attachment	97
Rhode, Gerald K., chairman, Electric Utility Companies' Ad Hoc Nuclear Transportation Group	115
Attachments	123
Rifakes, George P., manager of fuel and budgets, Commonwealth Edison Co	146

JULY 20, 1979

Opening statement by Senator Packwood	167
Harris, Dr. William J., Jr., vice president for research and test, Association of American Railroads	157
Prepared statement	170
Jefferson, Robert M., manager, nuclear transportation technology department, Sandia Laboratories	149
Prepared statement	155
Macklin, Leo, president, Trans Nuclear Inc.; Dennis G. Maxwell, general manager, nuclear division, NL Industries; accompanied by George L. Stukenbroeker, manager, nuclear transportation	190
Prepared statement of Mr. Macklin	194
Prepared statement of Mr. Maxwell	197
Pollack, Richard, director, Critical Mass Energy project	175
Prepared statement	186

IV

ADDITIONAL ARTICLES, LETTERS, AND STATEMENTS

Colby, L. J., Jr., Allied Chemical Corp., letter of April 30, 1979	204
Cordaro, Matthew C., Ph. D., vice president, Long Island Lighting Co., letter of April 27, 1979	203
DOE Transportation Safeguards System, report	83
Evans, Hon. John V., Governor of Idaho, letter of August 3, 1979	36
Harris, William J., Jr., vice president, Association of American Railroads, letters of:	
May 17, 1979	207
September 6, 1979	164
Hendrie, Joseph M., Chairman, Nuclear Regulatory Commission, letter of July 18, 1979	100
Incidents at Beatty Burial Site, report	102
Jefferson, Robert M., manager, nuclear materials transportation technology department, Sandia Laboratories, letter of July 25, 1979	170
Jett, George, General Counsel, Federal Emergency Management Agency, letter with statement of July 27, 1979	214
Macklin, Leo, president, Trans Nuclear, Inc., letter of August 29, 1979	217
Memorandum of understanding between the U.S. Department of Transportation and the U.S. Nuclear Regulatory Commission, for Regulation of Safety in the Transportation of Radioactive Materials	56
National Society of Professional Engineers, statement	218
Pollock, Richard P., director, Critical Mass Energy project, letter of June 20, 1979	208
Rhode, Gerald K., chairman, Electric Utility Companies' Ad Hoc Nuclear Transportation Group, letter of April 30, 1979	204
Rickover, Adm. H. G., Department of the Navy, letter of July 13, 1979	210
Schaefer, Barry C., vice president, law, Union Pacific Railroad Co., letter of July 20, 1979	212
Smith, Philip M. Associate Director, Natural Resources and Commercial Services, Office of Science and Technology Policy, letter of July 17, 1979	29
Weeks, Nathan C., Savannah, Ga., letter	218
Wiggin, Edwin A., executive vice president, Atomic Industrial Forum, Inc., letter of May 1, 1979	206

NUCLEAR WASTE TRANSPORTATION SAFETY ACT OF 1979

WEDNESDAY, JULY 18, 1979

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
SUBCOMMITTEE ON SCIENCE, TECHNOLOGY, AND SPACE,
Washington, D.C.

The subcommittee met at 9:30 a.m. in room 5110, Dirksen Senate Office Building, Hon. Howell Heflin, presiding.

OPENING STATEMENT BY SENATOR HEFLIN

Senator HEFLIN. The hearing will come to order.

The joint hearings of the Senate Subcommittee on Science, Technology, and Space, and the Subcommittee on Surface Transportation conducted on August 16, 1978, identified areas of needed improvement in the transportation of commercial spent fuel and nuclear waste.

Among the improvements urged by a number of witnesses at those hearings was a clarification and consolidation of regulatory responsibility for the transportation of radioactive materials, especially, but not limited to, spent fuel and nuclear waste from commercial power reactors.

In addition to clarification of regulatory responsibility and authority, a specific need was indicated for uniform nationwide routing guidelines or requirements. In the absence of such Federal requirements, there arose a need for local routing restrictions which were proliferating.

Our hearings commencing this morning are set to consider measures now proposed to fulfill these needs, and to assess the status of need not covered by such proposals.

Those measures include S. 535, the Nuclear Waste Transportation Safety Act of 1979, as well as rules issued by the Nuclear Regulatory Commission, and other rules proposed by the Department of Transportation.

The timeliness of these hearings is further underscored by the recent joint statement of the Governors of Washington, Nevada, and South Carolina, to Secretary Adams and Chairman Hendrie.

Our transportation system has achieved a favorable record during about 25 years of carriage of radioactive materials, including nuclear materials involved in electric power generation and defense activities, plus radioactive pharmaceuticals for medical purposes, and various radioactive materials involved in university and government research facilities.

Although accidents and mishandling incidents have occurred, to my knowledge no death or serious injury has ever been attributable to radiation which may have been released in any of those instances.

Indeed, several accidents of great severity have occurred in which tractor trailers have overturned at expressway speeds without rupturing the specially constructed and licensed cask containing nuclear spent fuel.

Nevertheless, we have learned from the frightening episode of the Three Mile Island that nuclear safety depends on constant vigilance and upgrading of procedures and facilities.

The fine record of the past cannot offset the consequences of an accident in the future. We hope and trust that these hearings, for which we have solicited the informed viewpoints of a broad cross section of our Nation, will lead to sound decisions as to whether safety in nuclear materials transportation can and should be further enhanced by any combination of legislative and regulatory action.

The key issues to be evaluated during the hearing are: First, the Energy Reorganization Act of 1974 conveyed to the NRC, among other responsibilities, the prior existing authority of the former Atomic Energy Commission to regulate transportation of radioactive nuclear fuel and nuclear waste.

The Hazardous Material Transportation Act of 1974 consolidated within the Department of Transportation the regulatory authority for safety and transportation of all hazardous substances, including radioactive materials.

Consultation and coordination between those regulating authorities has been relied upon since then. Should that situation continue? Or should such overlap be eliminated by law?

Second, what specific areas of transportation regulation involve overlap or conflict? And how should they be resolved?

Third, if the Department of Transportation is to be clearly designated as the lead agency, should that imply a separate office or bureau within the DOT to fulfill that role?

Fourth, is security against theft and sabotage necessary and realistically attainable?

Fifth, should the DOT be responsible for assuring a coordinated Federal-State emergency response plan for possible nuclear related transportation emergencies? Or should that responsibility be included in the newly organized Federal Emergency Management Agency?

Sixth, is the Federal grant program of S. 535 necessary? And if so, is it adequate?

Before calling our first scheduled witness, I'd like to recognize at this time the chairman of the Committee on Commerce, Science, and Transportation, Senator Cannon.

OPENING STATEMENT BY THE CHAIRMAN

The Chairman. Thank you very much, Senator Heflin.

I am pleased that Senator Heflin has undertaken to preside over these important hearings. I congratulate him on the extensive effort he's made to assure the viewpoints and recommendations of such a broad spectrum of our society.

I am particularly glad to see among those invited to testify this morning Governor Bob List of my home State of Nevada. I know he shares with me a common determination to make sure that incidents such as we experienced recently in Nevada are not viewed as tolerable simply because we believe there was no injury actually encountered by any of our people.

The incident at Beatty, Nev., on May 14 involved the combining of nuclear waste in a shipment with nonradioactive waste.

I don't take comfort in the fact that it was the chemical characteristics of that waste, rather than the radioactivity of the material, which caused that fire. I am far more concerned at the evident fact that either existing regulations for proper containment of hazardous materials are inadequate, or that the procedures for enforcement of those regulations are inadequate.

Similar concerns apply to the incident on July 2 in which radiation leakage in excess of permissible limits was observed and measured on another truck shipment to Beatty from another part of the country.

The residents of those States which have responded to national needs for safe, isolated storage and disposal facilities, must not be penalized or jeopardized by transportation accidents or incidents which are preventable by proper regulatory standards and enforcement procedures.

At this stage, I am not convinced that legislation authorizing changes in the delegation of authority and responsibility for regulation of nuclear material transportation is necessarily the proper answer.

Too often, such changes are legislated to circumvent failure of administrative agencies to carry out existing responsibilities competently.

For that reason, Senator Heflin, I am particularly glad to hear your closing remark to the effect that these hearings are set to provide information and guidance as to the proper course of action this committee should initiate or support.

Certainly I intend to be guided by a study of all the testimony we shall hear in the next few days. Whether or not further legislative action by the Committee on Commerce, Science, and Transportation is found necessary, there is no doubt that a needed improvement in the enforcement of existing regulations is required.

Members of the committee staff have been in close touch with the Department of Transportation and the Nuclear Regulatory Commission to ascertain whether they are indeed pursuing appropriate measures.

During these hearings, we shall have ample opportunity to learn more about them. I hope those measures will provide the added safety our people in Nevada will rightly demand to permit continued operation of our Beatty low-level burial facility.

I am optimistic that sufficient improvement in monitoring and achieving compliance with existing regulations for packaging, handling, and transportation of radioactive materials can be quickly achieved. After all, as Senator Heflin pointed out, the Nation's overall safety record in transportation of such materials is highly gratifying.

For example, a study completed by the DOT of transportation accidents involving all hazardous materials over a recent 5-year period showed a total of 32,000 reported incidents, of which 144, less than one-half of 1 percent, involved radioactive material. Of those, 36 involved actual or suspected release of some of that material.

In the present reporting system, a visibly damaged package is recorded as suspected release, whether or not actual leakage occurred.

No significant injury was traced to any of those incidents. Most of those 36 cases involved failure due to mishandling or accident of so-called exempt type A packages used for routine shipment of radioactive pharmaceuticals. Such packaging is required to be safe and leakproof only under normal conditions of handling and transport, and is permissible for many classes of materials.

Four incidents involved type B packaging, which must withstand transportation accidents without leakage. Two of those four were not involved in accidents, but released radiation. One was leakage due to use of an obviously defective container; the other, to improper procedure in which the radioactive material, a source material for radiography, was not installed in the shielded portion of the container. The remaining two incidents involved serious highway accidents mentioned by Senator Heflin, in which trailers overturned at highway speeds. The type B packaging withstood these accidents without failure or leakage.

I applaud Governor List's participation with the Governors of Washington and South Carolina, in demanding even tighter enforcement of safety regulations dealing with packaging and shipment of nuclear waste.

I trust these hearings will serve to underscore that need, and help to achieve early improvement.

[The bill and agency comments follow:]

96TH CONGRESS
1ST SESSION

S. 535

To regulate commerce by providing for the safe transportation of nuclear waste and radioactive nuclear reactor fuel, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 5 (legislative day, FEBRUARY 22), 1979

Mr. SCHMITT (for himself, Mr. CANNON, Mr. FORD, Mr. PRESSLER, and Mr. THURMOND) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

A BILL

To regulate commerce by providing for the safe transportation of nuclear waste and radioactive nuclear reactor fuel, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That this Act may be cited as the "Nuclear Waste Transpor-
4 tation Safety Act of 1979".

5 SEC. 2. In order to enhance the safety and simplify the
6 regulation of the transportation of nuclear waste and radioac-
7 tive commercial spent fuel, it is declared to be the policy of
8 Congress that the Department of Transportation has the
9 principal responsibility for regulating, monitoring, and ensur-

1 ing the safety and security of such transportation. The Con-
2 gress further declares that the efforts of the Department of
3 Transportation in fulfilling this responsibility may best be
4 conducted by appropriate consultation with the Nuclear Reg-
5 ulatory Commission.

6 SEC. 3. Section 103 of the Hazardous Materials Trans-
7 portation Act (49 U.S.C. 1802) is amended to read as
8 follows:

9 "DEFINITIONS

10 "SEC. 103. As used in this title, the term—

11 "(1) 'commerce' means trade, traffic, commerce,
12 or transportation, within the United States, (A) be-
13 tween a place in a State and any place outside of such
14 State, or (B) which affects trade, traffic, commerce, or
15 transportation described in clause (A);

16 "(2) 'commercial spent fuel' means any reactor
17 fuel which has become radioactive as a result of its use
18 and irradiation in an operating commercial nuclear
19 reactor;

20 "(3) 'emergency situation' means any situation in-
21 volving the shipment of nuclear waste or commercial
22 spent fuel which could lead to dangerous exposure of
23 the public or property to radiation or an attempt to
24 divert or interfere with a shipment of nuclear waste or
25 commercial spent fuel;

1 “(4) ‘hazardous material’ means a substance or
2 material in a quantity and form which may pose an un-
3 reasonable risk to health and safety or property when
4 transported in commerce;

5 “(5) ‘nuclear waste’ means any radioactive mate-
6 rial, or combination of materials, other than commer-
7 cial spent fuel, which is deemed to have no immediate
8 commercial value or application;

9 “(6) ‘radioactive material’ means any material or
10 combination of materials which spontaneously emits
11 ionizing radiation and has an estimated specific activity
12 greater than 2 nanocuries per gram of material;

13 “(7) ‘Secretary’ means the Secretary of Trans-
14 portation, or his delegate;

15 “(8) ‘serious harm’ means death, serious illness,
16 or severe personal injury;

17 “(9) ‘shipment’ means any movement of nuclear
18 waste, commercial spent fuel, or radioactive materials
19 by any mode and any loading, unloading, or temporary
20 storage incidental thereto, excluding the receipt, pos-
21 session, use, and transfer of nuclear waste, commercial
22 spent fuel or radioactive materials within the bound-
23 aries of a facility licensed by the Nuclear Regulatory
24 Commission;

1 “(10) ‘State’ means a State of the United States,
2 the District of Columbia, the Commonwealth of Puerto
3 Rico, the Virgin Islands, American Samoa, or Guam;

4 “(11) ‘transports’ or ‘transportation’ means any
5 movement of property by any mode, and any loading,
6 unloading, or storage incidental thereto;

7 “(12) ‘transuranic waste’ means any nuclear
8 waste which is measured or assumed to contain a con-
9 centration of chemical elements with an atomic number
10 higher than 92 and a specific activity greater than 10
11 nanocuries per gram; and

12 “(13) ‘United States’ means all of the States.”.

13 SEC. 4. Section 104 of the Hazardous Materials Trans-
14 portation Act (49 U.S.C. 1803) is amended by adding imme-
15 diately after the first sentence thereof the following new sen-
16 tence: “The materials so designated shall include commercial
17 spent fuel and transuranic waste in quantities greater than 1
18 kilogram.”.

19 SEC. 5. The Hazardous Materials Transportation Act
20 (49 U.S.C. 1801 et seq.), as amended, is further amended
21 by—

22 (1) redesignating section 115 thereof as section
23 118; and

24 (2) inserting immediately after section 114 thereof
25 the following new sections:

1 "NUCLEAR MATERIALS TRANSPORTATION

2 "SEC. 115. (a) RESPONSIBILITIES.—The Secretary
3 shall have the primary responsibility for the safety, regula-
4 tion, and logistical aspects of the shipment of nuclear waste
5 and commercial spent fuel, except that the primary responsi-
6 bility for regulating and certifying the safety of shipping
7 casks and packages shall remain with the Nuclear Regula-
8 tory Commission.

9 "(b) EMERGENCY RESPONSE PLAN.—(1) Within 18
10 months after the date of enactment of the Nuclear Waste
11 Transportation Safety Act of 1979, the Secretary shall for-
12 mulate and send to the Congress a national emergency re-
13 sponse plan to deal with emergency situations that may occur
14 during the shipment of nuclear waste, commercial spent fuel,
15 or other radioactive material. Such plan shall include provi-
16 sions for a program of educating State and local officials with
17 respect to the possible hazards associated with such ship-
18 ments, and the steps that should be taken in case of an acci-
19 dent or emergency situation which occurs during any such
20 shipment. The emergency response plan shall define clearly
21 the role of Federal, State, and local governments in respond-
22 ing to an emergency situation. Such plan shall include esti-
23 mates of the cost of the equipment and the training of emer-
24 gency response personnel that the Secretary determines nec-
25 essary in order to prepare local officials to deal promptly with

1 the immediate problems associated with an emergency situa-
2 tion. The Secretary shall make recommendations to the Con-
3 gress concerning funding or other assistance which the Fed-
4 eral Government might supply to local governments in order
5 to improve their ability to respond to an emergency situation.

6 “(2) In developing the emergency response plan, the
7 Secretary shall consult with those State and local govern-
8 ments which he believes will be significantly affected by ship-
9 ments of nuclear waste, commercial spent fuel, or other ra-
10 dioactive material.

11 “SHIPMENTS WITHIN STATES; STATE GRANTS

12 “SEC. 116. (a) NOTIFICATION.—Any person or Feder-
13 al, State, or local government entity proposing to develop a
14 long-term storage or disposal facility, including a test
15 disposal facility, which would result in nuclear waste or com-
16 mercial spent fuel being transported within a State, shall
17 notify the Secretary within 60 days of selection of a site for
18 such a facility. Such notification shall list the States within
19 which nuclear wastes or commercial spent fuel will be
20 shipped during transport to the facility. The Secretary shall
21 notify the Governors of the States within which the nuclear
22 waste or commercial spent fuel is proposed to be shipped
23 within 10 days after the Secretary has received such notifica-
24 tion.

1 “(b) APPLICATION BY STATES.—Upon receipt of notifi-
2 cation pursuant to subsection (a) of this section, a State may
3 apply to the Secretary, in such form as the Secretary may by
4 regulation prescribe, for a grant which shall be issued in ac-
5 cordance with the provisions of subsection (c) of this section.

6 “(c) AUTHORITY.—The Secretary is authorized to pro-
7 vide grants to any State to assist it in conducting an inde-
8 pendent State review of the safety and logistics of shipment
9 associated with any proposal to develop a long-term storage
10 or disposal facility, including a test disposal facility, which
11 would result in nuclear waste or commercial spent fuel being
12 shipped within that State.

13 “(d) ADMINISTRATION OF GRANTS.—Within 6 months
14 after the date of enactment of the Nuclear Waste Transporta-
15 tion Act of 1979, the Secretary shall promulgate regulations
16 for the issuance of grants under this section. Such regulations
17 shall include provisions governing the amount of any such
18 grants, except that no single grant approved pursuant to this
19 section may exceed \$50,000. Such regulations shall take into
20 consideration the proposed level of State review and the con-
21 tinued development of the proposed facility. Any sums re-
22 ceived by the State in excess of its actual cost shall be re-
23 turned to the Department for further distribution for other
24 grants provided pursuant to this section.

1 "FOREIGN SHIPMENTS

2 "SEC. 117. (a) NOTIFICATION.—Any person, or Feder-
3 al, State, or local government which proposes to accept nucle-
4 ar wastes or commercial spent fuel from any source outside
5 of the United States shall be required to notify the Secretary,
6 at least 90 days before arrival of the nuclear waste or com-
7 mercial spent fuel, of—

8 "(1) the amount, form and quantity of nuclear
9 wastes or commercial spent fuel that will be imported
10 into the United States;

11 "(2) the mode of shipment, the routing, and desti-
12 nation of the shipment; and

13 "(3) a detailed technical description of the safety
14 and other characteristics of the proposed shipping
15 containers.

16 "(b) REPORT.—The Secretary is directed to analyze
17 and report to the Congress within 45 days of any notification
18 made pursuant to subsection (a) of this section on the adequa-
19 cy of the safety and logistical considerations involved in the
20 shipment of such nuclear waste or commercial spent fuel
21 from any source outside of the United States.

22 "(c) SAFETY.—The Secretary is directed to ensure that
23 any foreign nuclear waste or commercial spent fuel that is
24 shipped to the United States from a source outside of the
25 United States is packaged in containers that are licensed or

1 certified by the Secretary to be safe for shipment within the
2 United States. The Secretary shall also ensure that the ship-
3 ment procedures for any such containers are consistent with
4 those for such shipments within the United States.”.

5 SEC. 6. Section 109(e) of the Hazardous Materials
6 Transportation Act (49 U.S.C. 1808(e)) is amended by—

7 (1) striking “and” at the end of paragraph (5)
8 thereof;

9 (2) redesignating paragraph (6) as paragraph (10)
10 thereof and inserting after paragraph (5) thereof the
11 following new paragraphs:

12 “(6) a review of the safety requirements associ-
13 ated with the shipment of nuclear wastes, commercial
14 spent fuel, and other radioactive materials, and recom-
15 mend action for any safety-related research or changes
16 in shipping mode or procedure which might signifi-
17 cantly enhance the safety and security of such ship-
18 ments;

19 “(7) a compilation of shipment data (including
20 number of accidents, number and volume of nuclear
21 waste, commercial spent fuel, and other radioactive
22 material shipments), and other information that can aid
23 risk assessment, can be used for improved container
24 and vehicle design, or can indicate changes in proce-

1 dures and practices which would make significant im-
2 provements in the safety of shipments;

3 “(8) recommendations for Federal routing guide-
4 lines or requirements which might alleviate the need
5 for State and local governments to place additional re-
6 strictions on shipments of nuclear waste, commercial
7 spent fuel, or radioactive materials;

8 “(9) an assessment of the Nation’s inventory of
9 containers, packages, and vehicles that are suitable for
10 the shipment of nuclear waste or commercial spent fuel
11 and a comparison of this inventory with the projection
12 of future shipment requirements; and”.

13 SEC. 7. Section 118 of the Hazardous Materials
14 Transportation Act, as redesignated by section 5 of this Act,
15 is amended by—

16 (1) inserting “(a)” immediately before the first
17 sentence thereof; and

18 (2) adding at the end thereof the following new
19 subsections:

20 “(b) There are authorized to be appropriated to the Sec-
21 retary not to exceed \$3,500,000 for each of the fiscal years
22 1980, 1981, and 1982 for the purposes of sections 115 and
23 117 of this title.

24 “(c) There are authorized to be appropriated to the Sec-
25 retary not to exceed \$2,500,000 for each of the fiscal years

- 1 1980, 1981, and 1982, for the purposes of section 116 of this
- 2 title.”.

COMPTROLLER GENERAL OF THE UNITED STATES,
Washington, D.C., June 19, 1979.

Hon. HOWARD W. CANNON,
Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate.

DEAR MR. CHAIRMAN: Your letter of March 13, 1979, requested our views on Senate bill 535, the proposed "Nuclear Waste Transportation Safety Act of 1979." The purpose of the bill, which would amend the Hazardous Materials Transportation Act of 1974, is to enhance safety and simplify regulation of nuclear waste and radioactive commercial spent fuel transportation by assigning principal regulatory responsibility to the Department of Transportation. The Department would consult with the Nuclear Regulatory Commission as appropriate.

Senate bill 535 would not, in our opinion, result in any measurable improvement on safety and simplified regulation of nuclear waste and radioactive commercial spent fuel transportation. In fact we believe the bill would require the Department of Transportation to compile transportation shipment data which closely duplicates data now collected and maintained by the Department of Energy.

Senate bill 535 would also require the Secretary of Transportation to develop and submit to the Congress a national emergency response plan for dealing with nuclear waste, commercial spent fuel, or other radioactive material transportation accidents. In a May 7, 1979, report to the Congress on nuclear materials transportation we concluded that the new Federal Emergency Management Agency should assume the responsibility for making policy and coordinating radiological emergency response planning for nuclear transportation accidents.¹ This is consistent with that agency's charter as the focal point for all Federal emergency preparedness and response activities. Thus, in our view, the Federal Emergency Management Agency should be the lead Federal agency for developing a national nuclear materials transportation emergency response plan.

Our detailed comments are presented in the enclosure to this letter.

Sincerely yours,

ROBERT F. KELLER,
Deputy Comptroller General.

Enclosure.

SPECIFIC COMMENTS ON SENATE BILL 535

SECTION 2

The bill assigns the Department of Transportation principal responsibility for ensuring the safety and security of nuclear waste and radioactive commercial spent fuel transportation. Throughout the remaining sections, however, the bill is silent with respect to the Department's security-related responsibilities.

SECTION 4

The bill's requirement that the Secretary designate commercial spent fuel and transuranic waste as "hazardous waste" is unnecessary. "Radioactive Materials," which include spent fuel and transuranic waste, are already designated as hazardous materials in Department of Transportation regulations.

SECTION 5

Nuclear materials transportation

Responsibilities.—The designation of responsibilities does not appear to change the present division of responsibilities between the Department of Transportation and the Nuclear Regulatory Commission.

Emergency response plan.—The bill requires the Secretary of Transportation to submit to the Congress a national response plan to deal with radioactive material transportation emergencies. In our view, the new Federal Emergency Management Agency should have overall responsibility for developing a radioactive materials transportation emergency response plan in consultation with other Federal, State, and local government agencies. Furthermore, as the focal point for all Federal emergency preparedness and response activities, the Federal Emergency Management agency, rather than the Department of Transportation, should make recom-

¹We made a similar recommendation with respect to emergency response planning around fixed nuclear facilities in our March 30, 1979, report "Areas Around Nuclear Facilities Should be Better Prepared for Radiological Emergencies" (EMD-78-110).

mentations for emergency response program funding or other assistance to local governments, and should administer such funds.

Shipments within States; State grants

Notification.—The bill would require persons proposing to develop a long-term storage or disposal facility, including a test facility, to notify the Secretary of Transportation who in turn must notify State Governors, of the States within which nuclear wastes or commercial spent fuel will be shipped during transport to the facility. We would point out that the list of States within which nuclear and commercial spent fuel wastes might be shipped to a proposed disposal site would likely include all States within a very large geographic region of the country. This is because nuclear waste includes a wide variety of materials such as contaminated laundry and supplies from hospitals and universities.

Administration of State grants.—The bill would authorize the Department of Transportation to grant States up to \$50,000 to review the safety and logistics of nuclear waste or commercial spent fuel shipments within States as a result of a proposed storage or disposal facility. States should not, we believe, be permitted to spend Federal funds to review the safety of proposed nuclear waste or commercial spend fuel shipments; these matters are more properly the responsibility of the Department of Transportation and the Nuclear Regulatory Commission. Furthermore, because nuclear waste and commercial spend fuel shipments might pass through several States enroute to a proposed storage or disposal facility, we believe a Department of Transportation routing regulation, developed in close cooperation with States, is preferable to individual State routing requirements developed under a Federal grant program. The Department of Transportation is now preparing a routing regulation for radioactive material shipments. It does not expect to complete this regulation, however, for at least another year. Furthermore, the Department is not aggressively seeking the views of affected State governments in developing the regulation.

Foreign shipments

Notification, report, safety.—The bill directs the Secretary of Transportation to ensure that foreign nuclear waste or commercial spent fuel shipments are packaged in containers licensed or certified by the Secretary, and that shipment procedures are consistent with those for shipments within the United States. We believe this requirement is unnecessary, because the former requirement is now covered in the Nuclear Regulatory Commission import licensing proceedings, and the latter is already the Department's responsibility. Furthermore, from a safety and logistics standpoint, we see no need for prior congressional notice of foreign nuclear waste or commercial spent fuel shipments to and within the United States.

SECTION 6

The bill requires the Secretary of Transportation to review safety requirements and recommend safety improvements, and to compile data on shipments and shipment capabilities. To a large extent, the Department of Energy is already assessing this country's inventory of transportation containers and vehicles and comparing it to projected future requirements. Thus a requirement for such an effort by the Department of Transportation would duplicate the Department of Energy's ongoing efforts in this area.

EXECUTIVE OFFICE OF THE PRESIDENT,
COUNCIL ON ENVIRONMENTAL QUALITY,
Washington, D.C., July 19, 1979.

HON. HARRISON H. SCHMITT,
U.S. Senate,
Washington, D.C.

DEAR SENATOR SCHMITT: I am pleased to provide to you the views of the Council on Environmental Quality regarding S. 535, the Nuclear Waste Transportation Act of 1979.

The proposed legislation would designate the Department of Transportation as the lead agency for regulating the transportation of nuclear waste and commercial spent fuel. In this regard, we would note that the relationship between the two agencies responsible for regulating transportation of nuclear wastes, i.e. the Nuclear Regulatory Commission and the Department of Transportation, is set forth in a Memorandum of Understanding, and that this memorandum is currently being revised by these agencies. We believe this should be taken into account if any action

is taken on S. 535. However, we defer to DOT as to whether or not the bill is necessary.

The bill has a number of provisions which are commendable and generally consistent with the findings and recommendations in the Final Report to the President by the Interagency Review Group on Nuclear Waste Management, which was published in March, 1979. The bill assigns to the Department of Transportation the responsibility to develop, in cooperation with State and local governments, an emergency response plan to cope with emergency situations and the authority to assist states to allow them to carry out an independent analysis of any plan to develop a waste or spent fuel facility. The IRG Report contains similar recommendations of this type.

The IRG Report also recognizes the importance and need to improve State and local involvement in Federal decisions regarding nuclear waste management.

Thank you for the opportunity to comment on the proposed legislation.

Sincerely,

GUS SPETH, *Acting Chairman.*

DEPARTMENT OF ENERGY,
Washington, D.C., July 26, 1979.

Hon. HOWARD W. CANNON,
*Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in further reply to your letter of March 13, 1979, requesting the comments of this Department on S. 535, a bill "to regulate commerce by providing for the safe transportation of nuclear waste and radioactive nuclear reactor fuel, and for other purposes."

While the Department of Energy supports the stated intent of S. 535 to enhance safety and simplify regulation, we believe that enactment of the bill is unnecessary because it would duplicate existing legislation and regulatory authority.

We feel a good deal more needs to be done to deal with incidents involving all hazardous materials being utilized in our society. It is particularly important that programs be established to provide training at the State and local levels to deal with emergency situations involving hazardous materials. We share your interest in assuring that adequate response capability exists to cope with emergencies.

As was indicated in the report to the President by the Interagency Review Group (IRG) on Nuclear Waste Management, which was published March 1979, the premise was accepted that emergency planning and response are primarily State and local agency functions. However, it was recognized that many localities do not have the capability and resources for adequate preparation and planning. The IRG recommended greater Federal assistance with the expectation that this would be implemented primarily through the existing framework of the Interagency Radiological Assistance Program. The IRG recommended that the Department of Transportation (DOT), rather than the Nuclear Regulatory Commission, be assigned the lead responsibility for assisting States in planning and training. DOT is currently expanding its capability to provide emergency information on all hazardous materials. In the event that the Congress decides to take action on the bill, we have enclosed detailed comments for your consideration.

The Office of Management and Budget has advised that there is no objection to the presentation of this report from the standpoint of the administration's program. If we can be of further assistance, please let us know.

Sincerely,

JOHN M. DEUTCH,
Acting Under Secretary.

Enclosure.

COMMENTS ON S. 535

a. The Department of Transportation (DOT) already exercises the responsibility described in Section 2 of the bill. Furthermore, DOT fulfills its responsibility at present by consulting with the Department of Energy (DOE), as well as the Nuclear Regulatory Commission (NRC).

b. Section 4 of the bill, designating commercial spent fuel and transuranic waste as hazardous materials, is unnecessary because this designation has already been applied in Title 49, Section 173-389 of the Code of Federal Regulations.

c. Section 5, which would require notification to DOT and subsequently to the States of proposed long-term storage or disposal facilities for nuclear waste or

commercial spent fuel, is unnecessary because mechanisms already exist which dictate such notification.

d. The provision in Section 6 which would require annual recommendations by the Secretary of DOT to the President on routing guidelines for shipment of nuclear waste, commercial spent fuel, or radioactive materials, is unnecessary because the control of routing of hazardous materials is already within the purview of DOT, and DOT routinely reexamines this matter and the need for updating of routing rules. DOT is presently developing Federal guidance in this area through proposed rule-making action (Docket HM-164, "Highway Routing of Radioactive Materials"). Moreover, the new paragraph (8) to be added by Section 6 (beginning on line 3, page 10) may imply Congressional sanction of a State authority in regulation of interstate commerce which may not exist under present law. We believe the State role in such regulation is a subject which is both sensitive and important. Therefore, changes in existing law should be made after careful examination of the benefits and adverse effects of altering the present balance between State and Federal jurisdiction.

e. As defined, "shipment" would pertain to the movement of nuclear waste, commercial spent fuel, or radioactive material within many non-NRC licensed facilities such as DOE facilities, private and government shipyards, and pharmaceutical manufacturing plants. Such broad applicability of the bill is inappropriate.

DEPARTMENT OF STATE,
Washington, D.C. July 26, 1979.

Hon. HOWARD W. CANNON,
*Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate.*

DEAR MR. CHAIRMAN: The Department of State welcomes the opportunity to comment on S. 535, the Nuclear Waste Transportation Safety Act of 1979. Our remarks will be confined to the provisions of foreign shipment of nuclear wastes and commercial spent fuel, contained in Section 103 and 117 of the bill.

We are somewhat unclear as to the intent of the requirement in proposed Section 117 (b) for reporting to the Congress. If the reason for the reporting is to notify the Congress of an impending shipment of spent fuel under the President's policy for acceptance of limited amounts of spent fuel for non-proliferation reasons, this would be duplicative of the Congressional review provisions of Section 131 f. of the Atomic Energy Act of 1954, as amended by the Nuclear Non-Proliferation Act of 1978.

We are also concerned about the possibility of provisions for emergency shipments of spent fuel. If Section 117 is retained, we think that it would be important to include a clause that allows the Secretary, in cases of emergency, to accept material from foreign sources with less prior notification. We note that Section 131 f. (2) of the Atomic Energy Act of 1954, as recently amended by the Nuclear Non-Proliferation Act of 1978, provides in cases where the President determines and notifies the Congress that the storage of certain quantities of foreign spent fuel is "required by an emergency situation" and that it is "in the national interest to take such immediate action" that the 60-day Congressional review procedure is not applicable. It would seem advisable that this bill provide for a similar emergency procedure.

Current international regulations which are reflected in the Department's hazardous materials regulations require that shippers give notice to countries through which certain shipments of radioactive materials will travel fifteen days before the shipment begins. Therefore, the Department of Transportation already receives advance notification for all radioactive materials import shipments, including those covered by the S. 535. Imposition of a ninety-day requirement as prescribed in proposed section 117(a) will create an inconsistency between our domestic and international regulations, with the effect being a greater burden on shippers who must be aware of the varying requirement.

Finally, spent foreign research reactor fuels have, as you may know, been successfully returned to the United States over the years without problems. If this process were to become uncertain in the future, it would undercut our non-proliferation goal of recovering these types of materials. Thus, we would not like to see any impediment to the Department of Energy's current ability to provide transportation, on an expeditious basis, for the return to the United States of spent fuel from foreign research reactors, and we believe the bill should apply specifically only to commercial power reactors as in Section 131 f. Accordingly, we suggest insertion of the word "power" after the word "commercial" in Section 103 (2).

The Office of Management and Budget advises that from the standpoint of the Administration's program, there is no objection to the submission of this report.

I hope that the Committee will find these comments of use.

Sincerely,

J. BRIAN ATWOOD,
*Acting Assistant Secretary
for Congressional Relations.*

OFFICE OF THE SECRETARY OF TRANSPORTATION,
Washington, D.C., August 9, 1979.

Hon. HOWARD W. CANNON,
*Chairman, Committee on Commerce, Science and Transportation,
U.S. Senate, Washington, D.C.*

DEAR MR. CHAIRMAN: Your Committee has requested the views of the Department of Transportation concerning S. 535, a bill "To regulate commerce by providing for the safe transportation of nuclear waste and radioactive nuclear reactor fuel, and for other purposes."

The bill would designate the Department of Transportation as the lead agency for regulating the transportation of nuclear waste and commercial spent fuel. In addition, it would amend the Hazardous Materials Transportation Act (HMTA) (49 U.S.C. 1801-1811) to require the Department to develop a national emergency response plan for dealing with radiological emergencies in transportation; to establish a State grant program to fund independent safety analysis and review of transportation aspects of any proposal to develop a long-term storage facility for spent fuel or nuclear waste; and to review safety and logistics of foreign shipments of spent fuel before acceptance by the United States.

The Department supports the concepts of S. 535 in recognizing the need for State involvement in planning, for transportation emergency preparedness, for better forecasting of transportation requirements, and for assurance of overall safety in the transportation of nuclear waste and spent fuel. However, of the authorities provided in S. 535, only the grant provisions are not currently conveyed to the Secretary under the HMTA, enacted in 1975. In addition, it is not clear that all of the provisions, particularly the reporting requirements, of S. 535 would improve the Department's ability to ensure public safety. For these reasons, we believe the bill is unnecessary.

Should the Congress decide that action on the bill is desirable, the Department believes that a number of changes to the bill would be needed if it is to be compatible with the hazardous materials safety program now conducted under the authority of the HMTA.

Proposed section 115(a) of the HMTA assigns the Secretary primary responsibility for all aspects of the shipment of spent fuel and nuclear waste, except for regulating and certifying packages, which would be the responsibility of the Nuclear Regulatory Commission (NRC). Assignment of these functions differs from the division of responsibilities currently set out in a Memorandum of Understanding between the Department and NRC. Under that agreement, the Department is responsible for prescribing packaging regulations for all Low Specific Activity radioactive materials and for smaller quantities of other radioactive materials. The NRC sets packaging standards for fissile materials and for larger quantities of radioactive materials. The NRC also is responsible for issuing regulations for safeguards and other transport controls over its licensees to assure common defense and security. The Department believes this section should reflect the existing relationship developed between the two agencies. A suggested change to this section would be—

"... commercial spent fuel, except that this responsibility may be carried out in conjunction with the Nuclear Regulatory Commission according to agreement of the Secretary and the Nuclear Regulatory Commission."

We are also unclear as to the drafters' intent regarding "logistical aspects" of shipments. If this is to mean ensuring an adequate supply of packages and vehicles, arranging for shipments, and generally managing the transportation of nuclear waste and spent fuel, the Department considers these promotional activities to be an inappropriate addition to its hazardous materials safety regulatory program.

The Department supports the need for emergency response planning at the State and local levels. Through the existing Interagency Radiological Assistance Program, under the lead of the NRC, the Department now participates in providing planning assistance to States. As a result of the Interagency Review Group on Nuclear Waste Management's (IRG) examination of the transportation issues, the IRG's March 1979 Report to the President recommends transferring the lead for radiological incident planning for transportation to this Department. A related Departmental project scheduled for completion later this year is a checklist and guidelines for

States to follow in developing and implementing radiological transportation incident plans.

We are deferring our comments on the grant program set up in proposed section 116, which would permit States to use Federal funds for one-time planning related to site selections for waste storage and disposal facilities, pending completion of an on-going Departmental review of this subject. We recognize that States may need Federal assistance for their programs but believe that the Federal government must carefully weigh the costs of such assistance and the benefits in terms of enhanced safety. In addition, the Department's current rulemaking proceeding on highway routing of radioactive materials is likely to affect the Federal-State relationship and may lead to more State involvement. A notice of proposed rulemaking is scheduled for next month and a final rule in July 1980.

The Department and NRC contract on an ad hoc basis with a limited number of States (five currently, with the anticipated addition of five more) to perform surveillance of radioactive shipments. This program is mutually beneficial since the States provide the two agencies with data on package performance and radiation exposure, and the States obtain information about shipments moving through their jurisdictions. The IRG in its March 1979 Report to the President recommended that the Department and NRC review this existing State program with a view toward expanded participation and additional Federal funding. Present plans are for the Department to spend approximately \$150,000 for this program in fiscal year 1980.

Proposed section 117(a) of the HMTA would require specific information to be provided to the Secretary by any person, or Federal, State or local government "which proposes to accept nuclear wastes or commercial spent fuel from any source outside the United States. . . ." The purpose of this notification is so that the Department may carry out proposed section 117(b). This section would require DOT to analyze the shipment in terms of safety and logistical considerations and report to Congress.

The Department is unclear as to the intent of the requirements contained in these proposed provisions. Logistical aspects of shipping are not generally part of DOT's safety concerns; and to the extent that all regulatory requirements are met, every shipment would be adequate in terms of safety. If the intent of proposed sections 117(a) and (b) is to notify the Congress of an impending shipment of spent fuel under the President's policy for acceptance of limited amounts of spent fuel, this would appear to be duplicative of the Congressional review provisions of section 302 of the Nuclear Non-Proliferation Act of 1978.

Proposed section 117(c) is troublesome in that it could significantly change the relationship which has been developed with other member countries of the International Atomic Energy Agency. Within the spirit of the international regulations, the Department, as the national competent authority, reviews documentation and certification received from the competent authority of the exporting country to ensure that the containers and procedures proposed for the foreign shipment provide an equivalent level of safety to those of domestic shipments. The language of this section could be interpreted as an inflexible requirement that import shipments be subjected to administrative approval procedures identical to those for domestic shipments, thus nullifying the international relationships now existing. To correct this situation, this section could read—

" . . . certified by the Secretary to be safe for shipment. The Secretary shall also ensure that the shipment procedures for any such containers provide an equivalent level of safety as such shipments within the United States."

To implement paragraphs (7) and (9) of section 6 of S. 535 (proposed sections 109(e)(7) and (9) of the HMTA) would involve imposing additional reporting requirements on the shipping industry and the container and vehicle manufacturing industries. Given the possible economic implications of such requirements, plus the unconfirmed contribution to safety, consideration should be given to less than annual updates to such information or to the use of sampling data to achieve the objective.

The remaining two paragraphs of section 6 of the bill, (6) and (8), address reviews which are already central to the Department's hazardous materials safety program. Further, the routing recommendations in (8) are also the subject of the current regulatory proceeding mentioned above.

Technical comments regarding several definitions proposed in the bill are submitted as an enclosure to this letter. The Department is committed to ensuring the safe transportation of all hazardous materials, including radioactive materials, and would be pleased to assist your Committee in drafting specific revisions to S. 535, should you decide that action on the bill is desirable.

The Office of Management and Budget advises that from the standpoint of the Administration's program there is no objection to the submission of this report for the consideration of the Committee.

Sincerely,

MARK G. ARON,
Deputy General Counsel.

Enclosures.

TECHNICAL AMENDMENTS: S. 535

1. In proposed section 103(1) the definition of "commerce" omits three words found in the Hazardous Materials Transportation Act. It should read: "... or transportation, within the jurisdiction of the United States, . . ."

2. The definition of "emergency situation" at proposed section 103(3) should be deleted. As written, it narrows the term to only situations involving nuclear waste or commercial spent fuel, even though where used in proposed section 115(b) emergency situations may involve "other radioactive material." Further, this usage could be confused with "emergency" as used in reference to exemptions in existing section 107(d). It would be preferable to include the explanation found in proposed section 103(3) in the operational provision, proposed section 115(b).

3. A radioactive content of 2 nanocuries per gram as the absolute floor for defining what constitutes a radioactive material is unnecessarily low. It would include within that definition many common commercial and household items such as luminous timepieces, smoke detection devices, electron tubes, gauges and calibration sources. Such items are now exempt from special packaging, labeling, and marking regulations. Consistent with that current regulatory practice, it is recommended that proposed section 103(6) be amended to read as follows:

"(6) 'radioactive material' means any material or combination of materials which spontaneously emit ionizing radiation. However, it does not include any material which the Secretary determines is of such a low level of radioactivity that when prepared for and during transportation does not pose a hazard to health or safety."

4. The definition of "shipment" in proposed section 103(9) should be deleted because it would conflict with the existing regulatory use of this word which concerns not just radioactive materials and not just the circumstances described in section 103(9).

Also, the jurisdictional statement hidden in this definition properly belongs in proposed section 115(a). If the intent is to exclude authority over movements within facilities licensed by the Nuclear Regulatory Commission, appropriate exclusion language should be included in the operative section describing the Secretary's responsibilities.

The CHAIRMAN. Senator Heflin, I am delighted to introduce to you Governor Robert List, the Governor of the great State of Nevada, and we're very proud to have him here with us today. Senator HEFLIN. Thank you.

Governor List, we are delighted to have you. As I understand, you are representing the National Governors Association. We would be delighted to hear from you.

STATEMENT OF THE HON. ROBERT LIST, GOVERNOR OF NEVADA, ON BEHALF OF THE NATIONAL GOVERNORS' ASSOCIATION; ACCOMPANIED BY DR. RALPH DISIBIO, DIRECTOR, NEVADA DEPARTMENT OF HUMAN RESOURCES

Governor LIST. Thank you very much, Senator Heflin, Senator Cannon, distinguished members, and staff.

It is a pleasure for me to be here. At the outset, I want to thank you for this opportunity to testify on this proposed legislation. Certainly if this bill or something similar is enacted, it is going to have a very significant impact upon the lives of all American citizens, not just those of the States where these commercial disposal sites are located.

Let me at this point, if I may, Senator Heflin, also introduce to you Dr. Ralph DiSibio, who is the director of the department of human resources of the State of Nevada, seated with me, under whose jurisdiction this particular matter about which I am about to testify, comes within when it occurs within the State of Nevada.

My comments today may necessarily go somewhat beyond the specifics of the bill under consideration by this subcommittee, however I think it is essential to share with you Nevada's experience with respect to commercial disposal of low-level nuclear waste material.

When I speak about Nevada in particular, as indicated, I also represent the views of Governor Dixy Lee Ray, and Governor Richard Riley of South Carolina, the chief executives of the other two States which currently have low-level nuclear waste disposal sites.

I also am authorized to speak on behalf of Governor John Evans of Idaho, who serves as chairman of the Subcommittee on Nuclear Power for the National Governors Association.

I assumed the Office of Governor of our State on January 1 of this year. Previously, as Nevada's attorney general, I was aware of the disposal site in Nevada which is located near the small community of Beatty, about 115 miles north of Las Vegas. It's about 60 miles north of the nuclear testing ground at the Nevada test site. Frankly, I was not totally familiar with the operations of the disposal site, which is operated by a private company, Nuclear Engineering Co., nor with the rules and the regulations which govern the packaging and transportation of radioactive materials.

My real education began on Monday, May 14, at 12 noon. At that time, I learned that the driver of a truck delivering radioactive waste materials from California had reported a fire to representatives of the disposal firm at Beatty.

The driver at that time was sleeping in the cab of his truck during the early morning hours while awaiting personnel to open the gates of the disposal facility. When the fire broke out, he disengaged his truck from the trailer and drove to Beatty, some 10 miles north of the site. Beatty fire-fighting personnel then were dispatched to handle the problem.

Subsequent investigation by the States of Nevada and California, and by the U.S. Department of Energy, determined that the truck was carrying radioactive wastes from several California hospitals, as well as from the Aerojet Corp.

According to the official report, the cause of the fire was—and here I quote—"The spontaneous heat generated by the chemical reaction involving the absorbent laboratory waste materials packaged in cardboard boxes. This conclusion is based on examination of the residual debris from the cardboard boxes and statements from the individuals who opened the trailer and participated in the fire-fighting activities."

The report was dated May 16, 2 days after the incident. In the interim, I had issued an Executive order banning the shipments of radioactive materials from the various hospitals and medical clinics involved, as well as the Aerojet Corp. The embargo also was applied to a firm called Thomas Gray and Associates, which had collected and warehoused the material in southern California.

Concurrently, the California State Department of Health Services ordered Aerojet Corp., to suspend all use of radioactive material except safe storage. This action was taken when it was learned that two metal containers of depleted uranium waste, packaged by Aerojet Corp., and the waste from munitions manufacture, had ruptured at the storage facility maintained by Thomas Gray and Associates.

The ban on all shipments from Thomas Gray and Associates subsequently was modified, but is still in force against the Aerojet Corp.

There are a number of points which I would like to make with respect to the incident which I described and I hope the members of the subcommittee will forgive me if it sounds a little bit like a screenplay from a vintage Keystone Cops comedy.

First, appropriate representatives of the State of Nevada were notified of the fire early on the morning of May 14. They then tried to call the representatives of the Nuclear Engineering Co., the operator of the site, both at Beatty and at Louisville, Ky., which is the company headquarters.

The telephone lines were busy and contact was not made until nearly 10 a.m., some 4 hours after the fire broke out. My office, meanwhile, was not notified until the noon hour and, to add insult to injury, the notification came from a private citizen in the community of Beatty.

Compounding the confusion was the jurisdictional responsibility of the various Federal agencies involved. The Nuclear Regulatory Commission has responsibility for the inspection of the packaging of containers at some 16 collection sites around the Nation, including Thomas Gray and Associates.

But it is the responsibility of the Department of Transportation to safeguard the shipment of radioactive materials on the Nation's highways.

Finally, it is the dual responsibility of the U.S. Department of Energy and the respective States to monitor the level of radioactivity in the event of an accident.

This division of responsibility, to state it charitably, can only lead to confusion—a lesson which the State of Nevada learned the hard way.

In a good-faith effort to eliminate this confusion, Nevada arranged a meeting with the Nuclear Regulatory Commission in Washington, D.C., to discuss the scope of the problem.

I personally attended that meeting which took place on June 4. We received assurances there that the Nuclear Regulatory Commission would immediately begin the inspection of collection sites around the Nation and would coordinate its activities closely with the Department of Transportation.

We were treated with respect and were assured that the Nuclear Regulatory Commission would develop a plan of action within 10 days. But nothing happened. And we ultimately contacted the Nuclear Regulatory Commission again and the Department of Transportation to inquire about the progress. Still nothing.

The abscence of inertia on the part of the Federal agencies finally burst on July 2 when a truck carrying radioactive materials from a

nuclear powerplant in Michigan arrived at the Beatty site with leaking materials seeping out of containers.

The driver of the truck informed authorities that he had first noticed the leakage at a truck stop in Metropolitan Las Vegas. At that time he said he thought it might be rainwater as he had passed through a storm on his way in from Colorado.

Our investigation of this incident disclosed two alarming facts:

First, there were cracks in two of the containers which contained the radioactive sludges;

Second, the shipment included liquid waste material, which was clearly in violation of Federal law and Nevada license law.

Upon learning of that incident, I immediately suspended all shipments to the Nuclear Engineering Co. site at Beatty. And at the same time I determined that the time had arrived to strike some sort of an agreement with the States of Washington and South Carolina in an effort to get the attention of the Nuclear Regulatory Commission and the Department of Transportation.

At this point I would like to make it clear that I do not believe in making political hay by criticizing the Federal Government or its agencies just for the sake of criticism. But I will tell the members of this subcommittee that the Nuclear Regulatory Commission has been totally unresponsive to the public with respect to the nuclear waste problem. Accordingly, I am convinced that this insensitivity represents a grave peril to the health and safety of all of our citizens across the country.

In fairness, I will add that the NRC Commissioners and their staff have exhibited a far more cooperative attitude in the last week. Now I believe this expression of cooperation came about only because of the action taken by me, Governor Ray, and Governor Riley during the annual meeting of the Governors' Association in Louisville last week.

At that meeting, we three Governors created a formal agreement requiring the NRC and the DOT to develop a new plan for the disposal of low-level nuclear waste no later than August 1. This plan, to be enforced by executive orders of the three States, will require for the first time that all generators of nuclear waste certify to the respective States that State and Federal standards have been met. Noncompliance will empower these States to sanction offenders. The maximum sanction will be the closure of the operation of the offending generator. And such closure, if effected, would be honored on a reciprocal basis by the other States with low-level waste management sites.

In addition, the participating Governors agreed to create a tri-State task force to develop regulations requiring every generator of low-level waste to hold a certificate of deposit. Noncompliance would mean revocation of the certificate, and again such revocation would be recognized by all three States.

The plan we require from the NRC and the DOT must include the following:

First, a team of inspectors from the Nuclear Regulatory Commission and the Department of Transportation will randomly examine shipments on site before departure.

Second, a uniform method will be established to report to the States on the results of all inspections of the shipment of low-level radioactive materials.

Third, a national awareness campaign will be implemented informing the more than 9,000 generators of nuclear waste of the new rigorous inspection and enforcement procedures.

And fourth, alternatives to existing national policy will be developed to define the responsibility of other States with respect to the disposal of nuclear waste. Specifically, a plan of action is needed for the regional distribution of low-level waste at various management sites, other than those which currently exist in just three States.

During the last few days, Dr. DiSibio has been in close contact with representatives of the NRC. Out of these discussions have come a number of very affirmative and positive steps.

First, the NRC has agreed to the requirements laid down by the Governors in Louisville. Moreover, the NRC has agreed to process a rule change which would permit its inspectors to thoroughly inspect containers of nuclear material at any point on the Nation's highways. This responsibility currently rests only with the Department of Transportation.

I cannot emphasize too strongly the significance of this agreement by the NRC. The events of the last several weeks have made it clear that NRC and DOT simply are unaware of one another's activities. That impression clearly flows from our meetings and conversations with them.

What is urgently needed is overlapping responsibility which will enable either agency to act promptly in the event of a suspected violation or in the event of an accident involving radioactive material. The buckpassing simply must stop.

As I indicated, the NRC and the DOT have agreed to a joint effort with respect to the examination of packaged materials on our highways. Moreover, they have agreed to place inspectors at Beatty, Nev., on the site at such time as we permit the site to reopen. And as a matter of routine they will act jointly in carrying out periodic spot checks and will be fully prepared to take enforcement action.

This is progress, to be sure, but it is only the beginning. It is my hope that the appropriate committees and subcommittees of Congress will examine a number of priority areas for the purposes of insuring the health and safety of the American people.

Among the possibilities that might be considered would be the modification of the NRC to provide a one-man or one-woman accountability. This accountability I think is desperately needed and it currently does not exist in the multimember body.

I also would respectfully suggest legislation to provide stronger penalties for those who violate the rules governing the disposal of nuclear waste. Such penalties must include a law providing for Federal receivership of properties which are in constant violation.

Perhaps most importantly I believe all of the Nation's Governors would strongly support legislation which clearly defines the responsibilities of Federal agencies involved in the disposal of radioactive waste. We simply cannot rely upon informal agreements or rules and regulations.

This problem does not merely affect the States of Nevada, Washington, and South Carolina; it is a national problem with national ramifications.

I would commend to you the fact that virtually every county in America has low-level nuclear waste. It comes from thousands of hospitals and thousands of clinics and it is transported every day on our national highway system.

If I could choose one word to characterize Nevada's experience with nuclear waste, that word would be "lucky." The two accidents which occurred at Beatty could very well have occurred on the open highway or in congested metropolitan areas.

Had this been the case, you might very well have been faced with a national tragedy. The risk is too enormous to be tolerated. Action is needed and it is needed now.

Should inaction continue, we three States are prepared to close our facilities. Such closure would cripple the health care delivery systems of this country, wreak havoc with a major source of energy, and have ramifications which no domestic summit could solve.

Ladies and gentlemen, this concludes my testimony. Your kind attention to my remarks is appreciated, and I would be pleased to respond to any questions that you might have.

Senator HEFLIN. Thank you, Governor List.

Senator Cannon, would you like to ask some questions?

The CHAIRMAN. Well, thank you, Mr. Chairman.

Governor, since you wrote your strong and, I might add, very justifiably strong letter to Secretary Adams and Chairman Hendrie, has their response been reassuring to you as to the steps they will take to enforce safety regulations applicable to the commercial low-level nuclear waste shipments?

Governor LIST. They have verbally agreed to each of the points that we insisted upon, and I will be meeting this afternoon with Chairman Hendrie again to formalize that understanding. And certainly that is reassuring. It's long overdue.

The CHAIRMAN. And they will meet the suggestions that you made in your statement here?

Governor LIST. They have informed us that they will, Senator, yes, sir.

The CHAIRMAN. Now you referred to certain things that must occur before you would open the facility. Have you in fact already opened the facility now?

Governor LIST. No; I have not. Before we open it, we are going to insist upon the providing of the certificates by the generators and by the brokers and by the trucking firms that are bringing the material in, in addition to the assurances from the NRC.

I might further add that the Nuclear Engineering Co. has agreed to purchase for the State of Nevada some \$30,000 worth of equipment which will be installed in six highway patrol vehicles, and which will be used to detect radioactive materials on the highway. It's highly sophisticated equipment which has a range that enables it to pick up even low levels of radioactive waste if the contamination is taking place.

So there are a number of steps that are being taken in conjunction with the potential reopening. We expect that it's conceivable

that it could be reopened by next week, if all of those components fall into place.

The CHAIRMAN. How long do you feel the suspension of activity at the Beatty shallow disposal facility could go on before resulting in the layoff of people employed there?

Governor LIST. Probably not much longer. The point is, though, I think, in addition to the economic ramifications for those employed at the site, is that the other three sites are also prepared to close down unless these conditions are met.

So we're talking about economic ramifications in each of the three sites, plus the major wave effect that it will have across the country insofar as there will then be no sites whatsoever where these items can be shipped.

The CHAIRMAN. Do you have any estimate as to how long it will be before you would be able to reopen the site there?

Governor LIST. We're hopeful that it might be opened, if those conditions are met, by next week.

The CHAIRMAN. Thank you, Mr. Chairman.

Senator HEFLIN. We're pleased that Senator Harrison Schmitt has arrived. He had to testify at another committee. He is very much interested in this.

Senator Schmitt, would you like to make a statement at this time?

OPENING STATEMENT BY SENATOR SCHMITT

Senator SCHMITT. Governor List, I first of all want to thank you for your excellent testimony, and I will have a question or two for you in a moment. If I may, I would like to make a brief statement.

Mr. Chairman, it is clear that the safe management of nuclear waste is one of the most difficult and emotional policy issues that faces our Nation.

Being from New Mexico, and being still concerned about the waste isolation pilot project that is under consideration for that State, I think I have been exposed to concern over this issue far more than I would have wanted to be exposed to it in the first few years of my stay in the Senate.

Thirty-five years of nuclear weapons development, and a growing commercial nuclear power industry have left a legacy of nuclear byproducts, or nuclear resource, depending on your perspective, that must be safely and wisely managed.

Once we establish comprehensive nuclear waste management programs, transportation will be the link in the waste management chain that has the highest public visibility and highest public exposure.

Up until now, the safety record for transportation of radioactive materials has been very good. Nevertheless, the committee's hearings on nuclear waste management of the last Congress revealed gaps and overlaps of responsibility for regulating the safe transport of radioactive materials.

These inadequacies could cause serious problems as the volume of shipments increases in the near future, no matter what decisions we may make on the management of these wastes.

Testimony during the committee's August 16, 1978, hearing motivated my cosponsors and myself to introduce the Nuclear Waste

Transportation Safety Act of 1979. This proposed legislation clarifies the lines of responsibility for transportation of nuclear waste, mandates the development of an emergency response plan to deal with accidents, and provides grants for States that are impacted by large volumes of shipments of nuclear waste, whether they're to reside in that State or just passing through.

Recent events at the Three Mile Island nuclear powerplant underline the need to emphasize caution and safety in all aspects of the nuclear fuel cycle. These events also emphasized the need to establish, evaluate, and reevaluate the equipment design, operating procedures, and emergency procedures before problems occur rather than as they occur or after they have occurred.

The equipment and operator failures that occurred at Three Mile Island point to the need to anticipate the unanticipated by proper design, training, operation, and emergency planning and response. This is done routinely in many more complex endeavors, including space flight, major defense activities, and commercial air transportation.

Although they are probably less dangerous than shipments of other hazardous materials, such as chlorine and LNG, shipments of nuclear material do pose a risk, as well as a high public perception of risk. Accidents involving radioactive materials have occurred and will continue to do so. Most will be minor, but the possibility of a serious accident remains in the public mind.

In the area of radioactive materials transport, the Commerce Committee is attempting to anticipate problems that could occur and provide the mechanism for responding to them.

Mr. Chairman, the administration has completed a yearlong review of many aspects of nuclear waste management, including transportation. We are all anxiously awaiting the comprehensive waste management policy that will follow from this extensive study. Mr. Chairman, I do have a letter that I just received from Frank Press' office, signed by Phil Smith, that deals with this problem, and I would make that a part of the record of these hearings.

[The letter follows:]

EXECUTIVE OFFICE OF THE PRESIDENT,
OFFICE OF SCIENCE AND TECHNOLOGY POLICY,
Washington, D.C., July 17, 1979.

HON. HARRISON SCHMITT,
U.S. Senate,
Washington, D.C.

DEAR SENATOR SCHMITT: Dr. Press has asked that I reply to your request for OSTP comments on S. 535. We share your view that the transportation of nuclear waste is a critically important component of the overall nuclear waste problem and assailable national issue. For this reason the IRG carefully addressed the full range of nuclear waste transportation issues. A special Subgroup, chaired by the Department of Transportation, was constituted for that purpose. In addition, OSTP acting as an agent for the IRG led an interagency exercise that examined the regulatory processes of and jurisdictional overlap among the several Federal agencies with regulatory responsibility in the area of nuclear waste.

As a result of these reviews, the IRG has recommended that several actions be taken relevant to those aspects of nuclear waste transportation that fall within the Federal government's responsibility. These include the following:

A coordinated program is required for testing and evaluating the performance of current and future generation packaging systems during accidents.

DOT, with assistance from other agencies and industry should develop a data bank on shipment statistics and accident experience.

DOT should take the lead in expanding Federal assistance to states and localities in the development of capability for handling emergencies.

An advisory group on nuclear waste transportation should be established, possibly by the proposed State Planning Council.

The IRG's review of the current statutory authority and regulatory overlap in the area of nuclear waste transportation led to the conclusion that considerable overlap in authority does exist between DOT and NRC. However, neither this overlap nor the ongoing relationship between the two agencies in the management of day to day activities was found to result in serious problems. The two agencies worked well together in the past. In order to coordinate and rationalize their relationships further, DOT and NRC recently signed a revised Memorandum of Understanding between them. It was the judgment of the IRG that the division of responsibility embodied in this MOU is reasonable and that no further action is required either to alter or to clarify their relationship.

In light of the foregoing and because we expect that the IRG's recommendations in the area of nuclear waste transportation will be adopted by the President and implemented successfully by the Federal agencies, it is our belief that S. 535, despite its laudatory objective is not necessary. Of course I would understand a feeling on the part of your Committee that the relationship among the Federal regulatory agencies dealing with nuclear waste transportation should be written into legislation. If such a course must be followed, I would strongly recommend that the Congress use the recent DOT-NRC Memorandum of Understanding as a guide.

Sincerely,

PHILIP M. SMITH,
Associate Director,
Natural Resources and Commercial Services.

Senator SCHMITT. Nevertheless, the long delays that are inherent in the legislative process make it appropriate that the Commerce Committee hold hearings on this bill, S. 535, which covers the transportation aspects of nuclear waste management.

I view the Nuclear Waste Transportation Safety Act that is before us today as a good draft. It will be perfected in response to the valuable testimony which we will receive in the next few days.

With this in mind, I hope that the witnesses will comment as appropriate on the following questions:

1. Should any portion of the bill be extended to include all, or nearly all, radioactive material?
2. Should a separate office be set up in the Department of Transportation to administer the responsibilities of the bill?
3. Should the State grant program contained in the bill be modified so that it is of more direct benefit to those States that are or will be heavily impacted by the transportation of nuclear waste to repositories in their boundaries or in neighboring States?
4. Is the Department of Transportation the most appropriate lead agency for regulating the safety of radioactive shipments? Or would the Nuclear Regulatory Commission or some other agency do a better job?
5. Should radioactive materials be treated as a subclass of other hazardous materials? Or are there specific reasons to single them out for special treatment?

6. What is the real level of risk we face today and may face in the future if we do nothing?

Now, Governor, I would like to draw your attention specifically to the question of the appropriate agency of responsibility. You have had considerable experience in this. I know your testimony has treated that, and I apologize for not being here for the beginning. But could you summarize again your feeling about what agency of the Federal Government do you think is best qualified, or would be most appropriately designated as the responsible agency?

Governor LIST. Thank you, Senator.

It is my judgment that there should be a lead agency, and probably it should be the Department of Transportation. I also feel that there should be overlapping authority on the part of the NRC, so that in the event of an incident or a reported problem, that it would not be the exclusive domain of the DOT, and that then in fact the NRC could exert its jurisdiction.

We see no difficulty with overlapping sort of responsibility. And in fact, that would be far superior to the present exclusive nature of each agency, depending upon where the material happens to be, at the moment.

Senator SCHMITT. But you would, I presume, support having that overlap fairly specifically defined, so that there would not be any question who was responsible for seeing that the appropriate actions were taken in the event of an accident or potential problem?

Governor LIST. That is correct.

The overlap that I refer to is not so much for the purpose of determining who was responsible for sanctions that might be applied, but rather I believe that either agency should have the authority to inspect, to open packages, to conduct investigations in the event of a reported violation, immediately.

Senator SCHMITT. In the testimony last year we received on this subject, former Governor Edwards testified that the Governors Association's policy was to support this concept of the lead Federal agencies. Is your understanding that that still is their—

Governor LIST. Yes. I have a copy of that policy here, and that remains unchanged.

Senator SCHMITT. Is it your understanding that they favor the Department of Transportation as the lead agency?

Governor LIST. That is correct.

Senator SCHMITT. Do you think that it is appropriate to single out radioactive materials for special treatment? Or should we be thinking of it always as a subclass of other hazardous materials?

Governor LIST. I think it requires special expertise. I could envision, though, a section or an agency within DOT dealing with hazardous materials and radioactive materials jointly, insofar—or so long as there is a group of individuals within that office who would deal specifically with radioactive jurisdiction.

Senator SCHMITT. But you do believe that it is special enough, though, we must keep it in mind specifically and not just generally look at all hazardous materials?

Governor LIST. Yes, I do. Senator.

Senator SCHMITT. As a uniform category?

Governor LIST. Absolutely.

Senator SCHMITT. Of course I am sure we all recognize that at the present time—and maybe continuing into the future indefinitely—the risk to the population is much greater from other materials—chlorine, natural gas, and so forth.

Governor LIST. It's a perceptual problem.

Senator SCHMITT. Exactly.

Governor LIST. We also—

Senator SCHMITT. You would agree with that statement that I made earlier that a great deal of what we are dealing with is

perception—although there is some theoretical risk to the population.

Governor LIST. I think it's an actual and a real risk in dealing with low-level—so-called low-level radioactive materials. Certainly these sludges, for example, that were involved in our most recent incident could be highly damaging, and at the same time I recognize that other toxic materials, other forms of hazardous wastes compose a very real threat of a different nature, and that too has to be addressed.

Senator SCHMITT. Finally, Governor, do you have comments on the State grant program? And specifically, should it be focused in some way, taking into account the actual need of the State?

Governor LIST. I think it should. As the bill is presently written, as you know there is a specific authority there for a State to apply for a grant up to, I think, \$50,000, but it seems to me that each State's situation might be different and the need might be different.

The States which have disposal sites, for example, find themselves as sort of being at the hub of the activity with the greater amount of traffic honing in on them. Some States have relatively few miles of highway over which the material is transported. Some States have interstate systems, and perhaps others do not. Some States are "bridge States," so-called bridge States, through which heavy amounts of material is transported constantly back and forth.

And so I think that the grant should be adjustable to the specific situation.

Senator SCHMITT. Do you have any advice to the committee on what we should say in legislation? Or should we let that be the subject of detailed procedures to be worked out by the Department?

Governor LIST. I suppose the procedures—the details of the procedures would have to be worked out administratively; perhaps some guidelines with respect to standards, recognizing the States that have disposal sites have special needs, recognizing miles of highway system, public highways, as a factor to be considered. Those two, certainly.

Senator SCHMITT. Could I ask you to do some further thinking on this, and maybe consulting with some of your colleagues, and if you have additional ideas would you transmit them to the committee?

Governor LIST. I would be pleased to, Senator.

Senator SCHMITT. Because I think that's something we really must do, if we're really going to get the maximum benefit out of the taxpayers' dollars to be made available for this, then we should focus them on some system of priorities.

A State without nuclear reactors or without any significant nuclear materials in use which is not going to be a repository which is not in a transportation route to a repository, probably does not have a great call on the resources of the taxpayer for this purpose.

And the other extreme of course is to a State like yours or mine where clearly we have repositories. We are getting a great deal of traffic now. Because as you have said, we are at the hub of activity in this area.

Governor LIST. That is correct.

I will be pleased to provide that information to you.

Senator SCHMITT. Thank you.

Senator HEFLIN. Governor, you know in the course of trying to provide remedies in the event of such an accident we are faced with the problem of local governments, State governments, and the Federal Government moving and having to move rapidly. And if an accident were to occur where there was a container that released large amounts of nuclear waste, the first people on the scene are local. The next would be State. And finally I assume third would be Federal officials.

Basically the Federal officials would supposedly have more expertise to cope with the particular problem. I am sure that at a State level you would—particularly in your State where you're very cognizant of the dangers—would have people who would have expertise to move—particularly a difficult task in America at local levels—to have this expertise that is available. And of course that is what we are trying to eliminate and reduce the consequences as much as possible on this.

I say that as a prelude to asking one of two questions. Assuming that a container does break, what type of expertise do you foresee is needed immediately by the Federal Government? Is it more likely to come from the Nuclear Regulatory Commission or the Department of Transportation? Of course it could be provided, but are there peculiarities of this that you could foresee that might require first the Nuclear Regulatory Commission to be present, as opposed to officials of the Department of Transportation?

Governor LIST. At the present time, I think it's quite safe to say that the vast majority of the expertise resides with the Nuclear Regulatory Commission, as opposed to the Department of Transportation.

To answer the other part of your question, or to comment upon your remarks, I would suggest this: That in addition to expertise in dealing with an incident, it's also necessary to have equipment, clothing, and monitoring equipment. The incidents in Nevada fortuitously occurred at the site itself, the disposal site where there were personnel of the company, the disposal company operating the facility, who were trained, who had the proper clothing, and who had devices that they could immediately begin monitoring on.

In addition, the Department of Energy in a nearby test site dispatched a team of individuals who came up and did air sampling, and participated in a number of ways. But that kind of expertise, either from personnel at the site, or from the handy nearby Department of Energy facilities, would not have been available if we had been unlucky and the incidents had occurred elsewhere.

And so a certain amount of expertise and training and equipment I think is going to be necessary certainly at the State level that can respond rapidly and quickly. There isn't time to bring somebody in from a regional Federal office. There isn't time to fly somebody in from Washington, D.C., if in fact the truck has turned over and is leaking, or some other type of disaster is occurring.

I might mention that in this most recent incident where the leakage was occurring, one of the containers had literally been patched with tape, simply with tape, and had been painted over.

The situation with respect to inspections and enforcement has gotten so lax, it has deteriorated so badly, that there is virtually no deterrent to that kind of sloppy preparation for shipment.

And so, in addition to having the personnel, the expertise as you call it, and the equipment available to respond in the event of an incident, I think it's equally important to have those advanced inspections taking place on a routine basis to deter violators. And it is important where they find violations to prosecute them vigorously.

At the present time, the hospitals for example in this country, because they're not inspected on any kind of a routine basis by Federal authorities or State authorities in many areas, have gotten extremely lax in packaging of their radioactive materials.

We found in these paper cartons, at the time of the fire and during the cleanup thereafter, toluene—which is a highly flammable liquid substance containing radioactive materials. Vials of it had been thrown into paper cartons along with other combustible material in clear violation. Aerosol cans were put in these paper cartons. And we all know that aerosol cans shouldn't even be put in the waste basket in one's kitchen at home because of the fire danger that they pose.

These things are occurring because the individuals who work in the labs or work in the hospitals simply don't have anybody, either within the hospital or within Government, inspecting them and saying: If you don't mend your ways, you are going to lose your job, or you are going to get fined.

It isn't enough, I guess I'm saying, to just simply address the problem of what we're going to do in the event of an incident, and who's going to be responsible for it. What we have to do is get to the source of the problem, and that means putting the clad in the field, inspecting what's going on before the stuff hits the road.

Senator HEFLIN. Any further questions?

The CHAIRMAN. Yes, I have.

Governor LIST, you properly pointed out that the first incident at the site was as a result of a chemical reaction which caused the fire.

Was there any measurable radiation that exceeded the limits as a result of that fire?

Governor LIST. There was a slight contamination above the background level that occurred, but I want to emphasize that the reason it was contained was that the truck, the vehicle which caught on fire, was moved immediately about a quarter of a mile away to the pit, and the material was taken out of the truck and buried immediately. The fire was in the front of the truck. The material was taken—the material that had not yet caught on fire was rolled out of the back of the vehicle and dumped behind the pits, so it didn't catch on fire.

So the amount of material that actually burned was relatively small, and the amount of contamination of it was relatively small, but had the fire broken out on a highway or down in Los Angeles where the entire load could have caught on fire because there was no place to dispose of it, then we would have had a major, serious threat to the health of a good many people.

The CHAIRMAN. The best information we have is that there was no leakage of radiation above the permissible limits. Now do you have any information to the contrary?

Governor LIST. No, it was above background levels, but not above permissible levels.

The CHAIRMAN. And perhaps I should ask Dr. DiSibio this:

What radiation levels were actually measured in connection with the July 2 incident, and how do they compare with permissible levels?

Dr. DiSIBIO. The actual levels taken from the site of the truck were 15 MR on one side and 30 on the other, and they are within the framework of permissible levels. The geiger counter count on the underside of the truck was at 9,000. Again within the permissible limits.

The CHAIRMAN. So even with the leakage that occurred there, the area was not above permissible limits?

Dr. DiSIBIO. That's correct.

The CHAIRMAN. The measurements, I think, support the point that Senator Schmitt made earlier. Of course, as you point out, Governor, it's the perceived danger that people are concerned with, and we are certainly concerned with it, too, but the real danger with hazardous materials is far, far greater from other types of hazardous materials on the highways today than it is from transport of low-level radiation materials.

Dr. DiSIBIO. Of course, it has to be pointed out that the leakage of the containers at a rate of 1 quart per day, the real danger there is unpredictable with regard to migration, once it's in the ground forever in the State of Nevada, which is why there are containerization rules and regulations, which certainly were not being followed in this case.

Governor LIST. It's also why we prohibit disposal of liquid materials in the State of Nevada. If that container had been placed in the ground and those materials had been permitted to seep down into the aquifer and poison the water supply, and migrate, it's difficult to calculate the extent of the damage.

The CHAIRMAN. Except for the fact that there was leakage, were the containers the properly described containers for the transportation of low-level radioactive waste?

Governor LIST. They were the proper size and perhaps at the time of original manufacture they were the proper standards and fit specifications, but the seams had broken on two of them, and on one of them, instead of properly tending to it, through willing or otherwise, they had simply taken a piece of tape and they painted over the top of the tape which certainly is not in accordance with Federal standards, nor were the containers properly placarded and left in the truck, nor was the truck properly placarded.

The CHAIRMAN. Thank you very much.

Senator SCHMITT. Mr. Chairman, just to follow up very briefly on some of your comments.

Governor, do you feel that a revitalized Civil Defense organizational effort at the local and State level could bear some, if not a major part, of the responsibilities for the reactive responsibilities for incidents of this kind?

Governor LIST. Certainly that's possible, but I suspect—I know that in my State, and I suspect that in most States, it will be a matter of sort of reinventing the wheel, because most States have the primary responsibility now, and their primary expertise and whatever equipment exists, residing in their health departments, as opposed to Civil Defense.

When we had our incidents, I had occasion to look at that and find out where our material and our manpower existed. We have very little in Civil Defense, and what small amounts we did have were in the State Health Department, and I would frankly rather see that beefed up than to see it start over and try to bring our Civil Defense people into this.

I should mention one other thing that I neglected in my formal testimony to apprise the committee on.

Following that first incident, we sent a team of individuals down to the Thomas Gray Associates in Orange County to exhume on a spot-check basis, with representatives of the State of California and I believe the DOT, to see randomly what they might find coming out of other hospitals and medical institutions.

They opened eight containers, and four of them were illegally packed.

So I think without any question, we have the tip of an iceberg in this matter of supervision and enforcement of packaging.

Senator HEFLIN. Thank you, Governor.

The committee has submitted to the National Governors Conference a list of questions—I think you generally covered it—but might I ask if you would, to contact the staff and let them reply in writing to us on those letters? I think it would fill in, perhaps, some gaps that we would like to have closed.

Governor LIST. I'd be pleased to do that. I have a copy of that correspondence, and I would be most pleased to provide you with detailed answers.

Senator HEFLIN. Thank you. I appreciate your testimony.

[The information follows:]

OFFICE OF THE GOVERNOR,
State Capitol, Boise, August 3, 1979.

HON. ADLAI E. STEVENSON,
Committee on Commerce, Science, and Transportation,
Washington, D.C.

DEAR SENATOR STEVENSON: As a follow-up to Governor List's testimony on S-535, "The Nuclear Waste Transportation Safety Act of 1979," I was requested to address the questions noted in your letter of invitation dated June 28, 1979. The Nuclear Power Subcommittee staff advisors recently met in Washington, D.C. to discuss the transportation of nuclear materials and a position paper based on that meeting is currently being prepared. I will make certain that you receive a copy of that paper when it is available.

In response to your questions, the most critical need is for an effective lead agency. Simply designating one by name will not accomplish much. There is a need to clarify roles and provide a lead agency for states, local governments and the public to deal with. However, if the agency so designated is not provided with the resources to effectively carry out its responsibilities, nothing is gained.

In response to your inquiry about categories of radioactive materials, one fact is becoming clear. While most of the regulatory and research attention is being directed at high level materials, the accidents that are destroying the public's confidence in our ability to safely transport nuclear materials are occurring with the low-level materials shipments. Our failure to adequately enforce existing regulations regarding these low-level shipments may result in a public outcry that will restrict further shipments of any nuclear materials.

In regards to your question on the State Grant Program, it is important to keep in mind that radioactive materials are transported through all 50 states and that each state bears a responsibility in case of an accident. It should be possible to devise a formula that provides support to each state based on the amount of material transported and the distance involved. The funding level proposed for the state grants and the other activities mandated under the act should be reconsidered. It is not sufficient.

I hope this helps to clarify our views on this very important subject. I think the position paper, which will be sent to you as soon as it is available, will address all your questions, in greater detail.

I thank you for the opportunity to present our views. If I or any of the Governors on the Nuclear Power Subcommittee can be of any assistance, please do not hesitate to ask.

Sincerely,

JOHN V. EVANS, *Governor.*

Senator HEFLIN. Our next witness is the Honorable Howard Dugoff, the Administrator, Research and Special Programs Administration of the Department of Transportation.

Good morning, sir. Pleased to have you. Go ahead.

STATEMENT OF HOWARD DUGOFF, ADMINISTRATOR, RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION, DEPARTMENT OF TRANSPORTATION; ACCOMPANIED BY KEN PIERSON, DEPUTY DIRECTOR, BUREAU OF MOTOR CARRIER SAFETY, FEDERAL HIGHWAY ADMINISTRATION; AND LEE SANTMAN, DIRECTOR, MATERIALS TRANSPORTATION BUREAU

Mr. DUGOFF. Good morning, Mr. Chairman, members and staff.

I'm delighted to be here today to discuss S. 535, a bill designed to enhance safety in the shipment of nuclear wastes and spent fuel.

I'm accompanied by Mr. Lee Santman, on my left, the Director of the Materials Transportation Bureau, and Mr. Ken Pierson, the Deputy Director, Bureau of Motor Carrier Safety, of the Federal Highway Administration.

With your permission, Mr. Chairman, I would like to submit for the record the Department's written testimony, prepared in response to the committee's invitation, and merely summarize the principal points in a shorter statement.

Senator HEFLIN. We not only accept that, but thank you for doing it.

Mr. DUGOFF. My colleagues and I, then, of course, will be happy to answer any questions you might wish to ask of us.

The safe transportation of radioactive materials, particularly spent fuel and nuclear waste, is a matter of growing public concern and, therefore, must elicit an intensified government response at all levels.

While we believe that the basic scheme for the development and enforcement of the rules governing the transportation of nuclear materials reflects a logical and workable division of responsibility, we have come to realize that improvements need to be made if the good record which has been achieved in this area is to be maintained.

As we have all just heard, evidence that all is not well was reflected in the recent letter to DOT and NRC from the governors of Nevada, South Carolina and Washington, which was prompted in large part by the recent incidents at Beatty, Nev., that led to the closing of the disposal facility located there.

I have to report with regret that our written statement contains an error in regard to the current situation at Beatty, which we will have to correct for the record. At the time we wrote that part of the statement, just a couple of days ago, we were under the impression that as a result of the recent discussions between the representatives of the State, the NRC and ourselves, the Governor had agreed to reopen that site as of yesterday.

However, as we've all heard this morning, that was a misunderstanding on my part, and we will have to amend our written statement to reflect that.

In any event, it is clear that the concern expressed, through their Governors, by the people of those States containing the waste repositories and the commitments which NRC and DOT have made in response to those very legitimate concerns, do signal the beginning of a regime of improved effectiveness between the Federal agencies, and among Federal, State and local officials.

We recognize that S. 535 was developed out of the same concern, as another approach aimed at giving State governments a more appropriate role in a process which affects the health and safety of its citizens.

We welcome it as an opening statement in the dialogue by which Washington and the State capitols together will improve the way we are doing things in this area.

It is our feeling that intensified application of existing programs and administrative arrangements, as well as innovation, can be accomplished on the Federal side generally within the interactive arrangements which have evolved among the participating Federal agencies over the years.

I think it would be useful for us all to refresh our recollections of how the agencies do relate to each other in this complex matter, and we have prepared several charts which we hope will help sort out the overlapping responsibilities of DOT, the NRC, the Department of Energy, and EPA.

As illustrated in the chart on my left, the general scheme is as follows:

The Environmental Protection Agency provides Federal radiation guidance generally pertaining to health effects, and sets general environmental standards.

Specifically, EPA establishes acceptable population radiation exposure standards.

The Nuclear Regulatory Commission and the Department of Transportation use EPA's exposure standards in establishing packaging regulations for radioactive materials.

The Department of Energy regulates the radioactive materials transportation activities of its contractors, which include national laboratories, weapons production facilities, and uranium processing plants.

DOE shipments that are made for purposes of national security and under escort are exempted from DOT regulations.

However, DOE imposes safety and packaging requirements for those shipments under its cognizance that are generally in accord with DOT's regulations.

The Department of Energy also provides liaison with State and local governments on sensitive issues, including storage, transportation and disposal of nuclear waste.

Now I'd like to get into the domain of responsibilities of the two agencies with principal responsibility for regulation of radioactive materials transportation, that is, NRC and ourselves.

An important distinction in radioactive materials transportation is that between so-called low-level materials and high-level materials.

The NRC issues regulations for transport controls over its licensees to assure safeguards and security of the high-level materials.

The NRC also sets and enforces packaging standards for fissile materials and for other high-level radioactive materials.

The DOT sets and enforces standards for radioactive material packages and for handling and storage of those packages by carrier.

For packages which contain no significant fissile radioactive material, and only relatively small quantities of other radioactive materials, so-called low-level materials, the DOT itself establishes the standards to provide adequate assurance of containment and shielding of the radioactive material.

While these packages containing low-level radioactive materials, termed type A packages, may fail in an accident situation, the radiological consequences would be limited because of the limited radioactivity of the package contents.

When the radioactive contents of a package exceed the small type A quantity limit, as is the case, for example, with spent reactor fuel, it may only be transported in a so-called type B package, for which the standards are set by NRC and incorporated into the DOT regulations.

A type B package must be designed to withstand a series of specified impact, puncture, and fire environments, providing assurance that the package will withstand the most severe transportation accident, and its design must be independently reviewed by the NRC engineering staff to verify its accident-resistance.

Procedures applicable to the shipment of packages of radioactive material require that a package be labeled with a unique radioactive materials label.

In transportation, the carrier of such materials is required to exercise control over radioactive material packages, including loading and storage in areas separated from persons and to restrict the aggregation of packages to limit the exposure of persons.

Procedures the carrier must follow in case of an accident include notification to the shipper and DOT, isolating any spilled radioactive material from personnel contact pending disposal instructions from qualified persons, and holding vehicles, buildings, areas, or equipment from service or routine occupancy until they are cleaned to specified values.

Radiological assistance teams are available through a Federal interagency program to provide equipment and trained advisory personnel, if necessary, to help manage accidents involving radioactive materials.

With that in the way of background, let me turn now briefly to a discussion of the bill under consideration.

I'll begin by noting that the Department of Transportation strongly supports the objectives expressed in S. 535. We believe that there is a real need for improving the planning capabilities of the States, and for cooperating in the development and conduct of effective emergency response programs.

Better information collection and dissemination organized by the Federal Government is a basic element in both of these activities.

We agree that the Department of Transportation must vigorously discharge its safety responsibilities for the transportation phase of the handling of spent fuel and other nuclear wastes.

In that connection, and as has been discussed by Governor List, we have recently been examining with the NRC ways to make better use of the resources, particularly the inspection resources, which we have available to us. And as the Governor has indicated, the NRC has agreed to institute a program under which they will employ NRC personnel to conduct the inspections of packaging at shipper sites, which, as the Governors have quite properly brought to our attention, has been insufficiently attended to in the past.

These efforts are aimed at improving the ability of the Federal Government to assure compliance with its regulations, a problem that, again, I think Governor List very accurately brought to our attention.

We have regulations in effect to insure adequate integrity of these containers, but the degree of enforcement activity has been inadequate to achieve sufficiently high levels of compliance.

At the same time, in our role as lead agency in this area, we are moving forward with a new rulemaking action intended to address the problems which are presented by the highway transportation of radioactive materials, with emphasis on spent fuel.

That proceeding, dealing with the routing of such materials, will be completed in approximately 1 year.

The rulemaking process and the provisions of that regulation under development are described in substantial detail in our written testimony.

Also, and very importantly, I think, I can report to you that we are now in the process of shifting budget priorities within the Department of Transportation to provide enhanced support to various activities consistent with the need we perceive to provide greater opportunity for the States to cooperate as full partners in making the shipment of dangerous commodities as safe as possible.

The intensified efforts will extend to all hazardous materials, radioactive as well as others.

I've already mentioned that we will be substantially upgrading our program to collect and analyze relevant data on both hazardous materials accidents and on the patterns of flow of such materials. This information which is desperately needed to improve the quality of both our regulations and our enforcement mechanisms.

The information will exist not only for the benefit of our program, and other Federal programs, but will also be made fully available to State and local planners.

We will also be stepping up our program to support the people and systems needed to provide real time reaction to actual transportation incidents, that is emergency response, to help insure that

the improved data and communications tools that are being developed can be used to maximum effectiveness.

We will also be spending additional money in providing training for Federal, State, and local officials in this area.

Also, during fiscal year 1980, we will be initiating several demonstration programs to provide support to States to help them identify the most important requirements for Federal-State cooperation, and the areas in which both Federal and State funds can most intelligently be used.

The results of these demonstration programs will provide us with information on the basis of which we can undertake planning for future augmented programs of aid to the States.

As we have explained in our prepared statement, we believe that most of the objectives of S. 535 can be met through existing legislative authorities and institutional arrangements.

On the other hand, we certainly want to cooperate closely with Congress in improving the system. If you should determine to proceed with S. 535 as a vehicle for such improvement, we urge that you take into consideration the specific DOT comments which are addressed to particular provisions of the bill.

The Department of Transportation is fully committed to working with the legislative branch and with State and local government to remove all of the risks that can be removed from the transportation of spent fuel and nuclear waste, as well as all hazardous materials.

Thank you very much, and my colleagues and I stand ready to answer any questions.

Senator HEFLIN. Thank you, sir.

Senator Cannon, do you have questions?

The CHAIRMAN. Mr. Dugoff, conclusions from previous studies by the Bureau of Hazardous Materials Transportation of DOT and from the May 1979 study by the GAO indicate clearly that virtually all known incidents of leakage and potential danger from carriage of radioactive materials are associated with violation of existing packaging requirements by licensed shippers of such materials, and by inadequate testing to assure that initially safe containers are suitable for frequent reuse.

In light of this history, do you have a definitive program to carry out the recommendations of the GAO report which clearly addresses these needs?

Mr. DUGOFF. Senator Cannon, I'll begin by endorsing the conclusions and recommendations to which you made reference, and I will advise that I believe we have the beginnings of the plans for a definitive program to upgrade such enforcement activities, a very key feature of which is the agreement with the NRC for their enforcement staff to undertake inspections of packaging at shipper facilities.

I believe it is generally recognized that the bulk of both hazardous materials transportation regulation violations and incidents of field carriers are attributable to packaging deficiencies, which can be laid at the feet of shippers, and we are very hopeful that by mobilizing the resources of NRC to engage in such inspection at the facilities of the shippers who they license, we'll be able to make a very substantial dent in this problem.

We are also engaged in a number of efforts to enhance our on-site inspection program activities and perhaps Mr. Pierson might wish to elaborate on this.

Mr. PIERSON. Yes, sir, Senator Cannon, we share your view that those defects and violations that are detected and remedied upstream will never get into transportation, and thereby not expose the public to risk. And as a result of that we're revising our enforcement strategy to, one of increasing visits and inspections at the place where materials are generated and packaged, and the Federal Highway Administration Bureau of Motor Carrier Safety will have as a formal program emphasis area one of shifting resources from some of the other activities in which we are engaged to increase the amount of visits and inspections to shipper sites and collectors of these materials where they consolidate them for transshipment to depositories.

The CHAIRMAN. Now do you say you're planning to do that or you actually are doing that now as a result of what's happened?

Mr. PIERSON. Yes, sir. For the year which we're currently in, the formal program emphasis area is on increased inspection of hazardous materials, laden vehicles, and shippers, and we have increased our inspection activities in both areas something on the order of 25 percent. But we are now shifting that so that the emphasis area on hazardous materials will be with particular attention to radioactive material shipments.

Mr. DUGOFF. The principal effort, Senator Cannon, though, is the one which the NRC has only just recently agreed to support us on, and I don't believe we can say yet that that effort is underway, although it's imminent and is just a matter of marshaling forces and getting them out and running.

The CHAIRMAN. Thank you, Chairman Heflin.

Senator HEFLIN. Would you describe the present staff of the Department of Transportation which has responsibility for dealing with the transportation of nuclear waste radioactive materials? I'm sure some of this overlaps with the duties and responsibilities pertaining to the transportation of other hazardous materials, but, I realize that this comes as a responsibility to the Congress to provide you with the resources, do you have in the Department of Transportation a number of people who are dealing solely with this problem of nuclear and radioactive waste and material transportation? How many, in effect, 40-hour-a-week personnel are involved?

Mr. DUGOFF. Mr. Chairman, I suspect we'll have to answer this question accurately for the record, because the responsibility for this program area is rather widely dispersed within the department.

Generally the organizational entity responsible for the development of standards and the oversight of the program is the Materials Transportation Bureau, and I'm going to ask Mr. Santman, director of that bureau, to attempt to answer the question with respect to staff levels within his shop.

The responsibilities for enforcement are delegated to the respective modal administrations with the Federal Highway Administration, Bureau of Motor Carrier Safety, responsible for enforcement of regulations for highway shipment, the Federal Aviation Admin-

istration, the U.S. Coast Guard, and the Federal Railway Administration, responsible for enforcement in their respective areas.

I will ask Mr. Santman to do his best to answer on the spot, but again I think we will want to follow up for the record, if that is agreeable to you.

Mr. SANTMAN. Exclusive of supervisory personnel, it's my estimate that we have approximately five persons working on a part-time basis in the development of regulations, the development of training materials for use in the emergency response area, and handling coordination matters with other agencies; three full-time health physicists who provide the technical support for the regulation development and who operate in the international standards-setting area, and provide technical assistance and review of the emergency response materials that we develop.

We are bringing onboard an additional health physicist to assist in backup investigative work behind Mr. Pierson's field investigators, and comparable field investigators in the aviation, and rail administrations.

That health physicist will be dedicated to the task of providing technical backup investigations where there's need for some special expertise to bring an enforcement action to proper closure.

Senator HEFLIN. In the enforcement side of it, is it possible to narrow the personnel down to some sort of an estimate of the number of 40-hour-per-week personnel?

Mr. PIERSON. Yes, sir. Bureau of Motor Carrier Safety has four hazardous material specialists on staff, full time, in headquarters office. We have nine regional hazardous materials officers, one in each region, and then each of our 158 general investigators is trained and they actually do the bread-and-butter inspections out in the field, and they are dispersed at 80 locations throughout the Nation.

Senator HEFLIN. If you had a serious accident in which there was a container of, say, nuclear waste material and it was fractured and spilled on the ground, how would your regional expert then get to that scene? Would he fly a commercial airline to go there, or what procedures do you have to get that person to the scene as soon as possible?

Mr. PIERSON. We rely either on commercial air transportation or personal automobile, depending on the distance from the regional office.

I might add that the general safety investigator is generally the first one on the scene, and in terms of the Federal presence and because of their dispersion at the 80 locations around the country and if it's one which requires that kind of backup expertise, he not only has the regional hazardous materials specialist, but the technical specialist in Material Transportation Bureau are at our disposal for any incident in which we require their services.

Senator HEFLIN. Could the delay of presence of adequate expertise on the scene by 1 hour or 2 hours cause increased or vast increased dangers to the public?

Mr. PIERSON. Senator Heflin, in general, it has not been our experience that that has happened. Obviously——

Senator HEFLIN. You really had no such occurrence?

Mr. PIERSON. That's correct. I'm judging that experience on other hazardous materials other than radioactive waste, but I think the local officials are usually the first on the scene. They take charge, they seek assistance, generally first within the State resources, which would be the Public Health Department or their emergency organization, and then there's a notification process by which the Federal officials are involved as they are required.

Now we require the motor carrier to report immediately by telephone or telegraph to our regional office when involved in an accident, and that seems to get us there at least in a timely enough fashion to conduct a thorough investigation, and detect violations where they are occurring.

Mr. DUGOFF. Mr. Chairman, I think it's worth a moment to try to emphasize the distinction between inspection and enforcement activities, which are the principal expertise of the BMCS people, and the emergency response function which fundamentally is a State and local matter.

There are certain Federal emergency response assistance teams and we are attempting to enhance Federal capability for coordinating emergency response and for providing training to State and local personnel to cope with emergency conditions, but because of the exigencies of time and space that you were pointing out, I think quite properly the first level of defense in coping with an emergency is vested in the State and local authorities, and the Federal role, as best we try to fulfill it, is to provide them with whatever support systems and training we can to get them up to the job.

Senator HEFLIN. Well, because of the inherent dangers that exist, it appears that expertise from either the Federal Nuclear Regulatory Commission or your department is necessary to be on the scene.

I'm not criticizing the State and local authorities, but we realize the danger of having inadequate expertise available, and the mechanism and the procedures to get expertise to a scene seem to me to be a vital cog in trying to stop any great danger that can occur. I think it needs to be explored.

I don't know whether, for example, any planes are available for Federal emergency agency officials, or whether the Governors can fly experts in, but if you've got to wait 4 hours to get a flight before your people can get there, these are some real serious delays.

Now I'm assuming that if your expertise gets there, that it can provide some antidote. Maybe there would be no antidote. Maybe this is something we ought to go into.

Mr. DUGOFF. Well, I would agree, Mr. Chairman, it certainly is a complex and important issue. I am really not prepared to offer constructive analysis and suggestions at this point, but I pledge to you that we will take a very serious look at the questions you've raised, and come forward with our recommendations and best thinking.

Senator HEFLIN. All right, sir.

In your written statement, you indicate that all seems to be going quite well in the delineation of responsibility between the NRC and the DOT. You say that DOT develops, issues, and enforces regulations for the packaging and transportation of all radio-

active materials; and you said that NRC sets packaging standards for fissile material and for quantities of radioactive material.

That sort of sounds like there is either an overlap or duplication and I suppose it would seem so to many shippers.

What is the true status in regard to this? Is this something that needs to be corrected or are there ambiguities?

Mr. DUGOFF. Well, I will invite Mr. Santman to correct me if correction is needed, but I believe this is an area where statutory authorities do overlap and where administrative agreements have been reached to delineate areas for the respective agencies which do not overlap.

The NRC sets and enforces standards for packaging of high level radioactive wastes, and the department, according to terms of our administrative agreement with NRC, incorporates by reference the standards set by NRC in this area.

Mr. SANTMAN. Yes. I would only add that we incorporate them by telling the shippers and the carriers who are subject to our general regulations that those are the standards that bind them when they are engaged in the business of shipping high level materials.

Senator HEFLIN. Senator Schmitt.

Senator SCHMITT. Thank you, Mr. Chairman.

Could we see that first chart again, please.

Mr. Dugoff, I realize that there's not a great deal of hazardous radioactive material transported around the country compared to other hazardous material. But anybody who doesn't think that that quantity is going to increase just hasn't been paying attention.

Now my fear is that the administration is excessively sanguine about that and I presume the 25-percent increase is reference to the nine people you have working full time or part time on this task right now.

You said there was going to be a 25-percent increase in personnel.

Mr. DUGOFF. That's a 25-percent increase with respect to the amount of enforcement activity.

Mr. PIERSON. It's man-hours of inspectors' time and inspecting.

Senator SCHMITT. Well, that's 25 percent of what?

Mr. PIERSON. Highway inspectors, inspection time devoted to this activity.

Senator SCHMITT. But what number? You can throw percentages out and say 25 percent of anything is relative to what you started with. That's like you mentioning 100 percent success rate for porpoises saving human beings from drowning. Well, you don't have complete statistics, you don't know how many are drowned by porpoises.

Mr. PIERSON. Last year, the Bureau of Motor Carrier Safety conducted 1,521 hazardous materials inspections of carriers and 1,203 inspections of hazardous material shippers. Within the current year our activities are programed to increase that activity to about 2,000 carriers and 2,000 shippers.

Senator SCHMITT. And so within that, what percentage is radioactive?

Mr. PIERSON. Well, quite frankly, I'd be surprised if it was more than a couple of hundred.

Senator SCHMITT. Do you expect that to increase by 25 percent? Is that what you are talking about?

Mr. PIERSON. Yes, sir. The whole level of radioactive materials to increase by 25 percent.

Senator SCHMITT. All hazardous materials increased?

Mr. PIERSON. Inspections, yes, sir.

Senator SCHMITT. Are there agencies other than the ones that are listed there who have something either directly or indirectly, to say about this problem?

Mr. DUGOFF. By all means there are interactions. The inter-agency review group to which reference was made earlier consists of, in addition to these four agencies, several others.

Mr. Santman, who is a member of the group, could probably provide the names of the participants.

Senator SCHMITT. Well, I'm not so interested in all the people. It's just that now the administrative responsibility is very broadly spread throughout the administration. That's really what has stimulated the legislation, and I think what has stimulated the criticism of the administration and of DOT.

Your testimony that there is no need to explicitly designate a lead agency to regulate this problem is that it diverges from most of the other statements that we've received.

How do you explain that? Or are you complacent about the problem, when everybody else seems to be concerned about it?

Mr. DUGOFF. I've really done the department an injustice if I've conveyed an attitude of complacency. I certainly should be conveying an attitude far different.

We are seriously concerned and we also recognize the likelihood that this problem is the tip of the iceberg. Someone noted earlier the increase in nuclear transport that we can anticipate, and particularly spoke to our assertion that statutory designation of DOT as the lead Agency is unnecessary.

Our assertion is based on the premise that we have administrative authorities which already permit us to fill that role, and that in the course of the recent interagency dialogs on this issue, decisions have been reached which de facto constitute a charter for us to undertake that lead agency role.

Our intent is to aggressively proceed.

Senator SCHMITT. What do you mean by aggressive? Would you expect that next year you would come in with a clear-cut set of charts that would indicate how various agencies report to you or to your designated representatives for the purposes of receiving approval for the transport of waste? Is there a training and procedures oversight on the handling of this waste, the handling of incidents, and a prediction of the number of incidents that would have to be handled over a period of time? The growth of the availability of personnel to do that? Simulations to make sure those personnel are trained? That State, local authorities are also part of a team that your interaction with DOT, if there happened to be interaction, was clear and without ambiguity?

The same goes for all the other agencies. Can we expect to see all that laid out in front of us within a year, 6 months, 8 years, or what?

Mr. DUGOFF. I believe that what you've just articulated is a very sensible charter for the program development activity to which we are committing ourselves and that a timeframe of a year is a realistic one for virtually all of the accomplishments you've enumerated.

The one caveat I would want to throw out relates to the current and very troublesome deficiencies of the information systems that are in place for analyzing this problem area. The shortcomings of these systems are sufficiently endemic and great that I think it will be a matter of several years before we really have an effective information system and analytical basis for some of the more sophisticated simulations and quantitative assessments. But with that exception, however, I think it's entirely reasonable to expect us to come forward here in a year with a plan containing the elements you described.

Senator SCHMITT. Do you have personnel that can put together that plan?

Mr. DUGOFF. Yes, sir.

Senator SCHMITT. Are those the personnel that were listed, five part time, three full time, and one potential full-time investigator?

Mr. DUGOFF. They would contribute to the development of the plan, but within the RSPA we have substantial additional technical and planning personnel resources that we can and will apply to this to this program.

Senator SCHMITT. What are they doing now that they don't have to do, so that they can get on to this particular job?

I am being a little bit facetious—

Mr. DUGOFF. I recognize that.

Senator SCHMITT. I've been over there in one of those buildings, too, and every time you take on a new task without more people, then it's something that isn't going to be done, and we're going to then climb down your throats because you're not doing it.

Mr. DUGOFF. Well, they will just have to work twice as hard.

I really can't answer the question. We have made some priority decisions which have set these actions in motion, and we will continue to have to face tough priority questions and assure that this work gets done without compromising our program.

Senator SCHMITT. Perhaps I am being unfair, but nevertheless, does this mean that your work on the more serious threats of chlorine and other toxic chemicals is going to be lessened? Because you don't have all the problems solved there, either.

Mr. DUGOFF. Oh, by all means, not.

Senator SCHMITT. You have more problems there than in the area we are talking about today.

Mr. DUGOFF. By all means. One of the precise points which I want to make very forcefully in this entire discussion of the various efforts we are undertaking to enhance our program is that we are talking about an effort that goes across the board in the hazardous materials field, and it is implicit in what I have said that we will undertake these programs in the context of judgments as to the respective hazards associated with various types of materials.

To be sure, we're equally concerned about some of those other—

Senator SCHMITT. Are all your jurisdictional conflicts with FMEA resolved?

Mr. DUGOFF. I am not aware of outstanding conflicts. Perhaps Mr. Santman wants to amend that statement.

Mr. SANTMAN. In many respects, we're still waiting to see what they really look like. Our contacts continue to be with the various elements that are going into the mix making up the Federal Emergency Management Agency.

I think my basic hope for the emergence of that agency relates to its constituency in the emergency response services around the country. We are in a position with our resources and personnel to take our knowledge of the chemicals and the materials we are dealing with and embody it in basic training materials, training aides, guides, and advice.

I rather look hopefully toward FEMA as a delivery mechanism and a coordinating mechanism for establishing true across-the-board emergency planning.

The chemical problem, whether it be in transportation or in a fixed facility, I would assume appears pretty much the same to the local fireman. So I think there is a major role for FEMA to play and we are watching it closely and dealing with the various elements that are going into it, as we have in the past.

Senator SCHMITT. The DOT comments on May 7, GAO Report on Radioactive Materials Transportation, included the statement:

The DOT finds a recommendation for the coordination with State and local governments along the line of the Nuclear Regulatory Commission Agreement States program to be appealing, but what can be achieved is limited under existing statutory authority.

Can you suggest a way in which S. 535 can be amended to give you the necessary authority?

Mr. DUGOFF. Yes, Senator Schmitt. We believe that what is needed here is some specific authorization by statute for us to defer exercising regulatory responsibilities in the event that States are enforcing these responsibilities in a fashion that is acceptable to the Federal agency.

One example of this kind of arrangement is in the Natural Gas Pipeline Safety Act of 1968, which provides that the Federal scheme for regulation of certain pipelines will not be applicable in States which certify that they have jurisdiction over those lines; that they have adopted Federal standards of their own; and are enforcing those standards.

Another approach which has the same effect essentially is found in that portion of the Atomic Energy Act which provides that during the duration of an appropriate agreement between the Commission and the State Governor, it will be recognized that the State has the authority to regulate the materials covered by that agreement.

We would be pleased to consult with staff in the drafting of provisions which would effectuate this purpose, if you wish.

Senator SCHMITT. Is my understanding correct that the NRC has the responsibility for enforcing your regulations relative to the low-level burial site?

Mr. DUGOFF. I don't think our regulations apply with respect to the operator of the burial sites, per se.

Senator SCHMITT. No; I mean regulations concerning the transportation of materials into those sites. Your regulations apply to that; don't they?

Mr. DUGOFF. Yes.

Senator SCHMITT. And at the site or in the vicinity of the site, does the NRC enforce those regulations?

Mr. DUGOFF. We are developing an agreement with NRC according to which their enforcement staff will help in enforcement inspections, not only at the disposal sites, but also at shipper facilities. Under the terms of our memo of understanding with them, that is permissible and they have agreed to augment their efforts in those areas.

Senator SCHMITT. Well, we're going to have further discussions and questions on this issue for the record. But I really am concerned here, as I have been concerned for 2½ years. Very often this committee identifies a particular interagency problem in the Government and all we hear from the administration, Mr. Chairman, is that, we're handling it with a memorandum of understanding and there is a lead agency, and that it'll all be good in a year or two.

I haven't seen many of those issues handled in that timeframe. I am concerned about this one because, although there are many more serious problems, this is one that maybe we can solve earlier, then go on to the more serious problems.

I can't say that I've been satisfied as yet this morning or with my other conversations at other times that we in fact are well on the way to solving this problem, getting the situation laid out so it can operate on its own, without diluting other efforts which are equally as important.

I thank you, Mr. Dugoff, for your testimony. We'll be in touch further.

Senator HEFLIN. Senator Warner, we'd be delighted to hear from you.

Senator WARNER. Thank you, Mr. Chairman.

You indicate you have overlapping statutory authority in transportation of nuclear wastes, but you've worked out this overlapping authority through a memorandum of understanding just referred to by my colleague, Senator Schmitt. Would you consider submitting a copy of this memorandum to the Committee,¹ so that we can see how the various agencies have resolved these overlap problems?

Mr. DUGOFF. Yes, by all means, we will, Senator Warner.

Senator WARNER. I think that would be helpful if we looked at it. Thank you very much.

Mr. DUGOFF. I would like to make a remark. I have attempted to convey the sense that it's the administration's belief that the existing administrative arrangements among the respective agencies involved in this field are adequate. I certainly do not want to attempt to convey the sense that we're doing the full job that needs to be done.

The meaning I want to leave—and I recognize, Senator Schmitt, that this is something we're going to have to show you, rather than just tell you—is that the administrative arrangements that exist

¹ See p. 56.

provide a framework for us to do the job well, and what we've got to do now is show you that we're doing it.

Senator SCHMITT. You have to prove that to a lot of people, because most people don't believe that's true. And otherwise you wouldn't see a bill.

The CHAIRMAN. You indicated a moment ago that the inspections at the site are accomplished by NRC personnel? There are no NRC personnel permanently at the sites, are there?

Mr. DUGOFF. I don't believe so, Senator Cannon. Perhaps my colleagues will check me on this. The specific arrangement to which I was referring was the one which we worked out with the NRC in just the past few days in response to the concerns raised by Governor List and his colleagues. According to that agreement, we have agreed to place at the Beatty site in particular both NRC and BMCS personnel to inspect incoming cargoes.

The CHAIRMAN. On a regular basis? They'd be there regularly?

Mr. DUGOFF. The agreement is that they will go there when the site is reopened and will stay there for some indefinite period. We haven't made any commitment for a permanent arrangement of that sort.

The CHAIRMAN. I see.

Thank you, Mr. Chairman.

Senator HEFLIN. Would you explain what appears to the transportation and electric utility industries, as well as to some members of this committee and its staff an inordinate delay on the part of the Department of Transportation in developing routing guidelines or requirements? These might relieve the States and local communities of their need to initiate local restrictions which can constitute a network of inconsistent requirements which shippers and carriers must contend with.

Your rules were initially proposed at the time of this subcommittee's hearing in August 1978, I'm told. We're sort of beginning to wonder, must we hold annual hearings to track the slow progress of the rulemaking in this area?

Would you explain this delay to us?

Mr. DUGOFF. Mr. Chairman, the rulemaking process is inherently one which moves more slowly than members of the public who seek the expeditious promulgation of such rules would like.

In this instance, I believe I can say fairly that we are proceeding with appropriate dispatch. We are on schedule with respect to this rulemaking. We did issue, as you noted, in August of last year an advance notice of proposed rulemaking on this matter. In November of last year, a public hearing was held on the subject. The public comments were delivered to the docket, an analysis of those comments has been completed, and a notice of a proposed rule is currently in preparation, and we expect it to be published shortly.

After publication of that notice, there will be additional public hearings and analysis of the public reaction to the proposal. And we anticipate that a final rule will be issued in July 1980.

But this is the schedule that I believe was publicly stated by my predecessor at the time of his last appearance before this committee. It's a schedule to which we have been working, and it is a reasonably expedited one, I believe.

Senator SCHMITT. Mr. Chairman, one more question.

Did the Department of Transportation, interact with the NRC in the promulgation of the interim final rules that were effective July 15 on the nuclear material transportation, entitled "Physical Protection of Irradiated Reactor Fuel in Transit?"

Mr. SANTMAN. Yes, we did. And while those are aimed at the question of safeguards, they obviously have public safety benefits, and it's a factor that our notice of proposed rulemaking on routing will take into account. We worked closely with them, with a view to employ some of the generally accepted principles that both their agency and our agency would agree upon, because safeguards do yield safety benefits.

Senator SCHMITT. You felt that there was sufficient coordination and consistency with your activities in those regulations?

Mr. SANTMAN. Yes. Several members of my staff have spent considerable amounts of time with NRC. I personally communicated with Mr. Dircks concerning their action two or three times.

Senator SCHMITT. Thank you.

Senator HEFLIN. Thank you, gentlemen. We appreciate you coming to testify.

[The statement follows:]

STATEMENT OF HOWARD J. DUGOFF, ADMINISTRATOR, SPECIAL PROGRAMS
ADMINISTRATION, DOT

Good morning, I am pleased to have the opportunity to appear before you this morning to discuss the provisions of S. 535 which is designed to accomplish a variety of things concerning the shipment of nuclear waste and spent fuel. Since representative of the Research and Special Programs Administration appeared before this subcommittee last August 16, there have been several developments in the transportation of hazardous materials, in general, and radioactive materials in particular, which I will make reference to at appropriate points in my comments upon S. 535.

Before specifically discussing S. 535, I would like to turn to a recent related development. On July 10, 1979, the Governors of the three States that are currently accepting low-level commercial radioactive waste for disposal wrote joint letters to the Department of Transportation and the Nuclear Regulatory Commission. Governors Dixy Lee Ray of Washington, Richard Riley of South Carolina, and Robert List of Nevada, prompted, in part, by two recent incidents involving radioactive materials transportation at Beatty, Nevada, expressed their serious concern with the Federal Government's inspection and enforcement of packaging and transportation requirements for low-level radioactive wastes. The letter to DOT indicated certain specific components that the Governors wanted included in a plan to be devised by DOT and NRC by August 1, 1979, for implementation no later than September 1, 1979.

Representatives of DOT and NRC have been meeting in order to address the specific concerns raised by the Governors. The most recent meeting, on July 13, included discussions with Dr. Ralph DiSibio, Director of the Nevada Department of Human Resources. As a result of this meeting, DOT and NRC have agreed, in principle, to undertake the following actions:

1. NRC will amend their regulations, thus allowing NRC to enforce DOT regulations at licensee sites. This will provide significant additional personnel to the inspection and enforcement of shipper activities.

2. DOT and NRC provided for inspectors to be placed on-site when the Beatty, Nevada, facility reopened yesterday and they will remain there during the initial reopening phase. The general policy will provide for periodic unannounced inspections to be made of shipments at all three burial sites, with enforcement action taken as appropriate.

3. A special bulletin will be issued notifying shippers of the necessity of complying with packaging and transportation requirements for radioactive waste and informing them that these requirements will be strictly enforced through a Federal/State enforcement effort.

4. DOT and NRC, in conjunction with the three States, will develop a program to improve the overall regulation of radioactive waste transportation and disposal.

DOT considers the States' concerns to be legitimate and will be working closely with the States involved, and with NRC, during the planning process and, of course, during the implementation of this program.

Turning now to S. 535, the Department of Transportation supports many of the objectives embodied in S. 535 and hopes to work more closely with the Congress in improving the safety of hazardous materials transportation. We recognize also the appropriate concern about the transportation of spent fuel, nuclear waste, and other radioactive materials, in particular, which the bill reflects.

We believe that S. 535 serves a useful purpose in directing attention to the need for State involvement in planning and for enhanced emergency response through better emergency preparedness and improved forecasting. We all share the same goal which is greater assurance of overall safety in the transportation of spent fuel and nuclear waste.

Having said that, however, I must add that it is our belief that most of the authority which S. 535 would confer upon the Department of Transportation in designating us the lead agency for regulating this activity has already been conferred upon the Secretary by the Hazardous Materials Transportation Act of 1974 (HMTA). As such, I believe the bill is unnecessary. An exception to this is the grant authority contained in section 5 of the bill, which would add a new section 116 to the HMTA and about which I will have more to say later. I will also offer technical comments should Congress decide to enact this bill.

S. 535, in addition to designating the Department as lead agency, would require the development of a national emergency response plan for dealing with radiological emergencies in transportation; the review of the safety and logistics of foreign shipments of spent fuel before the acceptance by the United States; and the establishment of a State grant program to fund independent safety analysis and review of transportation aspects of any proposal to develop a long-term storage facility for spent fuel or nuclear waste.

We feel that the existing interagency arrangements, within which the Department of Transportation discharges its responsibilities under the HMTA provides a fundamentally sound approach to the task of providing for the safe transportation of radioactive materials, including spent fuel. It may be useful to restate those arrangements once again as you embark on this set of hearings, and to outline the interaction between executive branch agencies and the specific role of the Department of Transportation in this regulatory scheme.

The Environmental Protection Agency provides Federal radiation guidance pertaining to health effects general environmental standards. Specifically, EPA establishes acceptable population radiation exposure standards. The Nuclear Regulatory Commission and the Department of Transportation use these standards in establishing their packaging specifications. The Department of Energy regulates the radioactive materials transportation activities of its prime contractors, which include national laboratories weapons production facilities and uranium processing plants. DOE shipments that are made for purposes of national security and under escort are exempted from DOT regulations. However, DOE imposes safety and packaging requirements that are generally in accord with NRC's and DOT's. The Department of Energy also provides liaison with State and local governments on sensitive issues, including storage, transportation, and disposal of nuclear waste. The Nuclear Regulatory Commission sets packaging standards for fissile materials and for quantities of radioactive materials, other than low specific activity materials, exceeding certain (Type A) limits. NRC issues regulations for transport controls over its licensees to assure common defense and security. The NRC also must approve package designs and associated transport controls proposed for fissile materials and larger quantities of radioactive materials.

Under the Hazardous Materials Transportation Act, the DOT develops, issues, and enforces regulations for the packaging and transportations of all radioactive materials, including waste materials, as part of its overall Federal regulations for hazardous materials transportation. These regulations are applicable both to persons who ship radioactive materials as they package and offer such materials for transportation, and to carriers of radioactive materials as they load and transport such materials in their vehicles. The regulations provide protection to transport workers and the general public from the hazards of radiation.

Primary reliance for safety in transportation of radioactive material is placed on the packaging. The DOT regulations prescribe general standards and requirements for all packages of radioactive material, and for handling and storage of those packages by carriers. For packages which contain no significant fissile radioactive material and only small quantities of other radioactive materials, the DOT establishes the standards and requirements to provide adequate assurance of contain-

ment and shielding of the radioactive material. While these small packages, termed Type A packages, may fail in an accident situation, the radiological consequences would be limited because of the limited radioactivity of the package contents.

When the radioactive content of a package exceeds the small Type A quantity limit, as is the case with spent fuel, it may only be transported in a Type B package—one which will survive transportation accidents. A Type B package must be designed to withstand a series of specified impact, puncture, and fire environments, providing reasonable assurance that the package will withstand the most severe transportation accidents and its design must be independently reviewed by the NRC engineering staff to verify its accident resistance.

The standards which have been established in the DOT and NRC regulations provide that the packaging shall prevent the loss or dispersion of the radioactive contents, provide adequate shielding and heat dissipation, and prevent nuclear criticality of certain kinds of special nuclear materials under both normal and accident conditions of transportation. The normal conditions of transportation which must be considered are specified in the regulations in terms of hot and cold environments, pressure differential, vibration, water spray, impact, puncture, and compression tests. Accident conditions which must be considered are specified in terms of impact, puncture, and fire conditions.

In 1977, the Energy Research and Development Administration, in conjunction with Sandia Laboratories, conducted a series of performance tests involving spent fuel shipping casks in accident conditions. The tests verified the accident survivability of the casks but left open the question of thermal integrity. DOT is now participating in an interagency assessment of the ability of the casks to withstand fire tests. The examination will include torch fire tests and pool fire tests and is scheduled for completion in 1981.

Procedures applicable to the shipment of packages of radioactive material require that a package be labeled with a unique radioactive materials label. In transportation, the carrier is required to exercise control over radioactive material packages, including loading and storage in areas separated from persons, and to limit the aggregation of packages to limit the exposure of persons. The procedures the carrier must follow in case of an accident include notification of the shipper and the DOT, isolating any spilled radioactive material from personnel contact pending disposal instructions from qualified persons, and holding vehicles, buildings, areas, or equipment from service or routine occupancy until they are cleaned to specified values. Radiological assistance teams are available through a Federal interagency program to provide equipment and trained advisory personnel, if necessary, to help manage accidents involving radioactive materials.

Next, I would like to turn to the specific questions which the subcommittee has raised in its invitation to the Department to appear today.

First, you asked whether any changes need to be made in the division of responsibilities between the executive branch agencies in order to fulfill the intent of section 2 of the bill. Among other things, that section declares it to be the policy of the Congress "that the Department of Transportation has the principal responsibility for regulating, monitoring, and ensuring the safety and security" of the transportation of nuclear waste and radioactive commercial spent fuel, and that these efforts may best be conducted by appropriate consultation with the Nuclear Regulatory Commission. In general, as we described earlier, this is how the system works today.

However, we do have reservations as to the fashion in which the general intent is further specified in proposed section 115(a) of the HMTA (section 5 of the bill), in which the regulating of packages is said to remain with the NRC. This is at variance with a longstanding memorandum of understanding between DOT and NRC (and their predecessors) under which, as I mentioned earlier, DOT is responsible for packaging regulations for Low Specific Activity materials and for smaller quantities of all non-fissile radioactive materials. We think that this division has worked quite well and that it should not be altered after such a long period of satisfactory experience. In the event that Congress takes action, we suggest that section be amended as follows:

"... commercial spent fuel, except that this responsibility may be carried out in conjunction with the Nuclear Regulatory Commission according to agreement of the Secretary and the Nuclear Regulatory Commission."

We are also unclear as to the intent regarding "logistical aspects" of shipments. If this is to mean ensuring an adequate supply of packages and vehicles, arranging for shipments, and generally managing the transportation of nuclear waste and spent fuel, the Department considers these promotional activities to be an inappropriate addition to its hazardous materials safety regulatory program.

In connection with the intent expressed in section 2 of the bill, you ask also whether a separate office should be established within DOT having overall responsibility. As you know, the regulation of transportation of all hazardous materials, including radioactive materials, has been conducted since 1975 by the Materials Transportation Bureau, now a part of the Research and Special Programs Administration. We are not aware of any compelling arguments which would dictate the establishment of a separate office for radioactive materials transportation within the Department. Indeed, while the transportation of radioactive materials may, perhaps, present safety problems of a different nature from most other dangerous commodities which are transported daily, there are far more commonalities involved in the rulemaking, enforcement, and the philosophy of emergency response than there are differences. It would be, in our view, unwise and unfortunate to fragment the coordinated efforts which now exist in the Department in the area of hazardous materials transportation.

Another area in which the subcommittee expressed interest concerns the interim final rule, amending 10 CFR Part 73, recently published by the Nuclear Regulatory Commission dealing with the protection of spent fuels in transportation. Concurrently with this rule the NRC issued a guidance document (NUREG-0561) to assist in the implementation of the rule's provisions. The rule is restricted in applicability to shipments of reactor irradiated fuel by persons licensed by NRC. It imposes certain reporting and approval requirements on the shipment of this specific class of radioactive materials designed to protect the security of these shipments from unauthorized intrusion.

The purpose of the NRC issuance is to safeguard materials that have national security implications against theft or sabotage while in transit. NRC's rule includes some aspects, such as reporting and routing, that also fall within the sphere of DOT rulemaking authority. However, NRC has stepped into these areas in the interest of increased security over material being shipped from its licensees. The subject of security is one in which we recognize that NRC is properly engaged and the NRC rule, in addressing security issues, also benefits safety. While safety is the purpose of the DOT regulations, these regulations are generally only directed towards the prevention of accidental, inadvertent, or careless releases.

As you know, our rulemaking on the highway routing of radioactive materials (HM-164) has not been completed. We plan to issue a notice of proposed rulemaking in September 1979 and a final rule at about this time next year. Among the possible regulatory approaches which were outlined in the advance notice of proposed rulemaking were some which could involve DOT approval of routings. We note that the general rule established by NRC is to route the shipment in such a way as to avoid, where practicable, heavily populated areas. It seems unlikely to us that this general, good commonsense requirement would be inconsistent with any routing requirements that might emerge from the investigations now underway in our HM-164 rulemaking.

At this point, I would like to refer to several provisions of the bill which seem to us to be at variance with existing requirements under our regulatory authority and which provisions do not clearly lead to a better way of doing things.

Proposed section 117(a) of the HMTA would require specific information to be provided to the Secretary by any person, or Federal, State or local government "which proposes to accept nuclear wastes or commercial spent fuel from any source outside the United States. . . ." The purpose of this notification is so that the Department may carry out proposed section 117(b). This section would require DOT to analyze the shipment in terms of safety and logistical considerations and report to Congress.

The Department is unclear as to the intent of the requirements contained in these proposed provisions. Logistical aspects of shipping are not generally part of DOT's safety concerns; and to the extent that all regulatory requirements are met, every shipment would be adequate in terms of safety. If the intent of proposed sections 117(a) and (b) is to notify the Congress of an impending shipment of spent fuel under the President's policy for acceptance of limited amounts of spent fuel, this would appear to be duplicative of the Congressional review provisions of section 303 of the Nuclear Non-Proliferation Act of 1978.

Proposed section 117(c) of the HMTA is troublesome in that it could significantly change the relationship which has been developed with other member countries of the International Atomic Energy Agency. Within the spirit of the international regulations, the Department, as the national competent authority, reviews documentation and certification received from the competent authority of the exporting country to ensure that the containers and procedures proposed for the foreign shipment provide an equivalent level of safety to those of domestic shipments. The

language of this section could be interpreted as an inflexible requirement that import shipments be subjected to administrative approval procedures identical to those for domestic shipments, thus nullifying the international relationships now existing. To correct this situation, the section could read—

"... certified by the Secretary to be safe for shipment. The Secretary shall also ensure that the shipment procedures for any such containers provide an equivalent level of safety as such shipments within the United States."

To implement paragraphs (7) and (9) of section 6 of S. 535 (proposed section 109(e) (7) and (9) of the HMTA) would involve imposing additional reporting requirements on the shipping industry and the container and vehicle manufacturing industries. Given the possible economic implications of such requirements, plus the unconfirmed contribution to safety, consideration should be given to less than annual updates to such information or to the use of sampling data to achieve the objective.

The remaining two paragraphs of section 6 of the bill, (6) and (8), address reviews which are already performed and are central to the Department's hazardous materials safety program. Further, the routing recommendations in (8) are also the subject of the current regulatory proceeding mentioned above.

Finally, I would like to address the matter of Federal-State relationships in connection with the transportation of spent fuel and nuclear waste. For one thing, the Department supports the need for emergency response planning at the State and local levels. Through the existing Interagency Radiological Assistance Program, under the lead of the NRC, the Department now participates in providing planning assistance to States. As a result of the Interagency Review Group on Nuclear Waste Management's (IRG) examination of the transportation issues, the IRG's March 1979 Report to the President recommends transferring the lead for radiological incident planning for transportation to this Department. A related Departmental project, scheduled for completion later this year, is a checklist and guidelines for States to follow in developing and implementing radiological transportation incident plans.

The Department and NRC are currently, on an ad hoc basis, contracting with a limited number of States (five currently, with the anticipated addition of five more) to perform surveillance of radioactive shipments. This program is mutually beneficial since the States provide our two agencies with data on package performance and radiation exposure, and the States obtain information about shipments moving through their jurisdictions. The IRG in its March 1979 Report to the President recommended that the Department and NRC review this existing State program with a view toward expanded participation and additional Federal funding. In fact, present plans are for DOT to spend approximately \$150,000 for this program in FY 1980.

It is difficult at this point for the Department to comment in any detail about the grant program which is authorized in proposed section 116 because of overall planning in which we are now engaged with respect to the entire hazardous materials program. One observation which can be made, however, is that the proposed program is narrowly tailored as is to be expected considering the specific purposes of the bill. That provision would make funds available to States within which nuclear waste or commercial spent fuel is to be transported as a result of the establishment of a storage or disposal facility. The funds could be used by the States to conduct independent reviews of the safety and logistics of shipments associated with those facilities.

We, in the Department, feel that the ability of the States to improve planning, analysis, and response with the assistance of the Federal government deserves study on a broader basis than that and should be conducted within the context of the transportation of hazardous materials in general. We plan to conduct this type of study internally. Therefore, we are not prepared to support the establishment of the grant program described in S. 535 at this time.

In the meanwhile, you should be aware of those budget priorities which the RSPA has established for itself in the hazardous materials programs which will affect Federal-State cooperation and will include, of course, radioactive materials transportation.

We plan to spend more on information concerning commodity flow and incident data, since these are basic ingredients in planning and in the development and implementation of emergency response programs. The system development and communications which are integral to the success of emergency response will also receive important new funding. These areas of intensified effort, however, cannot realize their maximum potential for protecting our communities without more and better training of State and Federal officials. That area will also receive greater attention and funding in our RSPA budget.

TECHNICAL AMENDMENTS: S. 535

1. In proposed section 103(1) the definition of "commerce" omits two words found in the Hazardous Materials Transportation Act. It should read: "... or transportation, within the jurisdiction of the United States, ..."

2. The definition of "emergency situation" at proposed section 103(3) should be deleted. As written, it narrows the term to only situations involving nuclear waste or commercial spent fuel, even though where used in proposed section 115(b) emergency situations may involve other radioactive material. Further, this usage could be confused with "emergency" as used in reference to exemptions in existing section 107(d). It would be preferable to include the explanation found in 103(3) in the operational proposed section 115(b).

3. A radioactive content of 2 nanocuries per gram as the absolute floor for defining what constitutes a radioactive material is unnecessarily low. It would include within that definition many common commercial and household items such as luminous timepieces, smoke detection devices, electron tubes, gauges and calibration sources. Such items are now exempt from special packaging, labeling, and marking regulations. Consistent with that current regulatory practice, it is recommended that proposed section 103(6) be amended to read as follows:

"(6) 'radioactive material' means any material or combination of materials which spontaneously emit ionizing radiation. However, it does not include any material which the Secretary determines is of such a low level of radioactivity that when prepared for and during transportation does not pose a hazard to health or safety."

4. The definition of "shipment" in proposed section 103(9) should be deleted because of the conflict with the existing regulatory use of this word, as it concerns not just radioactive materials and not just the described circumstances.

Also, the jurisdictional statement hidden in this definition properly belongs in proposed section 115(a). If the intent is to exclude authority over movements within facilities licensed by the Nuclear Regulatory Commission, appropriate exclusion language should be included in the operative section describing the Secretary's responsibilities.

[The following information was referred to on p. 49.]

MEMORANDUM OF UNDERSTANDING BETWEEN THE U.S. DEPARTMENT OF TRANSPORTATION AND THE U.S. NUCLEAR REGULATORY COMMISSION, FOR REGULATION OF SAFETY IN THE TRANSPORTATION OF RADIOACTIVE MATERIALS

Abstract.—This agreement delineates the respective responsibilities of the Department of Transportation (DOT) and the Nuclear Regulatory Commission (NRC) for the regulation of safety in transportation of radioactive materials. It supersedes the existing agreement executed on March 22, 1973, between the DOT and the Atomic Energy Commission. Generally, the DOT is responsible for regulating safety in transportation of all hazardous materials, including radioactive materials, and the NRC is responsible for regulating safety in receipt, possession, use, and transfer of byproduct, source, and special nuclear materials. The NRC reviews and approves or denies approval of package designs for fissile materials and for other radioactive materials (other than low specific activity materials) in quantities exceeding Type A limits, as defined in 10 CFR Part 71.

Agreement between the DOT and the NRC.—The Department of Transportation (DOT), under the Transportation of Explosives Act (18 U.S.C. 831-835), the Dangerous Cargo Act (R.S. 4472, as amended, 46 U.S.C. 170), Title VI and 902(h) of the Federal Aviation Act of 1958 (49 U.S.C. 1421-1430 and 1472(h)), the Department of Transportation Act (49 U.S.C. 1655), and the Hazardous Materials Transportation Act (49 U.S.C. 1801-1812), is required to regulate safety in the transportation of hazardous materials, including radioactive materials.

The Nuclear Regulatory Commission (NRC), under the Atomic Energy Act of 1954, as amended (42 U.S.C. Chapter 23), and Section 201 of the Energy Reorganization Act of 1974, as amended (42 U.S.C. 5841), is authorized to license and regulate the receipt, possession, use, and transfer of "byproduct material," "source material," and "special nuclear material" (as defined in 42 U.S.C. 2014). The NRC authority to license air shipment of plutonium is further governed by P.L. 94-79.

For the purpose of developing, establishing, and implementing consistent and comprehensive regulations and requirements for the safe transportation of radioactive materials, and avoiding duplication of effort, the DOT and the NRC agree, subject to their respective statutory authorities, as follows. Terms used in this agreement are defined in 49 CFR Parts 100-199 and 10 CFR Part 71.

I. DEVELOPMENT OF SAFETY STANDARDS

A. The DOT (in consultation with the NRC) will develop safety standards for the classification of radioactive materials; for the design specifications and performance requirements of packages for quantities of radioactive materials (other than fissile materials) not exceeding Type A limits and for low specific activity (LSA) radioactive materials; for the external radiation fields, labeling, and marking of all radioactive materials packages and vehicles; for the mechanical conditions, construction requirements, and tie-down requirements of carrier equipment; for the qualifications of carrier personnel; for the procedures for loading, unloading, handling, and storage in transit; for any special transport controls (excluding safeguards) necessary for radiation safety during carriage; and for all other safety requirements except those specified in the next paragraph.

B. The NRC (in consultation with the DOT) will develop safety standards for design and performance of packages for fissile materials and for quantities of other radioactive materials (other than LSA materials) exceeding Type A limits in the following areas: (1) Structural materials of fabrication; (2) closure devices; (3) structural integrity; (4) criticality control; (5) containment of radioactive material; (6) shielding; (7) generation of internal pressure; (8) internal contamination of packages; (9) protection against internal overheating; and (10) quality assurance of packaging design, fabrication, testing, maintenance, and use.

II. ADOPTION OF SAFETY STANDARDS AND REGULATIONS

A. The DOT will adopt regulations imposing on shippers and carriers subject to its jurisdiction those standards developed by the DOT and the NRC pursuant to Section I of this Memorandum of Understanding and any additional requirements necessary to protect the public health and safety. The DOT will require NRC approval of designs of packages for shipment of fissile materials and other radioactive materials in quantities exceeding Type A limits (except LSA materials) by all persons subject to the jurisdiction of the DOT. The DOT will issue complete and comprehensive Federal regulations for the packaging and transportation of all radioactive materials as a part of its overall body of Federal regulations (49 CFR Parts 100-199) for the packaging and transportation of all hazardous materials.

B. The NRC will adopt packaging standards for fissile materials and for quantities of other radioactive materials (other than LSA materials) exceeding Type A limits and will adopt regulations imposing on its licensees administrative, procedural, and technical requirements necessary to protect the public health and safety and to assure the common defense and security.

C. The NRC will adopt procedures, standards, and criteria for approval of package designs and for approval of special transport controls proposed by the applicant for a given package design. The NRC will require its licensees to comply with the DOT regulations when those persons are not otherwise subject to the DOT regulations.

III. PACKAGE REVIEW

A. The DOT will submit to the NRC for review the following package designs:

1. Specification containers. Approval by the NRC of package designs for fissile materials and for radioactive materials (other than LSA materials) in quantities exceeding Type A limits will be obtained before publication of such designs in the DOT regulations.

2. Packages with foreign certification. Approval by the NRC will be obtained before revalidation of the foreign certificates required in the DOT regulations for packages shipped between origins and destinations within the United States, except for import and export shipments. Approval by the NRC is not required if a package is used solely for export or import or if a package is authorized by the DOT regulations solely for transportation through or over the United States between origins and destinations outside the United States. The DOT has the responsibility for exercising discretion as to whether it requests NRC review of such packages.

3. Any package for which NRC evaluation is warranted in DOT opinion.

B. The NRC will evaluate package designs for fissile materials and for other radioactive materials (other than LSA materials) in quantities exceeding Type A limits and will, if satisfactory, issue approvals therefor (viz., a license, Certificate of Compliance, or other package approval) directly to the person requesting the approval.

IV. INSPECTION AND ENFORCEMENT

A. Each agency will conduct an inspection and enforcement program within its jurisdiction to assure compliance with its requirements. The NRC will assist the DOT, as appropriate, in inspecting shippers of fissile materials and of other radioactive materials in quantities exceeding Type A limits.

B. The DOT and the NRC will consult each other on the results of their respective inspections in the areas where the results are related to the other agency's requirements, and each will take enforcement action as it deems appropriate within the limits of its authority.

V. ACCIDENTS AND INCIDENTS

A. The DOT will require of all carriers subject to its jurisdiction the notification and reporting to the DOT of accidents, incidents, and instances of actual or suspected leakage involving radioactive material packages if such an event occurs in transit and the DOT will promptly notify the NRC of such events.

B. The NRC will require of its licensees the notification and reporting to the NRC of accidents, incidents, and instances of actual or suspected leakage involving radioactive material packages if such an event occurs prior to delivery to a carrier for transport or after delivery to a receiver. The NRC will encourage the Agreement States¹ and the DOT will encourage the non-Agreement States to impose incident reporting requirements on shippers and receivers subject to the States' jurisdiction.

C. In all accidents, incidents, and instances of actual or suspected leakage involving packages of radioactive material regulated by the NRC, the NRC will normally be the lead agency for investigating the occurrence and preparing the report of the investigation. The DOT may either participate, as appropriate, in the investigation with the NRC as the lead agency or conduct a separate investigation. Subsequent to each investigation involving radioactive material regulated by the NRC, the NRC and the DOT will jointly define the scope of the enforcement actions to be taken by each agency to assure that shippers and carriers are subject to concurrent and equivalent enforcement actions but not unduly subject to duplicate enforcement actions.

D. This section V does not affect the authority of the National Transportation Safety Board, which is independent of the DOT and the NRC, to receive accident reports and to investigate transportation accidents.

VI. NATIONAL COMPETENT AUTHORITY

A. The DOT will be the national competent authority with respect to the administrative requirements set forth in the Regulations for the Safe Transport of Radioactive Materials of the International Atomic Energy Agency (IAEA). In issuing certificates of competent authority for the United States under those regulations, the DOT will require for certain packages other than DOT specification containers an NRC approval in accordance with Section III.A. of this Memorandum of Understanding. The NRC will provide to the national competent authority (DOT) technical support and advice pertaining to the transportation of radioactive materials.

B. The DOT will act as the representative of the United States to the IAEA and other international groups on matters pertaining to the administrative and safety regulatory aspects of transportation of radioactive materials. The NRC will provide technical support and advice to the DOT in this capacity.

VII. EXCHANGE OF INFORMATION

A. Prior to issuance of any regulations by either the DOT or the NRC involving transportation of radioactive materials, each agency will advise and consult with the other to avoid possible conflict in regulations and to assure that: (1) the regulations will afford adequate protection of the health and safety of the public; (2) the effect of these regulations will not be inimical to the common defense and security of the United States; and (3) the regulations are in the public interest.

B. The DOT and the NRC will exchange information, consult and assist each other within the areas of their special competence in the development and enforcement of regulations and procedures. Each agency will make available to the other, subject to security requirements and statutory provisions affecting the release of

¹ States which have entered into an agreement with the Atomic Energy Commission or the NRC pursuant to section 274 of the Atomic Energy Act of 1954, as amended, under which the NRC has relinquished to such States the majority of its regulatory authority over source, byproduct and special nuclear material in quantities not sufficient to form a critical mass.

information, summaries of inspection records, investigations of serious accidents, and other matters relating to safety in the transportation of radioactive materials.

VIII. WORKING ARRANGEMENTS

The NRC and the DOT will designate appropriate staff representatives and will establish joint working arrangements from time to time for the purpose of administering this Memorandum of Understanding.

IX. EFFECT

A. Nothing herein is intended to affect the statutory exemption of shipments of radioactive materials made by or under the direction or supervision of the Department of Energy or the Department of Defense in accordance with the provisions of 18 U.S.C. 832(c).

B. This agreement shall take effect upon the signing by authorized representatives of the respective agencies, and shall supersede in its entirety the March 22, 1973, Memorandum of Understanding between the DOT and the Atomic Energy Commission.

C. Nothing in this Memorandum of Understanding is intended to restrict the statutory authority of either the DOT or the NRC.

Done at Washington, D.C., in triplicate, this 8th day of June 1979.

For the U.S. Department of Transportation.

JAMES D. PALMER,
Administrator.

For the U.S. Nuclear Regulatory Commission.

JOSEPH M. HENDRIE,
Chairman.

Senator HEFLIN. Our next witness is Mr. William Reynolds, coordinator of nuclear transportation project, American Friends Service Committee, High Point, N.C.

All right, Mr. Reynolds. Go ahead, sir.

STATEMENT OF WILLIAM REYNOLDS, COORDINATOR, NUCLEAR TRANSPORTATION PROJECT, AMERICAN FRIENDS SERVICE COMMITTEE

Mr. REYNOLDS. I'm William Reynolds, coordinator of the nuclear transportation project of the American Friends Service Committee.

The AFSC is an independent Quaker organization which has been active on issues of peace and social justice since 1917. Our work has received international recognition, including such prizes as the Nobel Peace Prize for reconstruction efforts following World War II.

The southeastern regional office of the AFSC has been involved in research and action involving issues of transporting radioactive materials since the fall of 1977, when our office began investigating the shipment of plutonium for weapons production through southern cities. For the past year I have been working nationwide with State and local governments, citizens' organizations and emergency response personnel who are concerned about the present system of shipping radioactive materials and are taking actions to improve the safety of such shipments.

Although many types and quantities of radioactive materials are carried in the United States, our focus has been on the shipment of nuclear wastes, spent fuel from nuclear reactors, and radioactive materials used in producing nuclear weapons. Shipments of nuclear waste and spent fuel account for the majority of materials carried, when viewed from the number of curies in shipment, and will increase dramatically in the early 1980's. Shipments of nuclear

weapons materials represent a large unknown. Most State and local officials responsible for protecting the public's health and safety, know little about these shipments, though certain of them present significant potential hazards.

Our work has uncovered certain problem areas which we seek to rectify in the following ways:

1. ESTABLISH THE INVOLVEMENT OF LOCAL AND STATE GOVERNMENTS IN REGULATING AND CONTROLLING RADIOACTIVE MATERIALS SHIPMENTS

State and local government officials have the responsibility for responding to emergency situations and for planning orderly growth of communities. State and local agencies are more intimately aware of local hazards and optimum routes of shipment. Given the limited staff of DOT and NRC, State agencies can be effectively involved in enforcement and inspection of radioactive shipments.

2. INCREASE PUBLIC INVOLVEMENT IN DETERMINING WHICH ROUTES WILL BE UTILIZED FOR SHIPPING RADIOACTIVE MATERIALS

The task of approving routes of shipments for radioactive materials from a Federal office is nearly incomprehensible for routes involving more than simply shipments of spent nuclear fuel. The most effective method of planning for such routes would be to involve States and localities in a framework under Federal coordination. This will lead not only to the identification of the safest and most effective routes of shipment, but would allow for the resolution of local and State needs and concerns regarding radioactive shipments.

3. DEVELOP MORE THOROUGH AND EFFECTIVE EMERGENCY RESPONSE PLANS FOR TRANSPORTATION ACCIDENTS INVOLVING RADIOACTIVE MATERIALS

Although the NRC requires emergency response plans for stationary facilities such as nuclear power reactors, this is not required for transportation situations. Present planning for radiological emergencies does not adequately address the transportation accident situation. Many communities are lacking functional plans on how to respond to transportation accidents and lacking in trained personnel and equipment to cope with a radiological emergency should one arise. In certain areas, plans which do exist are based on how to respond to a nuclear war; these are not suitable for response to peacetime situations.

4. SIMPLIFY THE REGULATORY CONFUSION ABOUT RESPONSIBILITY FOR RADIOACTIVE SHIPMENTS, PARTICULARLY IN EMERGENCY SITUATIONS

Response experience to actual accident situations has shown that delays in determining the level of radiological hazard, confusion about who has lead responsibility, and unnecessary exposure of innocent bystanders has occurred.

Present regulation of radioactive shipments is carried out by a number of agencies including the DOT, NRC, DOE, DOD, U.S. Postal Service, and intrastate shipments by various State agencies. Lead responsibility for regulation needs to be lodged within a single agency to clarify the existing regulations and develop a systematic framework for new regulations. A systematic plan for responsibility in emergency situations is also needed; experience at radiological accidents has shown that confusion among agencies responding is common.

5. INCREASE MONITORING OF RADIOACTIVE SHIPMENTS BY PUBLIC AGENCIES

Presently there is little monitoring and inspection of radioactive shipments due to staff and funding shortages. Monitoring of radioactive shipments needs to be increased by establishing Federal enforcement staff dedicated to radioactive transportation and more effectively involving State agencies.

6. INCREASE AND STRENGTHEN THE MONITORING AND CONTROL OF OCCUPATIONAL EXPOSURES TO TRANSPORTATION WORKERS WHO HANDLE RADIOACTIVE PACKAGES

Transportation workers are not monitored for radiation exposure under Federal regulations. NRC reports have indicated that some workers may be receiving exposures above allowed limits. As many as 40 percent of all packages surveyed in one study had some infraction of DOT rules, such as illegible labels, radiation emissions greater than indicated on the packages, proper shipping name missing, or detectable contamination on the surface of the package. More stringent precautions need to be taken to insure that the levels of radiation exposure to transportation workers are kept as low as reasonably achievable.

7. DEVELOP OPEN PUBLIC AGENCY INVOLVEMENT IN SHIPMENTS OF RADIOACTIVE MATERIALS BY THE DEPARTMENT OF ENERGY

Currently the DOE and the DOD ship many types of radioactive materials such as spent nuclear fuel, large quantities of plutonium, high level wastes, and transuranic wastes which could present significant public health hazards in the event of an accident causing the release of such materials into the environment. These shipments should be subject to the same regulatory authority as commercial shipments. For example, where the NRC has established special rules for handling spent fuel, these rules should apply to DOE and DOD shipments as well.

RESPONSES TO COMMITTEE QUESTIONS

The committee has outlined six questions for which responses are requested. The questions and responses follow.

Question. 1. Will the proposed clarification of the lead agency responsibility of the DOT as indicated by Section 2 of S. 535 improve the ability of State and local entities to coordinate and

resolve their needs in connection with nuclear material transportation?

Answer. Establishing the DOT as the lead agency responsible for regulating the transport of nuclear waste and commercial spent fuel will not, in and of itself, improve the ability of State and local entities to coordinate and resolve their needs in connection with nuclear material transportation. Certainly, lodging this authority within a single agency is a much needed step in simplifying some of the confusion which presently exists in the regulation of radioactive materials. However, this alone will not be sufficient to alleviate problems of conflict with State and local needs in regard to nuclear materials transport.

The policies and regulations established by the lead agency, as well as the effectiveness of their implementation, are what will determine the resolution of States' and localities' needs. The DOT in the past has had little involvement in cooperating with States and localities in the matter of regulating the transport of radioactive materials. S. 535 gives no guidance to the DOT on such policy questions as how to involve States and localities in planning and regulating future transportation of radioactive materials. It is our opinion that the legislation should direct the lead agency to effectively involve States and localities in the regulation of radioactive shipments.

I stress the need for local and State involvement in regulating radioactive materials transport and would like to point out that Federal rules will not always result in the safest or most effective route of shipment. A good example of this is Charleston, S.C. Under the recently issued NRC rules for transporting spent fuel, Charleston is not included on the list of embargoed cities, as is nearby Savannah, Ga. Using Federal criteria, one would have chosen Charleston over Savannah as a preferred route for the shipment of spent fuel. However, if current population estimates from local planning agencies are used, one finds that the urban population density of east Charleston, where such shipments would enter, is 11,841 people per square mile compared to 4,117 people per square mile in Savannah. In addition, the total population of metropolitan Charleston is 371,000 people, compared to only 207,000 for metropolitan Savannah.

The most effective format for setting up regulations for transporting radioactive materials would be to establish general Federal regulations, including routing guidelines and notification procedures. Within this framework, States and localities should have the authority to enact more stringent regulations over such aspects as specific routes of shipment, notification to public agencies, time of day restrictions, and inspection provisions. If conflicts arise under this scheme, the Federal agency would assemble the affected parties in a consultation process to develop an alternative plan for shipment.

Question 2. Would the establishment of a separate office of radioactive material transportation within the DOT be necessary or desirable to implement the role of the DOT as contained in section 2 of S. 535?

Answer. The Department of Transportation has shown itself to be ineffective in responding to State and local needs and concerns

regarding the transportation of radioactive materials. Although other Federal agencies, and particularly the NRC, have involved States in a consultative process prior to drafting regulations, the DOT has yet to do so for the regulation of radioactive materials. Additionally, numerous public hearings concerning radioactive materials transportation have been held by both State and local governments. Participation in these hearings would have resulted in a better understanding of State and local concerns by the DOT. However, the DOT has failed to participate in these hearings in any effective manner.

Ideally, authority for lead agency responsibilities in regulating radioactive shipments would be most effectively lodged in an agency other than the DOT. One such agency would be the Environmental Protection Agency (EPA). The EPA already has experience in radioactive materials issues through its Office of Radiation Programs and further experience in regulating hazardous wastes through its Division of Hazardous Waste Management. The major drawback to this is the large reorganization which would be necessary to bring the regulation of radioactive materials under the authority of the EPA.

Establishing a separate office of radioactive material transportation within the DOT would be a second best, but more easily accomplished, arrangement. This would only be effective if the office has adequate funding, staff, and support from other agencies, such as the NRC and EPA, which already have certain responsibilities and expertise in regulating various aspects of radioactive transports.

It would be unwise to establish such an office in a manner which does not recognize and involve existing expertise in other agencies. This is particularly true in regard to emergency response planning, implementing routing requirements and testing and certifying package designs. For instance, the NRC and the EPA both have considerable experience in emergency response planning for transportation accident situations. The NRC, through its Office of State Programs, has held lead authority in emergency response planning for radiological emergencies, both for fixed facilities as well as for transportation situations. The experience of the NRC should certainly be utilized in a consultative manner with a DOT office having lead responsibility for emergency response planning for transportation accidents.

The EPA has also had significant involvement in emergency planning through its drafting of an example plan and guide for emergency response to transportation-related radioactive incidents. DOT should be mandated to work closely with these and other agencies. The experience and expertise of NRC, EPA and other Federal agencies and sub-Federal bodies should be utilized to develop effective emergency response plans for transportation accidents under the DOT.

Another area of possible duplication of effort is in route inspection and approval. The NRC Office of Nuclear Material Safety and Safeguards has developed inspection teams and methods of route survey. These have been shown to be both efficient and effective in their inspection of routes used for the shipment of special nuclear materials and now spent fuel. DOT would not have to supersede

the functions of this office in fulfilling its responsibilities as lead agency. In fact, within the Office of Nuclear Material Safety and Safeguards separate branches have responsibility for conducting the route inspections and issuing the final route approval. A parallel arrangement could be set up with DOT as lead agency, by having route inspections conducted by the NRC with final route approval from DOT.

S. 535 provides for DOT to have lead responsibility for regulating the transport of radioactive materials with the exception that NRC would retain responsibility for certifying the safety of shipping casks and packages. If the DOT is assigned primary responsibility for insuring the safety and security of radioactive materials, then it should also have full responsibility for package certification. Again, this is an area where the NRC could maintain involvement through consultation with the DOT, however the DOT should have final authority for package certification.

Establishing a separate office of radioactive materials transportation within the DOT which would have principal responsibility for regulating, monitoring, and insuring the safety of radioactive shipments is no simple task. In order for such a reorganization to be functional and carry out the intent of simplifying regulation and improving safety, the DOT will need full authority for oversight of all aspects of radioactive shipments, a legislative mandate to develop closer consultative and working relationships with other Federal agencies, State and local government bodies, adequate staff and funding, and support from other agencies which are currently involved in various aspects of insuring the safety of radioactive shipments.

Question 3. What categories of radioactive materials should be encompassed by the provisions of this bill?

Answer. Section 2 and section 115 should give DOT primary responsibility for regulating the shipment of all radioactive materials. While it is appropriate for section 116, and 117 to focus on the transportation of nuclear waste and spent fuel, limiting section 2 of S. 535 to nuclear waste and commercial spent fuel is an awkward provision. Shipments of nuclear waste and spent fuel are certainly going to be one of the most significant problem areas in shipping radioactive materials in the future. According to the NRC, the total level of radiation carried in the nuclear fuel cycle will increase by over fifteenfold between 1975 and 1985. The actual number of shipments of spent fuel will increase from 273 in 1975 to over 2,100 in 1985. In terms of the number of curies shipped, the nuclear fuel cycle will account for more radiation than all other types of shipments combined. By far, nuclear fuel cycle shipments will account for the most radiological impact from normal transportation and present the most significant potential hazard in accident situations. Many problems will be associated with these shipments, such as where to ship them, which routes should be utilized, what modes of shipment will be the safest, how to develop adequate emergency response plans, and how to insure a sufficient number of casks for shipment. S. 535 begins to address these questions.

However, even though they account for less total radiation and less impact than nuclear fuel cycle shipments, the vast majority of radioactive packages shipped in the United States will continue to

be materials other than spent fuel and nuclear wastes. Radioactive packages shipped for industrial applications will number about 1.7 million in 1985. There is currently overlapping authority between the NRC and the DOT for regulating these shipments. In order to fully enhance the safety and simplify the regulation, the DOT should be granted authority for regulating all categories of radioactive materials.

In addition to commercial shippers, the Department of Energy and the Department of Defense are also involved in shipping radioactive materials. Shipments by these agencies include such materials as spent nuclear fuel, large quantities of plutonium, highly enriched uranium, transuranic wastes, and both high- and low-level radioactive wastes.

These are no different from the same materials as handled by commercial shippers and carriers. However, since they are carried by the DOE or the DOD they do not fall under the present jurisdiction of either the NRC or DOT. This does present some confusion and conflict in handling. For instance, DOE and DOD shipments of spent fuel are exempted from the provisions of the recent NRC ruling for the shipment of commercial spent fuel. This means that shipments between DOE facilities, such as from Brookhaven National Laboratories to the Savannah River plant, would not have to meet the NRC requirements. The same holds for shipments of spent fuel for nuclear submarines. Yet these shipments are no less hazardous or dangerous than other shipments of spent fuel from commercial power reactors or research reactors. In the reorganization provisions proposed by S. 535, the DOT should be granted primary responsibility for shipments of radioactive materials by the DOE and the DOD.

In this, the DOE and the DOD should have the authority to enact, when necessary, security provisions stricter than those set up by the DOT. This would apply primarily to the shipment of nuclear weapons and classified nuclear weapons components.

The DOE could also continue to operate its courier system for the transport of the nuclear weapons and weapons components. For other types of shipments there is no logical basis for distinguishing different sets of regulations between commercial shipments and DOE and DOD shipments. In this, the DOT should have authority for regulating all types of radioactive materials.

Question 4. Should the State grant program provided in section 5 be restricted to States within which a storage, reprocessing, or disposal facility is proposed? Should it be restricted to include States through which transportation of radioactive materials is likely to occur as a result of a proposed storage, reprocessing, or disposal facility in any other State?

Answer. The State grant program provided in section 5 of S. 535 should not be limited to States within which a storage, reprocessing, or disposal facility or States through which transportation of radioactive materials is likely to occur as a result of such a facility's location in another State. The management of commercial spent fuel is being carried out in an ad hoc and unsystematic manner. To try to predict where shipments of spent fuel or nuclear waste will occur in the future is an impossible task. There is hardly a State in the Nation which is free from a nuclear facility which

produces either spent fuel or other nuclear waste; when deployment sites for nuclear weapons are included, there is no State which is free from a facility which would require the transport of potentially hazardous radioactive materials.

The shipment of wastes from the Three Mile Island reactor, following the accident there last March, is a good example of the chaos which can surround nuclear waste shipments. In the initial shipments, trucks were directed to a storage facility in South Carolina. Upon arrival, the trucks were turned away from this facility and returned to Pennsylvania. After returning to Pennsylvania the wastes were then transported to a disposal facility in Richland, Wash. In all, these shipments passed through 15 States to reach their final destination.

The use of away from reactor (AFR) storage and transshipments will also be complicating factors in determining which States will be impacted by shipping nuclear wastes and spent fuel. Utilities such as Duke Power Corp. in North Carolina have developed plans for shipping spent nuclear fuels from reactor to reactor within their system. This will result in shipments crossing State lines in numbers and time periods which cannot be accurately predicted many years into the future. The use of AFR storage will even further increase the shipment of spent fuel. Currently, a facility in Morris, Ill., has received spent fuel from reactors as far away as California, with as many as 13 States being traversed along the various routes of shipment.

Additionally, other types of radioactive materials besides nuclear wastes are shipped which can pose public health hazards. These factors certainly indicate that every State in the United States can be impacted by shipments of radio active materials which could have public health impacts. In light of this, the State grant program should be made available to any State which requests assistance under the provisions of section 5.

The DOT, with primary responsibility for radioactive materials transportation, should also be the lead agency for establishing emergency response plans for transportation accidents. Other Federal agencies should continue their involvement in arranging training programs. The Defense Civil Preparedness Agency, or its successor, should continue its lead in establishing plans for war-time emergencies. Responses to peacetime transportation accidents are best coordinated through an agency whose primary focus is on the transportation of radioactive materials. Lodging this responsibility within the DOT and providing for the State grant program would enable States and localities to plan more functionally for such situations. The DOT should draft rules which would require the shipper of the radioactive material to bear the responsibility for preparing emergency response plans for shipments of large quantities of radioactive materials. These plans would require the approval of the DOT and should be supplied to the local agencies for their use.

Shippers should also be required to prepare instructions to drivers and handlers of radioactive materials packages on initial steps to be taken in the event of an accident, again under a framework established by the DOT. These instructions should be attached to

the manifest and carried by the driver for the duration of the shipment.

Question 5. Are the newly proposed rules of the NRC for routing and security in transportation of nuclear materials necessary, desirable or adequate? Explain.

Answer. The recently issued rules of the NRC provide for physical protection of spent fuel while in transit. While the rules are certainly necessary and desirable, they are barely adequate in their present form. By establishing routing requirements, requiring escorts of shipments, requiring immobilization features for trucks carrying spent fuel, setting training standards for drivers of spent fuel shipments, and other provisions, the NRC has begun to answer several serious questions concerning radioactive shipments.

The need for establishing this rule is based on a 1978 report by Sandia Laboratories which indicates that significant public health hazards could result from a successful sabotage attack on a shipment of spent fuel in an urban area. This report postulated economic impacts in the range of \$2 to \$3 billion, and health impacts resulting in tens to hundreds of early fatalities, hundreds to thousands of early morbidities and thousands of latent cancer fatalities. Research being conducted by the Batelle Memorial Institute will continue to investigate these areas, with results expected in the spring of 1980.

Based on the results of the Sandia study, the need for additional security measures is warranted. The rules developed by the NRC may not be as effective as they appear. Certain improvements to the rule could increase the security of spent fuel shipments and the safety of communities through which they pass, with little additional effort on the part of the shipper or the NRC. Under the NRC guidelines, the shipper is to notify the NRC of each shipment along an approved route. It would be a simple matter for the shipper to notify law enforcement agencies (LEA) and emergency response agencies along the route in advance of each impending shipment. The local LEA's would be responsible for reacting in the actual event of a sabotage attempt or accident situation, and emergency response personnel would be expected to oversee the implementation of any emergency plan. Notifying these agencies of proposed shipments would enable them to be on the alert during the time of shipment, as well as to prepare and test emergency response plans. The framework for providing this notification is the strip chart prepared by the NRC and carried aboard each shipment of spent fuel. This strip chart would identify each LEA along the route of shipment and provide telephone numbers and other pertinent information.

Considering the potential for radiological hazard, it would also be reasonable to require emergency response plans to be developed for transportation accidents. The NRC requires emergency response plans for stationary facilities (such as nuclear powerplants) to be developed by the licensee and approved by the NRC. Emergency response plans should also be required for the transportation of spent fuel, with the plans to be developed by the licensee for approval by the NRC.

The NRC identified an urgency in issuing this interim rule without the usual publication of a draft rule for public comment. Given

this sense of urgency such a process was appropriate for this rule. However, the NRC should develop a framework for public involvement in route approval. Such could come in the form of written comments to proposed routes published in the Federal Register, or through public hearings held along the proposed route. Such a framework would provide for a closer analysis of local hazardous situations which might exist along a proposed route, and for a better analysis of alternative routes. Citizens intimately familiar with an individual route could identify such hazards or alternative routes, whereas, an inspection team working in an area for just a brief period of time might not be able to identify such specifics.

The NRC rule also does not address the broader question of how to manage the movement of spent fuel. As it stands, any applicant requesting approval for a route or a shipment will be granted a route inspection and approval simply on the basis of the applicant's request. There is no provision in the Interim Rule to require a determination of whether there is a real need to ship and whether alternative methods of managing the fuel are available. Many methods of management alternatives to shipping spent fuel are available, such as compacted storage in existing onsite facilities, expanding onsite storage space, operating reactors at a lower capacity, and using a higher burnup of fuel in the reactor. These management alternatives should all be considered in assessing whether a shipment of spent fuel needs to be made.

Question 6. Do the provisions of section 7, S. 535 appear reasonable and adequate?

Answer. It is difficult to determine whether the authorizations established under section 7 are adequate and reasonable. The ability of the Secretary to fulfill the responsibilities of S. 535 will be determined by whether these dollar amounts are sufficient to support an effective office of radioactive material transportation. In my best estimation, these amounts appear reasonable to begin implementation of this act. However, I would recommend that the appropriations under section 7 be established not as a maximum upper limit, but as an initial reference. The Secretary should be instructed to operate for 1 year following enactment of S. 535 within the authorizations of section 7. At the end of the year, the Secretary should report back to this committee with recommendations as to whether this amount is adequate and reasonable to support the program.

SUMMARY

In summation I would like to review the major points and recommendations made concerning S. 535, The Nuclear Waste Transportation Safety Act of 1979.

One, if the DOT is established as the lead agency, then setting up an office of nuclear materials transportation would be the most effective means of implementing these responsibilities. The committee should also investigate the feasibility of establishing the EPA as lead agency for radioactive materials transportation.

Two, the DOT as lead agency should have authority for implementing emergency response planning for radiological transportation accidents. These plans should be developed at the local level, within a defined hierarchy of responsibility set up by the DOT. The

shipper of radioactive material should be required to develop the necessary emergency response plans for large quantity shipments, subject to the approval of the DOT.

Three, the DOT as lead agency should have responsibility for regulating all categories of radioactive materials. This should include radioactive shipments made by the DOE and the DOD.

Four, the DOT as lead agency should be directed to work in close consultation with other Federal agencies in implementing its responsibilities.

Five, the DOT should be directed to effectively involve States and localities in regulating and planning for radioactive shipments. States and localities should have as broad authority for regulation as is feasible.

Six, NRC regulations regarding the transport of spent fuel are reasonable given current information available. These regulations could be strengthened by requiring notification of individual shipments to local officials as well as to the NRC. Additionally, the rules should require a showing of the need to ship, and why no alternative methods of management can be used.

Seven, the States grant program should be made available to all States requesting assistance under this program.

Senator HEFLIN. Thank you.

Senator Schmitt, do you have any questions?

Senator SCHMITT. Yes.

Mr. Reynolds, you have suggested that the Environmental Protection Agency might be a more appropriate lead agency to regulate radioactive shipments. Our committee sent a copy of the bill to EPA in March and they had no comments on it. We informally requested them to testify on the bill and they said they had no interest.

Even if you were correct, it looks like we're having a hard time getting them at least to comment on whether they could or would or should have that kind of authority. Do you have any further comment on that subject?

Mr. REYNOLDS. Well, I hope that's not an indication that this is an issue which other Federal agencies don't want to be involved in. The EPA has been involved in developing emergency response plans and establishing criteria for public exposure.

My comment here is that the key point is that I don't believe that the DOT and the NRC have been as effective as they need to be in overseeing and regulating the transportation of radioactive materials, and if they—if these agencies cannot be strengthened and cannot be directed to carry out their authority effectively, then perhaps we should look to another agency who would be able to do this.

Senator SCHMITT. Well, based on their past performance. I have many of the same questions that I think you have in your mind about DOT. So this is going to be an issue we're going to look at very carefully.

Mr. REYNOLDS. I would like to add one point about the DOT here, and that is, there has been some discussion about delays in their present rulemaking procedure for the highway routing of radioactive materials. But I personally don't believe that there has been an excessive delay in the DOT's establishment of these rules, and I

think the DOT has been moving in a very prudent manner to enact these regulations.

One of the main reasons which I see for the length of time necessary to establish these rulemaking proceedings is because the DOT is holding public hearings, is soliciting public comment, and will be holding further public hearings at the regional level, to engage States and localities as well as the general public in commenting on these rules. That is going to take a certain amount of time and I think, given the issues that are coming up here, that time is certainly necessary to have a full public involvement in the rulemaking proceeding.

Senator SCHMITT. Well, in that regard, isn't the essential thing, though, proper containers and assurance that those containers would be used properly and not abused, in the general handling of the material. If we do that right, haven't we solved most or 90 percent of the problem, and then routing becomes more or less frosting on the cake, important but still frosting?

Mr. REYNOLDS. Well, that is certainly the entire rationale of the Department of Transportation in establishing packaging standards for all hazardous materials. And I do see the rationale for that. If the packages have a high degree of integrity, then we don't have to worry about other things because they won't create exposure to the public.

But I don't believe that it's—that it's possible to develop a package which would never break open under accident conditions. And I think that, given the economic factors that are involved in here, that we will have to accept the fact that certain packages would still be able to release their contents in an accident situation.

The accident experience to date has shown that there have been very few accidents releasing radioactive materials into the environment, and I think that that is a very good sign. But I don't think that this will necessarily hold true into the future, as we see greatly increased numbers of packages in shipment and as we see, as has been presented earlier, the fact that there is a high level of noncompliance with present DOT regulations.

Senator SCHMITT. Well, that's what I'm trying to get at. There's no such thing as zero risk. I admit that, and I think you would, also. But if we focus on the principal problem in respect to transportation, and that is the problem of containers and insuring that every time a container is used it's handled properly, then, while I would not ignore the routing problem, there's less risk along any route, if that packaging is done properly and under the right supervision.

Mr. REYNOLDS. I agree with——

Senator SCHMITT. The research that's been done on packaging is quite impressive. Now, whether we're utilizing all that research is another issue. You can make those containers awfully, awfully invulnerable.

Mr. REYNOLDS. I agree with you that the main line of defense should be in establishing very stringent criteria for the packages as well as the handling of them. But we are still going to need emergency response plans, involvement of State as well as local agencies, who will have to respond to potential emergency situations.

Senator SCHMITT. I'm not arguing with that. I'm just saying that we can make that whole process easier and simpler if we've done the first thing right. That's what I was hoping that you would agree with.

Finally, Mr. Chairman, I am wondering whether Mr. Reynolds would agree that there are dangers in both excessive action or excessive inaction by local authorities. That can go both ways. Excessive action may result in other States being unnecessarily deprived of materials that they need or need to transport. Excessive inaction results in the local government being unprepared for the kinds of situations that might develop.

Do you agree with that, that we have to keep that in mind as we develop this legislation?

Mr. REYNOLDS. Yes; I think so. And in this—somewhat anecdotal-ly, I would like to say that in my involvement with many numbers of people in many different levels from citizens to public agencies, I have occasionally heard references to people saying that we need to ban all radioactive shipments through certain areas. And, you know, I can't go along with this kind of notion.

The first thing you are faced with are the fact that there are many different levels of hazard represented by radioactive materials. Some radioactive materials really pose very little consequence in the event of an accident, and even the release of the entire contents of the package, while others would have very significant impacts in the event of a large-scale release.

Also, the notion that certain areas will be deprived of materials which they need is one which we do have to keep in mind as we're drafting these rules. But as yet, I have not seen a situation which is arising which would deprive any area of any needed radioactive materials. And in fact, the regulations which have been enacted in communities as well as States across the country—the only ones that have prohibited any shipments have been those which prohibit shipments of spent nuclear fuel, high-level waste, and in one small community in Massachusetts, atomic weapons.

At present, I haven't seen any area of our society where these materials are being used as a resource for something else.

Other types of radioactive materials, such as radio pharmaceuticals, fresh fuel used in nuclear reactors, the uranium yellow cake, are not banned in any areas that I am familiar with. And these materials are still allowed to be transported where they need to be utilized.

Senator SCHMITT. Thank you.

Senator HEFLIN. Thank you, sir.

Our next witness is Mr. Charles H. Mayer, the vice president, Nuclear Division, Tri-State Motor Transit, from Joplin, Mo.

Mr. Mayer, if you will come forward.

STATEMENT OF CHARLES H. MAYER, VICE PRESIDENT, NUCLEAR DIVISION, TRI-STATE MOTOR TRANSIT CO., JOPLIN, MO.

Mr. MAYER. Mr. Chairman, members of the committee and staff. My name is Charles Mayer and I am the Nuclear Division vice president of Tri-State Motor Transit Co., whose headquarters are located near Joplin, Mo. I appear here today on behalf of Tri-State Motor Transit Co. and my remarks relate solely to its business

activity and management philosophy. However, I do believe, from discussion with other persons, that my comments being made here today generally reflect that of the motor carrier industry.

Tri-State is an Interstate Commerce Commission certificated common motor carrier, engaged in the transportation of specific commodities. We are a publicly owned company incorporated under the laws of the State of Delaware, and our stock is listed on the American Stock Exchange.

We operate nationwide throughout the 48 States with a fleet of 1,100 tractor power units and 2,300 semitrailers. We have 34 terminals, located throughout the United States, 26 of which are directly coupled to the Joplin headquarters through remote on line computer terminals. Our gross operating revenue for 1978 was \$89,435,000 with a total of 91,766,000 miles traveled.

We have engaged in the transportation of nuclear materials since the early 1950's and believe we were the first commercial motor carrier to transport spent fuel.

From the beginning, our management has followed a policy of specialized transportation for nuclear shipments with safety being the primary consideration. We have always imposed higher standards on ourselves than those required by law, which is the case to this day.

Our program of specialization is unique to the transportation industry. It comprises the development and construction of specially engineered transport equipment, technically competent and experienced personnel including a radiological health physicist, a mobile radiation detection and decontamination unit, a large investment in portable radiation instrumentation, personal training and emergency response procedures. We also have the first nuclear transportation liability policy issued bearing the identification No. NS-1.

In line with our concern for safe and effective transportation of nuclear materials, we support the intent of S. 535 and are of the opinion that its passage will enhance safety and efficiency factors associated with nuclear shipment transportation.

I will now address the specific questions presented to me for comment at this time.

The first question was: Do you concur in the necessity to establish a lead agency for regulation of transportation of nuclear materials? Is the approach taken in section 2 of S. 535 the preferred one?

We concur that there is a need to establish a lead agency at the Federal level having primary regulatory authority over the interstate movement of nuclear shipments. A confusing and conflicting regulatory environment is developing as a result of unilateral regulatory action by Federal, State, and local governmental agencies. The multiplicity of regulatory requirements being imposed now and proposed for the future are counterproductive to public safety. We are finding travel restrictions such as those imposed by the State of Connecticut causing nuclear shipments to be parked in relatively unprotected areas, or being forced to move in a circuitous manner over secondary roads, the configuration of which are not always conducive to safe transport conditions.

Prenotification requirements being imposed by various regulatory agencies at State and local levels are burdening both the shipper and carrier, and are of questionable value.

The approach taken in section 2 of S. 535 seems to be appropriate, and I have no alternative suggestions.

The second question: Should a separate office be set up within the DOT with overall responsibility for fulfilling the intent of section 2 of S. 535?

We would urge that a separate office be established within the Department of Transportation to achieve the objectives of S. 535. We feel that the unique aspects of nuclear transportation set it apart from other hazardous material movements and a regulatory requirement pertaining to this commodity can best be treated by an office intimately knowledgeable on the wide range of nuclear materials, their varying physical and radiological characteristics, and potential biological and environmental hazards.

By appropriate consultation with the Nuclear Regulatory Commission, this office can develop and promulgate clear and concise regulations that will provide a realistic standard of nuclear transportation safety and security.

The third question: To what extent, or with respect to what activities, should existing division of responsibility between the DOT and other departments and the NRC, whether attributable to past practice or to specific enabling legislation, be revised to permit the DOT to fulfill the intent of section 2 of S. 535?

To effectively implement the objectives of S. 535, the Department of Transportation must have sole regulatory and enforcement responsibility in the matters dealing with the packaging and transportation of nuclear shipments. Anything less than this would tend to detract from the stated purpose of S. 535 of enhancing the safety and simplification of regulations.

Consultations with other agencies such as the Nuclear Regulatory Commission, Environmental Protection Agency, and those at various State and local levels, is recommended in order to assure that all aspects of environmental and public safety are considered.

Any enabling legislation that allows agencies other than the Department of Transportation to impose requirements on the shipper or carrier in matters pertaining solely to packaging and transportation of nuclear shipments should be revised in a manner that will permit the Department of Transportation to fulfill the intent of section 2 of S. 535 in a free and unencumbered manner.

Question four: What radioactive materials should or should not be encompassed by S. 535?

All radioactive materials should be encompassed by S. 535 in order to establish a consistent and uniform regulatory blanket. The myriad of regulatory requirements now being heaped upon shipper and carrier are often confusing and conflicting to the degree that it is impossible to comply with all requirements. The inclusion of all radioactive materials within the scope of S. 535 will have a clarifying effect as to applicable regulatory requirements on any given shipment. To exclude certain shipments would not be in the best interest of uniform, safe, and efficient shipping practice.

Question 5. Should other sections of S. 535 be amended the better to fulfill the intent of the bill as stated in section 2?

It is recommended that the Environmental Protection Agency be included in section 2, since there appears to be in existence enabling legislation allowing this Agency to regulate certain aspects of waste shipments, including those of a radioactive nature.

It is further recommended that in section 115(a) line six the words "regulating and" be stricken leaving the sentence to read in part "except that the primary responsibility for certifying the safety of the shipping casks and packages shall remain with the Nuclear Regulatory Commission."

This will place the sole packaging responsibility with the Department of Transportation which can carry out this responsibility after consultation with the Nuclear Regulatory Commission and the Environmental Protection Agency under the provisions of section 2.

It is recommended that radioactive material be added where nuclear waste and radioactive commercial spent fuel appear throughout S. 535.

Aside from what I have written here, I would also like to include that, in section 115 in the development of emergency plans, that the Department also consult with the carriers on emergency response, as I feel that the role of the carrier is significant and can contribute significantly to emergency response.

Question 6. Do the newly proposed rules—this is question six—Do the newly proposed rules of the NRC dealing with routing and security appear necessary, desirable, or adequate? Discuss the degree to which they complement or conflict with routing guidelines contained in rules proposed by the DOT in August of 1978.

The Nuclear Regulatory Commission's new rules effective as of July 16, 1979, dealing with the routing and security of spent fuel shipments are not necessary, as the Department of Transportation can, under S. 535, promulgate routing and security regulatory guidelines for the highway transportation of spent fuel or other radioactive materials where it appears necessary.

The Nuclear Regulatory Commission's new rules are intended to minimize the potential radiological consequences arising out of an act of sabotage. However, they force the use of secondary roads which are far more hazardous than using interstate highways. The reasons for this conclusion are stated as follows:

Interstate highways are two or more lanes, usually traveling in the same direction, that have an even traffic flow with limited traffic entry. By comparison, secondary roads are usually two lanes with frequent intersections and junctions with interrupted traffic flow.

Secondary roads are subject to pedestrian traffic, bicycle riders, children, schoolbuses, and slow-moving vehicles. Interstate highways are not.

Interstate highways have a high visibility factor both within and without urbanized areas and have a short response time frame for emergency assistance. Secondary roads have relatively low visibility factor and longer emergency response time frame.

Interstate highways within densely populated urbanized areas are isolated by embankments, fences, and landscaping, whereas secondary roads within populated areas have no barriers and

usually pass directly through the center of a business area of a community.

In addition to these four comments I have here, another requirement is radio-telephones. Deviating from an urbanized area onto secondary roads will very likely take us out of the range of that radio-telephone.

It is my considered opinion and that of others with whom I have discussed this matter that spent fuel shipments pose a far less potential hazard on interstate highways within urbanized areas than on isolated secondary roads conducive to a covert action such as hijacking or sabotage.

I sincerely hope that my comments prove helpful, and if I can answer any questions I will be happy to do so.

Thank you.

Senator HEFLIN. Thank you for very succinctly getting to the questions that were directed to you.

Do you have some questions, Senator Schmitt?

Senator SCHMITT. Thank you, Mr. Chairman. I have some minor followup questions.

Have you been able to calculate the added cost of the new rules that you've just commented on?

Mr. MAYER. No, sir, we have not calculated the cost.

Senator SCHMITT. You would expect additional cost, wouldn't you?

Mr. MAYER. Yes, sir, it could increase the cost, because our charges are based on a mileage, and the additional transportation, the additional hardware and so forth could in fact double the transportation costs; but no real definitive study has been made—

Senator SCHMITT. In time?

Mr. MAYER. In time. Definitely time.

Senator SCHMITT. Do you feel that the rules are justified by existing or potential threat of sabotage?

Mr. MAYER. I think it's a tradeoff, Senator Schmitt. I think that the potential of an accident situation on a secondary road in an isolated community are far greater than the potential of a hijack or sabotage situation.

Senator SCHMITT. Are there aspects of the rules, other than the one you mentioned in terms of isolation, that make sabotage more likely rather than less likely?

Mr. MAYER. I don't follow the question.

Senator SCHMITT. Well, you sort of indicated that there was more of a chance because of the isolation of the secondary road to be subject to hijacking or sabotage.

Mr. MAYER. Covert.

Senator SCHMITT. Are there other aspects such as considerations of covert action.

Mr. MAYER. Covert actions normally seem to take place in the dead of night, under cover of darkness, and usually in an isolated spot. This would appear to be the most likely situation that we would be faced with—would be in an out-of-the-way area, rather than in a high-visibility area of a city where they have law enforcement—high frequency of law enforcement patrolling and so forth.

Senator SCHMITT. Finally, Mr. Mayer, do you think that there is any large, existing department of Government—that can handle this job satisfactorily?

Mr. MAYER. The emergency response?

Senator SCHMITT. The total lead agency responsibility for transportation of nuclear materials.

Mr. MAYER. No, sir, I don't think there is one agency in existence right now that—let me qualify this—I think that it properly rests with the DOT, but I do not think that the DOT right at this moment is geared to, or may even have the expertise, to carry out the mandate of this S. 535.

Senator SCHMITT. Do you consider that statement applicable also to other hazardous materials?

Mr. MAYER. We're not engaged in other hazardous materials-wise transportation, and I'm really not too familiar with what's available in that area. The only other hazardous material that we handle are explosives, and they appear to be regulated in an adequate manner.

Senator SCHMITT. How would you recommend that the shippers and other appropriate members of the private sector with expertise in this area, and responsibility in this area, be integrated into the coordination of the Department of Transportation's activities?

Mr. MAYER. The shipping requirements are promulgated under title 49 of the Federal Register, or Code of Federal Regulations, rather, which are promulgated by the Department of Transportation. These of course as we're recommending here, and which has been the past practice, are developed in conjunction with the NRC.

I don't see any real change in that regard. The NRC also has licensing responsibility for all shippers of nuclear materials. The regulatory requirements can be imposed by the NRC at the licensing level, and then also enforced by the Department of Transportation once the shipment is tendered through the carrier.

Senator SCHMITT. But I presume you've made the comments that you made to us to the NRC about their proposed rules dealing with sabotage?

Mr. MAYER. We have until August the 17th to respond. We are drafting our comments to them right now.

Senator SCHMITT. You have not made these comments?

Mr. MAYER. No, sir, we have not made these comments to them in written form. We have made them verbally.

Senator SCHMITT. What was their reaction?

Mr. MAYER. That was hard to tell. We presented it to them—

Senator SCHMITT. Well, obviously their interim rules did not reflect your views.

Mr. MAYER. No; it did not.

Senator SCHMITT. Would you supply—Well, we can get that, but the committee will be very interested in the NRC's reaction to your formal comments.

Mr. MAYER. Yes, sir.

Senator SCHMITT. Thank you.

Senator HEFLIN. Mr. Mayer, does your company require any special training or qualification for the drivers of nuclear transport vehicles?

Mr. MAYER. No, sir. We have—incidentally, nuclear is only about 8 percent of our total business activity. We select the drivers for the nuclear loads with some degree of care, based on their driving experience.

Every driver that is hired by our company goes through a 3-day school. During this schooling period, we do give them a brief training, or I should say exposure to radiation instrumentation, and some brief outline as to what are entailed in transporting nuclear materials, particularly from an emergency standpoint.

We also give them a radioactive materials handbook, which we require them to study. But we do not have any very sophisticated training program in this particular area.

Senator HEFLIN. Do you think that carriers of nuclear waste—especially spent fuel—should be licensed to do so? Would this provide any added protection to the public? Would it have an adverse effect on the transportation industry?

Mr. MAYER. I think that a carrier should have a specific authority issued by the Interstate Commerce Commission for the transportation of radioactive material.

In other words, I think that certain standards should be established in the transportation industry for the movement of this material.

Senator HEFLIN. Would you tell us, if a nuclear waste container being carried by one of your trucks is involved in an accident, and if it were to be ruptured, what instructions have you given to your drivers as to what they are to do? What is their procedure that they are to follow?

Mr. MAYER. The first thing a driver is to do is to notify—somebody notifies the local response agency. That is, the law enforcement people, to be on the scene. He is instructed to immediately call Joplin, Mo., our centralized dispatch office, where we then notify the Department of Energy's radiological assistance network, who then in turn sends out a team or an individual to the scene, and they have people located around the country.

These are not necessarily DOE people. They may be from a university, or a hospital, or some laboratory that they have made previous arrangements with for this purpose.

Senator SCHMITT. Mr. Chairman, this is sort of a followup question. The thought that has been playing around in my mind for a number of months: Do you think that we are approaching a situation, or maybe have entered a situation with respect to the transportation of hazardous materials in general, that we need to have FAA-like oversight into the proficiency and training of the drivers and operators of transportation equipment?

Mr. MAYER. I don't know whether we would need that degree of oversight, Senator Schmitt. If the rules or the regulations are carried out with respect to proper packaging, and it is done in the proper packaging, and that the shipper complies with what is required, there does not seem to be a need for a sophisticated control at the area of the carrier.

If the carrier, in the event of an accident situation, responds quickly and calls in the appropriate emergency response organizations, I believe that would suffice.

I do believe that a level of expertise should be established by the carriers with regard to training, with regard to specialized equipment, with regard to emergency response procedures, in that area. But to get into a high degree of training for truck drivers may be a little too much, at least at this time.

Senator SCHMITT. Well, but don't you think that the transportation of a tanker full of chlorine through a populated section of the country represents as great a hazard to the public as does the transportation of 200 or 300 people in an airplane?

Mr. MAYER. I believe it presents a rather significant hazard.

Senator SCHMITT. You don't think anything would be gained by the insistence on a certain standard of proficiency for the driver of such a truck?

Mr. MAYER. I think that the driver proficiency should be looked at in perhaps a degree—just from his driving capabilities and his driving background.

Senator SCHMITT. Well, somehow 3 days of training doesn't sound adequate.

Mr. MAYER. Well, this is true. This is lacking. I think that more like a week's exposure to how to operate a geiger counter, how to rope off an area, what to do in case of—

Senator SCHMITT. No; but I am really thinking in terms of the actual driving proficiency of the individual, in addition to how they would react.

Mr. MAYER. Oh, now—I'm sorry. I might have misunderstood. Our drivers, the training program we give them has nothing to do with their driving.

Senator SCHMITT. You are talking about the 3 days applies purely to the nature of the cargo.

Mr. MAYER. There are several things that a driver has to go through. He has to learn how to make out his logs properly, which most—you see, we don't hire drivers without experience.

Senator SCHMITT. Without a driver's license.

Mr. MAYER. That's right. They come in, they've had at least 2 years of over-the-road driving before we'll hire them. And then we have to go through—there's a lot of documents that they have to maintain, interchange reports, inspection reports, log keeping—

Senator SCHMITT. What about their actual driving skill? 55 miles an hour, hopefully, with a load of chlorine gas behind them—chlorine, LNG, or something like that—in whatever kind of road you happen to be on, weather conditions, all of the things that can contribute to an accident. The fact is, if you list the things that you'd write down, they are the same kinds of things that contribute to airplane accidents.

Do you think that the drivers you have are adequately prepared? Is there adequate oversight over their capability to react with minimum risk in those kinds of situations?

Mr. MAYER. I would be hard pressed to say "yes" to that, because we have drivers of varying degrees of skill, and this is one reason why we only choose drivers on hazardous commodities, in our cadre of drivers, that have a proven record.

As I say, the drivers come to us, they have a 2-year-minimum driving record with other carriers. We look back over their accident record, their behavior patterns, and so forth, at the time we

hire them. This is the only thing that we have in order to judge a driver's capability.

Senator SCHMITT. Well, I would be curious for your further thoughts on this issue. It keeps coming up to mind as we explore it and it could be one of the ways in which, without significant interference with the carrier, we can significantly reduce the risk of accidents.

And I apologize, Mr. Chairman. I keep going back to chlorine and other things that are more of a risk than what we are actually dealing with here, but there are lessons to be learned there that definitely apply to the radioactive material.

Thank you.

Senator HEFLIN. Thank you, Mr. Mayer.

Our next witness is Mr. Roger DeGassie, the Deputy Assistant Secretary, Planning and Analysis, Energy Technology, Department of Energy.

Senator SCHMITT. Mr. Chairman, I would, since Mr. LeGassie and I have worked together on many other occasions, I would just merely correct the record by changing his name. I believe it is LeGassie.

Senator HEFLIN. I apologize. That's a southern pronounciation.

STATEMENT OF ROGER LeGASSIE, DEPUTY ASSISTANT SECRETARY, PLANNING AND ANALYSIS, ENERGY TECHNOLOGY, DEPARTMENT OF ENERGY

Mr. LeGASSIE. Thank you, Mr. Chairman, and members of the subcommittee.

I believe we have distributed copies of my formal testimony. So in the interests of time, I won't attempt to read the text of it. I hope it would be made available for the record.

I would like to verbally summarize or highlight a few of the points made in the testimony, and then respond to your questions.

The Department of Energy does share with the committee interest and concern in the area of transportation of nuclear waste, and a belief that it is desirable to improve the performance of the Federal Government and the transportation system generally to be responsive to public concerns, despite the fact that there is also an impressive established safety record in this area.

These views are widely held in the Government, as evidenced by the interagency review group report on nuclear waste management, which also stressed the importance of continuing attention to the transportation problem in the area of nuclear waste.

We are therefore sympathetic with the objective of the committee. We do believe, however, that the provisions of the proposed bill are in many cases duplicative of existing authority. That is to say that the objectives and purposes of the bill could be accomplished by the Federal agencies involved under their existing authority.

If the committee and Congress does believe that it is desirable to bring this material together into one place with the expressed view of the Congress, then we would recommend that you look at certain sections of the bill which we find troublesome in a detailed way, and which I tried to cover in my testimony. But we are also in agreement with other parts of the bill, both with respect to the

objectives and what is proposed, and these things can be done—and in some cases are already being pursued—under existing authority.

We are concerned that there be no change in the existing situation whereby the Department of Energy is able to certify compliance on its own with Federal standards for transportation events where the Department is the shipper.

We interpret the bill to be compatible with continuation of this existing relationship. If it were not, it would represent a significant problem for the Department with respect to its national security activities and other activities.

We believe that our record in certifying and managing our own shipments has been an excellent one and there is no basis for concern in terms of our demonstrated performance in this area.

I would also like to highlight a comment with respect to the proposal to provide for additional assistance to State and local governments through the grant mechanism, which is in the bill.

The Department agrees very strongly with the draft bill; that it is important to get much more involvement of State and local governments in addressing proposed shipments where they represent a significant level of potential risk. And indeed, the Department in the waste management area, has been pursuing a practice of being open to consultation with affected States where we have been talking about the location of waste repositories or away-from-reactor storage facilities for spent fuel.

We are actually funding, for example, the State of New Mexico, not under a grant but under a contractual relationship through our waste management budget, to let them look at all the aspects of the proposed siting of this facility.

So again, these kinds of things can be done under existing arrangements, and it may be preferable to use the contract as opposed to a grant route.

We would note that if a grant route is used, that the limitation of \$50,000 which the committee suggested may really not be adequate in magnitude for the kind of review which the State may wish to conduct.

We are also concerned with respect to some of the definitions that are in the proposed bill that represent potential problems. For example, the definition of "shipment" as I indicate in my formal testimony, could possibly be interpreted to restrict movement within non-NRC licensed facilities, such as some DOE facilities, private and Government shipyards, and pharmaceutical manufacturing plants.

We presume that is not the intent of the committee, and would suggest that you would perhaps review your definitions. There is also some concern we have with the numerical elements of two of the definitions. That is, the one for "radioactive material," where a specific number is cited; and the one for "transuranic materials," where the 10 nanocuries per gram is cited. The NRC is reviewing the latter number, and as a minimum that definition should indicate 10 nanocuries per gram, "or such other number as the NRC may subsequently establish."

So there are some detailed areas of that kind, and we would be pleased to interreact on a staff basis to pursue that type of question.

Getting back to matters of greater policy significance, there is some overlap with the Nuclear Nonproliferation Act, which has recently been passed, which relates to control of foreign shipments into the United States.

We believe S. 535 and the existing act are in conflict on several points, and our first preference would be simply to use the provisions of the existing Nuclear Nonproliferation Act, or as a minimum to conform this bill so that it is not in conflict with and does not represent some further restriction on that.

These are my general comments. I also would like to note that we have established in the Department of Energy now a Transportation Technology Center at Sandia Labs in Albuquerque, N. Mex. In the audience today is Bob Jefferson who is associated with that facility, and we are, through this mechanism, funding research and investigations and statistical compilation activities which are addressing a number of the areas identified in the bill as of concern to the committee. And we would hope that this activity will make a contribution to improvement of the transportation situation in the future.

I would be prepared to respond to questions the committee may have.

Senator HEFLIN. Senator Schmitt?

Senator SCHMITT. Thank you, Mr. Chairman, and thank you, Roger. Again, it's good to be working with you on another issue.

If the existing authority that you have mentioned is adequate, why did we run into difficulties in the recent response by the Federal Government to this situation in Nevada, the ultimatum that the three Governors sent?

Mr. LEGASSIE. Well, I think we're talking about the difference between authority, capability, and performance. Again using the experience of the interagency review group report, we had much public comment on the draft report indicating that the area of transportation needed more resources, needed more effort, needed more attention.

And I agree with that. The IRG Report agrees with that and has recommended that these efforts be accelerated, expedited, and greater resources in time and managerial attention be provided.

So that is to be distinguished, I think, from the question of whether these actions can be taken with existing authority. My point is that I believe that most of them could be, and it is not a lack of authority that is creating the problem, it is the lack of dedication of resources and attention.

Senator SCHMITT. Well, sometimes legislation is aimed at that purpose as much as granting new authority.

Mr. LEGASSIE. We will be sympathetic to that objective.

Senator SCHMITT. It will not be the first time the Congress has so acted.

The final draft of the IRG report, page 113, recommends that the DOE develop a data bank on shipment statistics and accident experience.

Would you compare this recommendation with the provision in Section 6 of the bill which calls on the Secretary to file shipment data and other information and can aid in risk assessment? And do you think it is necessary?

Mr. LEGASSIE. Well, first certainly we—the Department of Energy and I personally—support the recommendation in the IRG report. I think the distinction between that general statement in the report and the specific language in the bill would perhaps go to the point of whether or not this data bank needed to contain every piece of data with respect to every shipment, or whether it would represent a statistical sampling which is adequate to interpret what is happening, and the frequency with which the data is entered, and so on.

I think the concern that may exist with respect to the language in the bill is that it may require more effort, more cost, more time, more resources if read literally, and that there may be simpler processes to achieve the same end.

But certainly we are agreeing that the status of knowledge in which we have confidence statistically on shipments needs to be improved. This is one of the assignments we have given to the Sandia Center. And they have, by sampling techniques, begun to develop assessments of the shipments, the accident frequency and so on, which go beyond available statistics.

So I think the intent is the same. I am sure the Congress would not want to mandate an excessive effort, and there is an enormous amount of data which could be called for and could be stored in computers and could molder there and not be used, and it's a burden on the industry to supply and on the Government to manage.

So some reasonable compromise between needs and costs of data compilation should be sought.

Senator SCHMITT. I think you have an excellent point. And also with respect to the Sandia effort, do you think that we could gain appreciable increased protection of the public, and therefore a need for less emphasis in other areas, by concentrating on the design of the shipment casks?

Mr. LEGASSIE. I think the shipping cask is certainly the first line of defense, the integrity of the container. This is exemplified by the present system which does talk about type A and type B containers, in which we do attempt to design for type B on the assumption that there will be an accident—say, unlike your shipments of chlorine and LNG that are vulnerable to accidents when they occur. The approach in the nuclear shipments has been to assume that containers will be in accidents, and to design the containers so that they have a very high probability of withstanding such accidents without loss of integrity.

To the best of my knowledge, type B containers have in fact been in accidents, and to the best of my knowledge there has never been a breach of, and therefore corresponding loss of material from such a container that has been in an accident.

So we seem, at least in the experience up to date, to have achieved the objective we were after. And that's a fundamentally important element of the total system design, but it is not the only element.

So I am not saying that one should not be concerned about routing issues—I think one should be—and other aspects of security and safety in the overall transportation system as well.

Senator SCHMITT. To what degree does the Department of Energy test and attempt to maintain the proficiency of drivers of their shipments?

Mr. LEGASSIE. I will have to supply that information for the record, Senator. It is something that I am not personally familiar with.

Senator SCHMITT. I would appreciate that.

[The following information was subsequently received for the record:]

DOE TRANSPORTATION SAFEGUARDS SYSTEM

Introduction.—Since April 1975, the Manager, Albuquerque Operations Office (ALO) has operated with the Department of Energy (DOE—formerly ERDA, AEC) Transportation Safeguards System with responsibility for the safe, secure transport of all DOE-owned or controlled nuclear weapons and Category I (strategic) quantities of special nuclear material. The system, which is centralized in the ALO Transportation Safeguards Division (TSD), with staff, couriers, supporting facilities and equipment at Albuquerque, Amarillo and Oak Ridge, operates nationwide, serving about 125 DOE and DOD shippers/receivers by air, rail and highway modes of transportation. Programmatic responsibility for the system at the DOE Headquarters level is assigned to the Director, Office of Military Application.

Equipment.—The sensitive materials are transported primarily in unique, specially-designed safe, secure trailers (SST's) and safe, secure railcars (SSR's) which are armored, well insulated and have sophisticated deterrent and access-denial systems. The SST's and SSR's are highly resistant to attack and unauthorized entry and present a high degree of cargo protection in event of fire or serious accident.

Communications.—ALO/TSD operates and HF security communications (SECOM) system with the capability of maintaining highly reliable digital or voice communications with all TSD surface shipments in the United States. ALO/TSD conducts a continuous emergency response program to assure energy assistance by state police and other appropriate organizations when needed.

COURIER STANDARDS AND TRAINING

The key element in the DOE Transportation Safeguards System is the physically and mentally fit and properly trained, equipped and supervised courier who continuously meets the unusually high standards.

1. *Standards.*—ALO/TSD couriers must be at least 21 years old, possess DOE "Q"—access authorization and a high school diploma or equivalent, and qualify for employment under the Veteran's Preference Act. Couriers must meet physical fitness performance standards on a continuing basis and exacting medical standards, including mental and emotional stability for annual certification under the personnel reliability program. They must meet driver qualification for tractor/trailer other highway vehicles and qualify quarterly with .357 magnum revolvers and auxiliary firearms such as M-16 rifles, shotguns and 40mm grenade launchers. Couriers must find it unobjectionable and so certify in writing to work with nuclear explosives and to carry firearms and use force, including deadly force, as necessary to protect a shipment cargo against any threat, including an armed, overt attack. Sectin 161.k of the Atomic Energy Act of 1954, as amended, authorizes the arming of DOE couriers for the protection of material in their custody. Courier new hires serve one year in probationary status. If their performance is unsatisfactory, they are terminated or transferred. After the first year, any courier who fails to meet a standard or qualification requirement is not allowed to perform courier duties before his case is reviewed and resolved by a Standards Review Board.

2. *Training.*—All ALO/TSD courier training is conducted in-house. There are no courier specialists. Each must be qualified to perform all courier functions. Performance as a member of a courier team is stressed. All formal training programs are conducted at the TSD headquarters in Albuquerque.

A. *Recruit training program.*—Prior to probationary assignment to field duty, each courier recruit must successfully complete at least 240 hours of classroom and field instructions involving (1) tractor/trailer driving, (2) firearms qualification, (3) physical fitness, and (4) courier SOP's and courier team functions. (A subject schedule for the Recruit Training Program is attached.) Recruit training is conducted on a pass/fail basis. Any recruit who fails to meet all requirements by the last day of

scheduled training is disqualified. Past experience shows a 13 percent failure rate. Cost of the program for each recruit is approximately \$3,900.

B. *Advanced training programs.*—All couriers participate annually in advanced training programs of at least 40 hours which emphasize courier team tactics and deployment; organization, command and control; sniper and combat firing; live ammunition ambush problems; and offensive/defensive field problems utilizing the Multiple Integrated Laser Engagement System (MILES). The MILES involves the use of eye-safe lasers mounted on M-16 rifles and other firearms. All exercise participants, i.e., the courier team members protecting the shipment and members of the attacking team, wear laser detectors or sensors. The lasers, when fired, have range and accuracy characteristics very similar to that of an M-16 bullet. MILES, therefore, permits a defensive/offensive exercise with the capability of determining who wins and loses, individually and collectively, and provides for testing of many aspects of individual and team training. Emphasis is also given to emergency type training such as firefighting, first aid and radiation monitoring. Cost of the advance training programs is about \$500 per courier, including travel and per diem. Subject schedules for the already conducted Advanced Training I and II are attached.

C. *On-the-job training.*—When couriers are not in travel status, training and retraining programs are conducted by qualified instructors to cover virtually every aspect of their job, including physical fitness activities and firearms practice.

D. *Audits.*—To determine and evaluate how TSD couriers actually perform while in custody of sensitive materials, en route shipments are frequently surveyed, covertly as well as overtly, by trained security inspectors, and formal reports of their findings are sent to the TSD Director with copies to concerned offices in DOE Headquarters.

ANNEX B.—RECRUIT TRAINING PROGRAM

SUBJECT SCHEDULE

Introduction to security	
Tractor/trailer nomenclature	
Diesel engines	
Transmissions	
Pretrip inspections	
Brake systems	
Coupling and uncoupling	
Communications	
Tractor/trailer simulator	
Yard practice	
Supervised driving (on base)	
Supervised driving (off base)	
Instructor road test	
Simulator road test	
"10-Code" exam	
Tractor/trailer qualification	
Handgun fundamentals	
Techniques of firing	
Range demonstration	
Dry fire/ball and dummy practice	
Handgun exam number 1	
DOE short course practice	
M-16 introduction	
Shotgun instruction	
Shotgun practice	
Tactics field exercise	
Tactics 1	
M-16 basic course	
Combat fundamentals	
National police course (NPC)	
M-16 combat introduction	
Distance estimates	
M-16 distant firing	
Introduction and firing the 40 MM grenade launcher	
Firearms qualifications	
Parachute training	
Gas mask filter change and basic instruction	
Tactical deployment	
Trip report	
Security threats	
Legal considerations	
Weapons safety	
Trip planning	
Health protection	
Fire protection	
Criticality	1 hour
Emergency procedures	4 hours, 15 minutes
First aid	8 hours
SST	8 hours
Defensive, driving	7½ hours
SOP	7 hours
Physical fitness test	1 hour
Final exam	3 hours
Employee conduct	30 minutes
Classification	1 hour

ANNEX D.—ADVANCED TRAINING I PROGRAM

SUBJECT SCHEDULE

The TSD organization
 Course outline and purpose
 Observation I, II, and III

Accident prevention and reporting
 Courier equipment now/future
 The threat
 Courier standards
 Communications problems
 Tactical deployment
 Tactics I
 Gas mask filter change and mask test
 Courier firearms capability
 Firearms safety and courses of fire
 Range qualification .357 Magnum,
 short course and combat
 Firearms capability demonstration, range
 Shooting decisions II
 The Courier team—Organization and
 control
 The Courier team—Routing operations
 discussion
 The Courier team—Unscheduled operations
 The Courier team—Under attack
 Tactics II
 Tactics III
 Shooting decisions III
 Duress—Countersigns and signals
 Leadership
 Hostages
 Tactics problem I
 Night firing
 Pretrip briefing requirements
 Introduction to the 40 MM grenade launcher
 Distance estimates
 Firing the 40 MM grenade launcher
 unarmed defense tactics
 Tactics problem II
 Range activities
 Final test
 Critique
 Tactical problem review and critique
 Vehicle roadblocks
 SST refrigeration
 Tactics field exercise

ANNEX D.—ADVANCED TRAINING II PROGRAM

SUBJECT SCHEDULE

Course outline
 The threat—update
 MILES orientation (classroom)
 MILES sight-in/familiarization
 firing
 MILES exercises No. 1, 2, and 3
 Firearms qualification—Magnum
 and combat courses
 MILES debriefing—3 sessions
 Weapons cleaning/equipment return
 Team tactics
 "Time of the Jackal" (film)
 Women and terrorism
 Cover and concealment
 40 MM qualification
 Running man course/close combat
 Night firing qualification
 Tactics (observation and perceptions)
 Shooting decisions/distant shooting
 Tactics (vehicle exits)
 Safeguards branch discussion
 "Ambush—Tool of Terror" (film)

"Vehicle Bomb" (film)
 First aid review (accident scene)
 Fire fighting/fire team maneuvers
 Team movements—Under fire
 Operational problems
 Hostage situations
 Safeguards branch—Staff subjects
 "Shotgun or Sidearm" (film)
 Exertion shooting
 Firing from a moving vehicle
 Duelatron walking course
 Vehicle exits under fire
 Lessons learned
 Course critique

Senator SCHMITT. Also, I might recommend to the chairman sometime if he wants to see a spectacular movie, he ought to see some of the contrived accidents that these canisters have undergone in the Sandia experiments.

Mr. LEGASSIE. Yes.

Senator SCHMITT. And I don't think they have ever really breached the canisters in any of those. Is that correct?

Mr. LEGASSIE. That is my understanding. The containers have been damaged in the sense that cooling fins have been bent and so on, but again the integrity of the containers has been preserved in these tests.

Senator SCHMITT. The final draft of the IRG report says, "It is expected that the United States industry will meet this need"—that is, the need for a large increase in inventory of cask vehicles—"once the DOE has established a firm implementation program for spent fuel storage and nuclear waste management."

Do you think this is a realistic conclusion?

Mr. LEGASSIE. Well, I will answer "yes" to that question. The basis for that answer is discussions with the industry themselves who have expressed concern about the status of the industry and the ability to meet shipping requirements, but have indicated to me that the major impediment that they saw was the lack of certainty as to the shipping requirement; that they as prudent businessmen could not afford to invest in facilities to manufacture more casks without knowledge that the market was there.

We visualize, with respect to centralized storage of spent fuel, that there would be a contract between the Government and the utility which would call for 5 years advance notice of delivery of spent fuel to this facility, and if that contractual vehicle would in fact provide assurance that such a shipment was going to take place, that there would be adequate time for a utility to order and for the manufacturer to supply any additional needed casks for such shipment.

So our belief is that if we can remove the uncertainty with respect to the need for transportation events by such devices, that in fact we can then expect the private sector to behave rationally and make sure that the necessary facilities for the shipment have been provided.

Senator SCHMITT. Is there anything that we should consider doing with respect to S. 535 in this area to make sure that those casks are in fact available?

Mr. LEGASSIE. Well, again the activity that we believe is warranted is already taking place. You might wish to indicate your concurrence with continuation of such activity, but it relates to continuing efforts on the part of the Department of Energy to assess both the present status and the probable future status and to raise warning flags as a result of such analytic review.

So we have been assessing the inventory of containers; we do try to estimate the number of future shipments that might be occurring in what categories, and so on; and make this material widely available.

It is on the basis of such information that people may question the ability of the system to perform or to raise early warning flags that not enough time is available to manufacture casks, or things of that matter. That is the contribution that we are making in that area.

Senator SCHMITT. Do you think there is any danger that the industry will hold off too long and DOE will then have to get into the business of manufacturing casks?

Mr. LEGASSIE. Well, I think it would be an inappropriate activity for the Government to enter into the manufacture of casks and attempt to provide this basically commercial service. And I find it difficult to imagine the circumstances under which the industry would allow such a transfer of responsibility from the private sector to the Federal sector to take place.

So I certainly would hope that circumstances which would force this would not arise.

Senator SCHMITT. Well, I would also. However, the longer the policies are uncertain, the more probability that at least a crash program would have to be instituted, if we're going to meet what I think everybody agrees are going to be the eventual transportation needs.

Mr. LEGASSIE. I think again the main point I am trying to make here is, if the Congress can assist the executive in the resolution of these uncertainties by determining its will on such matters as the President's proposal on spent fuel policy, and arriving at a final policy which is law, which then will be implemented removing this uncertainty is what is important in terms of everybody then being able to see that here is the system, this is how it is going to go, these are the rules of the game, and now we are able to play our appointed parts.

Senator SCHMITT. Well, I think the Congress is generally willing to do that. We just can't seem to agree on what those rules ought to be.

And the present administration has the obligation to act realistically in those areas.

Mr. LEGASSIE. Yes.

Senator SCHMITT. Thank you, Mr. Chairman.

Senator HEFLIN. Thank you, sir. We appreciate your testimony. This will conclude today's hearing.

Mr. LEGASSIE. Thank you.

[The statement follows:]

STATEMENT OF ROGER LeGASSIE, DEPUTY ASSISTANT SECRETARY OF ENERGY
TECHNOLOGY, DEPARTMENT OF ENERGY

Mr. Chairman and members of the subcommittee, I am pleased to appear before you to discuss the draft Senate Bill S. 535 entitled, "The Nuclear Waste Transportation Act of 1979." That bill is designed to regulate commerce by providing for the safe transportation of nuclear waste, nuclear reactor fuel and related activities.

These hearings are timely because the transportation of nuclear materials is a matter of increasing concern despite the fact that there is an impressive established safety record in this area.

Public confidence in the safety of these shipments is essential. DOE has taken steps to consolidate and strengthen its nuclear materials transportation programs in anticipation of future transportation requirements for both defense and commercial nuclear materials.

In compliance with the request contained in Chairman Stevenson's letter of June 28, 1979 to Secretary Schlesinger, we have appended to my testimony the response to the questions raised in that letter.

I would now like to indicate those areas where the Department is in agreement with the provisions of S. 535 and those where we differ.

At the outset let me say that DOE heartily endorses the announced purpose of this legislation: "To enhance safety and simplify the regulation of the transportation of nuclear waste and radioactive spent fuel * * *." In our view it is vitally necessary to solve the problem of the proliferation of diverse and conflicting State and local regulation which creates an atmosphere of confusion and conflict that not only inhibits the free flow of commerce but also hampers the safety and security of these shipments. However, S. 535 is duplicative of existing authority and therefore DOE believes it is unnecessary. In the event that Congress decides to take action, we believe there are certain changes that should be made.

I would offer two general observations which are important in addressing this problem. As Congress stated in the Hazardous Materials Transportation Act of 1974 (HMTA), a uniform system of federal regulations must preempt State and local regulations on such commerce. However, any unique and unusual considerations which arise in a particular State or locale also deserve careful study and may warrant specially designed exceptions to the federal scheme. The administration of grants discussed in section 5(d) of S. 535 could provide State and local governments the resources to examine, evaluate and present concerns to DOT.

In connection with providing assistance to States, the Interagency Review Group Report, which is being forwarded to the President for his consideration, states: "The IRG supports a strong Federal-State relationship for transportation regulation and enforcement and in the draft report recommended that DOT and NRC review their existing program with States. The IRG believes that State participation in this transportation surveillance program should be expanded and additional funding provided." We believe that the provision for grants outlined in S. 535 is one possible mechanism for achieving a portion of the IRG recommendation. Authority exists in DOE's nuclear waste management program to provide assistance to State and to local governments through contractual arrangements and at least one such contract is in existence. We believe this may be a preferable approach as compared to the use of the grant mechanism as discussed in S. 535.

I would now like to comment on several parts of the bill.

We believe the definition of "shipment" in page 3, line 17, of the bill should be changed. As defined, "shipment" would pertain to the movement of nuclear waste, commercial spent fuel or radioactive material within many non-NRC licensed facilities such as DOE facilities, private and government shipyards, and pharmaceutical manufacturing plants. Such broad applicability is inappropriate and movements in these facilities should be excluded from the provisions of the bill.

In section 115(a) on page 5 the responsibility for "safety, regulation, and logistical aspects" is assigned to the DOT while the licensing of shipping casks and packages remains with the Nuclear Regulatory Commission. This, in reality, represents no change to the present situation and, we assume, the current authority for DOE to certify its own packages as being in compliance with Federal Regulations would remain in effect. We would oppose elimination of DOE certification, since such an action would have serious impacts on several DOE programs, including our nuclear weapons and defense programs.

Section 115(b) on page 5 calls for the establishment of a National Emergency Response Plan " * * * to deal with emergency situations that may occur during the shipment of nuclear waste, commercial spent fuel and other radioactive material." Such planning is already underway along with a very effective interagency emergency response capability. Included in this capability is aid to State organizations to

develop State programs, educate State personnel, and assist in the actual operations during emergencies. This capability has been very effective when called upon.

The text on "Foreign Shipments" in section 117 also contains provisions already met under existing law. The standards established by the International Maritime Consultative Organization (IMCO) and the International Atomic Energy Agency which call for certification before shipments made in packages originating in another country can be utilized in the U.S., are met under current DOT and NRC regulations. Moreover, the procedures for accepting foreign materials set forth in subsections 117 (a) and (b) are unnecessary in light of the recently enacted Nuclear Non-Proliferation Act, which requires full interagency consultation prior to any license or "subsequent arrangement" for return of nuclear spent fuel to the U.S., and also properly provides for emergency situations. Section 117's inflexible time period would eliminate this emergency exception which is necessary to our nonproliferation goals.

Section 6 of the bill contains a provision beginning in line 3, page 10, which calls for DOT to make recommendations for Federal routing guidelines which might alleviate the need for State and local governments to place additional restrictions on the transportation of radioactive materials. During the past two or three years there have been a large number of State and local restrictions and prohibitions proposed or adopted which are directed at the shipment of radioactive materials. These restrictions in many respects usurp the federal authority by establishing stringent permit and notice requirements reserving within the State or locality the exclusive right to judge the permissibility of each shipment regardless of federal certification. Indeed, a significant number of jurisdictions simply forbid any shipment except for emergencies as defined and determined independently by each local authority. These rules, though sincere in purpose, necessarily interfere with the interstate transportation of radioactive materials. As I have already suggested, the Federal Government has preemptive rights in this area and therefore the provision beginning in line 3 is not necessary. Traditionally, the Atomic Energy Act and, more recently, the Hazardous Materials Transportation Act contain implied and express preemption language. However, in order to activate the provisions of the HMTA, the Department of Transportation needs to complete its announced rulemaking on routing. DOE has formally urged DOT to expedite the rulemaking, which was first announced in April 1978, in order to confirm Federal responsibility in this area. It is our understanding that DOT plans to issue a notice of proposed rulemaking on these regulations in September of this year.

The provision beginning on line 8, page 10 calls for DOT to assess the Nation's inventory of containers, packages and vehicles suitable for shipment of nuclear waste and spent fuel. DOE is charged with assuring the overall national capability in the energy area including transportation needs and, therefore, the responsibility for this assessment belongs with DOE.

Another concern involves subparagraph (7) on page 9. This provision calls for the compilation of data useful in risk assessment, improvement of container design and development of procedures and practices which would make significant improvements in the safety and shipments. Much of this information exists in sufficient detail and to a sufficient level of accuracy and is in the process of being compiled by DOE. We would hope that this bill would not require any new or additional collections of data.

DOE feels it is important and helpful to the members of this Committee as it considers legislation in this area that it understand in more detail the programs that DOE has instituted to address some of the same problems that now concern this Committee.

At the beginning of fiscal year 1979 DOE established at Sandia Labs in Albuquerque, New Mexico, a Transportation Technology Center (TTC) to address many of the problems addressed by the bill. Further, the TTC does this within the existing infrastructure and without significant impact upon the industry in terms of cost and undue Federal interference. The TTC is charged with the development of the risk data which this bill calls for; for the development of improved transportation systems so the excellent record amassed by the nuclear transportation industry will remain intact; for the development of base technology of use to the industry; for the development of an understanding of the institutional problems surrounding nuclear transportation; and for communicating this information to policy makers, the industry and to the general public.

In summary, although we support the intent of S. 535 to enhance safety and simplify regulation of transportation for nuclear waste and radioactive commercial spent fuel, it is duplicative of present authority and is therefore unnecessary. However, if you decide to act on this Bill, it should be changed to reflect the

concerns I've discussed today, and, in particular, recognize existing responsibilities and capabilities.

Mr. Chairman, I would be happy to answer any questions the Subcommittee has at this time.

ANSWERS TO QUESTIONS RELATIVE TO SPECIFIC IMPACT OF S. 535 SUBMITTED BY
CHAIRMAN ADLAI E. STEVENSON

Question 1. Would any provisions of S. 535 in any way impede transportation of nuclear materials involved in national defense? If so, how should such interference be avoided?

Answer. In Section 115(a) on page 5 of the bill the responsibility for "safety, regulation, and logistical aspects" are assigned to the DOT while the licensing of shipping casks and packages remains with the NRC. We assume that this legislation is not intended to change the present situation, under which DOE is authorized to certify its own packages as being in compliance with Federal Regulations. Casks and containers used for transporting nuclear materials in DOE nuclear energy and defense programs are currently certified safe for unrestricted use by DOE under agreements of long standing with DOT. These containers meet very stringent requirements specified in the Code of Federal Regulations in Titles 10 and 49. Assuming that this is correct, we do not believe the bill would have an impact on DOE defense programs. However, if S. 535 would not sanction this procedure we would oppose the bill since it would require a redundant and time consuming process and seriously and adversely impact DOE defense program activities.

Question 2. In anticipation of future Federal operation by the DOE of away-from-reactor (AFR) spent fuel storage and ultimately of disposal facilities, would assignment to the DOT of principal responsibility for regulation of nuclear material transportation, as contemplated in Section 2 of S. 535, be advantageous for the planning and safe management of such future shipments?

Answer. Since both the DOE AFR and disposal facilities, as proposed by DOE, would be licensed facilities, existing DOT responsibilities would be applicable and the provisions of S. 535 would not change current requirements.

Question 3. What categories of radioactive materials should and should not be included in the provisions of S. 535?

Answer. As we read S. 535 the major reason for including definitions of radioactive materials is to provide a reference for the policy contained in Section 2 and the specific requirements which would be imposed by the proposed new sections 115, 116, and 117 of the Hazardous Materials Transportation Act. As drafted, these sections would mainly embrace radioactive waste and spent nuclear fuel. We do not believe that additional radioactive materials should be brought within the purview of these sections. DOT, of course, has authority under the existing Hazardous Materials Transportation Act to regulate transportation of any radioactive material which it finds may pose an unreasonable risk to health and safety or property when transported in commerce.

Question 4. Would the DOE's activities in the operation of future AFR storage, disposal, and possible reprocessing facilities be facilitated if a separate office of radioactive materials transportation was established within the DOT?

Answer. No.

Question 5. To what extent should existing division of responsibility between NRC and DOT be revised to permit the DOT to fulfill the role intended by Section 2 of S. 535?

Answer. Section 2 of the bill recognizes that DOT has the primary responsibility for "regulating, monitoring, and ensuring the safety and security of such transportation." Of course, this authority is shared with NRC, acting pursuant to its statutory mandate under the Atomic Energy Act and the Energy Reorganization Act of 1974. No change in the existing division of this responsibility is necessary.

Question 6. Should the State Grant Program provided in Section 5 be restricted to States within which a storage, reprocessing, or disposal facility is proposed? Should it be restricted to include States through which transportation of radioactive materials is likely to occur as a result of a proposed storage, reprocessing, or disposal facility in any other state?

Answer. We believe independent State studies can be very useful in providing State understanding and analysis of radioactive material shipments. We believe both States where facilities are proposed and through which shipments would pass should be eligible for grants of an appropriate magnitude based upon State involvement. Further, the \$50,000 limit places a severe restraint upon the quality of any State study of transportation impacts. DOE recommends that the limit on individual grants be raised to \$100,000.

Question 7. Are the newly proposed rules of the NRC for routing and security in transportation of nuclear materials necessary, desirable, or adequate? Explain.

Answer. Based upon the information available to DOE, it is not clear that the provisions in the new NRC rules are justified as safeguards improvements or cost effective. The rules enacted by NRC are based upon an interpretation of preliminary work performed by Sandia Laboratories for NRC.

Even assuming a risk which warrants greater protection, we believe certain provisions in the rules may be counterproductive and require further analysis. Routes away from population centers with greater shipping distances often are on secondary roads or, in the case of rail transport, over less well-maintained roadbeds, where transport conditions may be less than ideal and where notification and response to any diversion attempt would be greater. Most population centers, on the other hand, are served by excellent interstate highways and mainline railroad track that are well patrolled and easily accessible in case of emergency. Prior notification of shipments will also involve increased safeguards risks since routes and schedules will be established and available in advance.

The rules also will add significantly to shipping costs. NRC admits it will increase transportation costs by a factor of two but, we believe that other factors would indicate far greater possible increases.

[Whereupon, at 12:47 p.m., the hearing was adjourned, to reconvene at 9:30 a.m., Thursday, July 19, 1979.]

THE NUCLEAR WASTE TRANSPORTATION SAFETY ACT OF 1979

THURSDAY, JULY 19, 1979

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
SUBCOMMITTEE ON SCIENCE, TECHNOLOGY, AND SPACE,
Washington, D.C.

The subcommittee met at 9:30 a.m. in room 5110, Dirksen Senate Office Building, Hon. Howell Heflin presiding.

Senator HEFLIN. The hearing will come to order.

We are pleased to have the Chairman of the Nuclear Regulatory Commission, Dr. Joseph M. Hendrie, present to testify.

Mr. Hendrie, will you proceed.

STATEMENT OF DR. JOSEPH M. HENDRIE, CHAIRMAN, NUCLEAR REGULATORY COMMISSION; ACCOMPANIED BY BILL DIRCKS

Mr. HENDRIE. Thank you, Mr. Chairman.

It is my pleasure to appear before you today to testify for the Nuclear Regulatory Commission on S. 535, the Nuclear Waste Transportation Act of 1979.

As you know, jurisdiction over the transportation of radioactive materials is shared over a broad area by the Commission and by the Department of Transportation under the Atomic Energy Act and the Hazardous Materials Transportation Act. As we understand the bill, S. 535, one of its primary purposes is to more clearly define responsibilities of the agencies.

The provisions of the bill that would most affect Commission activities are those which allocate responsibilities between NRC and the Department of Transportation, particularly section 2 and proposed section 115(a).

Together they assign to DOT the primary responsibility for regulating the transportation of nuclear wastes, including commercial spent fuel, except that "primary responsibility for regulating and certifying the safety of shipping casks and packages shall remain with the Nuclear Regulatory Commission," in the language of the bill.

In order to explain the Commission's concerns about the bill, I will set out briefly the current arrangement between NRC and DOT and how it is evolving.

The two agencies have allocated their responsibilities under a memorandum of understanding, which was just recently renegotiated.

The division of responsibilities set out in the bill for the most part reflects the arrangements under the memorandum of understanding. Under that arrangement, the safety of radioactive materials transport has rested for the most part with packaging.

Packages have generally been designed so that they could be carried in ordinary transportation without special controls in transit.

The Commission has taken responsibility for regulating the packaging of fissile materials and the larger quantities of radioactive materials; DOT has regulated packaging of the smaller quantities and low specific activity materials.

Working arrangements between the two agencies under the MOU have been good. Our respective staffs know their assignments, lines of communication at all levels in the agencies are well established and work, and there has been little duplication of effort.

The memorandum of understanding and the ability of the agencies to modify it has permitted an important degree of flexibility to deal with problems as they arise.

For example, under a previous memorandum of understanding, NRC investigated incidents that occurred at NRC licensed facilities while DOT investigated incidents occurring in transit.

Under the current memorandum of understanding, NRC is to be the lead agency for investigating all nuclear transport incidents because of the nuclear technology involved and because many such incidents in transit have their origins at licensee sites.

By assigning primary responsibility over the transportation of nuclear wastes and spent fuel to DOT, the bill appears to narrow the Commission's authority and responsibility.

We believe, on the contrary, that the Commission should retain strong responsibility for the transportation of nuclear wastes and other radioactive materials, and that the present administrative flexibility is desirable.

Some recent developments indicate the need for continuing flexibility. Last May, the Commission adopted interim rules for safeguarding spent fuel during shipment. The rules will remain in effect until studies of the safeguards risks from transporting spent fuel can be completed, in about 2 years, and permanent measures can be evaluated and implemented.

This step was taken after consultation with DOT, and DOT indicated that NRC's assumption of security responsibilities connected with routing would substantially ease their job in establishing a routing rule confined to consideration of routine exposure in normal transport and radiological effects of transportation accidents.

Had S. 535 been law at that time, the Commission's authority to implement those regulations would have been in some doubt.

Similarly, just last week, in response to packaging problems as illustrated by complaints from the Governors of Nevada, South Carolina, and Washington, the Commission's staff has begun efforts which would lead to NRC enforcement of DOT's regulations concerning the packaging of low-level wastes against NRC licensees—a matter the memorandum of understanding assigns chiefly to Transportation.

This, too, is being done in consultation with Department of Transportation, and with its cooperation. This will bring the combined forces of NRC and DOT to bear on an important issue.

Here, too, the Commission's enforcement authority would be unclear under S. 535.

Finally, NRC has undertaken the major studies of the impacts of nuclear materials transportation which have formed the basis not only for the Commission's actions, but also to a substantial extent for DOT's pending rulemaking on the routing of truck shipments of radioactive materials.

In short, then, the recent trend has largely been for the NRC to participate more actively with DOT in the area of nuclear materials transportation. We think that there are sound reasons for continuing to do so.

In the case of many hazardous materials, there is no particular Government agency with special expertise in handling those materials, and if they are to be transported safely, DOT must develop the requisite expertise and the appropriate body of regulations. But for nuclear materials, the Commission has longstanding experience in their use and handling. It is unnecessary, in my view, for DOT to duplicate NRC's staff and expertise in those areas.

In a broad sense, it can be said that DOT is the appropriate agency to be responsible for collecting shipment data, for recommending Federal routing guidelines, and for administering State grants.

However, the NRC is the appropriate agency to be responsible for reviewing safety requirements for shipping radioactive materials, for emergency response planning, and for recommending safety-related research.

In sum, we do not think the Commission's responsibilities should be restricted in the manner proposed by S. 535. Events have developed too rapidly in the last few months for anyone to say with confidence precisely what the relative roles of NRC and DOT should be for the long term and we believe that administrative flexibility is preferable to amendment of the governing statutes, at least at this time.

There are other questions which were asked in your invitation to testify and other sections of the bill that I would like to comment on briefly. An attachment to my written testimony provides more detailed comments.

In answer to the first question—that is, what categories of radioactive materials should or should not be encompassed by S. 535—I would just like to say that my previous remarks apply to the transportation of all radioactive materials.

It would be confusing to have institutional arrangements and responsibilities for waste shipments that are different from those for other types of radioactive material shipments.

I think my testimony has answered question 2 concerning the responsibilities of DOT and NRC.

On question 3, I can only say that DOE, Department of Energy, and its contractors are not subject to Commission transportation regulations. I think you would have to ask DOE about whether any of its transportation activities need legislative clarification.

Question 4 asks which States should be included in the State grant program in proposed section 116. Here I think the important point is that transportation is only one part of the broader question of nuclear waste disposal generally, and that State study of transportation impacts is only one aspect of State participation in nuclear waste disposal decisions.

There will almost certainly be broader bills concerning waste disposal, and I think the grant program proposed here could be more profitably considered in such a bill.

The IRG report, for example, proposes a State Planning Council to facilitate State participation in waste management decisions, and we think the State grants proposed in the bill would better serve State interests if they were coordinated with such a council.

The IRG also envisions that transportation matters would be studied as part of the site selection process with the participation of all interested States, and the grant program in proposed section 116 should be coordinated with this procedure.

Questions 5, 6, and 7 pertain to the Commission's new interim regulations for the physical protection of spent fuel in transit, and ask why after the decades of good experience in the safe transportation of nuclear materials, the rules were promulgated so quickly without opportunity for prior comment; whether there was any coordination with DOT; and why the regulations do not specify security provisions for shipments by water.

An attachment to my written testimony provides detailed answers to these questions, which I shall go over briefly here.

Both the Commission's staff and Sandia Laboratories, under a contract with the Commission, have estimated the health effects that might result from the sabotage of a spent fuel cask with high explosives in a densely populated area.

The Sandia study calculated effects that were high enough to suggest that extra security measures against sabotage were needed.

The staff noted, and Sandia agreed, that the assumptions used were quite speculative because of the lack of experimental data regarding the effects of explosive attacks on the casks presently being used or on the contained spent fuel.

The staff initially concluded that such speculative calculations did not warrant taking security precautions.

But, speculative as it was, it was the only information the Commission had to go on, and when it became apparent that it would take 2 years to complete the research needed to provide better data, the Commission agreed with the staff's revised view that this was too long for such a potential risk to be accepted.

The staff communicated informally with the industry and determined that its proposed safeguards would increase the annual cost of transporting spent fuel by \$200,000. Since there were ongoing shipments, the Commission believed they should be covered by the staff's proposal, and thus the rule was made immediately effective.

The requirements can be modified if information obtained during or after the comment period suggests there is a need to do so. When the ongoing research is completed, the Commission will determine what permanent security measures, if any, are required.

Adoption of the rules was carefully coordinated with DOT. The NRC staff sent DOT a draft of the proposals, solicited and received DOT's written comments, and met with DOT staff.

The DOT staff was of the opinion that the NRC routing restrictions for safeguards would enable them to limit the scope of its pending rulemaking to normal transportation and transport accidents, thus substantially simplifying their rulemaking.

The general requirements of the NRC rule, which are contained in section 73.37(a) apply to all modes of transportation, including shipments by water.

Since all domestic shipments are by truck or rail, those shipments were the staff's primary concern in drafting the rule, and specific requirements for truck and rail shipment were included in sections 73.37 (b) and (c).

The specific rules also apply to the land portion of import and export shipments. After the staff has worked out some of the details for implementing the rules for rail and rail shipments, it will turn its attention to whether specific requirements should be placed on the strictly water-borne portions of shipments within the jurisdiction of the United States.

I think my general comments on the division of responsibilities between NRC and DOT also apply to the emergency planning section of the bill, proposed section 115(b), which would provide no role for NRC.

NRC has a substantial program for radiological emergency response planning connected with nuclear facilities, and assists States in handling radiological emergencies in transportation.

In addition, the President has proposed that the new Federal Emergency Management Agency assume the central coordinating role in Federal response to civil nuclear emergencies. FEMA may have a role in emergency planning for nuclear transportation accidents as well.

That finishes my prepared remarks for this morning, Mr. Chairman. As I mentioned earlier, an attachment to my written statement provides more detailed answers to some of the subcommittee's questions.

It also provides some technical comments on the language of the bill which we believe are in order if the subcommittee determines to proceed with the bill.

At this point I would be pleased to answer any questions the subcommittee may have.

[The attachment referred to follows:]

ATTACHMENT OF DR. JOSEPH M. HENDRIE, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

The Commission's staff has prepared the following detailed answers to the Subcommittee's questions numbered 5, 6 and 7 in its invitation to testify.

Question 5. In view of the decades of good experience in the safe transportation of nuclear materials, what were the considerations which prompted the NRC's somewhat hasty issuance on July 15 of interim and proposed rules involving routing and security provisions applicable to such shipments effective July 16, with no more than 30 additional days for comment on those rules?

Comment. In previous NRC staff documents, (NUREG-0194, Calculations of Radiological Consequences from Sabotage of Shipping Casks for Spent Fuel and High-Level Waste, February 1977; NUREG-0170, FES on the Transportation of Radioactive Materials by Air and Other Modes, December 1977), the staff estimated the

health effects of a radiological release in a non-urban area resulting from a high-explosive assault on a spent fuel cask. In June of 1978, Sandia completed and published a study "Transport of Radionuclides in Urban Environs: A Working Draft Assessment" (SAND-77-1927) which included a chapter on sabotage of spent fuel in urban transport. The chapter included estimations of the health effects of successful spent fuel sabotage in urban areas. Both the staff and Sandia postulated essentially the same release fractions—100 percent noble gasses, 1 percent solids as respirable material and about 1 percent cesium—resulting from a high-explosive breach of the cask.

Although the number of fatalities estimated by Sandia for areas of very large population densities would normally call into question the need for the application of safeguards, NMSS originally concluded that without additional substantiation of how both the fuel and the casks would respond to breaching explosives, immediate regulatory action could not be supported.

However, the extended time frame of the confirmatory research program initiated by the staff in 1978 raised the question of whether the potential risk, as presented by the Sandia study, could be accepted over such a long period. Even though the likelihood of a sabotage attack on a spent fuel shipment is considered to be low and the difficulty of breaching a cask and dispersing radioactive material is considered to be great, NMSS believed that, in order to protect health and to minimize danger to life and property (Sections 161b and 161i(3) of the Atomic Energy Act of 1954, as amended), it was prudent and desirable to require certain interim safeguards measures for spent fuel shipments until the results of the research program are available. The primary objective of these measures is the avoidance of sabotage in areas of high population density.

Since there were ongoing shipments, the Commission believed the interim requirements should be issued immediately, while noting that the rule would be subject to reconsideration or revision based on public comments received subsequent to its publication. Accordingly, the public was invited to submit its view during a 60 day comment period ending August 16, 1979.

Question 6. In what way and with whom were the routing provisions of those rules coordinated with the DOT on August 17, 1978, pertaining to routing guidelines?

Comment. The NRC staff forwarded draft materials pertaining to the proposed rule and the related justification to the DOT Office of Hazardous Materials Regulations during April 1979. In addition to soliciting their written comments, a request was made to meet with them regarding possible impacts of the proposed NRC action upon the DOT rulemaking activity regarding highway routing of radioactive materials (Docket HM-164). To this end, a meeting was held with DOT on May 3, 1979 and written comments were provided in a DOT letter dated May 15, 1979. In short, the DOT staff is of the opinion that the application of routing restrictions by the NRC for safeguards purposes will enable the scope of any DOT rule to be limited to normal and accident conditions, thereby reducing difficulties they may face in further rulemaking proceedings under Docket HM-164.

Question 7. Why do these newly issued rules not specify security provisions for shipments by water—whether barge canal, river, or sea?

Comment. The general requirements in Section 73.37(a) apply to all movements of irradiated reactor fuel by NRC licensees within U.S. jurisdiction regardless of the particular mode of transport. Additionally, specific security measures were set forth in Sections 73.37 (b) and (c) for shipments by road, or rail. Since no domestic shipments of NRC licensed irradiated-reactor fuel are currently being made or planned by sea or inland waterway, specific security provisions directly applicable to this mode of transport were not included in the new regulation.

Export and import shipments of spent fuel, however, may involve movement by sea within U.S. jurisdiction. When such shipments involve transfer to or from other modes, the NRC staff reviews the transfer arrangements and locations as part of the route approval process conducted in accordance with Section 73.37(a)(1).

Strictly with regard to the sea portion of spent fuel shipments made within the U.S. jurisdiction (during export and import activities or during unlicensed transient movements), the NRC staff has not yet determined whether specific shipboard security measures are needed.

The Commission is also providing the following detailed comments on the language of the bill, should the Subcommittee determine to proceed with the bill.

1. Consistent with the principles of the IAEA regulations, to which the U.S. subscribes, the Memorandum of Understanding allows the DOT discretion in deciding whether to request a detailed review by NRC of a foreign package that has been certified by the Competent Authority of a foreign country as meeting IAEA regula-

tions. Section 117(c) or its legislative history should clearly indicate that this discretion is not disturbed by the bill.

2. The definitions in sections 103(2) (commercial spent fuel) and (5) (nuclear waste) should be clarified to indicate whether or not they cover spent fuel from research reactors, such as those at institutions like the Brookhaven National Laboratories, spent fuel from national defense-related reactors, and other defense wastes.

3. The definition of "emergency situation", section 103(3), includes diversion and sabotage attempts. Section 115(b) requires the Secretary, DOT to formulate a plan to deal with emergency situations that may occur in transporting nuclear waste, spent fuel, or other radioactive material. With regard to diversion and sabotage attempts, this responsibility would appear to be more appropriate for the NRC, which has an extensive program and expertise in these areas.

4. The definition of "shipment", section 103(9), should also exclude facilities licensed by NRC Agreement States as well as those licensed by the NRC.

5. The definition of "transports" or "transportation", section 103(11), should exclude activities within the boundaries of a licensed facility as is done in the definition of "shipment".

6. With regard to section 115(b)(2), consultation should be based instead on the States desires, and should have a consistency provision such that the transportation emergency response plan is integrated with other nuclear or non-nuclear emergency planning by States.

7. In section 109(e)(6), the portion of the annual report dealing with review of safety requirements and recommended action for safety-related research would appear to be more appropriate for NRC than for DOT, or at least to be a joint function of the two agencies. Such an amendment would recognize the NRC's current responsibility for confirmatory research.

Senator HEFLIN. Senator Cannon.

The CHAIRMAN. Thank you, Mr. Chairman.

Doctor, yesterday when we heard from Governor List on behalf also of the Governors of Washington and South Carolina, he commented on a letter that they had written to you, as a matter of fact, in the record, and I wonder if you have now made a response to that letter and the points that were raised by those three Governors concerning the handling of nuclear waste.

Mr. HENDRIE. Yes, Senator Cannon, we have.

In the last couple of days I have talked to Governor Riley and Governor Ray, and yesterday, after he testified, I had the opportunity to meet personally with Governor List again.

I have assured them that the agency regards their letter as an appropriate and proper step in this difficult area of low-level waste management, and assured them that our response would be supportive and positive.

The Governor thought it would be a good thing all around if the Commission could be expeditious in its answer to the three Governors, something which I'm sorry to say we don't always succeed in managing with our correspondents, and I'm rather pleased to say that by hustling around the 11th floor at H Street yesterday afternoon, the Governor has an answer this morning, and I'd be pleased to have a copy—the letters to the three Governors are identical—simply addressed to each in turn and perhaps, since the letter to me is in the record of yesterday's proceeding, perhaps the letter in particular to Governor List seems appropriate—

The CHAIRMAN. Mr. Chairman, may I request that Dr. Hendrie's response to Governor List be made a part of the record.

The CHAIRMAN. Do you feel that the letter adequately responds to all of the points that the Governors were concerned with?

Mr. HENDRIE. Well, our response, Senator Cannon, on all of their points is right on. We agree with the Governors, and say here is

the way we are going to implement the sorts of things that you think need to be implemented in order to clear these things up.

Obviously, as we go down the line, and you work out the details on a program, why, there are going to be some arrangements to be made, and further discussions to have, but I think it's a positive and direct response that meets all of the requirements and, in fact, goes beyond that.

We note in our response that we're moving ahead with the Commission rule which will allow us to take action against NRC licensees who are not conforming to the Department of Transportation's packaging and transport regulations. And we want to help them as well in initiatives to bring about a more effective national program for low-level waste.

[The letter follows:]

NUCLEAR REGULATORY COMMISSION,
Washington, D.C., July 18, 1979.

Hon. ROBERT LIST,
Governor of Nevada,
State Capitol, Carson City, Nev.

DEAR GOVERNOR LIST: Thank you for your letter of July 10, 1979, with Governors Ray and Riley concerning the transportation and disposal of low-level nuclear waste. We are pleased to see that States with similar concerns have come together to address them in a unified and effective manner. We believe that your joint letter represents a needed action. Your position is clear to the Federal regulatory agencies involved and should also be clear to low-level waste generators and shippers. It facilitates the NRC's ability to deal with these concerns collectively and serves as a vehicle through which the NRC can work with the States in an effective and cooperative way. We want to work with the States on a unified basis to bring about some of the regulatory improvement which are outlined below.

Our augmented program to bring about improvements in the packaging, transport and disposal of low-level nuclear wastes includes the four points listed in your letter in addition to others. The steps called for in your letter are addressed as follows:

1. *The dispatch of a trained team of inspectors to perform regular site inspections of both the source generators and the collectors of nuclear waste. These inspections must include the opening of containers.*

Trained NRC and DOT inspectors will perform such inspections on a periodic basis. The greatest emphasis on package makeup will be directed at waste generators. We suggest that these inspectors be augmented by the Agreement State inspectors where appropriate. We will work with the Agreement States to arrange for these inspections and will keep you informed of our progress and of steps that you might take to help us in completing such arrangements. Selected containers will be opened during the course of inspection. I should point out that some waste collectors are not equipped to have packages opened at their facilities without endangering personnel or risking contamination of facilities and their licenses prohibit such activities. In these cases, we will need to identify qualified facilities to which the selected containers may be taken for opening, inspection, and repackaging.

2. *The consistent and uncompromising enforcement of sanctions imposed whenever violations are discovered.*

Enforcement action will be taken, in conjunction with DOT and the Agreement States, where violations of packaging and transportation regulations are found. We consider this a necessary ingredient to our inspection and enforcement program.

3. *The submission of monthly reports to the three respective states detailing the activities of the team, including the number and locations of inspections and the findings of the team.*

All reports of inspection and enforcement will be made public as they become available. They will be forwarded to the affected and interested States by our Office of State Programs.

4. *The issuance of a joint announcement by the NRC and the DOT to all source generators of nuclear waste nationwide containing details of the new plan. Such issuance will guarantee maximum impact.*

An announcement is being prepared for issuance by September 1, 1979. It will be coordinated with DOT.

5. *The plan must be implemented by September 1, 1979.*

With the exception of Item 4, which will be completed by September 1, all activities are under way.

In addition to these actions, the Commission is taking further steps to bring about improvements. Key to this effort is a rule change which the staff is preparing for Commission consideration which would allow NRC to directly enforce DOT regulations at NRC license sites and thus significantly upgrade inspection and enforcement actions in waste packaging and transportation. Such a rule change would be supplemented with new programs for inspecting transport activities and new enforcement criteria for violations of NRC-DOT shipping regulations. We are also exploring ways to provide training and packaging information for waste generators. These regulatory actions are being supplemented by investigations leading to improved design of Type A and other low specific activity material packages, which constitute the bulk of packages shipped to low-level burial grounds.

Your letter also mentions the timely implementation of a national waste management program. The NRC has supported the recommendations of the Interagency Review Group that the Department of Energy should develop a nationwide program aimed at establishing regional capacity for disposal of low-level radioactive waste. We have an active program underway to develop a comprehensive set of regulations, guides and standards for the disposal of low-level waste and we expect that such an active program could serve to facilitate the development of regional sites. The absence of such criteria has been noted as a major impediment to the development of licensed sites. Draft regulations will be available for public comment late next year.

We intend to explore ways by which NRC can play an active role in the encouragement of the principal waste generators to assume responsibility for providing means to dispose of their nuclear wastes. For example, we are investigating alternative methods for the disposal of liquid scintillation vials and will work with the medical research establishment to offer them licensable options for safe disposal of this kind of waste.

Again, we believe the States of South Carolina, Nevada, and Washington have taken an important step in dealing with problems of waste transport and disposal on a unified basis. It will allow us to work together in an effective and cooperative manner.

Sincerely,

JOSEPH M. HENDRIE, *Chairman.*

The CHAIRMAN. Does the NRC keep in-house inspectors at those three low-level radiation level repositories?

Mr. HENDRIE. No, sir, we do not. The three low-level waste burial sites that are now operating are all in agreement States.

You will remember that under the Atomic Energy Act, we can make arrangements with States under which the Commission cedes its authority to regulate—license and regulate nuclear materials, except for the powerplants and major facilities. But smaller amounts of materials to the States—there are about 25 States in the program—the three States in which the present burial grounds are located are agreement States, and so the regulation of those three sites and the inspection of those three sites is by the State radiological health people and licensing authorities.

The CHAIRMAN. When the two accidents occurred in Nevada, did the NRC send inspectors out?

Mr. HENDRIE. I would hope so. Yes, we did. But that's an emergency situation. In a case like that, why, the Department of Energy also immediately gets their radiological emergency response teams out to find out where the contamination is, if any, and to do whatever is necessary to protect health.

The CHAIRMAN. Is the committee's information correct that the radiation levels in both of those accident incidents did not exceed the permissible levels?

Mr. HENDRIE. That is my understanding, Senator. Let me turn to Bill Dircks.

I'm sorry, I should have introduced Mr. Dircks. He is the head of our Office of Material Safety and Safeguards, and therefore commands all of the staff in this area.

I believe that is correct, isn't it, Bill?

Mr. DIRCKS. I believe so, but we are still getting—they are monitoring the latest shipment, the shipment that came down from Palisades, so we don't have the final answers on that one yet. But before we allow that shipment to leave the Beatty site, going back to probably Battelle for investigation of the packaging in detail, we'll know specifically how much radiation is coming out of that container.

The CHAIRMAN. Are you saying now that there is still radiation coming out of that shipment?

Mr. DIRCKS. The container was leaking when it arrived. There was a crack on it. It was removed from the truck and placed in one of the trenches.

What they are doing now is investigating ways to repack the container and put it back on another truck to ship it back to Battelle Northwest Laboratories for investigation of the exact way that that container was put together at Palisades plant in Michigan.

The CHAIRMAN. I see.

But the measurements so far do not indicate that any radiation exceeded permissible levels; is that correct?

Mr. DIRCKS. In the latest information I have, I think that is correct. We can get you the full details and submit them.

The CHAIRMAN. Well, I'd like to know personally as well as have it in for the record, because I'd like to be able to reassure my constituents that even though there were two accidents, that whatever radiation leakage there was did not exceed permissible levels.

That ought to be ascertained, and the information we have is that it did not in either instance. But I want to be absolutely sure, and that's why I want to ask you people that question.

Dr. DiSibio said yesterday that in the leakage case, the leakage measured 15 to 20 MR, and it's my understanding that a routine chest X-ray exposes about 20 to 200; is that correct?

[The following information was subsequently received for the record:]

INCIDENTS AT BEATTY BURIAL SITE

With respect to the questions raised at the hearing by Senator Cannon concerning the two incidents at the Beatty Burial Site, we can state that based on the information available to us there were no radiation exposures or radiation levels in excess of permissible limits. Information to support this statement was obtained from the Office of Inspection and Enforcement, State Programs, and the State of Nevada.

With respect to the first incident—radioactive waste shipment fire—air sampling was performed during the fire and no radioactivity was noted as going offsite. Surveys were made at the burn site and preliminary reports indicated minimum exposure of personnel and no residual contamination.

With respect to the second incident—shipment of resins from Consumer Power Company—the information we have indicates that the radiation levels from the packages were within DOT requirements and the contamination levels on the vehicle from the packages that were leaking were within DOT contamination limits.

U.S. NUCLEAR REGULATORY COMMISSION—OFFICE OF INSPECTION AND
ENFORCEMENT

REGION V

Report No. 79-03.

Docket No. 99990005. Nevada State License No. 13-11-0043-02.

Licensee: Nuclear Engineering Co., Beatty, Nev.

Facility Name: Beatty Facility.

Inspection at: Beatty, Nev.

Inspection conducted: July 6, 1979.

Inspectors: H. E. Book, for, William J. Cooley, Fuel Facilities Inspector. Beth A. Riedlinger, Radiation Specialist. Date Signed: 7/24/79.

Approved by: H. E. Book, Chief, Fuel Facility and Materials Safety Branch.

Summary: Inspection on July 6, 1979 (Report No. 99990005/79-03)—*Areas Inspected*.—The purpose of this inspection was to gather first hand information at the Nuclear Engineering Company (NECO), Beatty, Nevada, low-level radioactive waste disposal site regarding a shipment of radioactive waste from Consumers Power Company, Covert, Michigan to the Beatty site. The inspection included acquiring copies of pertinent records which had accompanied the shipment and others which had been generated by Nuclear Engineering Company at Beatty. Those records included radiation and contamination surveys; radioactive material shipment records; and certain available shipping papers. The inspection also included independent measurements by NRC Region V personnel of radiation levels and contamination levels to verify that type of information already available from the records listed above. A number of photographs were obtained showing the containers and the shipments. A representative of the State of Nevada Health Division obtained two core samples of the contents of one of the shipping containers and presented one of those samples to the Region V representatives. Region V has sent that sample to be analyzed for gross beta-gamma activity and Sr-90 content by the Idaho National Engineering Laboratory, Chemistry Division. Results of that analysis are not available at this time, but will be added to this report when they become available.

Results.—The measurements made by Region V personnel are in substantial agreement with those obtained by Consumers Power Company and Nuclear Engineering Company both with regard to radioactive and contamination levels. Substantial agreement also appears to exist with similar data obtained by the State of Nevada Health Division. Those measurements indicate about 40-60 dpm/beta-gamma per 300 square centimeters removable activity from certain contaminated areas of three containers and 400/500 dpm/100 cm² on the interior floor of the trailer. Observations by Region V were that three of the twelve cylinders in the shipment showed evidence of leakage; two at the cylinder base weld and one at a cylinder drain plug. A fourth cylinder appeared to have leaked at a fill port at the top of the cylinder but swipe results did not show appreciable contamination. See Annex A and Annex L of this report for cylinder and swipe identification.

A possible item of noncompliance with NRC regulations exists in that the shipper transferred contaminated liquids to NECO contrary to the requirements of the NECO license issued by the State of Nevada to operate the Beatty, Nevada waste burial site.

The contamination found on the floor of the trailer and its undercarriage was caused by at least one of the leaking cylinders.

Mr. HENDRIE. I think that's—yes, that's a large range. I would have guessed an average for a chest X-ray of around 50 to 70, and that's right in the middle of the range you are quoting, so the answer is yes, sir.

The CHAIRMAN. Thank you very much, Mr. Chairman.

Senator HEFLIN. Senator Schmitt, do you have questions?

Senator SCHMITT. Yes. Thank you, Mr. Chairman.

Good morning, Mr. Hendrie.

Mr. HENDRIE. Good morning, Senator.

Senator SCHMITT. It appears that a number of references including those with respect to the problems in Nevada and South Carolina and the State of Washington low-level burial sites, that the NRC is enforcing DOT's regulations.

Why is it, in your opinion, that the Department of Transportation cannot or maybe should not enforce its own regulations?

Mr. HENDRIE. There is certainly no reason in principle, Senator. The practical side of the matter is that the material—the Hazardous Materials Transportation Bureau has a very broad scope of responsibility. There are a great many materials that are shipped around the Nation by all modes of transportation, as you know, that have some hazardous element.

Radioactive material shipments are quite a small fraction, I think, of their total area of responsibility and activity. And as pointed out in my testimony, the most—for most of those other materials in transportation areas, there is not a particular other Federal agency that has expertise and devotes its time to that particular area.

So the DOT people really are the only Federal officers that are working on it.

In the area of radioactive materials, that's not the case. The NRC has been regulating, and its predecessor agency regulated for a long time. The radioactive materials come from, for the most part, our licensees and go to our licensees, so we have a natural interest in the beginning and end of the transportation process.

And when something happens, they do respond to accidents and emergencies, in any event, and we just end up as a practical matter seeming to be more involved.

Now I think, you know, I talked to Jim Palmer about it, and I think we are both comfortable with the arrangement.

Senator SCHMITT. But one of the reasons for the consideration of S. 535 and these related issues is that I think everybody anticipates the workload will increase with time, not decrease, or even stay constant.

As you look into your crystal ball, do you see the NRC being able to maintain its responsibility for the enforcement of the regulations that may be promulgated by the Department of Transportation in this specific area?

Mr. HENDRIE. I think so, yes, because our concerns here have to do with the difficulties that the Governors have forcefully brought forward. Our difficulties have to do with NRC licensees who are packaging low-level waste for transportation to a burial site, and to simply—either careless or for some reason, aren't meticulous about following the packaging regulations. And then you end up with a defective package, because at the first incident at the Beatty site in Nevada, liquid scintillator material, essentially toluene, just vials of it, were just thrown in from nuclear medicine, from diagnostics, medical diagnostics were just thrown in with dry low-level trash, gloves, bottles, aprons, what have you, compacted in the packages, and a fire occurred, and not surprisingly.

That stuff is supposed to be packed in a way that loose liquid is not able to just seep through the package. So it's a packaging problem, primarily. The packaging goes on at our licensees, or in the agreement States, at licensees of the agreement States, and it's a fairly natural place for us to inspect or for the agreement State radiological health people to inspect.

Senator SCHMITT. Well, do you think then that radioactive material should be separated as a clear subclass of other hazardous

materials, and in that respect maybe just let the NRC handle the whole thing, in terms of transportation?

Mr. HENDRIE. I guess—Senator, let me go about it in a slightly round-about way, if I may.

The simple answer is no, but let me tell you how I get there.

The proposition of simply putting the full responsibility for nuclear material transport in the Department of Transportation, as is the responsibility of transporting other materials that can be hazardous, is a very appealing one, and I think until a few months ago I was onboard with you.

As I've worked through the final stages of the memorandum—renegotiation of the memorandum of understanding, and talked to Transportation people, and as we've had some of these problems with packaging of low-level waste material, it does seem to me there is some advantage in having both agencies able to contribute their strength to regulating this area.

What the downside of it, of course, is, is that you then have an overlapping responsibility of two Federal agencies, and to keep all us bureaucrats from duplicating things and stumbling over each other, there has been a need for the two agencies to very clearly understand what the other fellow is doing and have it worked out so that nothing falls in the crack and that we don't, on the other hand, duplicate each other's work, and that we have close coordination.

Going the other way and saying, all right, the whole thing is in DOT's area, and that's it, then I think it pretty well prevents us from dealing with the licensees that generate this material, about the packages, leaves it to DOT to come into those places and inspect and regulate.

I think they will need a substantial chunk of new staff and some time to get it trained up before they can do that fully.

On the other hand, I don't think we are going to be able to either turn over to them or fire a bunch of our people who cover that area, as well as other areas in nuclear material licensing and safety.

I don't think I'd want the NRC to have the sole responsibility, because I think the Department of Transportation fundamentally is the right place.

Senator SCHMITT. I think you can understand maybe the committee's bewilderment a little bit, since you are doing most of the work.

Do you still want DOT to establish the regulations and administer the program. I realize there are other examples of that happening, NASA does part of the solar energy development work for the Department of Energy, and that seems to work out pretty well to have a NASA project managing a DOE program. But in the regulatory area, it's not quite so clear. It's a little more gray in regulation, maybe, than it is in technology.

Mr. HENDRIE. I expect that's true, Senator, and I must say I don't think I would care to tell you that I think the present status necessarily ought to go on forever.

The view I've come around to in, say, the last 6 months is that I believe it would be desirable not to take the sort of legislative steps that you have in hand here in S. 535 at this time.

I think in a couple of years down the line, why, things may be a little clearer and maybe we can cut it then. I think ultimately one would like to be in a position where indeed nuclear material transportation is like transportation of—I don't know, bags of cement or tanks of chlorine, or whatever. It has its aspects that have to be carefully watched, but having done that, why, it's no big, special deal.

Senator SCHMITT. Mr. Hendrie, one reason that some of us decided to introduce this bill was not that we felt there was a major problem, but we felt that because of the clear trends. There is going to be large quantities of nuclear materials moving around this country. No matter what we do with respect to the total picture of nuclear energy and the use of those materials for beneficial purposes there will be more and more radioactive shipments every year.

Mr. HENDRIE. I think that's correct.

Senator SCHMITT. We thought maybe we can learn something by getting ahead of the game for once. And as we've dug into this, we've discovered that even with the small level of activity right now, it is not clear who is in charge. There have been difficulties in Nevada and elsewhere, and it just seems as if there is no clear coordination in spite of what is in the memorandum of understanding, and in spite of the administration telling us, that there is no need for any kind of legislation because all the needed authority already exists.

All the authority may well exist, but it is not clear that it is being used in a coordinated way. And that's why I guess we're asking the kind of questions we're asking.

Mr. HENDRIE. Well, I'm thinking you've kind of put your finger on the right place, and a little bit of a tender place. I think if there is a difficulty—and I guess we wouldn't be having letters from the Governors if there wasn't—my view is it's more one of aggressive management and coordination than it is a need to recast the final legislative responsibility.

Senator SCHMITT. Sometimes Congress, even if the authority does exist, can provide some assistance.

Mr. HENDRIE. There's no question about it, that the Congress is capable of considerable stimulus. I certainly would agree with that.

Senator SCHMITT. If there should be a lead agency, who is the most logical one for this particular problem?

Now frankly I tend to be biased towards trying to deal in a general way with all hazardous materials, both bulk handling as well as transportation of hazardous materials under one hat. Maybe an independent agency would be appropriate for that purpose. I don't know where we are going to end up.

The more I hear in these hearings, though, the more I'm wondering whether any of us really understand what is going to be the best way to tackle these problems.

Was there a significant discussion of this issue that involved all members of the Commission?

Mr. HENDRIE. In terms of the testimony, the answers to the questions, testimony drafts and testimony were circulated, but the Commission did not have a specific discussion so that, you know, there was a particular meeting, and so on.

Senator SCHMITT. Was there general agreement, though, with the testimony?

Mr. HENDRIE. I guess in the absence of a discussion of the kind I mentioned, Senator, I'd prefer to put it that I do not know that any of my colleagues disagree with the views that I've expressed here this morning.

Senator SCHMITT. You had indicated, as you may recall, in discussions with me and Senator Sasser and Senator Johnston before the Appropriations Subcommittee dealing with your budget, that you thought the Department of Transportation would be the right place for the responsibility as lead agency.

Mr. HENDRIE. I continue to think that.

Senator SCHMITT. You did say that was your personal view, and not the considered view of the Commission. I presume that still is your personal view?

Mr. HENDRIE. That still is my personal view, Senator.

You know, in making these comments, I would be reluctant to see the bill go as it is now, and just put the whole thing in Transportation, because I think the present flexibility is very useful. I don't, by any manner or means, then go around and say no, no, we should be the lead agency, if you're going to do that. I don't think that.

Senator SCHMITT. Well, flexibility can be very useful, as almost everybody knows.

Mr. HENDRIE. Yes, sir. It imposes a more complex and demanding management responsibility on the agencies jointly concerned.

Senator SCHMITT. I believe your testimony indicates that even now you're not sure the memorandum of understanding presently in existence or in circulation is going to be adequate to define this. Is that correct?

Mr. HENDRIE. I think that's right, Senator. We already know, in terms of this agreement we have with DOT, that we will move forward with a rule that allows us to inspect our licensees against their regulations for the packaging, that already runs in disagreement with one of the provisions of the memorandum of understanding which just recently has been renegotiated.

It is clear that as circumstances change and specific things come up, that we and the Department of Transportation will attack them with, whichever side has got the best resource base and expertise to go at it will go at it. And I can foresee as we go down the line amending the memorandum of understanding periodically to reflect those changes.

One of the advantages of the present situation, at least as I see it as an advantage, is that since the statutes don't rigorously define one or another of us out of the area, we in fact have between us and the Department of Transportation the flexibility to make those adjustments.

But, as you point out, it puts a demanding management responsibility on the two agencies.

Senator SCHMITT. Yesterday we had testimony from Charles Mayer with Tri State Motor Transit Co. critical of the new rules, NRC rules designed to minimize the radiological consequences arising out of an act of sabotage.

You mentioned that this morning, I believe.

Could we have for the record your comments or rebuttal to his criticism which appears in his testimony?

Mr. HENDRIE. Yes, sir. I've had an opportunity to scan his testimony. Mr. Mayer in his comments on the rules is focusing on a particular aspect; namely, as he reads the rules, they seem to force spent fuel shipments off interstate highways and onto secondary roads.

And reading it and thinking about the secondary roads I've driven, and the interstate highways I've driven, I find his remarks highly germane to the subject.

Now, I'd like, if I may, to submit a reply for the record.

Senator SCHMITT. We'd like that.

[The following information was subsequently received for the record:]

The following comments are in reply to the Tri-State response to Question No. 6 (Enclosure 1, page 3) of the Subcommittee.

The first paragraph of the Tri-State response can be read as implying that the regulations recently issued by the NRC for the protection of spent fuel shipments are unnecessary. We disagree with that view. A recent NRC-supported study indicates the possibility of serious consequences to the public health and safety if one postulates successful sabotage of a power reactor spent fuel shipment in a heavily populated area. Although our studies have revealed no identifiable threat to spent fuel shipments, and although the casks in which the shipments are made are highly resistant to sabotage, we nonetheless concluded that it would be a prudent precaution to issue interim regulations for the protection of these shipments. We expect that the requirements will continue in effect until we can obtain results from an ongoing research program designed to determine more about the vulnerability of spent fuel and spent fuel casks to attempted sabotage. At that time, about one or two years hence, the requirements may be amended, rescinded, or made permanent, as appropriate.

The new regulations were coordinated with the DOT regulatory program. Currently, both the NRC and the DOT have the legal authority to regulate the transportation of nuclear material, including spent fuel. Following a series of meetings, representatives of the two agencies agreed that it would be in the public interest for the NRC to take the lead in the safeguards regulation of spent fuel shipments. Among the reasons favoring this approach is the fact that the NRC has had a number of years experience in the safeguards regulation of nuclear material transportation and has the resources available to carry out the regulatory process, whereas the DOT did not. Moreover, it was determined that the issuance of the regulation by the NRC complemented and did not interfere with the DOT regulatory program.

The second paragraph of the Tri-State response contends that the NRC regulation forces transporters to use secondary roads and implies that the transporters are denied the use of interstate highways. We would like to point out that the fundamental NRC safeguards approach for controlling the potential consequences of successful sabotage consists of requiring spent fuel ships to avoid heavily populated areas where practicable. Naturally this approach generally prohibits the use of roads, including interstate highways, in heavily populated areas. The use of inways outside of heavily populated areas is not prohibited, in fact, it is encouraged. NRC's main concern is to protect the public health and safety from radiological release. Data in the draft Sandia study, *Transport of Radionuclide in Urban Environs*, shows that such health and safety is affected significantly only in heavily populated areas.

Therefore, the NRC has determined that it is prudent, interim policy to conduct safeguards regulation on the basis that the consequences of successful sabotage are more serious in a heavily populated area than in a lightly populated area. A regulation to protect against sabotage of spent fuel shipments in heavily populated areas has been issued. A research program is being conducted to determine the response of spent fuel and spent fuel casks to acts of sabotage. The current interim safeguards regulations may be amended, rescinded, or made permanent in accordance with the results of the program.

Senator SCHMITT. Based on the little bit I've heard about it, it would seem to me that his criticism of these interim rules had some merit.

Mr. HENDRIE. These are interim rules, and the first thing I'm not sure about is whether they do, in fact, force these shipments off the interstates. I think the staff ought to reply, and I think it's a good comment. If indeed we've set things up like that, we ought to think carefully about whether we're getting optimum safety out of that.

Senator SCHMITT. I think the committee was impressed by his arguments, but again we're not familiar with the intent of the rules, and so we would appreciate those comments from you.

Mr. HENDRIE. We will make that response.

Senator SCHMITT. I understand the shipments of foreign spent fuel to a Federal repository or waste burial facility are not covered by the provisions of the Price-Anderson Act.

Has the NRC given any thought concerning the gap in insurance and indemnity protection relative to that material?

You can supply that for the record also.

Mr. HENDRIE. Let me supply it for the record, Senator. Frankly, I haven't the faintest idea, I must say, whether it's covered or not. I would think it would be, but let me supply it for the record.

[The following information was subsequently received for the record:]

Foreign spent fuel is currently being shipped to this country under contracts with the Department of Energy for processing at DOE contractor facilities.

Although not covered by NRC licensee indemnity provisions, foreign spent fuel shipments while in the United States could be covered by DOE contractor indemnity provisions contained in section 170d. of the Atomic Energy Act of 1954, as amended.

In accordance with DOE's contract with E.I. du Pont de Nemours & Co., Inc., the operator of the Savannah River plant, shipments of foreign spent fuel en route to Savannah River would be indemnified while being transported in the continental United States.

Senator SCHMITT. And finally, Mr. Chairman, you recently promulgated routing requirements for spent fuel shipments for NRC licensees.

Mr. HENDRIE. In the safeguards rule.

Senator SCHMITT. That's right.

Mr. HENDRIE. It says keep them out of heavily populated areas, because if somebody does get to one and makes a sabotage attempt—

Senator SCHMITT. My specific question here for the record would be an outline of the mechanisms available to you for enforcement of such routing requirements should they become a final rule. Are there criminal or civil penalties that can be imposed relative to violations of those rules once they are filed?

Mr. HENDRIE. Yes, sir. I think we can make that most clearly and concisely if we can submit it for the record. Just as a general matter, why I comment that we enforce provisions like that through the licensee who ships the material. But let us put it in full for the record.

[The following information was subsequently received for the record:]

APPROVAL AND ENFORCEMENT PROCESS FOR SPENT FUEL ROUTES

A licensee who plans to ship spent fuel must submit proposed routes to the NRC for approval. One or more of the proposed routes will be surveyed by the NRC staff. If it satisfies the requirements of 10 CFR 73.37, the route is approved. Licensees must notify the NRC of shipment schedules. For truck shipments, current planning calls for applicable inspections at the point of origin or destination for all shipments and essentially continuous inspection of 10% of all shipments while en route. For rail shipments, current planning calls for applicable inspections at the point of origin or destination for all shipments, and essentially continuous inspection of 30% of the shipments while en route.

Failure to comply with the routing requirement could involve an NRC notice of violation, imposition of fines up to \$5,000 for each violation cited and/or revocation of license to transport spent fuel.

FEDERAL STATUTES CONCERNED WITH SABOTAGE OR HIJACKING OF SPENT FUEL TRUCKS

18 USC 33-34 make it a federal crime to sabotage a truck, train, plane, or other conveyance engaged in interstate commerce, including spent fuel shipments.

18 USC 659 makes theft of a vehicle engaged in interstate commerce (hijacking) a federal crime, whether or not the driver is also abducted.

Senator SCHMITT. Yesterday, Mr. Hendrie, it seemed that there was some general agreement that if we could really do the kind of job everybody believes we are capable of doing in the design of casks and shipping containers, that would greatly mitigate the kinds of problems that result from other considerations, routing, handling and so forth.

Mr. HENDRIE. I think that's right.

Senator SCHMITT. Now there also have been some indications to me that although there is some excellent research in cask design, being done at Sandia, and I presume elsewhere, there may not be any clear way in which those designs are integrated and actually used by all shippers. And I would like to have some information for the record on how you take the R. & D. and move it into the private sector where the casks are actually being used. How do you test for quality control and quality assurance that the casks that are actually in use versus those that were actually tested.

Mr. HENDRIE. Yes, sir. It's a good point, and we will do that for the record, Senator, particularly the quality assurance one, because we have had to pull approval from a particular cask model because we're not quite sure whether the ones that are to that design were manufactured according to the quality assurance standards that should have been there, it may turn out to be all right, but we don't know at the moment, so it's a good question.

Senator SCHMITT. Thank you.

Senator HEFLIN. Mr. Warner.

Senator WARNER. Mr. Chairman, I apologize for being late.

Mr. Chairman, yesterday we were in another section of the Commerce Committee, taking testimony on the subject of the problems in safety today in interstate truck transportation, and it is startling the increase in accidents going up in the trucking industry. I think this consideration bears directly on what we are looking at here today.

Mr. Hendrie, I would like to ask if you can, even though the studies are not complete on the subject, try in ways that the public can understand to provide us with your best judgment as to what

would happen should an accident take place on an interstate highway with a truck.

I'd like to read from an article that appeared in the *Ledger-Star*, Saturday, July 14, in Virginia.

News of the NRC decision drew criticism from members of the Tidewater Truth-in-Power organization. Spokesmen for that organization stated, "Considering that these radioactive waste shipments contain essentially the same killing power as the wastes that are given off by the explosion of a nuclear weapon, we feel that the NRC is using less than sound judgment by allowing even one more shipment through this densely populated area."

Now when the average reader reads that, of course, it's questionable the credibility that he or she attaches to the statement, but nevertheless these are ringing words, "the same killing power as the wastes given off by the explosion of a nuclear weapon."

How would you characterize the consequences of, say, a good old head-on collision that unfortunately occurs all too often on the highways today, and these canisters or containers are scattered about, and some of this material is exposed to persons in the element?

Mr. HENDRIE. Senator, if your article talks about nuclear bombs and the killing power of the wastes and therefore can only refer to spent fuel shipments, in no other shipments does one have the concentration of fission products, of lightly radioactive materials, that have any sort of relation to weapons radiation level—

Senator WARNER. Excuse me. The article definitely relates to spent nuclear fuel.

Mr. HENDRIE. Now spent fuel is required under the Commission's regulations to travel in what are called type B packages; that is, these are serious amounts of radioactivity, higher amounts, and we require—and the designation is type B packaging.

Now type B packaging means that you have to put the radioactive material inside an objective which can withstand all of the kinds of accidents that occur on highways.

The casks that are built to those standards are tested. They've been tested in a series of tests over the years, and the most recent ones which were, I guess, concluded last year, we had Sandia running these casks on a rocket sled down the White Sands Proving Ground into great concrete monoliths at great rates of speed.

The casks are very carefully designed and built with quality assurance standards. I have noted that when we have any suspicion about one, as we have recently, we pulled approval for it.

Let me tell you some of the tests that we've made from some of these things.

We take one of these casks and hoist it up 30 feet into the air and then drop it onto a steel plate on a concrete pad in any direction, trying to find the direction in which maximum damage would occur.

We drop it a yard and a half or something like that on a 6-inch diameter steel spike, to see if you can puncture it from that kind of an impact.

We run it through fire tests, 1,500°, 30-minute tests, and so on.

We plunk it under 30 feet of water for 8 hours just to make sure it's not likely to leak.

What it means is that if we have a highway transportation accident with a type B cask, there may indeed be injury and death, but it will be because people are crushed, and when it is all over, that cask won't have a scratch on it, and there won't be any radioactivity out of the thing.

Now we've worked very hard over the years to make these casks just simply invulnerable to the sorts of transportation accidents to which they may be subject.

There are still a couple of questions that we are working on. Recently people came up and said, well, you know, trying to think of the far-out things that might happen, to cover all of the possibilities, people came around and said, suppose we imagine a sabotage group bound and determined to blow open one of these casks, and let's give them credit for all kinds of explosive material expertise, shaped charges, and all the rest of the stuff, what's the worst they could do?

And, indeed, if you let a group of experts have unfettered access to a cask, and all the shaped charges of any kind that they want, and so on, I guess they can eventually blow the thing open and spread some radioactive material around.

We have gone back to look in more detail at all the assumptions and try to judge just whether we're dealing with something here that is such a remote speculation that it just doesn't make sense to try to regulate against it, or whether indeed some provisions ought to be taken, and in the meantime we're saying put a guard with those shipments and watch out on the routing, and that's the recent safeguards rule.

Now that's a long, windy answer. Let me come around and see if I can summarize it.

Spent fuel shipments, which travel for the most part by highway, if there are accidents, the consequences will be due to just the mechanical effects of the collision, just like any other thing, and the fact that they are carrying a large and heavy load, but there won't be any radioactivity. And the article you've read from simply in trying to make it sound as though these casks will explode like nuclear weapons, is an irresponsible sort of thing.

Senator WARNER. If I can summarize your testimony, I don't know whether we can quantify it, but you've designed and engineered the safest possible means by which to transport this waste.

I went down to our plant in Surry, Va. last weekend to just look, in preparation for this hearing, at the casks and the manner in which they were handled. And although I am not skilled in all the procedures here, or knowledgeable, it did seem to me that they were taking extraordinary care with the waste, and that they were carefully packaged.

And I again direct my question—I think you've answered it, but perhaps you'll wish to add a word—in your judgment, if the worst situation were to happen in which one of these casks were punctured, and there was a freeing of this waste in the highway, it would not have quite the same killing power as the wastes that are given off by the explosion of a nuclear weapon.

Mr. HENDRIE. That is correct. It would not have, by many, many, many orders of magnitude.

Senator WARNER. What would happen?

Mr. HENDRIE. I think relatively little. There would be some contamination, there would be some gaseous radioactive—some of the gaseous fission products might escape. Because I have to assume if the cask has been punctured in some fashion, that it was shaken up, and so some of the fuel elements, the rods have cracked again, or whatever. I would expect a modest amount of gaseous activity to come out. Not enough to cause serious injuries.

Senator WARNER. Your voice dropped, and that was the key.

Mr. HENDRIE. Some gaseous radioactive materials would come out. I would expect not enough to cause serious injury to anyone.

The solid fission products which compose 99 percent of what's there—well, 99 percent I withdraw, but a large fraction of the radioactivity that's there are simply going to stay in the cask, even if it's got a hole in it. They won't come out unless there's a lot of other things going on.

So for type B casks, which are the requirement for shipping spent fuel, in particular, but are also used for some other materials that can have a fair amount of radioactivity, I really don't have much concern about transportation accidents.

Senator WARNER. Now in the area of Portsmouth, Va., and its proximity to South Carolina, is a controversy going on which I am certain you are familiar with, namely the reluctance of the citizens of Virginia to incur these minimal risks, as you described, versus the citizens of South Carolina.

Now the citizens of South Carolina, as I understand it, have passed laws, I suppose they are municipal ordinances, prohibiting the transportation of nuclear waste through some of the cities in South Carolina, which blocks the direct route to the ultimate repository down in South Carolina.

What steps are you taking to deal with the situation?

Mr. HENDRIE. Well, unfortunately, the authorities in the NRC don't allow us to deal in a very direct way with that kind of problem, Senator, and it is a problem, and it's becoming more of a problem, and I can foresee a time in the near future when we'll be tied in such knots in this country that you can't move this material, and I think that would be very unfortunate.

There is a rulemaking hearing going forward—proceeding going forward under the Department of Transportation to establish Federal guidelines of routing of radioactive material shipments.

My understanding is that that proceeding could result, and my hope is that it will result, in Federal rules for routing which will take reasonable account of the concern of localities and so on, but will not prevent the movement of interstate commerce; which is what the present situation is leading to, and that rulemaking will take, I guess it will be another year before we see the guidelines promulgated.

I must say as a sort of side comment that one of the things if we were to have a specific bill to deal with the transportation of radioactive materials, I would have hoped that the Congress would give consideration to a preemption to the Federal authorities for routing and safety guidelines for those materials in transportation, on all of the Nation's transportation routes.

It does seem to me that that is ultimately what is going to have to be done if we are going to prevent, on the one hand, a total

paralysis with regard to the movement of these materials or a set of complex local routing requirements which end up causing a waste shipment or a radioactive material shipment to wander all over the countryside trying to avoid complaining localities.

In truth, the mileage that's traveled, and the overall level of risk, even though that's low, it inevitably increases it.

Senator WARNER. Have you specifically asked the Congress for that to be included in this legislation?

Mr. HENDRIE. No, I have not, Senator, and I should note that that is a personal view of mine, and it is not one I have asked the Commission to try to come to a collegial view on, so I present that as a personal view, let me emphasize again, and not as a collegial position of the Nuclear Regulatory Commission.

Senator WARNER. Would you not consider it wise to formalize it and advise the Congress, because we're heading into a situation between the States of Virginia and South Carolina, as further on in the article it says it's approaching proportions of a civil war between these two States. And the citizens of Virginia, now particularly in Portsmouth, have taken what I view as a very responsible position. They recognize the need for the transportation of nuclear waste through their port although they are aware of the fact that like citizens elsewhere have taken actions to block it.

From the standpoint of distances, it would be easier to import this into South Carolina, and the transit time from the port of South Carolina to the repository in Aiken would be much shorter than coming up through Virginia. So I think it would be helpful if the Congress were to address this issue.

Mr. HENDRIE. Well, if you do go forward with S. 535 in some version or other, why, I'd personally, heartily recommend to you the question of preemption to the Federal authorities for—

Senator WARNER. What about formalizing action with your Commission?

Mr. HENDRIE. Well, I can always see whether I can get two of the Commissioners to go with me, Senator Warner, but, as you know, with collegial bodies, well, you have to look and see where you can get your majorities and on what positions you can get those.

Senator WARNER. Would you take a look?

Mr. HENDRIE. I'm willing to take a look.

Senator WARNER. Thank you very much.

Senator HEFLIN. Thank you, sir. We appreciate your appearing before us.

Our next witnesses will come as a panel. Mr. Gerald Rhode, chairman of the Electric Utility Companies Ad Hoc Nuclear Transportation Group of Niagara Mohawk Power Corp., and Mr. George Rifakes, manager of fuel and budget of the Commonwealth Edison Co.

Gentlemen, let me explain. I have a little problem with the schedule to vote at 10:45, which is 10 minutes from now, and some of us have got to go over and get knowledgeable on issues on the vote.

We, of course, would be tied up there for a while. If you would proceed with your testimony, even if we have to leave, we will read your testimony. Mr. Smick here will probably ask questions, in the

event that we can't get back. The time frame is such that it can cause some problems.

We hate this, but this is—the issues coming up are the energy crisis—trying to go through as many authorization bills and get those disposed of, and we are having early morning sessions and other things at this time.

So there are problems here that we would appreciate you understanding.

STATEMENT OF GERALD K. RHODE, CHAIRMAN, ELECTRIC UTILITY COMPANIES' AD HOC NUCLEAR TRANSPORTATION GROUP

Mr. RHODE. Thank you, Mr. Chairman.

In the interest of time, and perhaps to have the opportunity to show you a couple of exhibits that we brought with us, I shall quickly skim.

On April 30, 1979, I commented to Senator Harrison Schmitt on S. 535, and I ask that this letter be included in the record of today's hearing.

In general, we wholeheartedly support key provisions of the bill. Namely, designation of the Department of Transportation as the agency with principal responsibility for regulating, monitoring, and insuring the safety of transportation of radioactive materials; and establishment of a firm timetable and allocation of responsibilities for development of emergency planning.

As explained in my letter, there are certain aspects of the bill which we believe could be improved. Namely, mandating a date for completion of the DOT rulemaking on highway routing of radioactive materials; revising the emergency planning provisions of the bill to place them in the context of DOT's annual reports to Congress, rather than a one-time report after 18 months, and to place emergency response planning in the context of planning for shipments of all hazardous materials; and last, to revise the program for grants to States so as to limit them to those States in which a radioactive materials waste disposal facility will be located, and to provide the grants in support of States' participation in or comment upon the Federal siting or licensing proceedings for the waste disposal facility.

In order to place my April 30 letter and today's testimony in clear perspective, I shall briefly restate the views I expressed when I appeared before your subcommittee August 16, 1978; and then comment on how recent developments have impacted these views.

In my earlier testimony, I identified the principal concerns of our Nuclear Transportation Group as follows:

One, recent efforts by State and local governments to impose controls or total bans on nuclear shipments;

Two, disputes over alleged transportation safety hazards;

Three, attempts by rail carriers to impose unjustifiable special conditions for transport of nuclear materials;

Four, criticism of emergency response capabilities for transportation accidents; and

Five, fragmented responsibility and lack of direction at the Federal level.

I also recommended that a lead Federal agency be designated to serve as the final authority for regulating safe transportation of radioactive materials.

This recommendation stemmed from observations that transportation problems related primarily to institutional factors and the absence of a clear, harmonious relationship among the various Government entities which in our judgment was impeding the decisionmaking process.

Moreover, it was apparent to us that lack of a clear Federal policy in all areas of waste management was compounding the problems of transport of spent fuel and radioactive wastes in that, because of their inextricable relationship, no meaningful long-range planning or transportation resource commitments could be finalized.

I cited the need for the Federal Government, in cooperation with States and localities, to accelerate its efforts to insure that a comprehensive, practical, and uniform system of regulation of transportation of radioactive materials be established nationwide; and that the roles of Federal, State, and local authorities, and carriers and shippers, in responding to transportation emergencies should be better defined at the Federal level in order to establish clear, uniform lines of authority and responsibility.

I also commented that emergency planning for radioactive materials transport should fit into a logical plan which contemplates all hazardous material shipments.

Subsequent to expressing these views before your subcommittee last year, our Nuclear Transportation Group conducted a number of activities related to these concerns, some of which I have appended to my testimony as further background information.

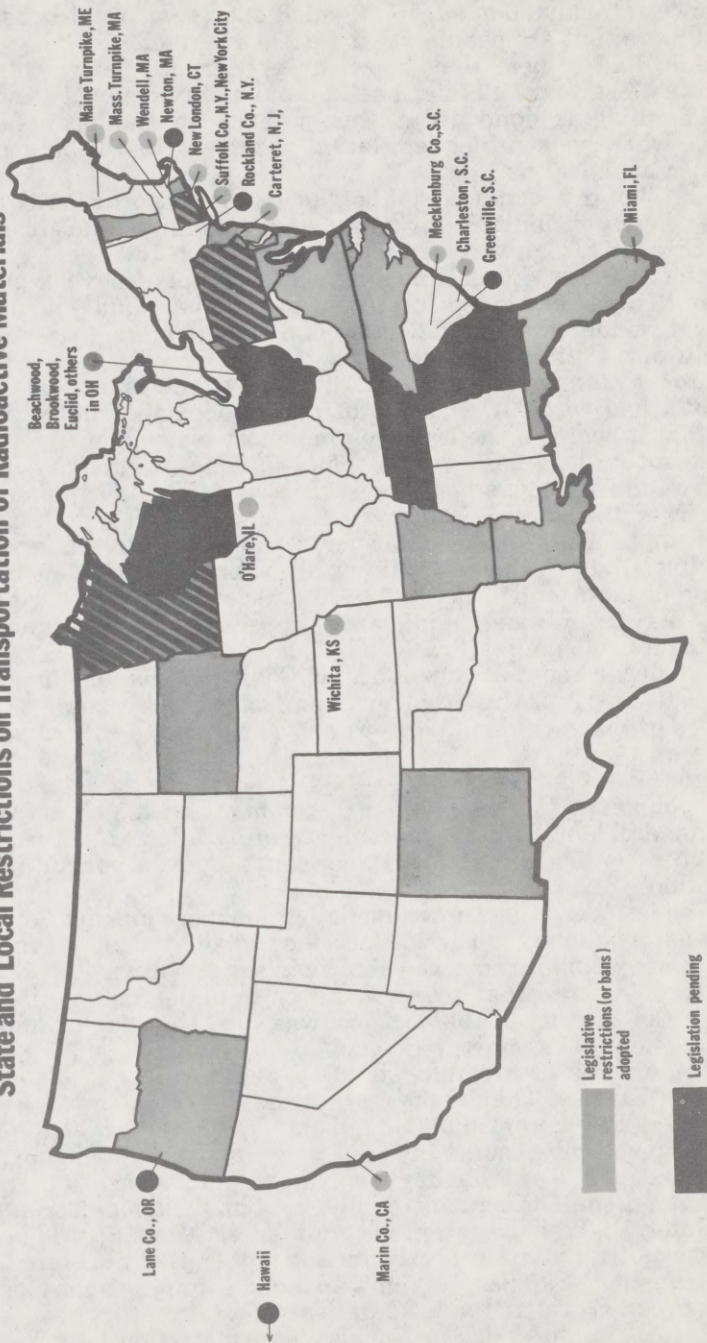
Exhibit 2 is a Nuclear Transportation Group report on the proliferation of State and local restrictions to transportation of radioactive materials, dated January 1979. And in this connection, I brought with me today a chart which illustrates the depth of the problem.

The chart, as you see here, is broken down into two different categories.

First, the States which have either enacted or have pending legislation dealing with restriction of transportation of radioactive materials. And then the small dots are the various smaller political subdivisions which have either enacted or are considering pending legislation.

The difference between "already adopted" and "pending" is shown by this color coding [indicating]. It is interesting to note that, today there are 16 States in the Union which have already enacted legislation dealing with nuclear transportation, 1 of which is a total ban, and 8 more which currently have pending legislation.

State and Local Restrictions on Transportation of Radioactive Materials



Mr. RHODE. With regard to lesser subdivisions, there are 23 ordinances already adopted, 18 of which operate as total bans, and some 4 more that are pending that we are aware of.

I would like to note that, since my appearance before the subcommittee last year, this list has approximately doubled. And unless something is done about this problem in the near future, perhaps when we consider legislation next year it will be doubled or tripled at that time.

Exhibit 3 of my testimony is the Nuclear Transportation Group's suggested responsibilities for emergency planning and response dated October 1978, a very important topic which I will—

Senator WARNER. Excuse me. Might I interrupt? I have to go and vote, and I was very much interested in the chart and your observations. I wondered if I might interject a question.

Mr. RHODE. Certainly, Senator.

Senator WARNER. I am sure you listened to the line of questioning that I had with Mr. Hendrie before he departed, and it seems to me that it bears on the issue you have just touched on.

What about the legality? Has someone done an analysis of the ability of the Congress to pass such a law to superimpose the judgment on the several States?

Mr. RHODE. Well, I'm not a lawyer, Senator, but my understanding is that, first off, that most if not all of these restrictions are in violation of the Atomic Energy Act, and depending on how far they go they may or may not significantly impede interstate commerce, which itself is a legal matter.

The nonlegal issues of course are as Chairman Hendrie responded to, that clearly if the problem is not solved we're going to find ourselves in the position of perhaps not being able to ship anything anywhere.

Senator WARNER. Yes.

Does your expertise enable you to comment on his observations about an accident, and if something were spilled into the open spaces, the consequences of that accident? Do you concur in his observation?

Mr. RHODE. Well, I am not personally an expert in safety evaluation, Senator, but my general experience in the industry over the last 20 years would confirm the chairman's observations.

Senator WARNER. That there would be minimal risk to life and health if the severity of the accident was such that one or more of these canisters were punctured?

Mr. RHODE. That is my understanding, Senator.

Senator WARNER. Thank you very much.

Dr. SMICK. Please continue.

Mr. RHODE. I will resume my testimony, picking up with exhibit 4, appended to the written text, a Nuclear Transportation Group statement on the Department of Energy/Sandia Laboratories Nuclear Materials Transportation program dated May 1979. This document suggests that if properly structured and administered, we believe the DOE/Sandia program can help eliminate many of the present problems related to essential transportation services.

Exhibit 5, also appended, a Nuclear Transportation Group statement on status and future availability of spent nuclear fuel casks and shipping services dated April 1979. This analysis confirms

views I expressed last year, that Government decisions are sorely needed to firm up time schedules and permit meaningful long-range transportation resource commitments.

Since my last appearance before you, the following major developments have occurred which bear on nuclear materials transportation issues:

First, the promulgation by the Nuclear Regulatory Commission of amendments to its regulations concerning physical protection of spent nuclear fuel shipments.

Second, a heightened focus on the issues of waste transportation, including emergency planning and advance notification requirements, in the context of general concern over the Three Mile Island plant accident.

While these recent developments do not change the thrust of my April 30 comments, they may call for some modification of the bill's language which I shall now discuss.

S. 535 takes the key step of designating the Department of Transportation as the agency with principal responsibility for regulating, monitoring, and insuring the safety of transportation of radioactive materials.

We continue to support strongly this portion of the bill and believe that if enacted it will facilitate an appropriate allocation of resources within the Federal Government, insofar as regulation of radioactive materials transportation is concerned.

In this connection, and in response to one of Senator Stevenson's questions to me, it is not clear to us why establishment of a separate office of radioactive materials transportation within the DOT would be desirable.

We say this because it is important that radioactive materials be considered in the context of other hazardous materials. Assigning greater resources to the effort of regulating radioactive materials, particularly the enforcement of existing regulations, rather than creating a separate office would appear to us to be the better response to this problem.

Section 2 of S. 535 recognizes that in fulfilling its responsibilities the Department of Transportation must conduct appropriate consultations with the Nuclear Regulatory Commission. This is essential because the statutory authority and responsibilities of the NRC would not be affected by S. 535.

As you know, the NRC recently promulgated a rule, effective July 16 of this year, providing for interim physical protection requirements for spent nuclear fuel shipments.

The key elements of this rule consist of: Advance NRC approval of routes; avoidance of heavily populated areas where practicable; and specific protection measures to guard against sabotage both in heavily protected areas and elsewhere, including advance arrangements with local law enforcement agencies.

Whether the NRC's new rule is necessary and adequate in the sense that there is a serious risk of public harm from sabotage of a spent nuclear fuel cask in the absence of the new requirements is debatable. Questions can also be raised whether the NRC's new rules are reasonable, in the sense that they call for arrangements that are workable, while at the same time protecting public health and safety.

Since so much depends on the NRC's interpretation of these rules—particularly with respect to rail shipments and shipments through heavily populated areas—I am not yet in the position to make specific suggestions as to how to improve the rule.

We are in the process of developing our comments and plan to file them by the August 17 deadline established by the NRC. I respectfully request an opportunity to submit these comments to the subcommittee for inclusion in the record of this hearing as part of my testimony.

Mr. SMICK. That will be done.

Mr. RHODE. Regardless of the need for and adequacy of the NRC's new rule, it is clear that the NRC has in effect taken upon itself the sole responsibility for deciding routes for NRC licensees' spent fuel shipments.

Moreover, the NRC's establishment of these routes must take into account not only the potential threat of sabotage—even though this is obviously the principal concern being addressed—but all other relevant considerations such as practicality and economics.

This action by the NRC has important implications concerning both the Transportation Department's rulemaking on highway routing of radioactive materials, and the activities of States and localities seeking to regulate these shipments.

We think it is clear that the DOT should not reconsider the issue of highway routing of spent fuel shipments by NRC licensees in this rulemaking. Rather, DOT should adopt the NRC's recent action and formalize a continuing delegation of responsibilities for spent fuel shipment requirements to NRC through amendment to the DOT's regulations and the DOT-NRC memorandum of understanding. Otherwise, we would have the prospect of two Federal agencies designating routes for these shipments.

With respect to State and local restrictions on spent fuel shipments, it is essential that there be a single Federal mechanism for establishing the routes. The NRC's route selection process must become the focal point for resolution of any concerns on the route; otherwise, we shall be faced with the prospect of approval of the route by a Federal agency which then may later be found to be unacceptable under State or local requirements. Obviously this can only lead to a frustration of national objectives for shipment of radioactive materials and needless litigation.

We believe that exclusion of licensees' spent fuel shipments from the DOT's highway routing rulemaking is not inconsistent with enactment of S. 535, which designates the DOT as the lead agency for regulating transportation of radioactive materials.

Section 2 of S. 535 states that in fulfilling its responsibilities the DOT must conduct appropriate consultations with the NRC. However, to clarify the intent of S. 535 we recommend that section 115(a) of the Hazardous Materials Transportation Act, which would be added by section 5 of S. 535—page 5, line 2 to 8—be amended to read as follows:

Section 115(a) "Responsibilities."—The Secretary shall have the primary responsibility for the safety and regulation of the shipment of nuclear waste and commercial spent fuel, except that the primary responsibility for determining the routes, and regulating and certifying the safety of shipping casks and packages, for ship-

ments of commercial spent fuel shall remain with the Nuclear Regulatory Commission.

With regard to emergency planning, S. 535 focuses needed attention on planning for emergencies in transportation of radioactive materials. However, we believe events since our April 30 letter reemphasize the need to consider emergency planning for transportation of radioactive materials:

First, as an ongoing matter to be addressed in its regular annual reports to Congress by the DOT rather than in a one-time report to Congress after 18 months;

Second, in the broad context of all transportation hazards and emergencies generally.

Bills have been reported in the Senate and House of Representatives calling for major revisions in emergency planning for fixed nuclear facilities, and the Comptroller General has submitted a report recommending that the new Federal Emergency Management Agency should become the focal point for encouraging State and local governments to develop and maintain emergency response plans for nuclear transportation accidents.

Both of these bills and the Comptroller General's report suggest to us that emergency planning for transportation of radioactive materials should be addressed in a broader context than is presently provided in S. 535.

Our group considers that improved emergency preparedness will facilitate nuclear shipments by alleviating concern over the effects of an accident, even if these effects are highly unlikely or minor.

We continue to believe that a lead Federal agency—DOT, as would be designated by S. 535—should be required to define the broad role of all parties and seek early accomplishment of detailed planning tasks, either through its own resources, those of the Federal Energy Management Agency, or some combination thereof.

Consistent with the intent of S. 535, we believe the DOT should consult with the NRC with respect to transportation emergency planning, and should not conduct duplicative review of plans approved by the NRC.

Late last year our group drafted a chart showing our views of how emergency planning and responsibilities might be formulated, and these views are displayed on the chart now in front of you.

You will note that the suggested responsibilities for emergency planning and response are broken down into three broad phases:

First, the planning, which would consist of defining responsibilities; identifying the packaging and safety requirements; the training of State and local authorities; the carrier qualification and packaging adequacy determination; and, finally, the preparation of an emergency action plan by Federal, State, and local carrier participants.

The response phase would consist of the notifications in the event of an incident; the securing of public health and safety aspects; confinement, cleanup, and advisory assistance to those primarily responsible for the response action.

The third phase would be that of followup, wherein the effectiveness of the actions or response would be evaluated post-incident.

While it is very clear that no one entity—that is, the Federal, State, and local government, carrier or shipper—would be entirely

responsible for any one phase, nevertheless there is a logical leadership role in each of the three phases.

For example, in the planning phase, the principal activity or leadership role here would be one of defining the responsibilities—and herein we've noted we believe that should be a Federal responsibility.

In the response phase, the key element here is obviously that of assuring public health and safety. From that standpoint we believe that the lead element in the response phase should be the State and local authorities.

Finally, in the followup phase in evaluation of effectiveness, we believe this would be primarily a shared responsibility among Federal, State, and local entities.

A copy of this chart, incidentally, is also appended to my testimony as an attachment of exhibit 3. Obviously such a broad guideline would have to be supplemented by much more detailed plans for preparedness by each party involved.

With regard to notification requirements for shipments of radioactive materials, I would comment that since the introduction of S. 535, bills have been introduced in the Senate and the House of Representatives—for example, S. 562 and H.R. 2608—which would require the Nuclear Regulatory Commission to establish a system of advance notification to States of shipments of nuclear materials through their boundaries.

As noted in my testimony last August, there is substantial question what use would be made of such information by States and localities. Moreover, there is a conflict between the desirability of notifying appropriate persons—such as local officials with police or emergency planning responsibilities—and the need to maintain a reasonable degree of security to avoid the very threat against which the NRC promulgated its regulations on spent fuel shipments.

Should the Congress decide that an advance notification system is desirable, whether by the Nuclear Regulatory Commission or the Department of Transportation, it is essential that the system be standardized, operating on a pyramid-type network basis, and taking into account the reasonable needs of State and/or local authorities.

For example, it may be sufficient to utilize in each State one central State police office as the point of notification within each State for individual shipments.

Regardless of how it is structured in detail, the development of a standard uniform system will probably not be an easy task because we believe States and localities have highly varying desires in this respect.

Once the Federal system is established, it must take precedence over State and local requirements. But in any event, what has to be avoided is a hodgepodge of advance notification requirements from one locality to another.

As utilities responsible for the construction or operation of nuclear powerplants, members of our group have a vital interest in assuring that the regulations applicable to transportation of radioactive materials provide adequate protection to public health and

safety, are perceived as adequate by the public, and permit the continued economical operation of these plants.

Everyone acknowledges that the safety record for transportation of radioactive materials has been exemplary over the past 25 years, particularly when considered in the context of the accidents that have plagued transportation of other hazardous materials.

Nonetheless, concerns continue to be expressed about the adequacy of these transportation regulations. The utility industry must necessarily look to the Federal Government to establish the safety standards and procedures for this very vital activity.

The problem we face, in our judgment, is primarily a challenge to the ability of the Federal Government to fashion a workable arrangement for sharing its authority with States and localities.

We believe that S. 535—modified as we have suggested—would help to shape that arrangement.

[The attachments referred to follow:]

EXHIBIT 1

NIAGARA MOHAWK POWER CORP.,
Syracuse, N.Y., April 30, 1979.

Hon. HARRISON H. SCHMITT,
U.S. Senate, Washington, D.C.

DEAR SENATOR SCHMITT: Thank you for your letter of April 4, 1979, affording me an opportunity to comment on your bill, S. 535 (the "Bill"), which would amend the Hazardous Materials Transportation Act (49 U.S.C. § 1801, et seq.) (the "Act"). I offer these comments as the Chairman of the Ad Hoc Electric Utilities' Nuclear Transportation Group, comprised of 29 utilities which together are operating, constructing or planning roughly half of this country's nuclear capacity. The Group was formed early in 1978 because of our concerns for the transportation problems confronting the nuclear industry.

We wish to congratulate you and your co-sponsors for taking the initiative in preparing the Bill. Also, we strongly support key provisions of the Bill, namely (1) designation of the Department of Transportation as the agency with principal responsibility for regulating, monitoring and ensuring the safety of transportation of radioactive materials, and (2) establishment of a firm timetable and allocation of responsibilities for development of emergency planning. These provisions of the bill are entirely consistent with positions we and others have advocated in testimony before your Subcommittees on Science, Technology and Space and Surface Transportation on August 6, 1978.

Moreover, we wholeheartedly agree with the features of the Bill which:

1. Require notification to a State that nuclear waste or commercial spent nuclear fuel will be transported within that State as the result of plans to develop a storage or disposal facility (proposed section 116(a) of the Act; section 5(2) of the Bill); and
2. Require notification to the Secretary of Transportation when foreign spent fuel or nuclear waste shall be imported into the United States and direct the Secretary to ensure that such materials are properly packaged and shipped (proposed sections 117(a) and (c) of the Act; section 5(2) of the Bill).

There are certain respects, however, in which we believe the Bill could be improved. These areas are as follows:

1. The most serious nuclear transportation problem confronting the utility industry today is the proliferation of State and local restrictions on the transportation of spent nuclear and other fuel cycle materials. This has been exacerbated by the perceived lack of direction and fragmented responsibility at the Federal level for nuclear transportation safety, problems which the Bill should go a long way to cure. The failure of the Department of Transportation to rule that the New York City Health Code ordinance, which bans transportation of spent fuel through the City, is inconsistent with the Hazardous Materials Transportation Act has encouraged many States and localities to follow New York City's lead. Although the DOT has commenced a rulemaking proceeding to establish Federal routing requirements, the proceeding is moving much too slowly. Attached hereto is our latest list of State and local restrictions on transportation of radioactive materials, many of which have been adopted since the DOT announced in April 1978 that it would conduct its

routing rulemaking. There is no technical or practical reason why the DOT cannot complete this proceeding by March 31, 1980 if sufficient resources and priority are assigned to this task. We therefore strongly recommend that the Bill require the DOT to complete the proceeding by this date.

2. With respect to section 115(b) of the Act (added by section 5(2) of the Bill), whereas we heartily agree there is a need for a Congressional mandate to the DOT to improve emergency response planning at the Federal, State and local level, and particularly to define the role of Federal, State and local governments in responding to a transportation emergency, we recommend certain clarifications of the Bill. First, we believe it would be preferable to require continuing reports to Congress on emergency planning activity as part of the annual report of the Secretary under section 109 of the Act, rather than a one-time report after 18 months. This would enable Congress to remain informed of important developments in this area. Second, we believe emergency response planning for radioactive materials shipments needs to be considered in the context of planning for shipments of all hazardous materials. The same network of Federal, State and local officials are involved and similar principles of planning and response must be applied. Indeed, planning for all emergencies—including those involving transportation hazards—needs to be coordinated, a point which has been recognized in the recent establishment of the Federal Emergency Management Agency.

Accordingly, we recommend that proposed section 115(b) of the Act/section 5(2) of the Bill (and section 109(3) of the Hazardous Materials Transportation Act as it would be amended by section 6 of the Bill) be amended to require the Secretary of Transportation to include in his next annual report a clear definition of the role of Federal, State and local governments in responding to transportation emergencies involving radioactive and other hazardous materials. In that report and in succeeding annual reports the Secretary should also be required to assess the adequacy of the organizational structure at the Federal, State and local levels to respond to transportation emergencies; to assess the response to particular accidents that have occurred during the year; and to make recommendations for improvements. These reports would encompass but not be limited to radioactive materials.

3. We believe the State grants provisions of sections 116(b) through (d) of the Act (added by section 5(2) of the Bill) should be modified. It is entirely logical that States should be granted funds to implement emergency response planning consistent with Federal guidelines. This concept is implied in proposed section 115(a) of the Act and we support it as well as the mechanism for issuance of the grants set forth in proposed section 116(d) of the Act. However, we do not believe it is necessary to provide grants to all the States within which nuclear waste or commercial spent fuel would be shipped as provided in proposed sections 116(b), (c) and (d) of the Act. This could result in grants to a very large number of States, some of which may not be well equipped or motivated to use the grants. Moreover, it does not seem desirable for each State to conduct "an independent State review of the safety and logistics of shipments associated with any proposal to develop" a disposal facility. Such a grant program would appear to call for many duplicative State reviews which should properly be conducted comprehensively at the Federal level.

Accordingly, we recommend that any programs for grants to States to review transportation aspects of radioactive waste disposal facilities, other than grants to implement emergency planning, (1) be limited to those States in which the disposal facility will be located and (2) be for support of the State's participation in or comment upon the Federal siting or licensing proceeding. We suggest that using the grant for this purpose would markedly improve the quality of the Federal review.

4. With respect to proposed section 115(a) of the Act (added by section 5(2) of the Bill), as we understand the phrase "logistical aspects of the shipment of nuclear waste and commercial spent fuel," it would seem reasonable to assign responsibility for such matters, insofar as the Federal government is concerned, to the Department of Energy as opposed to the Department of Transportation. This would be consistent with that Department's responsibilities for radioactive waste management and disposal and for energy-related matters generally. Furthermore, we believe it would be consistent with the expertise and experience of both the Department of Transportation and the Nuclear Regulatory Commission if this section were clarified so that the primary responsibility for regulating and certifying shipping casks and packages for fissile and large quantity materials remained with the Nuclear Regulatory Commission.

5. We agree with you that the primary problems being encountered today relate to proposed shipments of spent nuclear fuel and that secondary problems arise from shipments of nuclear waste materials. However, it is also true that shipments of other fuel cycle materials, e.g., uranium concentrates and other forms of enriched

uranium, sometimes present problems of a related character. We believe it would therefore be useful if section 2 of the Bill (as well as proposed section 115(a) of the Act, added by section 5(2) of the Bill) were broadened to include all nuclear fuel cycle materials within the scope of the Department of Transportation's responsibilities. In this connection, it is not clear what advantage is gained by amending section 104 of the Act as is proposed by section 4 of the Bill.

We would be happy to meet with you or your staff to discuss this matter in further detail, including any necessary drafting changes to carry out the suggestions we have made.

Once again, I congratulate you on making a major contribution toward maintaining the use of nuclear power as one source of energy for the nation.

Sincerely,

GERALD K. RHODE,
Chairman, Electric Utility
Companies' Ad Hoc Nuclear
Transportation Group.

Attachment.

Beachwood, Brooklyn, Euclid, Lakewood, Mayfield Village, Middleburg Heights, Olmsted Falls, Richmond Heights, Shaker Heights and South Euclid, Ohio—Spent Fuel Shipments Banned.

Carteret, New Jersey—Waste Shipments Banned.

Chicago, Illinois—High Enriched Uranium and Plutonium Banned from O'Hare Airport.

Connecticut—Permit Required.

Delaware—Prior Notification Required on Turnpike; Police Escort.

Florida—Prior Notice Required and Routes Must Be Approved.

Louisiana—Spent Fuel and High-Level Waste Shipments Banned.

Maine Turnpike—Permit and Prior Notice Required.

Maryland—Bond and Permit Required.

Massachusetts Turnpike—Shipments Banned.

Miami, Florida—All Radioactive Shipments Through Port Banned.

Minnesota—Prior Notice Required.

New Jersey—Handling Certificate Required.

New London, Connecticut—Spent Fuel Shipments Banned.

New Mexico—Environmental Improvement Board Given Authority to Promulgate Regulations.

New York City—Spent Fuel Shipments Banned.

North Carolina—Prior Notice Required.

Oregon—Prior Notice Required.

Pennsylvania—Yearly, Renewable Permit on Turnpike; Ban Through Tunnels.

Rhode Island—Permit Required.

South Dakota—Authority Given to State Department of Transportation to Adopt Regulations.

Suffolk County, New York—Prior Notice Required.

Vermont—Prior Notice Required.

Wendell, Massachusetts—Certain Shipments Banned.

Wichita, Kansas—Recommends Routing Around City.

Legislation Pending in Arkansas, Connecticut, Greenville, South Carolina, Georgia, Lane County, Oregon, Hawaii, New Mexico, Newton, Massachusetts, Pennsylvania, Rockland County, New York, Tennessee, Texas, Virginia and Wisconsin.

EXHIBIT 2

REPORT OF THE ELECTRIC UTILITY COMPANIES' AD HOC NUCLEAR TRANSPORTATION GROUP ON THE PROLIFERATION OF STATE AND LOCAL RESTRICTIONS ON TRANSPORTATION OF RADIOACTIVE MATERIALS, JANUARY 1979

The proliferation of state and local restrictions on the transportation of certain radioactive materials was one of the principal reasons for the formation in 1978 of the Electric Utility Companies' Ad Hoc Nuclear Transportation Group.¹ A number

¹ The Group consists of the following 24 electric utility companies which are the operators of 39 reactors and are responsible for planning, design, and construction of an additional 61 reactors: American Electric Power Company, Arizona Public Service Company, Baltimore Gas & Electric Company, Commonwealth Edison Company, The Detroit Edison Company, Duke Power Company, Florida Power & Light Company, Houston Lighting & Power Company, Kansas City Power and Light Company, Kansas Gas and Electric Company, Long Island Lighting Company, Niagara Mohawk Power Corporation, Northeast Utilities, Northern States Power Company,

Footnotes continued on next page

of new restrictions were introduced in 1978. Unfortunately, more are expected in 1979, largely because of a perceived lack of direction and fragmented responsibility at the Federal level and notwithstanding the exemplary safety record of the nuclear transportation industry over the past 30 years.

We believe that state and local requirements that seek to ban shipments of radioactive materials are irresponsible and in fact unlawful. They violate the Atomic Energy Act of 1954 which is designed to ensure the safe, peaceful use of atomic energy. They constitute an unlawful burden on interstate commerce. Moreover, absolute bans are inconsistent with the scheme of Federal regulation of transportation under the Hazardous Materials Transportation Act. On the practical side, a proliferation of bans will ultimately shut down the Nation's nuclear plants and deprive millions of people of needed electricity from a proven, economical energy source.

The Nuclear Transportation Group in 1978 established among its members an informational network to monitor pending state and local ordinances and regulations nationwide and to disseminate this information to interested parties. Because so many jurisdictions in different parts of the country have begun to enact or consider transportation restrictions, it is difficult to maintain a current list. Attachment 1 is the Group's list of state and local restrictions as of January 29, 1979. Because more can be expected in the absence of responsible Federal action, Attachment 1 also contains the names and telephone numbers of the Group's regional contacts. Persons with information about new or pending restrictions are encouraged to communicate such information to the nearest contact.

At a minimum, state and local restrictions have the potential for disrupting the normal operation of the Nation's nuclear power plants with little, if any, increase in safety. Depending upon the manner of enforcement of these regulations and whether additional state and local municipalities adopt further restrictive laws in the future, these requirements could eventually cause a shutdown of the country's operating nuclear plants and deter utilities from constructing needed additional generating plants.

Recently enacted or proposed state and local requirements generally fall into three categories:

1. Ordinances or regulations that operate, in effect, to ban completely the transportation of radioactive materials through a jurisdiction.
2. Ordinances or regulations that, while not constituting a total ban, nevertheless impose permit requirements which, in many cases, are extremely burdensome or restrictive.
3. Ordinances or regulations that require prior notice concerning transportation of nuclear materials through a particular jurisdiction and which, in some cases, are extremely detailed.

Some of these regulations apply to all radioactive materials, while others cover certain specified categories, such as spent reactor fuel. Some apply to a particular mode of transport, while others seem to cover all modes of carriage. It is not clear at this time what, if any, benefits are derived from these restrictions.

The New York City Health Code Ordinance, adopted in January 1976, is the most publicized example of a state or local requirement that seeks to ban transportation of radioactive materials through a particular jurisdiction. Under this regulation, a carrier is required to obtain a "certificate of emergency transport" prior to transporting certain radioactive materials, including spent fuel, into or through New York City. Such a certificate will be issued only "for the most compelling reasons involving urgent public policy or national security interests transcending public health and safety concerns and . . . economic consideration alone will not be acceptable as justification for the issuance of such Certificate." the New York City ordinance has operated as a total ban on shipments of spent fuel from Brookhaven National Laboratory, a research facility on Long Island, and has had a major impact upon the transportation of other types of radioactive materials through New England. Prior to the adoption of the City's ordinance, Brookhaven had safely made shipments of these materials through New York City for approximately 25 years. Following the City's ban, the Laboratory has attempted to ship spent fuel to South Carolina by initially sending it further north by ferry to New London, Connecticut.

Footnotes continued from last page

Pacific Gas & Electric Company, Philadelphia Electric Company, Portland General Electric Company, Power Authority of the State of New York, Public Service Electric & Gas Company, Rochester Gas and Electric Corporation, Southern California Edison Company, Union Electric Company, Virginia Electric & Power Company, and Yankee Atomic Electric Company. This report supplements the Group's more general statement on shipments of radioactive materials and the Group's statement on emergency planning and response for transportation of radioactive materials.

However, that City subsequently adopted a permit ordinance which has had the effect of banning shipments through its jurisdiction.

The New York City and New London ordinances have apparently served as examples to other jurisdictions. These restrictions unfortunately have been motivated in large part by a perceived lack of direction and fragmented responsibility at the Federal level. This is illustrated by a portion of the preamble from the City of Richmond Heights, Ohio, ordinance: "Whereas, the multitude of federal and state regulatory agencies governing various stages of the shipment and transportation of radioactive materials, and disasters in relation thereto, do not adequately prevent the occurrence of such accidents in local communities, and that the confusion in federal and state regulation has rendered it necessary for the City of Richmond Heights to supplement present regulations with its own procedure for the shipment and transportation of radioactive materials within the City itself."

Similar statements appear in the preambles of the ordinances of several other Ohio municipalities. While it decided to defer consideration of a transportation ban, the City Council of Hartford, Connecticut, also criticized the lack of action by the Federal Government.

The growing patchwork of state and local regulations threatens to disrupt an absolutely essential transportation network. It, therefore, is imperative that the Federal Government—in cooperation with states and localities—make every effort to ensure that a comprehensive, practicable and uniform system of regulation of transportation of radioactive materials be established nationwide. This arrangement can serve the public interest far better than the heterogeneous, decentralized and disorganized regulatory structure that is currently emerging. In order to remove the need which states and localities have felt to act in this area, the Nuclear Transportation Group previously has proposed that a lead Federal agency be established to ensure a comprehensive, nationwide regulatory structure for the safe and economic transport of radioactive materials. This structure must be based upon appropriate coordination of Federal, state and local authority and responsibility.

The Nuclear Transportation Group will continue to monitor state and local activities and to encourage remedial steps, such as the creation of a lead Federal agency and the prompt completion of the Department of Transportation rulemaking on highway routing of radioactive materials, to provide uniformity and public confidence in the transportation area. Without these actions, our country runs the risk of being effectively deprived of the benefits of electricity generated by nuclear power and prevented from having completed additional plants necessary to supply future electric power requirements, consistent with national energy policy.

Attachment 1 (Revised July 12, 1979.)

July 12, 1979

State and Local Restrictions on
Transportation of Some or All Radioactive Materials

Arkansas--Transportation Commission to Promulgate Regulations.
Beachwood, Brooklyn, Euclid, Lakewood, Mayfield Village,
Middleburg Heights, Olmsted Falls, Richmond Heights,
Shaker Heights and South Euclid, Ohio--Spent Fuel
Shipments Banned
Carteret, New Jersey--Waste Shipments Banned
Charlotte, North Carolina--Urges NRC to Postpone Spent Fuel
Shipments Through Charlotte
Charleston, South Carolina--Notification; Ban on Commercial
Material
Chicago, Illinois--High Enriched Uranium and Plutonium
Banned from O'Hare Airport
Connecticut--Permit Required
Delaware--Prior Notification Required on Turnpike; Police
Escort
Florida--Prior Notice Required and Routes Must be Approved
Louisiana--Spent Fuel and High-Level Waste Shipments
Banned
Maine Turnpike--Permit and Prior Notice Required
Marin County, California--Certain Shipments Banned
Maryland--Bond and Permit Required
Massachusetts Turnpike--Shipments Banned
Mecklenburg County, South Carolina--Board of Commissioners
Recommends that Spent Nuclear Fuel Transport Through
County be Postponed
Miami, Florida--All Radioactive Shipments Through Port
Banned
Minnesota--Prior Notice Required
New Hampshire--Department of Safety to Adopt Rules
New Jersey--Handling Certificate Required
New London, Connecticut--Spent Fuel Shipments Banned
New Mexico--Environmental Improvement Board Given Authority
to Promulgate Regulations
Newton, Mass.--Prior Notice Required
New York City--Spent Fuel Shipments Banned
North Carolina--Prior Notice Required
Oregon--Prior Notice Required
Pennsylvania--Yearly, Renewable Permit on Turnpike; Ban
Through Tunnels
Rhode Island--Permit Required
South Dakota--Authority Given to State Department of
Transportation to Adopt Regulations
Suffolk County, New York--Prior Notice Required
Vermont--Prior Notice Required
Virginia--Office of Emergency Services to Promulgate
Regulations
Wendell, Massachusetts--Certain Shipments Banned
Wichita, Kansas--Recommends Routing Around City

Legislation Pending in Greenville, South Carolina; Georgia;
Illinois; Hawaii; Massachusetts; Minnesota; Pennsylvania;
Rockland County, New York; Ohio; Tennessee; and Wisconsin

Contacts for Monitoring
State and Local Restrictions

National Coordinator:
Robert W. Bishop
(203) 666-6911

Northeast Region:
John M. Buchheit
(617) 366-9011

Midwest Region:
Earl Page
(313) 649-7091

Southern Region:
G. Douglas Whittier
(305) 552-3548

Western Region:
J.T. Owens
(503) 226-8424

EXHIBIT 3

STATEMENT OF THE ELECTRIC UTILITY COMPANIES' AD HOC NUCLEAR TRANSPORTATION GROUP ON EMERGENCY PLANNING AND RESPONSE FOR TRANSPORTATION OF RADIOACTIVE MATERIALS

INTRODUCTION

This statement is adopted by the Electric Utility Companies' ad hoc Nuclear Transportation Group consisting of 24 electric utility companies.¹ These companies are the operators of 39 reactors and are responsible for the planning, design or construction of an additional 61 reactors. The Group's members supply a substantial portion of the estimated 13 percent of the Nation's electricity that is currently generated by nuclear power. Members of the Group are or will be shippers of certain nuclear materials, such as spent nuclear fuel and radioactive waste. Utility shipments constitute only a small portion of the total radioactive material shipments each year.

While the safety record of the nuclear transportation industry has been outstanding over the past 30 years, there recently has been some criticism of emergency response capabilities for transportation incidents in general. Recognizing that transportation incidents leading to possible hazard to the public, though unlikely, can happen, we acknowledge the need for emergency planning. This statement describes the principal weakness with the present emergency response system in general and the means whereby the system may be strengthened. It discusses the existing allocation of responsibility for emergency planning and response and the insurance and indemnity protection afforded the public while radioactive materials are in the course of transport, as well as the Group's proposals for a more coordinated system for handling emergencies.

ALLOCATION OF RESPONSIBILITIES

Responsibility for dealing with an incident involving a shipment of radioactive materials (as with shipments of other hazardous materials) is divided among carriers, shippers and government agencies. This division of responsibility should be recognized and clarified. No one entity can assume full responsibility. Any clarification should be part of an inclusive plan for all hazardous materials because much of the concern that has arisen has been as a result of recent serious accidents involving other types of hazardous materials, such as chlorine gas, propane and propylene rather than radioactive materials.

As the actual transporters, carriers have continuous contact with each shipment. They, therefore, should continue to have the important responsibilities now allocated to them. The carriers have the primary responsibility for notifying appropriate government agencies (such as the U.S. Department of Transportation (DOT) and state and local law enforcement agencies and emergency crews) and the shipper when a transportation incident occurs. They also have the basic responsibility for confining the spread of the hazardous materials, and for cleanup, as required.

The shipper is required by DOT regulations to certify to the carrier, when shipment is made, that the stringent government packaging requirements have been met. In addition, the information given to the carrier must include any special precautions required for handling the shipment and for responding in the event of an incident. The shipper also is responsible for selection of the carrier and should determine that the carrier has adequate quality assurance and emergency programs. Recognizing that the shipper may be a great distance from the scene of the incident, the shipper, nevertheless, should be prepared to act in an advisory role, as necessary.

Because of their proximity and traditional functions, state and local government agencies are usually recognized as responsible for taking emergency actions for protecting persons and property at the scene of an incident. Part of the concern expressed by some state and local officials appears to stem from uncertainty as to

¹American Electric Power Co. Arizona Public Service Co., Baltimore Gas & Electric Co., Commonwealth Edison Co., The Detroit Edison Co., Duke Power Co., Florida Power & Light Co., Houston Lighting & Power Co., Kansas City Power and Light Co., Kansas Gas and Electric Co., Long Island Lighting Co., Niagara Mohawk Power Corp., Northeast Utilities, Northern States Power Co., Pacific Gas & Electric Co., Philadelphia Electric Co., Portland General Electric Co., Power Authority of the State of New York, Public Service Electric & Gas Co., Rochester Gas and Electric Corp. Southern California Edison Co., Union Electric Co., Virginia Electric & Power Co., Yankee Atomic Electric Co., this statement supplements the Group's recent more general statement on shipments of radioactive materials. That statement discusses several principal areas of concern in addition to emergency planning and response.

whether they can respond quickly and effectively, in the unlikely event of an incident involving a shipment of radioactive material. While primary reliance should continue to be placed upon the integrity of the prescribed shipping containers, which tests have shown are extremely unlikely to be breached, additional emergency planning and training, especially at the state and local level, is prudent.

After a transportation incident occurs, emergency action is required to identify and classify the incident as to the type of hazard and action required, and to attend to any injured. State and local law enforcement agencies and emergency crews have the authority and responsibility for protecting the health, safety, and welfare of citizens. They must be prepared to exercise these responsibilities appropriately. Some state and local law enforcement agencies and fire and emergency crews are trained and equipped with radiation detection instruments. More equipment should be readily available to state and local personnel who should be prepared to assume greater responsibility for radioactive materials transportation incidents. The Federal Interagency Radiological Assistance Plan (IRAP) teams should continue to be available to provide assistance to state and local agencies, as requested.

We have previously proposed in our more general statement on shipments of radioactive materials that a lead Federal agency be established to insure a comprehensive nationwide regulatory structure for the safe and economic transport of radioactive materials. The lead Federal agency's authority should include the primary responsibility to define the roles of Federal and state agencies and local authorities, as well as carriers and shippers, in the emergency planning and response areas. This structure must be based upon appropriate coordination of Federal, state and local authority and responsibility. State and local governments should be involved in planning and coordination. The lead Federal agency should issue guidelines. It should draw on the experience of the Interagency Radiological Assistance Plan and upon the General Services Administration's Federal Preparedness Agency, or the newly organized Federal Emergency Management Agency.

Until the lead Federal agency is established, agencies now assigned emergency planning responsibilities should expand their programs. DOT is required by law to provide information and advice for handling emergencies connected with the transportation of hazardous materials to all interested persons. DOT should continue to expand its assistance role in all hazardous materials transportation emergency planning and coordination. The Federal Government should provide additional funds to state and local governments for such training and equipment. The Department of Energy's course on radiological emergency response operations currently conducted for state and local personnel at its Nevada Test Site should be expanded. More sessions should be scheduled so that additional state and local emergency response personnel may attend the course. The Department of Transportation should follow through on its plans to expand its present 20-hour training course on all hazardous materials for firemen and law enforcement personnel to include more specific training on radiation emergencies. NRC should promptly issue guidance on the types and probabilities of incidents and potential impacts that should be planned for.

Concerns about emergency response capability and planning apparently in part have prompted the advance notification, routing and related restrictions which recently have begun to be imposed by a number of state and local governments. The need for such restrictions will be evaluated in the recently announced DOT rule-making on highway routing of radioactive materials. Meanwhile, state and local governments should concentrate on improving their emergency response capability and planning, rather than on placing unduly burdensome and often inconsistent restrictions on carriers and shippers. It is not clear at this time what, if any, benefits are derived from these restrictions. We recommend that, if advance notification to a state and local entity is deemed justified, a standardized system with appropriate safeguards be implemented at the Federal level to operate on a pyramid-type network basis in which each state designates a lead agency to receive notification and documentation of shipments through its borders. To the extent that it may be in the interest of a particular locality to have the same information, a network of coordination between states and localities can be established, in which the flow of communication from the state agency to the locality can provide the locality with sufficient information as to routing and time of shipments, quantities and potential impacts in the unlikely event of an incident. Local plans should be part of a state plan and the operational interrelationships of all organizations with emergency roles should be defined. Any such system should not apply only to shipments of radioactive materials but should fit into a logical plan for all hazardous materials shipments.

INSURANCE AND IDEMNITY PROTECTION

One should be mindful of the extremely broad insurance and indemnity protection afforded the public while radioactive materials are in the course of transportation to or from nuclear power plants. The Price-Anderson Act provides additional protection to the public against the risk of loss due to civilian uses of nuclear power, including transportation related to those activities. The amount of coverage now available is \$560 million, a figure that soon will begin to float upward and which could be about \$1 billion by 1990. Carriers also may purchase \$140 million in third-party liability insurance from the nuclear insurance pools (Suppliers and Transporters Form). The coverage for shipments of radioactive materials to and from nuclear power plants is generally much broader than coverage available for shipments of other hazardous materials under conventional insurance policies.

The adequacy and desirability of the Price-Anderson program has been confirmed recently by both the Congress and the NRC. When the Price-Anderson Act was extended and amended in late 1975, Congress specifically considered transportation coverage, deciding not to propose new legislation on this subject but to refer the matter to the NRC for additional action. The NRC conducted a rulemaking in 1976 and 1977. The Commission concluded that the "omnibus" provisions of existing financial protection plus indemnity coverage for transportation are adequate. The Supreme Court in 1978 upheld the system's constitutionality.

CONCLUSION

As indicated at the beginning of the statement, the history of safe transportation of radioactive materials has been exemplary. Nevertheless, there is some risk in transporting any of the hazardous materials that are necessary in an industrialized society. Basic emergency planning for all hazardous materials shipments is necessary and should be encouraged. As the number of shipments of radioactive materials of various types increases, there may be a greater need for additional radiological emergency capability and planning. The Federal Government should provide additional funds to state and local governments to accomplish this goal. A lead Federal agency should be designated to administer these funds and provide overall guidance. At the same time, primary reliance for emergency response should be placed upon state and local agencies as well as the carriers because of the proximity they would have to the scene of any transportation incident.

SUGGESTED RESPONSIBILITIES FOR EMERGENCY PLANNING AND RESPONSE

	Federal	State-Local	Carrier	Shipper
Planning:				
Define responsibilities.....	X			
Packaging/safety requirements.....	X			
Training State/local authorities.....	X	X		
Carrier Quality/packaging adequacy.....				X
Emergency action plan.....	X	X	X	
Response:				
Notifications.....			X	
Public health/safety.....		X		
Confinement/cleanup.....			X	X
Advisory assistance.....	X			X
Follow up: Evaluate effectiveness.....	X	X		

STATEMENT OF THE ELECTRIC UTILITY COMPANIES' AD HOC NUCLEAR TRANSPORTATION GROUP ON THE U.S. DEPARTMENT OF ENERGY/SANDIA LABORATORIES NUCLEAR MATERIALS TRANSPORTATION PROGRAM, MAY 1979

INTRODUCTION

This is a statement of the Electric Utility Companies' Ad Hoc Nuclear Transportation Group¹ on the currently developing U.S. Department of Energy/Sandia Labo-

¹ The Group consists of 29 electric utility companies which are the operators of 44 reactors and are responsible for planning, design and construction of an additional 60 reactors. A list of the Group members is attached.

ratories Nuclear Materials Transportation Program. If properly structured and administered, the DOE/Sandia Program can be of great benefit to the Nation and can help eliminate many of the present problems relating to the essential transportation services which link the nuclear fuel cycle and led to the formation of the Utility Group in 1978. The Group's principal areas of concern include recent efforts by state and local governments to impose restrictions or total bans on nuclear shipments, disputes over alleged transportation safety hazards (notwithstanding the exemplary safety record of the nuclear transportation industry over the past 30 years), attempts by rail carriers to require unjustifiable special conditions for transportation, and emergency response capabilities for transportation accidents.

By way of background, at the beginning of Fiscal Year 1979, DOE designated its Albuquerque Operations Office as the Lead Office and Sandia Laboratories as the lead contractor for Nuclear Materials Transportation activities within DOE. The broad purpose of the lead field office and contractor designation as stated by DOE is: . . . to establish a DOE organization for Nuclear Materials Transportation Technology and Systems Development, Operations and Planning that will develop a national level DOE capability to cope with the growing complexities of transporting all forms of nuclear materials in a safe, safe-guarded, reliable, and economic manner consistent with national policy and needs.

The Utility Group endorses the creation of the DOE/Sandia Program, but believes that its objectives and work should be restricted to a few definite areas. The Program should not duplicate work that already has been done. This would be a waste of time, money, and manpower. The Program also should not involve itself in areas which are the responsibilities of the private sector or other government agencies.

Recommended objectives for the DOE/Sandia Program and a strategy to achieve them will be addressed in this statement. Many of these emerged more clearly during the Nuclear Materials Transportation Program Development Seminar held in Albuquerque on April 18 and 19, 1979, which was attended by several representatives of the Utility Group and others.

RECOMMENDED OBJECTIVES FOR THE DOE/SANDIA PROGRAM

The Utility Group recommends the following objectives or goals for the DOE/Sandia Program:

1. Centrally collect and review available data and studies prepared by others concerning nuclear transportation.
2. Provide an objective information program in order to make current information available to the public, Federal, state and local officials, and private industry.
3. Identify social, legal, organizational and regulatory issues, including concerns of state and local governments, which may impact nuclear material transportation systems and provide support to resolve these issues.
4. Provide support in forecasting future nuclear material transportation system requirements.
5. Ensure that transportation systems are in place when required for shipment of government owned nuclear materials.
6. Provide support in stabilizing licensing and other regulatory requirements for nuclear material shipping packages.

RECOMMENDED STRATEGY TO ACHIEVE ABOVE STATED OBJECTIVES

The DOE/Sandia Program should concentrate its efforts and finite resources in a manner to best achieve the objectives outlined above. The Transportation Technology Center recently created at Sandia should serve as the focal point for these activities.

The Transportation Technology Center should first direct its attention to Objective 1 above, i.e. it should begin collecting and making available in one place the large volume of existing data and studies concerning nuclear transportation prepared by others. In the past, much work has been done without considering already existing written materials. That mistake should not be repeated by the DOE/Sandia Program. Collection of data and studies should be an on-going function of the Transportation Technology Center. The Center should be structured to serve as a permanent liaison and clearinghouse for all government agencies and private industry. Close cooperation should be maintained with all concerned to avoid duplication and conflicts.

Early attention should be given to developing an objective information program no later than January 1, 1980. Current information should be made readily available by the Transportation Technology Center to the public, Federal, state and local

officials, and private industry. For example, the information should include periodically updated written material, charts, sound films, slides, and models. Transportation Technology Center personnel should be available to make presentations and meet with concerned persons, such as state and local officials, considering adopting their own transportation restrictions. Sufficient manpower resources should be committed to this effort.

The Transportation Technology Center should identify the social, legal, organizational and regulatory issues, including concerns of state and local governments, which may impact nuclear material transportation systems. Many of these were discussed at the April 1979 Seminar. The DOE/Sandia Program should also provide objective support to the public, other government agencies and the nuclear industry in their efforts to resolve issues identified. A list of issues should be published in the immediate future for public comment, so that priorities for further actions by DOE and Sandia can be set. These should include the areas of concern identified in the Introduction above. They also might include some or all of the issues discussed in the individual workshops held during the April 1979 Seminar. The DOE/Sandia Program should not proceed much further without some agreement on the priority of issues and concerns.

Eventually, the Transportation Technology Center should provide support in forecasting future nuclear material transportation system requirements, including monitoring the private nuclear industry's ability to provide for transportation needs when and as required. It should develop the ability to accurately model nuclear transportation system requirements and utilization. The Center also should provide a technology base for the support and continued development of viable commercial transportation systems. In the past, for example, there has been much conflicting information about the status and future availability of spent nuclear fuel casks and shipper services. Following meetings with active or potential vendors, the Utility Group determined that some previously suggested problems, such as cask manufacturing capability in the United States, had been overstated. The Transportation Technology Center should provide this kind of service in the future.

For the Federal Government itself, the DOE/Sandia Program should be charged with ensuring that transportation systems are in place when required for shipment of government owned nuclear materials.

The DOE/Sandia Program should have as its ultimate objective the stabilization of licensing and other regulatory requirements for safe and efficient nuclear material shipping packages. While transportation safety regulation has been vested in the Nuclear Regulatory Commission and the Department of Transportation, the DOE/Sandia Program should assist those other agencies. To this end, the Transportation Technology Center should review all newly proposed regulations for nuclear material packaging and transport. It should provide recommendations to the appropriate regulatory agency as to whether proposed changes are necessary to provide substantial additional protection to the public health and safety and are cost effective. If, as a result of the data collection process, any additional full-scale or model package testing is found to be necessary, it should be conducted promptly. Then, if any standard or design changes are found necessary, they can be implemented quickly. Continued lack of stabilization in regulatory requirements only would further aggravate the reluctance of utilities to make firm commitments in the time frame necessary to ensure the adequacy of spent fuel shipping services when needed.

CONCLUSION

If structured as outlined above, the new DOE/Sandia Nuclear Materials Transportation Program, which includes the Transportation Technology Center, can help eliminate many of the present problems relating to the essential transportation services which link the nuclear fuel cycle. The Electric Utility Companies' Ad Hoc Nuclear Transportation Group was formed to help assure continued safe and efficient nuclear transportation activities. The Group stands ready to cooperate with and assist the Department of Energy and Sandia Laboratories in its nuclear materials transportation efforts including further definition of the issues and concerns upon which the DOE/Sandia Program should concentrate.

UTILITY NUCLEAR TRANSPORTATION GROUP

American Electric Power Co., Arizona Public Service Co., Baltimore Gas & Electric Co., Commonwealth Edison Co., Consolidated Edison Company of New York, Inc., The Detroit Edison Co., Duke Power Co., Florida Power & Light Co., Georgia Power Co., Gulf States Utilities Co., Houston Lighting & Power Co., Kansas City Power and Light Co., Kansas Gas and Electric Co., Long Island Lighting Co., Middle

South Services, Inc., Niagara Mohawk Power Corp., Northeast Utilities, Northern States Power Co., Pacific Gas & Electric Co., Philadelphia Electric Co., Portland General Electric Co., Power Authority of the State of New York, Public Service Company of Colorado, Public Service Electric & Gas Co., Rochester Gas and Electric Corp., Southern California Edison Co., Union Electric Co., Virginia Electric & Power Co., Yankee Atomic Electric Co.

STATEMENT OF ELECTRIC UTILITY COMPANIES' NUCLEAR TRANSPORTATION GROUP ON STATUS AND FUTURE AVAILABILITY OF SPENT NUCLEAR FUEL CASKS AND SHIPPING SERVICES

INTRODUCTION

Recent decisions by the Federal Government have introduced a large element of uncertainty as to when and where spent fuel will be shipped as reactor spent fuel pools become full. Some utilities have expanded existing reactor spent fuel pools by installing high density racks and have made plans to transfer spent fuel from reactors with crowded pools to other pools with available capacity. However, even with these measures, it is apparent that additional spent fuel storage capacity away from reactor sites will be required and a concern has been expressed that sufficient spent fuel casks will not be available to meet the transportation needs associated with interim and/or permanent disposition of the spent fuel.¹

Further aggravating the spent fuel shipping problem is the proliferation of state and local restriction on these shipments and possible changes that may be forthcoming in cask design.

As a result of these uncertainties most utilities have been reluctant to make firm commitments for spent fuel shipping services, while cask vendors are similarly reluctant to commit their own capital resources in the absence of contracts.

As part of the nuclear Transportation Group's (NTG) assessment of these problems, meetings were held individually with eight active or potential vendors of spent fuel casks and shipping services.² A summary of vendor responses to specific questions posed by the NTG are appended, and a summary of the NTG's findings and recommendations on this matter follow.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

1. There are today five vendors that have shipping casks available and are offering spent fuel shipping services. The total inventory of casks available in the United States for shipping light water reactor spent fuel consists of 6 rail casks and 11 truck casks. This fleet of existing casks is more than adequate to perform all the anticipated shipping of spent fuel between reactor sites or to potentially available existing storage sites such as the General Electric Company facility at Morris, Illinois for approximately the next 4-5 years. The vendors presently have a low demand for their services and under-utilization of their equipment. In this commercial climate, there is little economic incentive for vendors to commit additional capital.

2. Discussions with vendors have evidenced the need for an orderly build-up of cask inventories because of the lead times involved. An assessment of the projections made by cask vendors and other documents indicates that adding casks at the rate of three to six per year starting in 1983-1984 would be sufficient to service a storage facility located in a reasonable central location.

3. There is sufficient manufacturing capability in the U.S. to meet this demand. The mix of rail to truck casks would be influenced by the location of the storage facility and the rail/barge access of the shipping facilities. However, as a result of the lack of adequate Federal policies, as identified in the Introduction, a possible major problem in terms of supply/demand for casks in the next 10 years is that the potential demand may not develop in the orderly fashion necessary to support a competitive market.

4. Another factor which could alter future supply/demand outlook—even in the short term—is possible changes that might arise in cask design. Despite the fact

¹ In April 1977, the President announced that the United States will defer indefinitely all commercial reprocessing of spent nuclear fuel. This deferral of reprocessing means that increased storage capacity will be required to hold the fuel that normally would have been transferred to a reprocessing plant. In October 1977, the Department of Energy announced a new spent fuel policy whereby the Federal Government proposes to take title to and store spent commercial nuclear fuel. This policy indicated that the Federal Government would provide interim storage until a final decision were reached on reprocessing or a final geologic disposal facility were available.

² A ninth vendor submitted written responses to the NTG's questions.

that the adequacy of present designs has been demonstrated through extensive analyses and destructive testing, a possibility always exists for "ratcheting" of design requirements and early obsolescence of existing casks. Any further activities of government agencies in this area should be fully coordinated and designed to maintain cask licensing stability consistent with protection of public health and safety. Changes in cask design should be required only if they are demonstrated to be necessary to provide substantial additional protection to public health and safety and are cost effective.

5. In light of the above, certain specific needs are clearly identified to assure the viability of a competitive nuclear shipping industry:

- (a) early government decisions in the entire waste management area which would firm up time schedules and intended delivery locations.
- (b) decisive action at the Federal level which would effectively eliminate the need for state and local shipping restrictions.
- (c) continued monitoring of the spent fuel cask supply/demand picture.
- (d) close cooperation among the government agencies working on nuclear transportation programs, cask vendors, carriers and shippers.

COMMENTS OF AMERICAN ELECTRIC POWER COMPANY ET AL. ON NUCLEAR REGULATORY COMMISSION INTERIM RULE—10 CFR PART 73—PHYSICAL PROTECTION OF IRRADIATED REACTOR FUEL IN TRANSIT

The following entities submit these comments in regard to the Interim Rule published by the Nuclear Regulatory Commission ("NRC") in the Federal Register, of June 15, 1979, 44 Fed. Reg. 34466, to amend 10 CFR Part 73 to establish certain requirements for protection of irradiated reactor fuel in transit and the accompanying guidance documentation, NUREG-0561,¹ issued by the NRC:

American Electric Power Company.
 Arizona Public Service Company.
 Baltimore Gas & Electric Company.
 Commonwealth Edison Company.
 Consolidated Edison Company of New York, Inc.
 The Detroit Edison Company.
 Duke Power Company.
 Exxon Nuclear Company, Inc.
 Florida Power & Light Company.
 Georgia Power Company.
 Gulf States Utilities Company.
 Houston Lighting & Power Company.
 Kansas City Power & Light Company.
 Kansas Gas and Electric Company.
 Long Island Lighting Company.
 Middle South Services, Inc.
 Niagara Mohawk Power Corporation.
 Northeast Utilities.
 Norther States Power Company.
 Pacific Gas & Electric Company.
 Pennsylvania Power & Light Company.
 Philadelphia Electric Company.
 Portland General Electric Company.
 Power Authority of the State of New York.
 Public Service Company of Colorado.
 Public Service Company of Indiana, Inc.
 Public Service Electric & Gas Company.
 Rochester Gas and Electric Corporation.
 Southern California Edison Company.
 Union Electric Company.
 Vermont Yankee Nuclear Power Corporation.
 Virginia Electric & Power Company.
 Yankee Atomic Electric Company.

The entities submitting these comments are 32 electric utilities, which are the operators of 45 nuclear power reactors and are responsible for the planning, design or construction of an additional 64 reactors, and a nuclear fuel cycle product and services company (Exxon Nuclear Company, Inc.). Each entity is or expects to be a shipper of irradiated (or spent) nuclear reactor fuel and therefore is affected by the

¹ Physical Protection of Shipments of Irradiated Reactor Fuel—Interim Guidance, NUREG-0561 (June 1979).

Interim Rule. Each entity reserves the right to submit additional individual comments.

GENERAL COMMENTS ON THE INTERIM RULE AND ITS IMPLEMENTATION

The Interim Rule was adopted by the NRC without notice or opportunity for public comment based on a finding that health and safety considerations overrode the necessity for public comment before issuance of a rule. Whether or not publication of the Interim Rule without notice or opportunity for comment was a proper exercise of the NRC's power, we submit that the exercise of that power imposes on the NRC a special duty to implement the Interim Rule in a reasonable manner. In the Supplementary Information published in the Federal Register, the NRC has recognized that reconsideration or modification of the rule may be necessary in the light of comments received from the public and the results of the confirmatory research program. We construe this statement as a commitment that NRC will approach the formulation of a Final Rule, to the extent that it can, as though it were writing on a clean slate. We commend the NRC for adopting that approach.

The entities submitting these comments do not object to the Interim Rule as a temporary regulation if it is interpreted by the NRC as suggested in these comments. We recognize that there is concern that shipments of spent nuclear fuel might be sabotaged and that the NRC has an obligation to address that concern. We also note, however, that the Department of Energy does not necessarily share the NRC's views on the justification for the Interim Rule. The Department of Energy has testified that:

"Based upon the information available to DOE, it is not clear that the provisions in the new NRC rules are justified as safeguards improvements or cost effective. The rules enacted by NRC are based upon an interpretation of preliminary work performed by Sandia Laboratories for NRC.

"Even assuming a risk which warrants greater protection, we believe certain provisions in the rules may be counterproductive and require further analysis. Routes away from population centers with greater shipping distances often are on secondary roads or, in the case of rail transport, over less well-maintained roadbeds, where transport conditions may be less than ideal and where notification and response to any diversion attempt would be greater. Most population centers, on the other hand, are served by excellent interstate highways and mainline railroad track that are well patrolled and easily accessible in case of emergency. Prior notification of shipments will also involve increased safeguards risks since routes and schedules will be established and available in advance.

"The rules also will add significantly to shipping costs. NRC admits it will increase transportation costs by a factor of two but, we believe that other factors would indicate far greater possible increases."

(Testimony of Roger LeGassie, Deputy Assistant Secretary of Energy Technology, U.S. Department of Energy, before the Senate Subcommittee on Science, Technology and Space, July 19, 1979.)

Consistency in the regulation of shipments of spent fuel is a principal benefit to be achieved by the Interim Rule. Because of the proliferating State and local restrictions on such shipments, it is essential that there be a single, pre-emptive Federal mechanism for establishing routes and transport requirements. A route approval by the NRC under the Interim Rule would not necessarily affect State and local rules of general applicability to all "hazardous materials," e.g., rules dealing with the mechanics of driving and parking, but certain State and local rules dealing specifically with radioactive materials (e.g., bans, routing and advance notification requirements) must be pre-empted by an NRC route approval. Only through a pre-emptive Federal regulatory procedure, i.e., the route approval prescribed by the Interim Rule, can reasonable uniformity of treatment across the country be achieved. Such uniformity is essential to prevent inconsistent and prohibitory requirements from effectively banning shipments of spent fuel in some areas.

We concur with the Department of Energy that, assuming that there is a significant risk of sabotage, certain of the new requirements may be at variance with the fundamental security principle that activities subject to security concerns should not be fixed and routine or within the knowledge of more persons than absolutely necessary. This principle may be violated by the requirements for established routes and preplanned stops. It also may be violated if large numbers of persons are notified of proposed routes or are notified in advance of shipments. Advance notification of proposed routes should be confined to governmental organizations with a reasonable need for this information.

The NRC should implement its rule by granting advance approval to a number of alternative routes. Choice of an approved route should be left to the shipper and

carrier and there should be minimal advance notification requirements for either specific shipments or a shipping campaign. If the NRC disapproves the routes suggested by the shipper or carrier, it should designate an alternative route.

The Federal Register notice, 44 Fed. Reg. at 34467, stated that a Sandia Laboratories study² "... suggests that the sabotage of spent fuel shipments has the potential for producing serious radiological consequences in areas of high population density." Confirmatory research relative to these estimated consequences is to be conducted. The Interim Rule then may be modified or rescinded. We urge that the research be done as expeditiously as possible in order that uncertainty as to the ultimate form of the rule be reduced. Subject to security considerations, concerned persons should be invited to participate in the research program and testing proposals should be made available for public comment in advance. Continued lack of certainty in regulatory requirements would further aggravate the reluctance of shippers to make firm commitments in the time frame necessary to ensure the adequacy of spent nuclear fuel shipping services when needed.

By adopting the Interim Rule the NRC has taken upon itself the ultimate responsibility for deciding routes and transport arrangements for NRC licensees' spent fuel shipments. The NRC's approval of routes and transport arrangements must take into account not only the potential threat of sabotage (the principal concern being addressed by the new Rule) but all other relevant considerations, such as relative safety, practicality and economics. In determining whether to approve a particular route the Staff should take into account the safety, cost and environmental impacts of requirements for use of circuitous routes or less-developed or less well-maintained road or rail systems. It should be considered impracticable to avoid heavily populated areas, as described in NUREG-0561, if it would become necessary to utilize a route which presents a significant risk because of these considerations. In this regard, we strongly endorse the Department of Energy's above-quoted testimony that requiring re-routing away from interstate highways and mainline railroad track would not produce an overall safety benefits.³

The NRC's adoption of the Interim Rule has important implications vis-a-vis the Department of Transportation's (DOT) pending rulemaking on highway routing of radioactive materials, DOT Docket No. HM-164. DOT should not reconsider in its rulemaking the issue of highway routing of spent fuel shipments by NRC of responsibilities for spent fuel shipment requirements through adoption of the NRC's requirements as part of the DOT's regulations and as part of the recently revised DOT-NRC Memorandum of Understanding, 44 Fed. Reg. 38690 (July 2, 1979). Otherwise, we shall have the prospect of two Federal agencies designating routes for spent fuel shipments. The new Memorandum of Understanding does not address specifically the critical issues of routing controls, emergency planning and advance notification of shipments.

If there are state or political subdivision concerns about the route and transport requirements for highway spent fuel shipments, these should be taken into account by the NRC staff in its route approval process. Consultation with states or political subdivisions with respect to any such concerns should take place as needed and be informal. For example, the NRC could agree to notify a designated State agency of a proposed route. While the NRC should consider State and local conditions and cooperate with other governmental agencies in approving routes and transport arrangements, we cannot emphasize too strongly that the NRC cannot allow State or local governments to ban shipments through their jurisdictions or to dictate restrictions which the NRC deems unnecessary. To do so would lead to a frustration of national objectives for shipments of radioactive materials and needless litigation.

Whether the Interim Rule will permit arrangements for transporting spent fuel that are workable while, at the same time, protecting public health and safety, will depend upon the NRC's interpretation of the Rule as individual licensees apply for approval of their shipping routes and transport arrangements. The remainder of our comments thus are anticipatory of potential problems we now envision. Other issues undoubtedly will arise as individual approvals are sought.

² Transport of Radionuclides in Urban Environs: A Working Draft Assessment, SAND77-1927 (May 1978).

³ A similar observation was made during the Senate hearings on July 18, 1979 by Charles H. Mayer, Vice President of Tri-State Motor Transit Company. Mr. Mayer testified, "... spent fuel shipments pose a far less potential hazard on Interstate highways within urbanized areas than on isolated secondary roads conducive to a covert action such as hijacking or sabotage."

Comments on General Requirements

(1) *The Nuclear Regulatory Commission is notified in advance of each shipment in accordance with §73.72 of this Part, and that NRC has approved the route in advance of the shipment.*

10 C.F.R. § 73.37(a)(1) and NUREG-0561, §2

Subsection 73.37(a)(1) of the Interim Rule establishes the general requirement for licensees who transport or deliver to a carrier for transport irradiated reactor fuel to notify the NRC in advance of each shipment. It also provides that the NRC must approve the route in advance.

It is important to provide for blanket approval of routes so that the licensee will know what routes are available and will not be faced with the necessity of obtaining approval for each individual shipment. As we understand the discussion of this rule in NUREG-0561, at pages 2 and 3, this is what is contemplated. The shipper will furnish all relevant information to the NRC in advance prior to the first shipment and thereafter it need only notify the NRC as to the date of each shipment so long as the approval remains in effect. It is also important that a reasonable number of alternative routes be approved. The availability of alternative routes will give the shipper a desirable degree of flexibility and will make it more difficult for a potential saboteur to learn the precise route which a shipment will take.

Some guidance as to the meaning of this subsection of the new Rule is provided in NUREG-0561, § 2, but neither the Rule nor the Interim Guidance describes in any detail the standards the NRC intends to apply in approving specific routes or transport arrangements. For example, for shipments by road, no priority is established for use of different classifications of roads. Divided, limited access roads generally are considered safer than undivided roads with intersections. Transporters usually prefer to use divided, limited access roads, but they may traverse or come within 3 miles of "urbanized areas". Priority should be established for use of different classifications of roads based on consideration of the relative safety involved.

NUREG-0561, Appendix 2-A provides that the proposed routing and the location of planned stopovers and food and fuel stops should be submitted as part of the request for route approval. As noted earlier, this is at variance with the fundamental security principle that activities subject to security concerns should not be fixed and routine. Advance designation of precise routes and stops may be especially undesirable if route information submitted to the NRC is made available to large numbers of persons. In this connection no guidance is provided as to whether the information to be submitted as part of a request for a route approval shall be treated as confidential information. A precedent for such treatment is contained in 10 CFR 2.790(d). We suggest that the Interim Rule be amended to provide that such information shall be treated as confidential, subject to the disclosure of such information to States and political subdivisions in accordance with procedures to be developed by the NRC.

(2) *Arrangements have been made with law enforcement agencies along the route of shipments for their response to an emergency or a call for assistance.*

10 C.F.R. § 73.37(a)(2) and NUREG-0561, § 3

Subsection 73.37(a)(2) and NUREG-0561, § 3 address the new requirement that each NRC licensee make "arrangements" with law enforcement agencies (LEA) along the route of shipments for their response to an emergency or a call for assistance. No details are given by the Rule or the Interim Guidance about the nature of these "arrangements". We believe the NRC licensee's responsibility for these arrangements should be limited to maintaining an up-to-date list of LEA contacts and telephone numbers.

If construed as meaning that arrangements must be made with *all* LEA's along the route of shipment, this provision would require, on a long movement such as a coast-to-coast movement, arrangements with literally hundreds of law enforcement agencies since such arrangements would need to be made with the State Police or Highway Patrol in every state and with officials in every county through which the movement would pass.

On rail shipments in particular, the risk of sabotage where there is no scheduled stop for a train is so minute as not to require notification of all LEA's along the route of shipment. We believe that for rail shipments, arrangements should be required with LEA's only in areas in which a cask car is to be stopped in a yard, either for switching to another train or for a crew change. We do not believe that such notification should be required for areas in which a crew change is made on

the main line with only a very brief stop. It would not be feasible, of course, to give advance notification of unscheduled stops.

(3) *The route is planned to avoid, where practicable, heavily populated areas.*

10 C.F.R. § 73.37(a)(3) and NUREG-0561, § 4:

Subsection 73.37(a)(3) and NUREG-0561, § 4 address the new requirement that the route is planned to avoid, "where practicable", heavily populated areas. Appendix 4.A of NUREG-0561 identifies the "embargoed areas" by name.

However, there should be additional clarification in NUREG-0561 of when it is not "practicable" to avoid movement through or within 3 miles of an urbanized area. Transporters by road should be allowed to traverse such areas if they use divided, limited access roads for four or more lanes because of the increased safety that results.

If shipments are by rail, there often are no alternative routes. In determining whether avoidance of populous areas is practicable, NRC should consider all factors involved, including length of haul, transit time, number of crew changes, etc. The risk of sabotage of a rail shipment in a large city is much less than might be imagined because the shipment is under surveillance by armed railroad police with the capability of summoning assistance promptly, as more fully developed in the comments under subsection (d).

In determining whether it is practicable to avoid a heavily populated area (for a shipment either by road or by rail) the comparative safety and economic costs of alternative routes must be considered. While this would not require a formal cost-benefit analysis, a qualitative judgment must be made as to the comparative economic and safety effects of using an alternative route to one traversing a heavily populated area. Assuming that a route, although more costly to use, were nevertheless practicable, it would not be practicable if its use would increase the overall risk to the public and transport workers. Overall risk is a function of the probability and consequences of exposure to radioactivity as a result of normal transportation and accidents as well as sabotage-related releases. Determining of risk includes consideration of the non-nuclear hazards of transportation e.g. highway or rail accidents, and that a longer route would increase the risk of injury or death due to such accidents.

NUREG-0561, § 4 discusses unplanned detours after the shipment is underway. It may prove impracticable to implement the additional measures suggested after the shipment already has started. It may not be possible for the driver or escort on the road to estimate the expected duration of the detour, to identify all law enforcement agencies having jurisdiction or to implement additional protective measures such as those outlined in NUREG-0561, § 9. Furthermore, stopping the shipment to make such determinations could be inconsistent with the principle underlying 10 C.F.R. § 73.37(a)(4). NUREG-0561, § 4 should be modified accordingly.

Neither the Interim Rule nor the Interim Guidance addresses the possibility that it might be necessary or desirable for the licensee to change its proposed route or transport arrangements shortly before a planned shipment is to take place. Some provision should be made by the NRC for expedited approvals in such circumstances.

For rail movements, it is essential that flexibility be provided for minor variations in a route which may be required by temporary local conditions. Under standard railroad operating procedures, detour routes are designated for use when a main line is closed and we recommend that approval for each approved route and alternate route include approval of the use of all established detour routes.

Section II of NUREG-0561, § 4 states that shipments may transit heavily populated areas if "there are no alternative routes because laws, ordinances, or regulations of local jurisdictions embargo such shipments." We strongly urge that this statement be stricken. As noted above, the NRC staff should consult with States and political subdivisions which have expressed concerns with spent fuel shipments in determining which route to approve. However, to the extent the quoted language means that the NRC will refuse to approve a route simply because of a local ban, this concept is inconsistent with the objective of the Interim Rule to protect public health and safety. A route which has been embargoed by a State or local ban may well be the best route from the standpoint of fulfillment of the NRC's statutory obligations. Simply deferring to States or localities in this manner would constitute an abdication of the NRC's legal responsibilities.

(4) *The shipment is scheduled where practicable without any intermediate stops except for refueling and obtaining provisions, and that at all stops at least one individual maintains surveillance of the transport vehicle.*

10 C.F.R. § 73.37(a)(4) and NUREG-0561, § 5

This provision appears to have been drafted with truck shipments primarily in mind. On rail shipments, it is necessary to stop every 100 or 200 miles for crew changes and it is also necessary to stop in order to switch a cask car from one train to another. We recommend that the present requirement be included under "Shipments By Road" instead of under "General Requirements" and that a provision substantially as follows be included under "Shipments By Rail": The shipment is scheduled where practicable without any intermediate stops, except for crew changes and switching between trains.

(5) *If it is not possible to avoid heavily populated areas, the Commission may require, depending on individual circumstances of the shipment, additional protective measures.*⁴

10 C.F.R. § 73.37(d) and NUREG-0561, § 9

The word "possible" in Subsection 73/37(d) should be revised to read "practicable".

Subsection 73.37(d) and NUREG-0561, § 9 address in only very general terms additional protective measures which may be required for movement of spent fuel through heavily populated areas. These additional requirements must be clarified in detail so that they can be evaluated and commented upon as to their practicality and costs.

For rail shipments, we do not believe that additional protective measures beyond those routinely provided by the railroads are necessarily in heavily populated areas. If a cask car is yarded in such an area, the railroad police will be notified in advance and the cask car will be guarded while it remains in that area. Railroad police usually travel in pairs in automobiles equipped with two-way radios, they have excellent rapport with local enforcement authorities and they are in a position to summon assistance promptly if needed.

Comments on Requirements for Shipments by Road

10 C.F.R. § 73.37(b) and NUREG-0561, § 7

Subsection 73.37(b)(2) and NUREG-0561, § 7.2 address new communications requirements, which provide that the transport vehicle, or the escort vehicle, if one is used, be equipped with a radiotelephone and CB radio or approved equivalents and that call-ins to a designated location are to be made at least every 2 hours. The requirement for 2-hour check calls cannot be complied with in some areas using the single-vehicle concept. In the single-vehicle, two-person operation, one of the individuals normally would be in the truck's sleeper berth. When radiotelephone calls can be made, the individual driving could stop the truck to make the call from the tractor. Whether in rural or locations where radiotelephone communications are marginal or ineffective, which are many (as the Interim Guidance at page 23 itself recognizes), the individual driving would have to find a public land-line telephone from which to make the call. This may be difficult in rural areas. Whether in rural or urban areas, it would require another stop. It also would necessitate one of the individuals leaving the tractor, requiring the individual in the sleeper berth to arise. Such in turn would violate the Department of Transportation safety regulations governing hours of service of drivers. See 49 C.F.R. § 395.3 (1978). If the requirement for check calls were increased from 2 to 4 hours, shipments could operate within the requirements of the aforementioned regulations. This also would minimize the number of times the shipments would be stopped at which time they are most vulnerable to hi-jacking or sabotage.

Comments on Requirements for Shipments by Rail—Preliminary Comment

The concern of NRC, as stated in the Supplementary Information published with the Interim Rule, 44 Fed. Reg. 34467, is: On possible successful acts of sabotage in densely populated urban areas. Because of the possibility that spent fuel shipments could be hijacked and moved from low population areas to high population areas, the interim requirements apply to all shipments even though the planned shipment route may not pass through densely populated areas.

The risk that a rail shipment of spent nuclear fuel could be moved by hijackers to an area of high population density is very remote. The possibility that a cask car could be seized while stopped in a yard in a populous area is also very remote, because when a cask car is stopped in a yard in a populous area, it will be under surveillance, not only by the escort accompanying it, but also by armed railroad police. Attached hereto as Attachment I is the Joint Verified Statement of Clarence

⁴ This is a general requirement which appears separately in Subsection 73.37(d).

E. Jackman and John C. Sperry, two individuals with long experience in railroad operations, which explains many of the considerations dealing with appropriate protection of spent fuel from sabotage.

NUREG-0561 states at page 27 "It is not the intent of these requirements that a 'special train' dedicated to the shipment be used." This is extremely important. A special train trebles the cost of a shipment. The Supplementary Information, 44 Fed. Reg. 34467, estimates that imposition of the new requirements would probably double the "cost per mile rate." We know of no studies that reliably estimate the increase either in cost per mile or in rates of the imposition of these requirements. While there are circumstances in which a shipper will prefer special train service, it should be made clear that the use of special trains is not mandatory. All of the requirements of the regulation can be met equally well in regular trains. It is no more difficult to avoid populous areas if regular trains are used than if special trains are used and, overall, a cask car moving in a regular train is better protected from the risk of sabotage than the same cask car in a special train. Where special trains are used, the railroads propose to stop the train on a siding every time that it meets an on-coming train. Such stops would be very frequent and, while they would not be scheduled, it might increase the risk of sabotage at one of those sidings.

As we have noted above, the possibility of hijacking any train and moving it to a populous area is extremely remote. If a special train should be hijacked, however, the possibility that the saboteurs could move the train to a populous area would be much greater than in the case of a regular train with 50 to 100 cars. Furthermore, it is much easier to immobilize a regular freight train than to immobilize a special train. A train can be immobilized almost instantaneously by putting the air on emergency and shutting down the air pump. Depending on its length, it then takes 30 to 60 minutes to pump up the air so that a regular train can move, whereas, on a special train consisting only of a locomotive, caboose, a cask car and two buffer cars, the air could be pumped up in 5 minutes or less. Accordingly, the time available for a response to a call for help would be much greater for a regular train than for a special train. Under the regulations applicable to shipments by road, there is a requirement that the vehicle be equipped with features that permit immobilization of the vehicle. There is no such requirement for shipments by rail, but if hijacking of a train outside of a populous area is viewed as a realistic possibility, this is an important consideration.

With this preliminary comment, we now turn to the specific provisions of 10 C.F.R. § 73.37(c).

(1) *Each shipment is accompanied by at least one escort in the shipment car or in a separate car that will permit observation of the shipment car.*

10 C.F.R. § 73.37(c)(1) and NUREG-0561, § 8

While we question the need for an escort while the train is moving, the cars should be under surveillance while stopped and the most feasible way to insure such surveillance is to have the escort accompany the shipments from origin to destination. We anticipate that arrangements could be made for the escort to travel in the caboose, a location from which the cask car can be under observation at all times.

In normal railroad operations, a cask car would be placed at the rear of the train, separated from the caboose only by a buffer car. This is normal railroad practice but the Commission may wish to consider making such placement mandatory.

(2) *Two-way voice communication capability is available and that calls are made at least every 2 hours to a designated location to advise of the status of the shipment.*

10 C.F.R. § 73.37(c)(2) and NUREG-0561, § 8

We do not believe it is necessary that a train's status be reported every 2 hours. Moreover, this requirement needs clarification. Communication is always available at call boxes located along the railroad right-of-way but not all locomotives or cabooses are equipped with radio senders and receivers. Such equipment is much more likely to be available on a regular train than on a special train. The railroads' basic communication system should, however, be adequate to meet any reasonably foreseeable emergency. Since the risk of sabotage is so slight while a train is moving, we believe that two-way radio communication equipment need not be required. In the alternative, we suggest a requirement that trains not stop at any location where call boxes are not available.

Attachment I

JOINT VERIFIED STATEMENT OF CLARENCE E. JACKMAN AND JOHN C. SPERRY

This statement is being filed jointly by:

Clarence E. Jackman, 214 West Elpin Street, Baltimore, MD 21228, and John C. Sperry, 1569 Maple Avenue, Paoli, PA 19301.

We are both engaged in transportation consulting—Jackman since 1971 when he retired from the Chessie System and Sperry since 1974 when he retired from the Penn Central Transportation Co. Prior to their retirements, Jackman had 32 years experience with the Chessie System and Sperry had 30 years experience with the Penn Central and its predecessor the Pennsylvania.

We have both occupied successive positions of increasing responsibility, culminating in important management positions in the operation of our respective railroads. We are both thoroughly familiar with all phases of railroad operations. More complete statements of our qualifications are attached as Appendix "A" (Jackman) and Appendix "B" (Sperry).

We have reviewed the new Section 73.37 of 10 C.F.R. published in 44 Federal Register 34467 and also NUREG-0561 which provides interim guidance as to the implementation of such action. We have been requested to analyze the regulation contained in 10 C.F.R. § 73.37 and also NUREG-0561 and to evaluate them in terms of their practicability and effectiveness to prevent sabotage of cars of spent nuclear fuel (cask cars) being transported by rail. As a predicate of such analysis, we were asked to assume that it would be possible for saboteurs who had seized control of a cask car to breach the cask by attaching the right kind of explosive charge and that the objective of the regulations is to prevent this from occurring in a heavily populated area.

INTRODUCTORY COMMENTS

The first point that should be noted is rather obvious. It is the magnitude of the problems that would be encountered by saboteurs who wished to seize a rail cask car and transport it to a populous area that had been selected by the saboteurs as their target. They could proceed in one of two possible ways; they could try to take the whole train to the target area or they could try to separate the cask car, attach it to a locomotive and take only the cask car to the target area. In normal railroad practice, a cask car would be located at the rear end of a train, separated from the caboose by a buffer car. To separate the cask car from the train, to separate the locomotive from the train and to attach the locomotive to the cask car would be a major switching operation which would be time-consuming and extremely difficult to perform, except in a yard.

If the saboteurs were attempting to take the whole train to the target area, two possibilities present themselves. The target area could be an area not within the approved route. As soon as the train left the approved route, railroad officials would know of it and would take immediate action. If the target area were encompassed within the approved route, the task of the saboteurs would still be extremely difficult. In order to bring the train in, they would need to have skilled railroad men able to interpret and to react to every signal and operating rule. They would, moreover, require the cooperation of the engineer and the conductor since the voices of engineers and conductors on their regular runs are well known to the block operators and trained dispatchers.

If the cask car were being handled in special train service rather than regular train service, the problems encountered by the saboteurs would be less but still very formidable. It is easier to seize and move a special train consisting of a locomotive, 3 cars and a caboose than it is to seize and move a regular train with 50 to 100 cars.

APPROVAL OF ROUTES

We understand the regulation as explained in the "Interim Guidance" as not requiring a separate approval for each specific movement but as providing for a general approval of routes. We also understand that alternate routes can be approved. We would recommend that at least two alternate routes be available at all times. This would give the shipper and the railroad the flexibility necessary to assure that shipments can be handled expeditiously and would have the further advantage that the prospective saboteurs could not know with certainty the route which a shipment might take and thus could not make plans with assurance that a car would be at a specific location at a specific time.

Approval of alternate routes in itself, however, is not sufficient. Routes may be blocked because of flooding, wash-outs due to flooding, heavy drifting of snow and many other causes which may create stoppages lasting from a few minutes to several days. Approval of routes should, therefore, include approval of detours whenever detours are necessary to avoid prolonged delays. Most detour routes are standard operating procedures. The men charged with the operation know them and

put them into effect once the seriousness of the blockage has been ascertained. Approval of every route should include approval of appropriate detour routes.

The regulation requires that routes be set up to avoid heavily populated areas where practicable. For the most part, railroad routes can be set up to avoid heavily populated areas but in some cases, it is not practicable to avoid such areas whether in regular trains or special trains. Avoiding populous areas has disadvantages which should be weighed in determining whether their avoidance is practicable. Those disadvantages include increased mileage and transit times, more crew changes and more stops generally and poor quality of track and roadbed.

AVOIDING INTERMEDIATE STOPS

The rule requires that stops be limited, where practicable, to stops for refueling and obtaining provisions. For a railroad shipment it is never practicable to limit stops to those purposes. Both ICC and Railroad Labor regulations require stops to change crews. Stops for crew changes are required every 100 to 200 miles. Crew changes may take place on the main line, in which case the stops are relatively brief or they may take place in the yard, in which case the delay could be an hour or more.

Stops are also required for safety reasons. Railroads have signal systems and it is necessary to obey them. When a stop signal is received, by wayside or cab signal indication, the train must be stopped until a subsequent signal is received authorizing the train to proceed.

It should be noted in this connection that stops would be much less frequent on a regular train than on a special train. It is our understanding that where special trains are used, the railroads require the special train to stop on a siding every time it approaches an on-coming train and to remain on the siding until the regular train has passed. Depending on the line traveled and the number of sidings available, such stops could be frequent and of extended duration.

ESCORTS

The requirement that escorts accompany a cask car and keep it under surveillance at all times presents no particular railroad operations problem. For safety reasons, escorts should not be permitted to ride on the cask car itself since the cask car is not designed to carry passengers. Escorts could ride either in the caboose or in a separate car. In either regular or special train service, the cask car would be the second car ahead of the caboose and escorts riding in the caboose would have no difficulty in keeping the car under surveillance.

SPECIAL PRECAUTIONS IN HEAVILY POPULATED AREAS

In many respects, the cask car is safer in a large city than in a small one. In practically all cases, railroad police have excellent rapport with local law enforcement agencies and they would be in position to call for help immediately in the event of a terrorist attack. They also have arrangements to call federal, as well as state and local assistance, whenever bomb threats to railroad stations or trains occur and they would call for such assistance if it were needed to protect a cask car.

Any stops for an extended period (except special trains holding on a siding to permit an on-coming train to pass) would take place in freight yards. The precautions normally taken to insure the safety of any unusual shipment would appear to be adequate. Railroad police are available in all freight yards and the larger the freight yard and the larger the city, the more railroad police are used. Railroad police are armed and they usually operate in pairs in radio-equipped cruisers. Under normal operating procedures, the railroad police would be notified in advance of the arrival of a cask car. They would be expected to meet the cask car upon its arrival at the yard and to keep it under surveillance as long as it remained in the yard. Finally, more railroad police are available in large freight yards and in large cities. In certain large cities in the east, helicopter surveillance is used to protect property and apprehend criminals.

COMMUNICATIONS CAPABILITY

On many railroads, it would be necessary to stop and use wayside telephones to report the status of shipment, since two-way voice communication is not available. To install two-way voice communication between trains and wayside stations could be very expensive. Consistent with the requirements of 10 C.F.R. § 73.37(a)(4), we believe it would be preferable to avoid stops where practicable. Railroad operating personnel would be generally aware of the location of the train, thereby rendering it

unnecessary to report the train's status every two hours. From a railroad operations standpoint, we believe it would be feasible to make calls from time to time from call boxes located along the railroad right-of-way.

IMMOBILIZATION OF TRAINS

A train can be immobilized almost instantaneously by putting the air on emergency and shutting down the air pump. It then takes 30-60 minutes to pump up the air in a regular train of 50-100 cars so that the train can move; however, on a shorter train (such as special train) the air could be pumped up in 5 minutes or less. Therefore, it is much easier to immobilize a regular freight train of 50-100 cars than it is to immobilize a special train of just a few cars. Accordingly, the time available for a response to a call for help would be much longer for regular train than a special train. Hijacking a regular train should, for this reason alone, be more difficult than hijacking a special train.

PARTIAL STATEMENT OF CONSIDERATIONS TO ACCOMPANY PROPOSED RULE

Subsec. (b) of the proposed rule adopts regulatory steps taken by the Nuclear Regulatory Commission in 10 C.F.R. Part 73, secs. 73.1, 73.37, and Appendix D, to protect transportation of irradiated reactor fuel shipped by NRC licensees. The Part 73 regulations require NRC licensees which transport irradiated reactor fuel, or deliver such fuel to a carrier for transport, to notify the NRC in advance of any shipments of such fuel and to obtain from the NRC advance approval of the route used for such transport. When transporting irradiated reactor fuel (as defined in 10 C.F.R. sec. 73.1(b)(5)) for shippers subject to the requirements of 10 C.F.R. sec. 73.37, carriers that would otherwise be subject to the Department of Transportation's general routing rules set forth in subsec. (a) of the proposed rule are instead to use the routes approved by the NRC. This avoids the need for a carrier to examine and comply with routing regulations of two agencies in an area over which the NRC has special expertise.

The Materials Transportation Bureau believes that adoption of the NRC's regulations is appropriate and serves the public interest in a number of ways. Pursuant to Section I.A. of the most recent Memorandum of Understanding ("MOU") executed by the NRC and DOT on June 8, 1979 (43 Fed. Reg. 38,690 (1979)), the NRC is to be primarily responsible for any special radioactive materials transport controls related to safeguards, due primarily to its thorough knowledge and expertise in this regard. The regulations contained in 10 C.F.R. Part 73, secs. 73.1, 73.37 were published by the NRC essentially as a safeguards measure, although other appropriate health and safety factors are also being considered. Thus it is contemplated, in the MOU, that DOT regulations reflect NRC judgment in this area. Moreover, the DOT's adoption of the NRC's regulations eliminates duplicative regulatory effort, and ensures consistency and clarity of regulatory requirements. Duplicative enforcement efforts will likewise be avoided, as the NRC is to be responsible for enforcement of the requirements of 10 C.F.R. sec. 73.37.

PROPOSED AMENDMENT TO 49 C.F.R. PART 177—CARRIAGE BY PUBLIC HIGHWAY

Sec. . . Routing of Radioactive Materials.*

(a) Except as provided in subsec. (b) of this section—

(1) A private, common, or contract carrier by motor vehicle engaged in interstate or foreign commerce in accordance with the regulations in Parts 170-189 of this title may transport all radioactive materials by any route but, except as provided in the next sentence, heavily populated areas, tunnels, narrow streets and alleys must be avoided unless there is no practicable alternative highway route. A highway route of four or more lanes, divided and with access control, need not be avoided because it traverses a heavily populated area. A route which might otherwise be considered a practicable alternative shall not be so deemed for purposes of this section if its use would increase the overall risk to the public and transport workers. Operating convenience of the carrier alone is not a basis for determining whether a highway route is a practicable alternative.

(2) In addition to the general authorization set forth in subsec. (a)(1) of this section, a shipper or carrier of radioactive materials may apply to the Director, Office of Hazardous Materials Regulations ("OHMR") of the Materials Transportation Bureau, for specific authorization to transport radioactive materials along a particular route. The Director, OHMR, shall grant such an authorization upon

*Changes in the proposed rule attached to the letter from LeBoeuf, Lamb, Leiby & MacRae dated December 19, 1978 are underlined.

finding that transportation in accordance with the application will provide an equivalent level of safety as provided in subsec. (a)(1) hereof or levels of safety consistent with the public interest and the policy of the Hazardous Materials Transportation Act. The OHMR shall follow procedures [comparable to those contained in secs. 107.107 through 107.123 of this title] ** in determining whether to grant such an authorization. The OHMR shall serve notice on any State and/or political subdivision traversed by the proposed route and such State and/or political subdivision may become a party to the application. The applicant and any other party to the application may file an appeal of the issuance or denial of such authorization with the Director, OHMR, in accordance with [procedures comparable to those contained in sec. 107.121 of this title] ***. The holder of any such authorization shall not be subject to enforcement proceedings under secs. 107.301 through 107.373 of this title on the grounds of failure to comply with the requirements set forth in subsec. (a)(1) of this section. The fact that an application for an authorization has been filed under this paragraph shall not prevent a carrier from transporting radioactive materials in accordance with the general authorization set forth in subsec. (a)(1) of this section during the processing of such application.

(3) Any State or political subdivision may apply to the Director, OHMR, for an order prohibiting transportation of radioactive materials along a specific highway route, requiring a specific route for transportation of such materials, requiring specific measures to be taken for transportation of such materials, or any of these. The applicant shall serve a copy of its application on the holder of any authorization to transport radioactive materials through its jurisdiction and on any other shipper or carrier which the applicant has reason to believe may be affected by the application. After notice, including publication in the Federal Register, and an opportunity for a hearing, the Director, OHMR, may issue an appropriate order. If the Director, OHMR, determines that such application concerns a matter of such general applicability and future effect as to warrant being made the subject of rulemaking, he may initiate rulemaking under Part 102 of this title in addition to or in lieu of granting or denying the application.

(b) In any case in which a private, common, or contract carrier designated in subsec. (a)(1) transports irradiated reactor fuel in a shipment subject to the Nuclear Regulatory Commission's regulations contained in 10 C.F.R. secs. 73.1, 73.37, and Appendix D thereto, subsec. (a) of this section shall not apply. In any such case, the carrier shall utilize the route of shipment approved in advance by the Nuclear Regulatory Commission pursuant to 10 C.F.R. sec. 73.37. The carrier shall require written evidence from the shipper that the Nuclear Regulatory Commission has approved the route chosen for transport.

(c) Except as authorized by an order or rule issued pursuant to subsec. (a)(3) or an order issued pursuant to sec. 107.221 of this title, any requirement imposed by a State or a political subdivision prohibiting transportation of radioactive materials along a specific highway route, requiring that a specific route be used for transportation of such materials, or requiring that specific measures be taken for transportation of such materials is preempted.

LEBOEUF, LAMB, LEIBY & MACRAE,
Washington, D.C., August 24, 1979.

DOCKETS BRANCH, INFORMATION SERVICES DIVISION,
Materials Transportation Bureau, Research and Special Programs Administration,
U.S. Department of Transportation, Washington, D.C.

DEAR SIR: This letter and enclosures are submitted on behalf of the members of the Electric Utility Companies' Nuclear Transportation Group in regard to the Advance Notice of Proposed Rulemaking on Highway Routing of Radioactive Materials published on August 17, 1978. 43 Fed. Reg. 36,492. These comments supplement our letter dated October 19, 1978; the oral statement of Leonard M. Trosten at the public hearing held in Washington on November 29, 1978; and our letter dated December 19, 1978.

In further response to the Advance Notice of Proposed Rulemaking, we submit the enclosed copy of comments, dated August 16, 1979, which we have submitted to the Nuclear Regulatory Commission on behalf of American Electric Power Company, *et al.* These comments concern the interim rule recently published by the NRC to amend 10 C.F.R. Part 73 to establish certain requirements for physical protection of irradiated reactor fuel in transit ("the interim rule"). 43 Fed. Reg. 34,466, June 15, 1979.

The interim rule establishes NRC controls over the routing of shipments of irradiated reactor fuel by highway. Because of the obvious relationship of the

**To be specified in detail in the actual regulation.

***To be specified in detail in the actual regulation.

interim rule to the Materials Transportation Bureau's rulemaking on highway routing of radioactive materials, we request that the MTB adopt by reference the interim rule in its forthcoming notice of proposed rulemaking in Docket No. HM-164, as shown in the second enclosure.

There is clear precedent for this in the regulations of the Department of Transportation. (See, *e.g.*, 49 C.F.R. sec. 173.396(c)(3).) This procedure would also be consistent with the purpose of the June 8, 1979 Memorandum of Understanding between the Department of Transportation and the NRC, *i.e.*, . . . developing, establishing, and implementing consistent and comprehensive regulations and requirements for the safe transportation of radioactive materials, and avoiding duplication of effort . . .

The principle objective of the interim rule is the safeguarding of shipments of irradiated reactor fuel, a subject the responsibility for which is assigned to the NRC by Paragraph I.A. of the Memorandum of Understanding. However, as noted on pages 7-8 of the enclosed comments, the NRC must consider not only the potential threat of sabotage, but all other relevant factors when approving a route pursuant to 10 C.F.R. sec. 73.37. Thus, it is not necessary that the Department of Transportation reconsider this matter.

Very truly yours,

LEONARD M. TROSTEN, *Partner.*

Enclosures.

Mr. SMICK. Thank you very much.

I regret that their other duties have precluded the committee members from discussing with you directly your very responsive and complete testimony, Mr. Rhode.

Mr. RHODE. Thank you.

Mr. SMICK. I am sure they may have, and may very likely send on questions derived from your testimony that they would like you to answer for the record.

Mr. RHODE. I would be most happy to do so.

Mr. SMICK. Do any of your associates have a statement to make?
Mr. Rifakes?

STATEMENT OF GEORGE P. RIFAKES, MANAGER OF FUEL AND BUDGETS, COMMONWEALTH EDISON CO., CHICAGO, ILL.

Mr. RIFAKES. Yes, sir.

Mr. SMICK. Proceed.

Mr. RIFAKES. I am George Rifakes, manager of Fuel and Budgets of Commonwealth Edison Co. I am here today to testify on a number of nuclear transportation matters which bear on the subcommittee's consideration of S. 535, and also in response to Senator Stevenson's letter to Mr. O'Connor of June 27, 1979.

The principal business of Commonwealth Edison is the supply of electric energy to the northern one-third of Illinois. We presently provide service to about 2.8 million customers, and 45 percent of the electricity generated by the company during 1978 was nuclear.

The company is the Nation's largest nuclear power operator with 10 percent of the Nation's nuclear capacity. We currently have seven nuclear power reactors in operation, and an additional six units under construction. As a result of the current hiatus regarding the disposition of spent fuel, we will in the near future need to transport fuel between stations in some cases in order to maintain our ability to operate some of our units.

The company is a member of the Ad Hoc Nuclear Transportation Group, and as such supports the positions expressed by Mr. Rhode this morning.

However, we feel that it is important to add our comments on behalf of the company because of our great reliance on nuclear power.

One of the principal transportation concerns of the utility industry is the attempt by rail carriers to impose unjustifiable conditions for the carriage of nuclear materials. This has been the subject of litigation before the Interstate Commerce Commission for the past several years, which unfortunately still continues.

During the course of this litigation, the Commission has thoroughly reviewed the vital need for rail transportation of this commodity and the railroads' position concerning alleged safety hazards in transporting spent nuclear fuel.

Based on its independent review of the facts, the Commission issued decisions which in all cases have been contrary to the railroads' position on these issues. In particular, the possible benefits and associated costs of using special trains have been thoroughly explored by the Commission.

The Commission also prepared an environmental impact statement on the transportation of radioactive materials by rail in support of its decision.

Apart from the Interstate Commerce Commission proceedings, the subject of rail transportation of nuclear materials has been evaluated by other Federal agencies and Government contractors. For example, as you know, DOE has sponsored a series of full-scale crash tests by Sandia Laboratories which demonstrate the ability of the containers to resist extremely severe transportation accidents and the ability of analytical models to predict the consequences of such accidents.

The Energy Department also participated in the ICC proceedings and presented detailed evidence on the safety of transporting spent fuel in NRC-approved containers.

The NRC has prepared a final environmental impact statement on the transportation of radioactive materials by air and other modes, including railroads. This was in NUREG-0170, December 1977.

Sandia, acting under contract with the NRC, also has evaluated the transportation of radioactive materials including rail transportation in urban environs, and published its conclusions in June 1978 in SAND-77-1927. And most recently, the NRC has decided to modify its regulations to provide safeguards against sabotage for highway and rail shipments of spent fuel, which include prior approval of both highway and rail routes.

In light of these analyses, and in particular the recent action of the NRC in modifying its regulations, we believe that the conduct of yet another special study of transportation of nuclear materials by rail carriers is unjustifiable.

Unfortunately, just such a study is called for by section 2 of H.R. 3502, a bill to amend the Hazardous Materials Transportation Act to authorize appropriations thereunder, as it was reported out by the Committee on Interstate and Foreign Commerce of the House of Representatives on May 15, 1979.

As reported out by that committee, the Secretary of Transportation would be required, in consultation with the NRC, to evaluate 11 subjects and to report thereon to Congress by January 1, 1980.

Included among these subjects are the topics of sabotage, routing of rail shipments, the use of special trains, emergency planning, and advance notification to States and localities.

The HMTA authorization bill as reported out on May 15, 1979, by the Senate Committee on Commerce, Science, and Transportation doesn't contain a requirement for such a study. In its report on S. 1141, this committee noted its concern with the issue of safe transportation of radioactive materials and the need for additional steps to be taken by the DOT in coordination with other Federal departments and agencies in this regard. Of course that is the subject of S. 535 and of this entire hearing.

Legislating a requirement for yet another special "comprehensive study" by the Department of Transportation of rail transportation or radioactive materials is not the way to satisfy the committee's concerns.

As I have indicated, the subject of rail transportation of radioactive materials has already been exhaustively evaluated. What is needed now is to gain some experience under the NRC's new regulations and to allocate adequate resources, particularly to the Department of Transportation, to carry out the responsibilities it already has with respect to transportation of radioactive materials.

That concludes my statement. Thank you.

Mr. SMICK. Thank you, Mr. Rifakes.

All right, thank you, gentlemen.

Before recessing this session of the hearings, I want to apologize to Mr. Jefferson who was our scheduled next witness. He has traveled the farthest to talk to us, and he has agreed to return tomorrow morning. We will schedule you first on tomorrow, Mr. Jefferson. So if your travel plans have been interrupted, that will minimize that interruption.

Mr. JEFFERSON. Thank you.

Mr. SMICK. The hearing is now recessed until 9:30 tomorrow morning.

[Whereupon, at 11:07 a.m., the hearing was adjourned, to reconvene at 9:30 a.m., Friday, July 20, 1979.]

NUCLEAR WASTE TRANSPORTATION SAFETY ACT OF 1979

FRIDAY, JULY 20, 1979

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
SUBCOMMITTEE ON SCIENCE, TECHNOLOGY, AND SPACE,
Washington, D.C.

The subcommittee met at 9:35 a.m. in room 5110, Dirksen Senate Office Building, Hon. Howard W. Cannon (chairman of the committee) presiding.

The CHAIRMAN. The hearing will come to order.

The first witness will be Mr. Robert Jefferson, Manager, Transportation Technology Center, Sandia Laboratories.

Senator SCHMITT. Mr. Chairman, I was particularly happy to see Mr. Jefferson here, first of all, thanking him for delaying his return to our delightful home State for a day. We hope that Sandia will continue the excellent work that they have already provided in research and development and analysis of these kinds of problems.

STATEMENT OF ROBERT M. JEFFERSON, MANAGER, NUCLEAR TRANSPORTATION TECHNOLOGY DEPARTMENT, SANDIA LAB- ORATORIES, ALBUQUERQUE, N. MEX.

Mr. JEFFERSON. Thank you, Senator.

First of all, I would like to thank you gentlemen for inviting me to comment on S. 535, and to point out that although the program at Sandia is sponsored by the Department of Energy, I do not come here representing the Department of Energy's viewpoint. And as a matter of fact, the comments that I express are those that I have generated myself.

I would like to start off by saying that I applaud the objectives of this bill to improve safety and simplify regulation. I suspect it is going to be very hard to improve on the existing safety record of the shipment of nuclear materials, but it's possible that, as the volume of that shipment expands, that record might come into jeopardy.

I think it's perhaps even more difficult to simplify regulation, but nonetheless I do applaud those objectives.

I would like not to read my testimony this morning. You have it in front of you. I would like to simply emphasize and elaborate on four points.

The CHAIRMAN. We will make your statement a part of the record.

Mr. JEFFERSON. Thank you, Senator Cannon.

The first point I would make is a philosophical point; that is, that radioactive materials are simply a part of a class of materials known as "hazardous materials," as far as transportation goes. In the overall class of hazardous materials, have by far the best safety record. That is to say that radioactive materials have not caused the death or injury of anyone over the past 30 years during which they have been transported.

And if you do separate radioactive materials from other hazardous materials in the regulatory process, this tends to have, in my opinion, two effects. One of these is uneven regulation. If you attempt to eliminate the fear that surrounds nuclear materials, rather than to eliminate the hazard, you end up concentrating on these, and in the meantime ignoring other hazardous materials where in fact we are experiencing real impacts upon the public.

So I think by splitting it, you tend to generate uneven regulation with the real hazard being ignored.

Second, I think you tend, if you separate these, to create confusion in the field. The movement of radioactive materials represents a rather small proportion of those hazardous materials moved in normal commerce. If you separate their regulation and their emergency response and all of the other factors involved in the control of those materials, you tend to shift the focus away from the overall picture. And on those few occasions that arise in the movement of radioactive materials where there is a problem, the States, who are the ones that have to such respond to emergencies, will be confused about which directions they are to follow. If on the other hand, radioactive materials are consolidated under the broad category of hazardous materials, then the emergency response is much simplified.

This consistent approach, then, as I indicated before, should include the emergency response through the interagency radiation assistance program, and the Federal Emergency Management Agency.

The second point I would like to make concerns the NRC interim final rule concerning safeguards. That ruling, according to the meeting that NRC held at which they approved that ruling and the notice in the Federal Register, was based upon the urban study conducted by Sandia. The study was accomplished by another organization besides mine, but was an effort which I followed very closely.

It was a follow-on to a generic environmental impact study on the transportation of radioactive materials, which was conducted by my organization. I think it is important to understand the contents of the report cited by NRC.

That report simply states that there are possibilities for certain things, even though the probabilities are exceedingly low. For instance, the probability of an attack on such a shipment is considered to be very low—although it's unknown; but judging from history in the past 30 years or so during which these kinds of shipment have taken place, I know of only one shipment that's ever been attacked, and it happened to be a shipment that I made. It was attacked with a 10-gage shotgun, which really didn't represent much of a threat. But nonetheless, the probability of attack, up until now, has been very, very low.

Second, Sandia has conducted a number of experimental programs looking at the probability of success if an attack is launched. We find it very difficult to breach these containers. It is possible, but it requires a degree of sophistication and a great deal of knowledge of not only the explosives but of the containers as well.

The thing the NRC has focused on is the third part of this sequence of events called the consequences. In the study that Sandia conducted, an attempt was made to determine the bounding consequence, the absolute upper limit on consequences. It was found that these are rather high and—I think perhaps understandably so—unacceptable to the NRC.

It should be pointed out, though, that the attack itself, the use of explosives in the attack, kills more people than the release of the radiation. So when you talk about safeguarding spent fuel shipments, I think you've got to be very careful in your logic and consider all of the effects of such an attack.

Senator SCHMITT. Mr. Jefferson, could I interrupt you right there? Are you saying that one of the good reasons for having essentially impenetrable cask design is that it would discourage anybody trying to penetrate them and therefore killing somebody because of the explosives and not because of the radioactivity?

Mr. JEFFERSON. That's right. The impenetrable design exists. It can be penetrated, but it's very difficult. And in order to do so, you end up using so much in the way of explosives that the impact from the explosion is more significant than the release of radioactivity as far as killing people is concerned.

Now second, there are other commodities, other hazardous materials in the transportation activity which could be used to create more death and more property damage than the radioactive materials contained in the spent fuel shipment.

Senator SCHMITT. From a sabotage point of view.

Mr. JEFFERSON. From a sabotage point of view.

Senator SCHMITT. Such as chlorine.

Mr. JEFFERSON. Chlorine is a possible one. Probably the most common is gasoline, but there are others as well.

In other words, what needs to be done in considering the risk of sabotage is to include not only the consequences that are involved, but the probability of those consequences occurring.

Now the NRC studied that draft report for 1 year, as Chairman Hendrie said yesterday, and then concluded that time was of the essence.

They did not conclude that an attack was imminent, but simply that the information that was needed to define the probabilities didn't exist and wouldn't exist for a couple of years. And for that reason, they took that rather abnormal procedure and got around the rulemaking called for in the Administrative Procedures Act.

Unfortunately, the measures that they have taken, while they are an attempt to reduce the probability of attack and the probability of success of that attack, may in fact have precisely the opposite effect. The fact that they have called public attention to this matter now makes it a target for all of those people who would like to make a name for themselves. And furthermore, they've made the target more accessible by rerouting it around cities and onto secondary roads.

The city of Albuquerque is a prime example, and Senator Schmitt knows the difficulty of getting around Albuquerque. You end up going on very narrow two-lane roads by comparison to the four-lane divided highways which pass through the city.

So you've exposed the shipment to more possibilities of attack. In addition the probability of success has perhaps been increased simply because now, in order for the attack to be successful, the attacker has to gain possession of the shipping cask. He therefore has more time to do what he wants, and that improves his probability of success.

These two considerations would tend to indicate the probabilities go up as a result of the rulemaking. Further, the new rule has no impact at all upon the final consequences.

The net effect then is to possibly increase the sabotage risk. Certainly the rule has the effect of increasing the accident risk, and even the NRC admits that it increases the cost somewhere on the order of a factor of 2.

Now it would appear judicious for the NRC to have come out with some sort of cost/benefit analysis in order to assure the public that for this cost there is indeed some benefit.

As I said before, it also brings to mind the question of whether we ought to provide safeguards for other hazardous materials.

The third point I would like to make in my oral testimony is that if you really and truly want to improve safety, I think the key comes from the testimony of the Governor of Nevada the other day when he essentially said what we need to do is improve compliance.

The existing regulations are indeed adequate to provide the level of protection necessary for the public. It's simply a matter of assuring that they're complied with.

It would probably be the most cost-effective action available, and could accomplish perhaps the most in the immediate sense.

Under that condition, I would feel that the Department of Transportation would be the best agency to accomplish that, simply because again it does not separate radioactive materials from the general class of hazardous materials in this respect.

It might also be very worthwhile if the proposed legislation enabled the Department of Transportation to operate with an Agreement-State status similar to the one that NRC enjoys with the regulation of nuclear materials. In this way the DOT could utilize State inspectors to assure compliance with Federal Regulations.

The fourth point I would like to make is that if the bill is truly intended to simplify regulation, the point at which that simplification can have the most impact at this time, is in the area of clarifying the relationship between State and local regulations and the Federal statutes.

There is a growing number of either restrictions or outright prohibitions against the movement of nuclear material—as you have heard earlier—arising in municipalities and in certain States, and a strong statement from the Congress exercising the preemptive rights of the Federal Government in this area would be most helpful to free up this current strangulation.

There is, I agree—a current DOT rulemaking on that matter, and I am not a legislative wizard; I don't know how you go about that, but at least something in that area ought to be addressed.

The other comments that I have are in my written testimony and correspondence that I have sent to Senator Schmitt. I would now be willing to answer any questions you might have.

The CHAIRMAN. Thank you, Mr. Jefferson.

You made one point in your written statement where you say that one of the problems is the issue of the public perception of transportation safety. Could you elaborate on that a little and tell us how that particular problem might be improved?

In other words, how can we improve on the public's perception of the safety situation?

Mr. JEFFERSON. Senator, that's a very complex issue, and in fact part of the program that Sandia now has underway, is to try to understand that very point.

One of the problems that is inherent to the public perception is public understanding. There's a very low degree of public understanding of not only the necessity for radioactive materials in our society and their benefit, but also the impact that those materials have upon society.

So it's not a simple question to answer; the public perception cannot be turned around in a short period of time. I think perhaps the best description I can give of that is in a municipal hearing that one of my staff attended a couple of weeks ago, the people in that community claimed that there were trucks bringing radioactive materials—radioactive wastes through their city very frequently.

We happened to have chased that one down and found out that there was one occasion in which a logging truck had come through that city, and someone had seen it, and when we showed them the picture of it, they said "that's the one," and we happened to have a record of how often it came through the town. It had been through the town once in the past year, but they still felt it came through the town frequently and they were exposed to undue hazards as a result.

I don't know how you correct that public perception. We're working on it.

The CHAIRMAN. Senator Warner?

Senator WARNER. Thank you, Mr. Chairman.

Yesterday I presume you heard some of the questions that I asked concerning the health and safety consequence that would occur if an accident were to happen. Do you wish to comment on the answers, or perhaps to supply your own today?

Mr. JEFFERSON. If an accident were to happen, it depends on what type of packaging were involved.

Senator WARNER. Well, of course. Let's assume that some of the packaging—and I don't mean to dispute the fact that every precaution possible had been taken not to have a rupture, but if a rupture takes place, and some of this material is discharged into a public place, what are the parameters of endangerment to health and safety?

Mr. JEFFERSON. Those depend in large measure on a number of factors surrounding the accident—the climatological conditions, topological conditions, and so on.

Senator WARNER. What I am trying to refine is: The statement is being made that this accident is tantamount to explosion of a nuclear weapon and things like that, statements that I believe are indiscriminately cast out into the public domain.

Mr. JEFFERSON. I agree with you.

Senator WARNER. I think in fairness to the public, we should allow an expert like yourself who has devoted so much of your career to the subject, to at least have an opportunity to be on the record.

Mr. JEFFERSON. If we are talking—and again, Chairman Hendrie addressed that question I thought very well—if you're talking about the kinds of radioactive materials produced as the result of a weapons explosion, you're talking about fission products; you're now talking about spent fuel shipping casks.

Senator WARNER. Right there that there's a difference is the point you're making.

Mr. JEFFERSON. A "difference," in what sense, sir?

Senator WARNER. I thought you were trying to point out a difference.

Mr. JEFFERSON. No; I'm just simply saying that that restricts it to spent fuel shipping casks.

The tests we have conducted with spent fuel shipping casks to date shows that there simply is not an accident within the realm of possibility that's going to seriously threaten that cask.

You might in fact cause the cask to leak some of its coolant. You might in fact cause the cask to lose its hermetic seal. But you're not going to exude radioactive material from this cask. So the impact upon the public is going to be minimal.

I think the best example that perhaps I can give to put that in perspective is that some years ago, over Palmyra, Spain, we dropped a weapon in a tomato patch and it went off. Now it did not explode nuclearly, but it exploded high-explosively, and we recovered from that situation. No one, fortunately, was killed in the explosion, and we've kept track of those people over there, and no one's died from radiation, either. And that's been 15 years ago now. We certainly ought to be getting some early signs if anything was going to show up.

I can't imagine the transport of spent fuel being involved in an accident which would create a situation worse than that one.

Senator WARNER. Thank you very much.

The CHAIRMAN. Senator Stevenson?

Senator STEVENSON. I don't have any questions now.

The CHAIRMAN. Now you indicated that there was no danger of leakage, apparently no danger, but in the second accident that occurred out in Nevada, there apparently was some leakage from that low-level radiation cask in that instance.

Mr. JEFFERSON. We are talking about an entirely different type of package in this case.

The CHAIRMAN. All right—

Mr. JEFFERSON. Yes; in that case there was some leakage.

The CHAIRMAN. OK, you are talking about the high-level radiation casks then that are used for transporting the materials.

Mr. JEFFERSON. Yes, sir.

The CHAIRMAN. Are you familiar with that second instance in Nevada?

Mr. JEFFERSON. Not intimately. I know it occurred and know that the leakage had taken place, but I've been out of my office now for 2 weeks.

The CHAIRMAN. Now the testing done by your laboratory demonstrates the crashworthiness of fuel casks during severe accident situations, but in those tests the tiedown specifications were complied with. Have any other tests been conducted simulating failure to conform to the tiedown specifications?

Mr. JEFFERSON. Mr. Chairman, in the second of the truck tests where the truck impacted at 84 miles an hour—impacted this large concrete monolith—the tiedowns in fact failed very early in that crash, and the cask impacted the wall at approximately 65 miles an hour.

Now that would I think simulate the environment that you get in a normal highway crash—or oversimulate it perhaps—in a normal highway crash at the current 55-mile-an-hour speed limit. And having just crossed the country twice this spring, I find that trucks are no longer going over about 65.

So I think the answer to your question is: Essentially we've done that test, although not in that exact form.

The CHAIRMAN. Thank you very much. We appreciate your being here with us.

Mr. JEFFERSON. Thank you. I appreciate the opportunity.

[The statement follows:]

STATEMENT OF ROBERT M. JEFFERSON, MANAGER, TRANSPORTATION TECHNOLOGY CENTER, DEPARTMENT 4550, SANDIA LABORATORIES¹

In 1945, when the nuclear issue was not so emotional, a group of knowledgeable individuals met for the purpose of devising rules to assure that the transportation of radioactive materials was conducted in a manner that adequately protected the public from the risks involved. It is interesting to note that the fundamental principles developed by that group are still in effect and during the intervening years no one in the United States has been killed or injured as a result of the radioactive nature of these materials being transported. In the period since 1945 the regulations have become more complex, their promulgation and enforcement spread among several agencies and their interpretation clouded by reorganizations. Still, there is in effect a working system for regulating the transportation of radioactive materials (including spent fuel and radioactive wastes). Judging from the results the system serves its purpose well in that it has provided a level of protection to the public far greater than is generally achieved in the transportation of many other hazardous materials.

With the safety record of nuclear transportation already better than the record for other hazardous materials it is difficult to envision how any legislation aimed at increased or even modified regulation is going to "enhance the safety" of the transportation of nuclear wastes and commercial spent fuel. In addition to the problem of improving on a good safety record, the Bill implies that its objectives can be accomplished by: (1) improved emergency response, (2) a greatly expanded statistical data base, and (3) increased State participation in studies of safety and logistics. All of these actions address the issue of the public perception of transportation safety (which is certainly important) but do not serve to "improve safety". This evaluation of the affects of S. 535 is further supported by the fact that almost all of

¹ Sandia Laboratories, one of the eight multi-program laboratories of the U.S. Department of Energy, is operated by a wholly owned subsidiary of the Western Electric Company. The Laboratories are engaged in a broad range of research and development programs for the Federal Government with primary emphasis upon nuclear weapons development and testing.

the provisions of this Bill are already being met within the existing Federal/State structure.

The other purpose of the Bill, to simplify the regulation, is indeed a valid goal but one which is equally as difficult to attain. Very careful attention must be given to the results arising from attempts to simplify since such efforts often create confusion in the process. The regulation of the transportation of nuclear waste and commercial spent fuel is woven into a very complex fabric of Federal Agencies, State Agencies and private industry. Attempts to "simplify" one thread may place strains on the fabric which produces undesirable or even counterproductive results in other areas. These unexpected results may in fact heap additional complications upon the very point of attempted simplification. For example, DOT is a regulatory agency, but some of the functions being assigned to them by S. 535 are not regulatory in nature. Specifically, the development of emergency plans by DOT leaves no one to objectively assess the effectiveness of such plans. Furthermore, the emergency plan called for by S. 535 complicate the task of emergency response for those in the field by separating nuclear waste and commercial spent fuel from the host of other hazardous materials encountered in transportation accidents. The confusion thus generated is compounded by the fact that accidents involving nuclear waste and spent fuel occur so infrequently by comparison to accidents involving other hazardous goods. Thus, the purpose of this section of S. 535 will be thwarted by the confusion it creates on the very point it intends to simplify. If that were not enough, there is in existence an interagency emergency response capability which includes aid to State organizations, education programs, and operational assistance when requested. This capability has been effective when called upon. Further, Congress recently mandated and the President signed into law a bill which calls for the development of a national emergency response capability for the entire range of emergency situations which the people of this country might face at one time or another. Other examples of the overlap created by S. 535 are covered in my letter to Senator Schmitt dated April 27, 1979.

In the Committee's invitation to participate in these hearing, two additional questions, not covered by my comments of April 27, were set forth. The first of these asked if the establishment of a separate Office of Radioactive Material Transportation within the DOT would be necessary or desirable to implement the role of DOT as contained in Sec. 2 of S. 535. It is my belief that the establishment of such an office would be inadvisable. As pointed out earlier, the transportation of radioactive materials represents a small fraction of the hazardous goods currently being transported within the United States. Furthermore, the statistical history of the transportation of radioactive materials would indicate that its safety record far exceeds that of other hazardous materials. I fear that if the regulation of the transportation of radioactive waste and spent fuel were to be separated from the regulation of other hazardous materials in the transportation sector of our economy, the result would be undesirable. In response to pressures within our society, the separated function of nuclear transportation might then proceed to demand progressively more stringent regulations to "improve" the safety of an activity already more safe than corresponding activities. On that basis I would not be in favor of a separate Office of Radioactive Material Transportation within DOT.

You also asked for comments upon the Interim Final Rule proposed by NRC providing for safeguarding spent fuel shipments. This rule serves to reiterate my previous point about separate regulation of radioactive materials resulting in uneven requirements. The NRC has stated that they believes the probability of attack of a spent fuel shipment is low. They further stated that the probability of success (defined as release of substantial quantities of radioactive material), if such an attack were attempted, is also low. These estimates of probability agree with those contained in the Draft Urban Study, which NRC claims is the basis for their action. These observations aside, the NRC declared after a year of reviewing the Draft Urban Study, that "time was of the essence" and instituted the new rule without benefit of public hearing or the other requirements of the Administrative Procedures Act. By its action the NRC has said that they believe we face an imminent danger of saboteurs or terrorists successfully inflicting great harm to our population through attack on spent fuel shipments. This internally inconsistent approach to regulation is likely to create rather than abating hysteria, resulting in procedures which, while they may be well intentioned, create undesirable or even disastrous side effects. The NRC in enacting this rule has made no attempt to evaluate its true cost in terms of dollars, time and safety. Nor have they defined in concrete terms the benefit to be derived from these costs. In this era when the private sector is being asked to justify almost every action in terms of costs and benefits it would also seem appropriate for the Federal Government to do the same.

Over and above these two questions which your letter posed I feel there is one additional provision upon which I would like to comment. Specifically the provision for State grants for the purpose of reviewing the safety and logistics of shipments involving nuclear waste and spent fuel introduces both a limited technical capability and a troublesome prospect. With a limit of \$50,000 per State grant there is little likelihood that a substantive study with supportable results would emerge. Instead, it is likely that the grant might be used to develop obstructions to transportation of radioactive materials without the unbiased evaluation sought by the framer of this provision. Further, the provision for State grants imposes no limitations on which States are to obtain these grants. Thus, a few States with little transportation involvement could drain the resources allocated in S. 535 leaving those States in which facilities are to be located without the funds to study the transportation impact of those facilities. Thus, I believe that S. 535 should include provisions to: (1) limit the availability of funds to those States in which a long term storage or disposal facility is proposed, (2) up the maximum grant from \$50,000 to at least \$100,000 or to the level of \$150,000, and (3) strengthen the limitations on the use of the grant funds to prevent the State from using Federal funds to do any more than study the impact of transportation related to the proposed facility.

In spite of a good safety record in the transportation of nuclear materials and in spite of the existence of a functioning system for regulating the transportation of all radioactive materials, there are some places where improvements might be worthwhile. If one studies the incident reports covering nuclear transportation, it quickly becomes apparent that the overwhelming majority of these incidents arise not because of faulty regulations but because the existing regulations are not followed. That very point was made last week by the National Democratic Governors Conference. One way to address this problem would be to enact legislation aimed at enabling the Materials Transportation Bureau of DOT to develop an "Agreement States" program whereby by DOT could provide funding to the States for the purpose of upgrading the inspection of the packaging and transportation of all hazardous goods. Such a program, coupled with the DOT compliance program, could give this nation the assurance that hazardous materials, including spent fuel and radioactive waste, are being moved in accordance with the applicable regulations. If one of the objectives of this legislation is improved public safety in the transportation of spent fuel and radioactive wastes, improved compliance with the existing, well proven regulations is likely to produce the greatest gain at the least total cost.

One function called for in S. 535 which I believe is important to public safety is the provisions for emergency response to handle those few and infrequent occasions where accidents or intentional acts might pose a threat to the public. But, as stated before, it is important that this emergency response capability be a part of the already existent overall capability because as a separate effort it would aggravate the situation rather than improve the responses. Thus, the existing legislation establishing an interagency emergency response capability is better suited than the provisions of S. 535 to meeting the needs of the country in this regard.

These comments, in conjunction with those expressed in my April 27, 1979 letter to Senator Schmitt, cover the concerns of the DOE Nuclear Materials Transportation Center at Sandia Laboratories with respect to this proposed legislation.

The CHAIRMAN. Dr. William Harris, vice president, Association of American Railroads.

**STATEMENT OF DR. WILLIAM J. HARRIS, JR., VICE PRESIDENT
FOR RESEARCH AND TEST, ASSOCIATION OF AMERICAN
RAILROADS, WASHINGTON, D.C.**

Dr. HARRIS. Mr. Chairman, it is a pleasure for me to be with you this morning. I have offered my written testimony for the record, and I would like to summarize that testimony if I may this morning in the interests of your time.

The CHAIRMAN. All right, sir.

Dr. HARRIS. The testimony is organized to describe briefly what AAR is and what my responsibilities are, and then to respond to six questions that were addressed to me by the chairman of the subcommittee holding these hearings.

Question 1. Do you agree in the necessity to establish a lead agency for the regulation of transportation of nuclear materials—and so on.

Our response in summary is that it is necessary to establish an agency with primary responsibility for regulating the transportation of radioactive materials. Unifying regulatory responsibility encourages consistency in regulation which is necessary to insure safe and efficient transportation.

We agree with the designation of the Department of Transportation as the lead agency for regulating the transportation of radioactive materials, but we are concerned about the division of responsibilities established in section 5 of S. 535. Section 5 perpetuates the present assignment of regulatory responsibility by carving out of the responsibilities assigned to the Department of Transportation the responsibility for regulating and certifying the safety of shipping casks and packages and assigning casks certification to the Nuclear Regulatory Commission.

It is our view that this division of responsibilities has been an impediment to achieving the safest possible rail transportation of radioactive materials, and we fear that the proposed section 115(a) proposed in section 5 will continue that impediment.

The nature of cask design cannot be divorced from transportation safety. Whatever the behavior and performance of current casks, all I can do is look at the specifications for which they are designed, because I must assume that casks will be offered for shipment to the railroads that barely meet these minimum specifications.

Those are, I remind you: a 30-foot drop on an unyielding surface; a 42-inch drop onto a 6-inch diameter road; an exposure to fire for 1475°F for 30 minutes; and immersion in 3 feet of water for 8 hours.

We don't question that the casks certified by NRC can withstand these conditions. However, this specification doesn't necessarily insure compatibility with actual operating conditions. And I repeat, whatever the current may do, what I must look at is what the specifications that they're required to respond to are, because I have to assume that some casks would be offered to us that just barely meet these specifications.

These are equivalent to 30-mile-an-hour impacts, and an impact on a pin at 12 miles an hour. And since casks in ordinary train service could be exposed to greater forces than these and greater speeds, the forces the casks might experience in an accident could be considerably greater than that for which it was designed.

In addition, the threat of a fire of extended duration is always present in a railroad accident where flammable hazardous materials are also carried. A fire of 30 minutes' duration at 1475°F is probably not sufficient seriously to damage the present casks.

However, we've estimated the lead shielding of casks that are provided with lead shielding would become molten in 1½ to 2 hours in a fire of about this temperature, and this estimate has been confirmed by tests done by ERDA when ERDA was operational.

In that test, an empty cask was submerged in a pool fire. The lead became molten in about 2 hours, leaving voids in the radiation

shielding, thus exposing in an unknown way those around the cask to radiation.

We have long advocated that the most efficient way to prevent casks from being exposed to stresses greater than that for which they're designed is to control the operating environment to insure that spent fuel casks will not be exposed to an accident environment greater than that for which they were designed.

And we describe here in several pages the history of our development, starting in 1974, of this kind of an approach toward the safe movement of these products.

The advantages seen for carriage of this material in dedicated train service include: the potential for scheduling so as to reduce running speed; increased ability to control speed; shorter transit time total because of less switching; and increased safety for a number of reasons.

Several railroads published tariffs requiring spent nuclear fuel to be transported in dedicated train service. The rates were challenged before the ICC, and the ICC found against the railroads.

The ultimate rationale, so far as we can determine it, was the full faith and credit accorded the NRC's certification of cask safety. The ICC refused to second-guess the determination that no further safety precautions were necessary.

We are concerned that passage of section 5 of S. 535 without comment by the Congress will perpetuate the absolute deference paid to the NRC's certification of cask safety by its sister agencies.

In fact, as you know, the NRC has recently acknowledged that spent fuel casks could be vulnerable in certain circumstances—a high-explosive assault on a spent fuel cask has the potential, they say, for serious radiological consequences.

Significantly, the NRC has responded to that circumstance not by changing cask design, but by controlling the transportation environment in a way not dissimilar in principle from that that we've been advocating.

They direct licensees to route shipments to assure a minimum number of stops; avoid populated areas; arrange with law enforcement agencies along the route for emergency response; and to provide especially trained escorts.

The railroad industry believes that the railroad industry should not be prevented from requiring dedicated train service to prevent casks from being exposed to high forces in accidents.

Question 2. Should a separate office be set up within DOT with overall responsibility for fulfilling the intent of section 2 of S. 535?

The railroad industry thinks that the responsibility should not be placed on a separate office within DOT. The purpose, as stated in S. 535, is to enhance safety and simplicity in the regulation of the transportation of radioactive materials, but these are only one of a large number of hazardous materials transported by railroads.

The responsibility for regulating the transportation of all hazardous materials is presently lodged in MTB, the Materials Transportation Bureau of the DOT. Both safety and simplicity are enhanced when a single agency regulates all hazardous materials in a consistent fashion.

In order to respond to any emergency involving hazardous materials, a carrier must immediately know what material is involved.

And we have described in my full testimony ways in which hazardous materials are coded so as to insure there is information immediately available to the crews as to what kind of response is appropriate.

We believe that the regulation of all hazardous materials by a single agency would encourage a response plan for emergencies involving radioactive shipments to be consistent with the response plans for dealing with other transportation emergencies.

If they are consistent, then the very small number of possible nuclear emergencies could be handled by groups experienced in emergency management as a result of responding to the other accidents involving other hazardous materials.

Question 3. To what extent, or with respect to what activities, should the existing division of responsibilities between DOT and NRC be revised to permit the DOT to fulfill the intent of section 2?

In the response to question 1, we already have reviewed the problems associated with the division of this responsibility, and we continue to assert, given the characteristics of existing spent fuel shipping casks, there should be control of the transportation environment.

And we have been thwarted because of the conviction that one agency ought not to challenge the view of another agency in this regard. Placing all regulatory responsibility in one agency might be one way to harmonize cask design and transportation conditions.

Question 4. What radioactive materials should or should not be encompassed by S. 535?

It's our position that all radioactive materials present a potential danger and warrant the exercise of proper care in transportation. We believe section 3 of S. 535 enhances this purpose and is needed to achieve the goal of enhancing the safety and simplifying the regulation of the transportation of radioactive materials.

Question 5. Should other sections of S. 535 be amended, the better to fulfill the intent of the bill as stated in section 2?

The railroad industry believes that the new section 115(b) proposed in section 5 of the bill should be amended to include railroads as an integral part of any emergency response plan.

In instances where a radioactive shipment is involved in a rail incident or accident, railroad employees are invariably first on the scene, since they're in the train crew, and the first to be involved in emergency response.

In order for that response to be effective, these employees must be taught how to react to the situation and how to interact properly with the various Federal, State, and local officials who will also be responding over a period of time to the emergency.

Rail carriers must be a part of this educational program. They have a definite role to play in the response program, and they should receive appropriate assistance as a part of the program. Only in this way do we believe the Secretary's emergency response plan can become fully effective.

The new section 115(b) requires the formulation of a national emergency response plan to deal with transportation emergencies involving nuclear waste, commercial spent fuel, or other radioactive material.

We believe that this purpose will be enhanced if the response to emergencies involving radioactive shipments is consistent with the response to emergencies involving other hazardous materials.

Therefore, we recommend any emergency response plan which the Secretary develops be expanded to include response to emergencies involving all hazardous materials.

Finally, we believe the proposed section 109(e)(8) in section 6 should be amended to eliminate any implication that State and local governments might have the authority to impose their own restrictions on radioactive shipments in addition to those of the Department of Transportation.

Railroads operate in and through many jurisdictions, and they quite simply cannot physically contend with a multiplicity of diverse and differing State and local regulations.

The DOT regulations should be drawn and drafted so as to be adequate to insure the safe transportation of all radioactive shipments in all jurisdictions. Thus, those regulations should preempt State and local regulations. Otherwise, transportation of radioactive materials could be forestalled entirely.

Question 6. Do the newly proposed rules of NRC dealing with routing and security appear necessary, desirable, or adequate?

The railroad industry fully supports both NRC and the DOT in their respective determinations that additional safeguards for spent fuel shipments are necessary to protect health and minimize danger to life and property, and that there exists a need for consistent rules preempting conflicting local requirements covering transportation requirements for radioactive materials. But we are not in a position to address specific comments to either of the Government's proposed rules, except to say that the interim rule published by NRC applies only to the class of licensees subject to NRC authority. It does not therefore directly affect rail carriers, and the proposed regulations noted by DOT on August 17, 1978, do not extend to the railroads, but are applicable only to highway carriers of radioactive materials.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Dr. Harris.

Experts from Sandia tell us that their cask test specifications are selected to expose the casks to potentially greater damage than that possible in actual transportation accidents.

Now have you discussed your differences directly with them? And if so, what do they tell you? These were the same differences that existed a year ago.

Dr. HARRIS. Yes. We have expressed our differences to them, and we draw from them in the discussions that we have had with them that the series of transportation accidents that they have simulated or conducted at Sandia had as objectives to assess and demonstrate the validity of ERDA-scale modeling, and calculation programs for predicting damage, and to obtain some quantitative knowledge of extreme accident environments by measuring response of full-scale hardware.

But when we looked at the tests, and as we discussed with them, despite the caveats offered by the previous speaker, the cask was protected from the direct impact with the concrete barrier by the

truck cab and by impact limiters. The tests we don't believe really were designed to test the integrity of the cask.

In the locomotive-truck crash test, the trailer was adjusted vertically so the cask would be just barely struck by the underframe of the locomotive.

The railcar barrier test used an old, obsolete railcar of extremely heavy design. The cask was restrained by hold-down grids and cushioned by impact limiters. And therefore I do not accept the fact that those alleged crash tests achieved the objective of subjecting the cask to the maximum kind of credible accidents that we have.

In the one case where we did challenge them on the effects of fires of longer duration than in their specifications, when they conducted the test as we proposed the lead melted down.

I point out to you that casks can be designed either with spent uranium as a radiation shield, or with lead as a radiation shield. The lead, we have already shown in a test shorter in time than the duration of fires we find in many railroad accidents, did melt down. There had been no tests of this kind, so far as I am able to ascertain, with casks that involved the spent uranium material, which is a very brittle material. And with the kind of deformation that we saw in some of the casks, there is no question that would have fractured and left voids.

That does not speak to the question of breaching of the cask and release of the product, but at least it speaks to the issue that the cask, after these kinds of accidents, has a very great potential of having radiation exposure to personnel around it.

And I mention again that the casks that are currently designed are good casks. I don't doubt that they conform and probably overconform to the present specifications. All I can do is to say, when I look at the present specifications, I can envision casks that would not in fact stand up in railroad accidents.

If NRC proposes to change its specifications and to requalify the casks so as to carry them to a totally greater accident environment, that's one approach that might be taken. I think that's a very costly and very time-consuming approach, and I very much hope that we can find a way to reconcile this difference and to move toward a controlled transportation environment in order to insure safe transportation of these products.

The CHAIRMAN. Well, you make a very impressive case, and we certainly will expect to take this up further with Sandia and with the Department of Energy, as well.

Dr. HARRIS. We stand ready to be helpful in any way we can, Mr. Chairman.

The CHAIRMAN. Senator Schmitt?

Senator SCHMITT. Thank you, Mr. Chairman.

Thank you, sir. That is an intriguing statement.

Are you familiar with a recent accident that occurred between Albuquerque and a place called Vaughn, N. Mex.?

Dr. HARRIS. No, sir, I don't believe I am.

Senator SCHMITT. Something like 42 cars derailed in a great deal of fire, primarily because many of the railcars were carrying automobiles and trucks that had gasoline tanks; the gas plus the rubber

in their tires and a whole bunch of other things caused a great deal of fire.

In light of that and probably other situations, do you think that whatever we do hazardous materials ought to have some kind of a separation from other types of potentially hazardous cargo in the train itself?

Dr. HARRIS. With respect to the movement of nuclear materials, our recommendation has been that nuclear material not be moved in a train that has flammable products in it, because we think that's an inappropriate juxtaposition of materials.

Senator SCHMITT. Are there any other high-flammable materials that you think would justify special trains?

Dr. HARRIS. Oh, explosives, obviously, but surely there are certain classes of materials that we have identified in a preliminary way that should be excluded from trains that carry these products. And by controlling the transportation speed, then you have done the whole thing, as far as I am concerned in terms of the technical objectives of compatibility between the specification and the transportation environment.

Senator SCHMITT. Of course in theory at least, many of these potential interactive problems could be overcome by proper cask design. Is that correct?

Dr. HARRIS. I suppose it is possible to imagine a cask design that is impregnable, in the best sense of the word. There are some problems with that kind of concept.

One is weight. We already are at the upper limit of desirable weight for rail transportation of casks.

The second is human error. I don't care how well a cask is designed, it has to be fabricated and it has to be assembled. The fabrication problem can be handled by extreme care, which already is being exercised in the manufacturing plant. The failure properly to dog down a bolt or otherwise to assemble a cask is less subject to effective supervision and there is always that potential risk that has to be recognized, even if the cask were restructured and redesigned.

But I have never advocated redesign of the cask. I think these casks are very good shipping containers.

I think it is possible to achieve the objective of safe transportation in a much simpler and more straightforward manner.

Senator SCHMITT. Has your association researched modern rail accidents and tried to correlate the effects of those accidents on fuel casks, or the waste casks, had they been in the same train, in any systematic way?

Dr. HARRIS. We have done some analysis of the nature of the fires that we do unfortunately encounter on occasion. It is the objective of our department to reduce the number of incidents of this kind, as you can well imagine.

With respect to the examination beyond that, we have not carried out a major group of tests, feeling that there is a simpler and better approach to the problem.

Senator SCHMITT. I don't mean tests, I mean just analysis. The history of certain accidents, what if there had been a waste-carrying canister or cask involved in that accident.

Dr. HARRIS. We have conducted some analysis of accidents and we will be happy to share with you what we have done in this regard.

Senator SCHMITT. We would appreciate that for the record.

Dr. HARRIS. Surely.

[The following information was subsequently received for the record:]

ASSOCIATION OF AMERICAN RAILROADS,
Washington, D.C., September 6, 1979.

HON. ADLAI E. STEVENSON,

Chairman, Subcommittee on Science, Technology, and Space, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, D.C.

DEAR SENATOR STEVENSON: I appreciate the opportunity to present the railroad industry's point of view on S. 535 before the Subcommittee on Science, Technology and Space on July 20. As you are well aware, the railroad industry is deeply concerned about the shipment of nuclear waste materials, especially spent fuel.

In response to a question from Senator Schmitt on the severity of train accidents, I would like to emphasize that as part of our normal duties, members of the Research and Test Department work with train accident data in support of research efforts and to answer specific requests for information. Through these endeavors we have gained considerable knowledge regarding the mechanical and thermal forces generated in train accidents, although we do not have precise quantitative data on forces in trains during derailments.

An analysis of 44 recent accidents (1976-1978) of trains carrying hazardous materials which involved fires revealed that 32 of these fires (73 percent) lasted over one hour, 28 percent burned for more than twenty-four hours, with two of these fires lasting over eight days. Such data cause us to be very apprehensive about moving nuclear casks in regular train service when they are required to withstand fires of only 30 minutes duration.

Our analyses indicate that the number of cars derailed in mainline accidents does not increase significantly at speeds greater than 35 mph. However, the average damage sustained by cars derailed at higher speeds is almost two and one-half times greater than by those which occur at speeds below 35 mph.

We do not know the exact test performance of present casks made for shipment of spent nuclear fuel elements, but we are led to believe that the strength of existing casks exceeds the design requirements by a large increment. However, we have no assurance that future casks or foreign-built casks tendered for rail transport will be constructed to meet more than minimum requirements. Likewise, we have no assurance that the minimum design cask will not be loaded with spent fuel just meeting the 90-day cooling off requirement. Thus, we encourage any action by your Subcommittee to ensure that the transportation environment for movement of casks will not expose the casks to higher forces or fires of longer duration than the design requirements for these casks.

As you know, we have continued to recommend that when spent fuel elements are moved by rail the transportation environment be controlled by moving them in dedicated consists at speeds of no more than 35 mph and with no other commodities in the consist. We also have recommended specific controls on speeds of passing trains.

We commend the Subcommittee's activities in addressing the problem of safe transport of nuclear materials, and offer our assistance in any way possible that will help to achieve this goal.

Sincerely yours,

WILLIAM J. HARRIS, Jr.,
Vice President.

Senator SCHMITT. Also, what is your analysis of the relative appropriateness of lead agency responsibility for the Government in the Department of Transportation versus the Nuclear Regulatory Commission?

Dr. HARRIS. We have recommended that the Department of Transportation—and this is covered in the testimony—be construed as the agency responsible, and we have identified some problems that arise as a result of carving out the cask design responsibility

and assigning that to another agency. I think that of separation functions is probably inappropriate.

Senator SCHMITT. Why?

Dr. HARRIS. Simply because—

Senator SCHMITT [continuing]. DOT can't handle it?

Dr. HARRIS. No, sir. Because the fact that NRC is designated as having the cask responsibility, and DOT the transportation responsibility, puts us in the position that we have been in now for these last several years, in which one agency assumes that another agency speaks only the truth.

And when NRC certifies a cask, there has been very great reluctance on the part of any other agency to look at the issues surrounding that, and to have compatibility between the transportation environment and the cask design. And I think that's an unfortunate and undesirable circumstance to continue in this whole complex issue of effective and safe movement of hazardous materials overall.

Senator SCHMITT. Well, it hasn't been clear yet in the testimony before this committee that the Department of Transportation is going to take the responsibility as seriously as we would like them to. I am not suggesting in any way that the individuals in that Department might not want to take that responsibility. However, it has not been clear, from the testimony we have received, that all the needed authority exists, and therefore legislation is not necessary. It is not clear in fact the Department of Transportation is going to be allowed the personnel, the resources, and the clear administrative authority to do the things that most of us feel must be done in anticipation of future problems. By anticipating them we hopefully will preclude them.

Dr. HARRIS. Well, Mr. Chairman, I understand your concerns. Obviously I have to have the simplistic expectation that if we do create a lead agency and assign responsibilities correctly there will automatically follow appropriations and assignment of personnel, et cetera.

I believe that such a logical and desirable step should be taken and that it will in fact occur.

Senator SCHMITT. Well, there are many who thought the creation of the Department of Energy would work to solve the problems foreseen then, and appropriations have generally flowed, and so far we haven't gotten a solution.

Dr. HARRIS. Yes, Senator.

Senator SCHMITT. So the Congress does have to analyze the past performance, other pressures that exist within an administration and within the Congress itself, before we take the step of actually deciding who should have the lead responsibility.

Dr. HARRIS. All I can do, sir, is to point out what we construe to be a problem that will result if in this particular set of hazardous materials one agency has one responsibility and another another set of responsibilities.

I think this creates potential for problems which we would like to see dealt with in the way that we have outlined in our testimony.

Senator SCHMITT. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Doctor, you have given us an impressive list of advantages arising from special train services. Are there any disadvantages?

Dr. HARRIS. Well, I presume that the bulk of the discussion before the Interstate Commerce Commission and elsewhere has to do with the cost of such transportation. That is an area that I am not accountable for, nor is the Association of American Railroads. We are not involved in the setting of rates. So that issue has to go on outside my own area of competence and responsibility, but I think you will find that is where—

The CHAIRMAN. That would be the issue—the economic disadvantage, the big one.

Dr. HARRIS. That's right.

The CHAIRMAN. How much safer will those shipments really be?

Dr. HARRIS. Mr. Chairman, in my experience and my analysis with railroads of their experience and the movement of dedicated trains, I observe an accident rate that is very close to zero with those kinds of dedicated trains.

On that basis, all I can say is that we simply anticipate safe transportation by those means. And I guess, Mr. Chairman, I don't want to be appearing before this committee after we've had an accident involving a nuclear cask, whether or not there's been a breaching of that cask.

Therefore, I very much want to see us in a position to move these casks without involving all of us in what will happen if there are accidents involving those casks.

The CHAIRMAN. What you're saying really is that you think you could perhaps arrive at a zero accident rate with the dedicated train, whereas without a dedicated train you would be subject to the same percents that accidents occur now, the same accident rate that occurs now.

Dr. HARRIS. That is precisely my concern and our concern, and the basis on which this kind of approach has been recommended.

Beyond that, regular trains operate under circumstances, as I said before, that can expose a cask to conditions greater than the test and design conditions set for qualification by the NRC.

The CHAIRMAN. Do you think that the Federal Government ought to preempt the field in the transportation of the nuclear waste? Or should that be a joint operation with the State and local governments?

Dr. HARRIS. Mr. Chairman, I am sure the State and local governments have views that should be taken into account by the Federal Government, but I am absolutely sure as I sit here that if we do not have a single set of regulations that apply uniformly across this country, that we will have a very great deal of difficulty in moving these important articles of commerce.

I believe therefore there should be—there almost must be—Federal preemption of regulations for effective commercial transportation of these products.

The CHAIRMAN. You heard Mr. Jefferson's testimony when he indicated that, in some instances because of local rerouting requirements, the hazard was really increased rather than decreased?

Dr. HARRIS. Yes, sir, and I have also made that observation in other testimony in terms of other products. We can observe that

the rate of accidents increases when you move onto branch lines, in contrast to main lines. And therefore the routing has to be done in a very balanced way.

There are routings that appear to reduce hazard that actually can increase it. There's no question about that. But in some appropriate judgmental way I am confident there can come agreement on a routing which achieves the basic objectives which are safe transportation.

The CHAIRMAN. Senator Packwood?

OPENING STATEMENT BY SENATOR PACKWOOD

Senator PACKWOOD. Mr. Chairman, I have an opening statement for the record.

Mr. Chairman, I would like to commend Senator Schmitt for the valuable initiative he took when he introduced the Nuclear Waste Transportation Safety Act of 1979. The safe transportation of radioactive materials is a problem of importance to the Nation as a whole and of special concern to the people of Oregon.

Three-quarters of the Nation's military high-level waste is in so-called temporary storage at the Department of Energy's Hanford Reservation, just a few miles from the Oregon border. Literally millions of gallons of highly radioactive waste will either have to be permanently disposed of at Hanford, near the Columbia River, or safely transported to some permanent disposal site. Between 1958 and 1973, there were 16 different leaks of high level waste, at Hanford, releasing a total of 423,500 gallons of highly radioactive nuclear waste into the environment. In June of 1973, 115,000 gallons of high-level waste was allowed to leak out into the ground.

Considering this appalling record for stationary storage of nuclear waste, it is not surprising that the people of Oregon are concerned about the prospect of large scale movements of highly radioactive materials from Hanford.

In addition to the military waste that is generated at Hanford, various types of low-level nuclear waste are shipped through Oregon on its way to the Hanford burial ground.

The bill under consideration by the Commerce Committee today would designate the Department of Transportation as the lead agency to have the ultimate responsibility for radioactive materials transport and require the Department to devise an emergency response capability to deal with accidents and sabotage. The people of Oregon have a right to demand that one agency take the ultimate responsibility for the health and safety consequences of radioactive shipments through their State. The lines of responsibility must be clearly drawn if this Nation is to safely transport these hazardous materials.

During an earlier hearing, the Department of Transportation's lack of specific information concerning shipments through Oregon indicated that no one would be in charge in case of a serious accident. These and other issues will be thoroughly explored during our hearing on S. 535.

My greatest concern is that S. 535 does not go far enough. I feel that the coverage of several sections of the bill should be extended to include all radioactive material and not just commercial spent fuel. Instead of asking the Department of Transportation to make

recommendations of routing guidelines, the Department should be required to impose routing requirements for the more dangerous shipments, which avoid large population centers whenever possible.

Mr. Chairman, I would be interested in the comments witnesses might have on these two points because I am considering offering amendments to strengthen provisions of S. 535 along these lines.

If Mr. Jefferson is still in the audience, I would be curious about his comments about what Mr. Harris has said about the safety of the cask.

The CHAIRMAN. No, I think Mr. Jefferson left.

Senator PACKWOOD. He's in the audience!

The CHAIRMAN. Is he? Oh, he is still here; I'm sorry.

Senator PACKWOOD. Would you mind if he commented on Dr. Harris's statement?

The CHAIRMAN. Mr. Jefferson, did you hear the question posed?

Mr. JEFFERSON. Yes, sir.

Dr. Harris made a number of statements. I would be particularly interested in concentrating on the ones that you felt were the most important, so if you would elaborate I would appreciate it, sir.

Senator PACKWOOD. Well, specifically, that the spent fuel casks are not designed to a standard sufficient to guarantee their integrity during the conditions that might be involved in many railway accidents. Specific concern has been expressed that many railway accidents involve long exposure to intense fire.

Mr. JEFFERSON. Dr. Harris and I, as he has indicated, have discussed this on numerous occasions. I think that perhaps the best thing I can do is approach it from two standpoints:

First, the impact environment; and

Second, the fire environment.

The impact environment calls for, as Dr. Harris pointed out, a 30-mile-an-hour impact onto an unyielding surface. Now it's the unyielding surface that creates damage equally as much as the velocity involved.

We have done tests—and I will call on Senator Schmitt's memory of the terrain around Edgewood, N. Mex.—we have done tests where we dropped casks from heavylift helicopters from an altitude of 2,000 feet onto the desert floor.

Those casks impacted the ground at about 235 miles an hour, and penetrated the clay-like soil approximately 4 feet. The damage that was created by that test was significantly less than the damage created on an identical cask dropped 30 feet onto an unyielding surface.

Senator PACKWOOD. What do you conclude from that?

Mr. JEFFERSON. I conclude from that that the tests that are contained in 10 CFR 71 are indeed severe tests, and they do indeed provide an environment creating damage equal to or greater than that which you would expect in a transportation accident.

Senator PACKWOOD. Well, are you assuming that dropping this cask which hits the sand at 235 miles an hour is a tougher test than an unyielding surface at 30 feet?

Mr. JEFFERSON. No, it is not as tough a test.

Senator PACKWOOD. I am confused by your answer. I don't see the relevance of your statement.

Mr. JEFFERSON. We were trying to correlate between real targets and this imaginary unyielding target.

Senator PACKWOOD. Well, but I sensed that Dr. Harris and the railroads are talking about real targets, also, and real wrecks, and real fires.

Mr. JEFFERSON. That is correct, sir.

All I am saying is that in the impact area our studies would indicate that the regulatory tests now required are equivalent to impacts under accident conditions, where you don't have unyielding surfaces, that occur at velocities two to three times those that the actual impact takes place in the test.

In other words, you're testing to an equivalent of something on the order of 60 to 90 miles an hour.

Now in the fire test that Dr. Harris talked about, in which we subjected a cask, a rail cask, to a fire, several important features are involved in that test, one of which is that the cask was supported 4 feet off the surface of the liquid with nothing in between, in order to get the maximum heat input.

In a rail accident in which the cask is probably the heaviest piece of equipment around, with the possible exception of the locomotive, it's not going to end up suspended 4 feet above the ground, or above whatever fuel source you have.

Second, as he pointed out, we burned that fire for 2 hours—2 hours and 3 minutes to be exact—and in about an hour and a half we had completely melted all the lead in the cask. At about 100 minutes, we developed a crack in the cask. Now that crack is about 6 inches long and about five/one-thousands of an inch wide. From that crack we did exude some lead.

Two hours into the fire, the supporting structure that was holding the cask up—it consisted of the railcar and concrete pylons—the metal portions of that structure became so heated and so soft that the cask rolled over on its side.

Now we had, for instrumentation purposes, drilled holes into the cask at the top surface. So when the cask rolled over, it ripped all of that instrumentation out and exposed those holes, in addition to the crack that was created, lead poured out of those holes.

The unit at that time was up around 900° F. It cooled by itself; we didn't put any water on it or anything. And when it was all over, the combination of the leakage of lead attributable to the crack, as well the lead that poured out of that series of holes along the top surface which are now at midplane, reduced the shielding thickness on the top of the cask, or the top surface as it lay in the pan now, by about 3 inches.

Now that was not sufficient to create any large problem as far as radiation shielding goes. It would certainly have increased the radiation level, but it would not have increased it beyond that allowed by the current regulations in case of an accident.

Senator PACKWOOD. Dr. Harris, let me ask you this: Do I conclude from your statement that you were saying that the tests run to date were not sufficient for what could be an extraordinary railroad accident or fire?

Dr. HARRIS. Yes, I believe that's the case.

Senator PACKWOOD. And, Dr. Jefferson, you're saying that they are?

Mr. JEFFERSON. Yes, sir, and Dr. Harris and I have, as I said, discussed that on numerous occasions.

[The following information was subsequently received for the record:]

SANDIA LABORATORIES,
TRANSPORTATION TECHNOLOGY CENTER,
Albuquerque, N. Mex., July 25, 1979.

Dr. MIKE CRISP,
Minority Staff, Senate Committee on Commerce, Science, and Transportation, Dirksen Office Building, Washington, D.C.

DEAR MIKE: One of the comments I should have made, while Senator Packwood was pursuing questions concerning Dr. Harris' testimony (American Association of Railroads), is the following.

Another consideration involved in evaluating the risk from railroad accidents is the frequency and severity of those accidents. For instance, studies that Sandia has performed indicate that almost 75 percent of all railroad collision accidents occur at speeds below 15 mph; 95 percent of all railroad collision accidents occur at speeds below 40 mph. Thus, while the damage created on fragile box cars and thin tank cars appears to be considerable, these damages are not comparable to those that would be incurred upon the very rigid structures used to haul spent fuel. Similar arguments can be put forward for fire environments. In comparing the results of the fire test conducted on the spent fuel cask, it was found that total melt of the lead did not occur until approximately 90 minutes into the fire. From data collected on rail accidents, we find that approximately one fire in 1,000 exceeds a duration of 90 minutes. It is also useful to point out that in only about 10 percent of all the collision or derailment accidents is a fire involved at all. Thus, the probabilities for extremely long fires, although they do occur, is quite low. Further, it is generally conceded that extremely long fires are fueled by lower temperature sources; therefore, the total time/temperature product which is important in causing damage to the cask is still below that value reached in the Sandia fire test. As if this weren't enough. There are a number of other considerations involved, including the fire geometry. If a cask were laying on the ground with the fire around it it would have one surface (that is the one next to the ground) at a lower temperature than the other surfaces, thus reducing the total thermal input to the cask.

I hope this additional information is helpful in evaluation Dr. Harris' testimony and would appreciate its inclusion in the hearing record.

Sincerely,

ROBERT M. JEFFERSON,
Manager,
Nuclear Materials Transportation
Technology Department 4550.

Senator PACKWOOD. OK, I have no other questions.

Thank you.

[The statement follows:]

STATEMENT OF DR. WILLIAM J. HARRIS, JR., VICE PRESIDENT FOR RESEARCH AND TEST, ASSOCIATION OF AMERICAN RAILROADS

My name is William J. Harris, Jr., and I am Vice President of the Association of American Railroads in charge of the Association's Research and Test Department. The Association is a voluntary, non-profit organization composed of railroads operating in the United States, Canada, and Mexico. Its members annually log 92 percent of the railroad mileage and produce 97 percent of all railroad revenue in the United States.

I am a registered professional engineer. My Doctor of Science Degree, awarded by the Massachusetts Institute of Technology, is in metallurgy. Prior to assuming my present position with the railroads, I served as head of the Ferrous Alloys Branch of the Naval Research Laboratory in Washington, D.C., Executive Secretary of the Metallurgical Advisory Board of the National Academy of Sciences, and Assistant Director of the Columbus Laboratories of Battelle Memorial Institute. Additionally, I have been President of the Engineers Joint Council, President of the Metallurgical Society of the American Institute of Mining and Metallurgical Engineers and Chairman of the National Materials Advisory Board of the National Academy of Sciences. In 1977 I was elected into membership in the National Academy of Engineering.

My testimony on the subject of safety in the transportation of radioactive shipments will take the form of responses to the six questions put to me by the Chairmen of the Subcommittees holding these hearings.

Question 1. Do you concur in the necessity to establish a lead agency for regulation of transportation of nuclear materials? Is the approach taken in Section 2 of S. 535 the preferred one? If not, please indicate preferred alternatives.

The railroad industry agrees that it is necessary to establish an agency with primary responsibility for regulating the transportation of radioactive material. Unifying the regulatory responsibility encourages consistency in regulation which is necessary to insure safe and efficient transportation, and it provides a primary data source in case of emergency. We also agree with the designation of the Department of Transportation as the lead agency for regulating the transportation of radioactive shipments. The DOT is most familiar with the problems involved in transporting hazardous materials. With appropriate consultation with the Nuclear Regulatory Commission, DOT can extend the experience gained with other hazardous materials to the safe transportation of radioactive materials.

We are concerned, however, by the division of responsibilities established in Section 5 of S. 535. Section 5 perpetuates the present assignment of regulatory responsibilities by carving out of the responsibilities assigned to DOT the responsibility for regulating and certifying the safety of shipping casks and packages. This division of regulatory responsibilities has been an impediment to achieving the safest possible transportation of radioactive materials, and we fear that the new Section 115(a) proposed in Section 5 of the bill will continue that impediment.

The nature of cask design cannot be divorced from transportation safety. A cask is designed to withstand a specific set of forces and conditions. Present NRC requirements are written in terms of the ability to withstand specified conditions, to wit:

1. a 30-foot drop onto an unyielding surface;
2. a 42-inch drop onto a 6 inch diameter rod;
3. exposure to a fire at a temperature of 1,475°F for 30 minutes; and
4. Immersion in 3 feet of water for 8 hours.

We in the railroad industry do not question that the NRC certified casks can withstand these conditions. However, this specification of conditions which a cask must be able to withstand does not insure compatibility with actual operating conditions.

The test criteria used to qualify the casks have never been shown to represent adequately the full range of mechanical or thermal conditions which could result from a railroad accident. A comparison of the cask qualification criteria with actual operating conditions indicated that the forces generated in the 30-foot drop test are approximately equivalent to an impact at 30 mph and that the 42-inch puncture test is approximately equivalent to an impact at 12 mph. Since a cask transported in ordinary train service could be exposed to greater speeds, the forces that the cask might experience in an accident could be considerably greater than that for which it was designed.

In addition, the threat of a fire of extended duration is always present in a railroad accident. Because of the time-consuming and difficult process to get fire fighting equipment to the scene of the accident. In some cases to protect the safety of personnel, fires are allowed to burn out. A fire of 30 minutes duration at 1,475°F is probably not sufficient to seriously damage a spent fuel cask. However, the railroads estimate that the lead shielding would become molten in one-and-a-half to two hours in a fire of about 1,475°F. This estimate has been confirmed by an Energy Research and Development Administration test conducted by Sandia Laboratories. In that test an empty cask was submerged in a pool fire. The lead became molten, leaving unshielded areas, in less than two hours. This happened despite the fact that the cask used in the test was empty and, thus, not exposed to internal as well as external heat.

The railroads are genuinely concerned that the tremendous forces generated in a train accident would either rupture a spent fuel cask; destroy the shielding by either shattering the brittle spent uranium shields; or as a result of a fire melt the lead shielding.

The railroads have long advocated that the most efficient way to prevent casks from being exposed to stresses greater than those for which they were designed is to control the operating environment to insure that the spent fuel casks will not be exposed to an accident environment greater than that for which they were designed thus minimizing the danger of radioactive release. This requires reducing speeds and eliminating the possibility of fires of long duration.

The AAR Board of Directors on March 29, 1974, adopted and transmitted for voluntary consideration by individual railroads, the following statement of position:

Shipments of casks containing irradiated spent fuel cores should move in special trains containing no other freight, not faster than 35 mph. When a train handling these shipments meets, passes or is passed by another train, one train should stand while the other moves past not faster than 35 mph.

As the AAR Board of Directors realized, control of the transportation environment necessary for safe transportation of nuclear wastes could only be attained by carriage of this material in dedicated train service. Among the advantages foreseen for such services are: (1) Reduced running speed, (2) reduced switching and less movement in yards, (3) increased ability to control speed, acceleration and deceleration, (4) far shorter total transit time because of less switching and avoidance of yards, (5) reduced mass of the train, (6) the stopping of one train to permit another to pass, (7) the non-inclusion in special train consists of other hazardous materials, particularly combustibles and explosives, (8) special routing to avoid bad trackage, high-population areas and freight yards where cars containing other hazardous materials, including combustibles and explosives, may be present, (9) increased opportunity for observation and control by train crews due to the shorter length of the special train, the lower noise level, and lower dust levels, (10) the general tendency of train crews to be alerted to the special need for caution on special freight trains, (11) the presence in special trains of only the best rolling stock, (12) reduced free slack in the train, which lessens shock loads due to run-in and run-out (13) reduced tendency to cause failure in the track structure, (14) reduced likelihood of coupler failure and trainline air hose failure, (15) reduced time of train in grade crossings, (16) elimination of hazards or derailment possibilities caused by other cars in train, and (17) reduced exposure of employees to radiation present even in a perfectly operating cask.

In response to the statement of position issued by the AAR Board of Directors and because of their real concern for the vulnerability of spent fuel casks to stresses possibly generated in railroad accidents, several railroads published tariffs requiring spent nuclear fuel to be transported in dedicated train service. The rates charged under these tariffs were challenged before the Interstate Commerce Commission, and the I.C.C. found that the rates were unreasonably high and, thus, unlawful. *Radioactive Materials, Special Train Service, Nationwide*, — I.C.C. — (1978). The ultimate rationale for the I.C.C.'s decision was the full faith and credit accorded the NRC's certification of cask safety. The I.C.C. refused to second guess the determination that no further safety precautions were necessary.

The railroads are concerned that passage of Section 5 of S. 535, without comment by Congress, will perpetuate the absolute deference paid to the NRC's certification of cask safety by its sister agencies. In fact, NRC has recently acknowledged that spent fuel casks could be vulnerable in certain circumstances with serious adverse consequences to the public. In the recent rulemaking relating to physical protection of irradiated reactor fuel in transit, NRC stated that "a high explosive assault on a spent fuel cask" has the potential for "serious radiological consequences." 44 *Federal Register* 34467. We believe that the forces to which a cask could be exposed in the railroad accident environment are potentially as great as those generated by "a high explosive assault."

Significantly, NRC has responded to the potentially serious radiological consequences of a high explosive assault not by changing the cask design specifications, but by attempting to control the transportation operating environment—the same response as the railroads have advocated and continue to advocate. The NRC rules direct licensees to route shipments to assure a minimum number of stops and to avoid populated areas, to arrange with law enforcement agencies along the route for emergency response, and to provide specially trained escorts.

The railroad industry believes that they should not be prevented from requiring dedicated train service—i.e., controlling the transportation environment in the same way as NRC—to prevent casks from being exposed to forces as great as a "high explosive assault," simply because NRC has certified that the casks have met its safety specifications. Railroads should be permitted to exercise their considerable expertise to require additional precautions needed to assure safety under practical railroad experience.

Finally, nothing in my foregoing comments should be taken as indicating that the railroad industry is receding from its established position with respect to dedicated train handling of radioactive materials shipments. We firmly believe that dedicated train service is the best method available to assure the safe railroad transportation of radioactive materials in the real world operating environment.

Question 2. Should a separate office be set up within the DOT with overall responsibility for fulfilling the intent of Section 2 of S. 535?

The railroad industry thinks that the responsibility for regulation of the transportation of nuclear waste and radioactive commercial spent fuel should not be placed in a separate office within DOT. The purpose of Congress stated in S. 535 is to enhance safety and simplicity in the regulation of the transportation of radioactive shipments. Radioactive materials are only one of a large number of hazardous materials transported by the railroads. The responsibility for regulating the transportation of all hazardous materials is presently lodged in the Materials Transportation Bureau of DOT. Both safety and simplicity are enhanced when a single agency, such as MTB, regulates all hazardous materials in a consistent fashion. The simplicity of a single, consistent regulatory scheme is obvious to all.

In order to respond to any emergency involving hazardous materials, a carrier must know immediately what material is involved. A rudimentary knowledge of the type of hazardous material involved is conveyed by placarding rail cars containing hazardous materials, and it is important that the placarding system be simple and uniform so that railroad employees can identify placards instantly. Such a placarding system is now prescribed by DOT in 49 CFR Part 174.

A more detailed knowledge of the hazardous material involved in a transportation emergency situation is conveyed by the use of a numeric coding system. The railroad industry, together with the shipping community, has developed the 49 Series of the "Standard Transportation Commodity Code" (STCC)¹ to facilitate rapid identification of hazardous materials. Each commodity in transportation is assigned a seven digit STCC number of I.C.C. reporting purposes, and in addition, hazardous materials are also set forth in the 49 Series. The number "49" identifies the commodity as a hazardous substance and the next five digits provide a discrete identification system. For example, "Butadiene inhibited (butadiene from petroleum)" is assigned the STCC number 4905704, while "Butadiene inhibited (butadiene from alcohol)" bears the STCC number 4905705.

The 49 Series system has been in use by the railroads for several years, and its advantage in emergency response situations has proven beneficial. Many railroads have placed emergency response information aboard their trains. This has been accomplished by either generating the information from the AAR's "Emergency Handling of Hazardous Materials in Surface Transportation" directly on train consists for the specific cars handled in train, or by placing the hardcopy book in the caboose. Current and future issues of "Emergency Handling of Hazardous Materials in Surface Transportation" include a STCC/Page Number Index to allow access to the response information if only the STCC code is available. In addition, many railroads have placed the response for each material in their computers so that the information can be furnished on demand to emergency response agencies.

The DOT is currently considering adoption of a less precise numeric coding system as part of its regulations, and the railroad industry has urged the Department to adopt the 49 STCC system instead. A uniform numeric coding system covering all hazardous materials (including radioactive materials) is important to an effective emergency response, and regulation of all hazardous materials by one agency will help insure uniformity.

Regulation of all hazardous materials by a single agency would encourage the response plan for emergencies involving radioactive shipments to be consistent with the response plans for dealing with other transportation emergencies. If the response plans are consistent, then the very small number of nuclear emergencies could be handled by groups experienced in emergency management as a result of responding to accidents involving other hazardous materials. Only selected features of the response, as required by the special characteristics of nuclear materials, need be different.

Question 3. To what extent, or with respect to what activities, should existing division of responsibility between the DOT and other Departments and the NRC, whether attributable to past practice or to specific enabling legislation, be revised to permit the DOT to fulfill the intent of Section 2 of S. 535?

In my response to Question 1, I have discussed the division of responsibility between DOT and NRC for regulating operating conditions and cask design. The railroads believe that the best way to insure safety in the transportation of radioactive shipments, given the characteristics of existing spent fuel casks, is to control the transportation environment. The railroads attempted to do this by reducing spent nuclear fuel to move in dedicated train service. We have been thwarted in this effort, however, because sister agencies have been unwilling to question the invulnerability of casks certified by NRC, even though, as NRC explicitly recognized

¹ The Standard Transportation Commodity Code was published by the railroads in response to an action of the Interstate Commerce Commission requiring the use of a numeric code for reporting carrier freight commodity statistics.

in its recent rules, the casks might not be invulnerable in all circumstances. Placing all regulatory responsibility in one agency might be one way to harmonize cask design and transportation conditions. Other solutions might exist which are, as yet, unexplored. The railroad industry remains ready to provide whatever assistance it can to this Subcommittee in its efforts to solve this problem.

Question 4. What radioactive materials should or should not be encompassed by S. 535?

It is the position of the railroad industry that all radioactive materials present a potential danger to the public and warrant the exercise of proper care in transportation. All radioactive materials should therefore be covered by the Hazardous Materials Transportation Act which S. 535 would amend. We believe that Section 3 of S. 535, which expands the terms defined by the Hazardous Materials Transportation Act, accomplishes this purpose and is needed to effectuate the stated goal of enhancing the safety and simplifying the regulation of the transportation of radioactive materials.

Question 5. Should other Sections of S. 535 be amended the better to fulfill the intent of the bill as stated in Section 2? Explain.

The railroad industry believes that the new Section 115(b) of the Hazardous Materials Transportation Act, proposed in Section 5 of the bill, should be amended to include railroads as an integral part of any emergency response plan. In instances where a radioactive shipment is involved in a rail accident, railroad employees are invariably first on the scene and the first to know what types of hazardous materials are involved. In order for any emergency response program to be effective, these railroad employees must be taught how to react to the situation and how to interact properly with the various Federal, State, and local officials who will also be responding to the emergency. Accordingly, we believe that the new Section 115(b) should be directed specifically to include rail carriers as part of the emergency response plan he will develop. Rail carriers must be part of the educational program; they must have a definite role in the response program; and they should receive adequate funding and other assistance as part of the program. Only then can the Secretary's emergency response plan hope to be effective.

The new Section 115(b) requires the formulation of a national emergency response plan to deal with transportation emergencies involving nuclear waste, commercial spent fuel, or other radioactive material. As I mentioned before, the Congressional purpose stated in Section 2 of S. 535 will be enhanced if the response to emergencies involving radioactive shipments is consistent with the response to emergencies involving other hazardous materials and, further, if the both sets of emergencies are answered by the same personnel. Therefore, we recommend that any emergency response plan which the Secretary develops be expanded to include response to emergencies involving any hazardous material, not just radioactive material.

Many other hazardous materials present a threat to the public health and safety, and many of them are shipped in large quantities. Additionally, although the response to an emergency involving each hazardous material differs in some respects, there are many points of similarity; so the experience gained in responding to one accident involving hazardous materials is of great value in responding to an accident involving different hazardous materials. Thus, it makes good, practical sense to develop an emergency response program which covers all hazardous materials.

Finally, the railroads believe that the proposed Section 109(e)(8) in Section 6 of the bill should be amended to eliminate any implication that State and local governments might have the authority to impose their own restrictions on radioactive shipments in addition to those of DOT. Railroads operate in and through many jurisdictions, and they quite simply cannot physically contend with a multiplicity of State and local regulations. The DOT regulations should be adequate to insure safe transportation of radioactive shipments in all jurisdictions. Those regulations must preempt State and local regulations, or transportation of radioactive materials could be forestalled entirely.

Question 6. Do the newly proposed rules of the NRC dealing with routing and security appear necessary, desirable, or adequate? Discuss the degree to which they complement or conflict with routing guidelines contained in rules proposed by the DOT in August 1978.

The railroad industry fully supports both the NRC and DOT in their respective determinations that additional safeguards for spent fuel shipments are necessary to protect health and minimize danger to life and property, and that there exists a need for consistent rules preempting conflicting local requirements covering transportation requirements for radioactive materials.

On the other hand, the railroads are not in a position to address specific comments to either of the government's proposed rules. The interim rule published by the NRC applies only to the class of "licensees" subject to NRC authority. It does not, therefore, directly affect rail carriers. And the proposed regulations Noticed by DOT on August 17, 1978, do not extend to the railroads but are applicable to highway carriers of radioactive materials.

Senator PACKWOOD [presiding]. Next we will hear Richard Pollock.

STATEMENT OF RICHARD POLLOCK, DIRECTOR, CRITICAL MASS ENERGY PROJECT, WASHINGTON, D.C.

Mr. POLLOCK. Thank you very much, Mr. Chairman.

I would like to submit my full statement for the record, and I would just like to summarize my comments, if I might.

Senator PACKWOOD. Pull that microphone a little closer so they can hear you in back.

Mr. POLLOCK. Surely.

Thank you very much for the opportunity to testify before this committee. For a number of years we have been involved in the area of the transportation of radioactive materials. I myself served as an advisory task force member to Sandia Laboratories on their task force concerning the transportation of radioactive materials through urban areas.

Myself and Dr. Ida Hoos, from the University of California, also supervised a social impact statement or study concerning the transportation of radioactive substances. That particular social impact study for Sandia Laboratories is now in the process of its final stages of completion.

We have also been involved in the areas of filing rulemaking petitions, particularly before the Nuclear Regulatory Commission, on the transportation of radioactive materials. We have been involved in one other area which I hope that this committee will consider—and that is, the transportation by air of weapon-grade nuclear material known as special nuclear material.

Quite frankly, it's extraordinary for our organization, a consumer organization, to discover that 30 years after the birth of the nuclear age, that there appears to be no single Federal entity—no Federal Government authority—that has devised clear rules for the shipment of radioactive materials.

And I might add that once a commodity has left the jurisdiction of a licensed nuclear company, it is a free commodity on the road, and in our opinion it is a commodity free to cause public injury or property damage.

That is why, Mr. Chairman, that we find that States and cities have been compelled to enact certain types of restrictions and regulations for the local routing of radioactive materials.

The fact of the matter is that once a material is on the road, neither the Interstate Commerce Commission, the Nuclear Regulatory Commission, nor the Department of Transportation, has enacted any form of oversight to make sure that the packages are in fact in compliance with the law; that the routes are the safest routes that are being undertaken; and that in general public health and public safety is of utmost consideration while it is being transported over rails, over our highways, and through our airports.

Earlier this year, our organization published a report of the number of accidents involving radioactive materials over the last 5 years.

This compilation was based on Department of Transportation data that we obtained under the Freedom-of-Information Act. It is quite clear from this data that the mishaps, or the number of accidents involving radioactive substances are increasing in frequency.

In 1974, approximately 1.2 nuclear-related accidents each week were being reported to the Department of Transportation. In 1978, that nearly doubled to 1.9 accidents or close to 2 radiological transportation accidents each week are being reported to the Department of Transportation.

And it is interesting to note that the Department of Transportation readily admits that most accidents involving hazardous materials go unreported; that only about one-third of all accidents are reported to the Department of Transportation.

In the last 5 years there have been over 300 accidents involving radioactive materials—328 to be precise—of which about one-third, 118, involved the release of radioactive substances.

We believe that if one was to extrapolate on the basis that only one-third are being reported, we're talking about between 1,000 and 1,100 accidents over the last 5 years. The fact of the matter is, Senator Packwood, that we know that the number of shipments related to the nuclear fuel cycle are rapidly increasing. So that we can expect that there can be a larger number of accidents in the near future as more shipments are going across our highways, over our rails, and through those airports.

Senator PACKWOOD. Question. Are these statistics on the spent fuel shipment or are they on low-level waste shipments going specifically to those three commercial storage sites in Nevada, South Carolina, and Washington?

Mr. POLLOCK. They involve all forms of radioactive materials, including spent nuclear fuel. Some of them did go to South Carolina, Beatty, Nev., and elsewhere in the country. Some of it was low-level radioactive waste material that mainly went to those burial sites; some was spent nuclear fuel such as foreign spent fuel that we've been importing into this country; some of it involved radiopharmaceuticals that had been already used, et cetera.

So it was the whole spectrum of different radioactive materials.

Senator PACKWOOD. Where specifically are we storing the spent fuel from the generating plants?

Mr. POLLOCK. Well, of course the current solution for the most part is on-site storage at each individual nuclear power reactor site.

Senator PACKWOOD. Which we're running out of.

Mr. POLLOCK. Which we are running out of. I might add that, from a planning point of view, it was quite clear to the nuclear industry in the early 1970's that the notion of reprocessing of spent nuclear fuel to extract plutonium and uranium and try to recycle this was a process, a commercial process, which was not profitable.

Nuclear Fuel Services, General Electric, Allied General, other companies, indicated that this would not be a profitable enterprise at this time. Many utilities created on-site spent fuel pools on the

assumption that they would be able to move this spent fuel out to these reprocessing centers, and they've been building up in the pods ever since.

So there is great congestion there. We have urged the utilities to construct other spent fuel pools on their sites. There would be relatively very little regulatory redtape in doing this, because the site itself has already been approved. There would be no requirement for an environmental impact statement or anything of this sort.

Senator PACKWOOD. Let me ask you a question. We have one nuclear powerplant in Oregon.

Mr. POLLOCK. The Trojan plant.

Senator PACKWOOD. Yes, the Trojan plant. They have run out of space, or they are soon to run out of space for spent fuel storage and cannot get permission from the State for an increase. What are they to do?

Mr. POLLOCK. Well, I believe—I am not fully familiar with the Trojan case, but I do believe that what the Portland General Electric Co. has proposed is that the existing spent fuel pool be allowed to have more spent fuel assemblies than the original Federal license had permitted. This is called compaction.

And I don't think that there would be any objection to Portland General Electric building a second spent fuel pool on site so that the number of fuel assemblies would be as close together as they would be under the original license plan.

Now this compaction issue I think is the question in general that has raised a good deal of concern. The General Accounting Office has indicated that the Nuclear Regulatory Commission appears to be rubber-stamping many of the appeals or requests to amend the license in this area.

I think that if Portland General Electric would not go the compaction route, where I believe they're tripling the number of spent fuel assemblies in a single pool than originally the license had permitted, if they had elected to build a second pool, I think that would be a satisfactory and environmentally acceptable solution to the buildup at that site.

Senator PACKWOOD. Would you prefer that? With all of our nuclear plants in the country, would you prefer to the store-spent fuel onsite rather than transporting the spent fuel to a central, or to two or three centralized storage depots?

Mr. POLLOCK. Yes, we would. We believe that one of the most vulnerable pathways concerning radioactive materials is the transportation route. We would like to keep this material on site until there was a final or permanent repository for the disposal of spent nuclear fuel.

And hence, we have told the Federal Government, the Carter administration, that we have been opposed to the development of an away-from-reactor storage site or temporary storage site. We believe that there would be unnecessary public risk in trying to transport this material, in some instances thousands of miles, over very tough terrain, through urban areas, over waterways, over roadways which might not be adequate.

Senator PACKWOOD. But at some stage you want a central repository, and then we are going to have to transport it all there.

Mr. POLLOCK. This is correct. Ultimately this material will have to be transported, but the Carter administration has proposed we have an interim central storage facility, so you'll have twice as much shipments—once from the site to the actual interim storage facility; and then from the storage facility to a permanent repository.

We believe there should be only one shipment for this material. We also find particularly objectionable—and it has not occurred in your State, Mr. Senator, but it has in others—the notion of transferring spent fuel from one reactor site to another, sort of a set of musical chairs concerning spent fuel. And we believe that, again if there is mounting spent fuel on a site, that they should build a second pool on the site itself and not move the stuff as they're doing in South Carolina, North Carolina, at the Duke facilities, and which the Virginia Electric Power Co. would like to do in Virginia concerning the Surry Nuclear powerplants and the North Anna plants.

Senator PACKWOOD. Let me ask you a further question, and then I won't interrupt for a moment.

Should the Federal Government have the right to preemptorily decide where the site would be for ultimate storage, whether or not the State wants the site?

Mr. POLLOCK. Well, I believe that the final decision about the choice of a site carries with it a tremendous amount of public health and safety implications. The people that live within the boundaries of that State, or within the area concerning where that facility is located, will be exposed to greater risk potentially than those who are not.

Hence, we believe that there needs to be agreement from the State that in fact the State has evaluated the site technically, and that they are satisfied that it is a safe site.

The history concerning States rights issues, so to speak, as it's called, with radioactive waste, stems from the fact that on a number of occasions the Federal Government undertook sites that were deemed, after the States intervened at the 11th hour, to be deficient.

One of the greatest examples of that was Lyons, Kans., in 1966, where the Atomic Energy Commission moved in and wanted to use that area as an experimental site for the storage of radioactive spent fuel and other radioactive waste materials.

The Kansas State Geological Survey protested on a number of occasions and wanted to evaluate independently that site. Finally, after the intervention by the Governor of Kansas, the Atomic Energy Commission permitted an examination. And what the Kansas Geological Survey discovered after presumably exhaustive AEC studies, was that that site was, in their words, "swiss cheese."

And the Atomic Energy Commission at that point retreated and decided not to use the Kansas site. I think every State wants to have independent testing, because it not only affects their current citizens, but future generations as well.

Senator PACKWOOD. But would you give the State an absolute right of veto, for whatever reason?

Mr. POLLOCK. I believe that if on technical grounds the State decided that it was an unacceptable site, that they would have the right ultimately of veto.

Senator PACKWOOD. Then you think it should be decided on political grounds.

Mr. POLLOCK. Well, I believe——

Senator PACKWOOD. To give you an example consider what might happen in Oregon. If indeed the state wanted to give permission, there would be an initiative petition which would easily gather sufficient signatures to put the issue on the ballot, "Do you want a storage site in Oregon?" It has nothing to do with technical safety or anything else. And that proposal would be rejected overwhelmingly.

Mr. POLLOCK. Yes.

Senator PACKWOOD. Should a State have that right?

Mr. POLLOCK. I believe that at least until all other sites themselves are exhausted, that if the population within a State desires to prohibit the installation of a radioactive waste storage site, that that veto right should prevail.

It's a very tough decision to make, for sure; but one other concern that we have—and this was one of the reasons why we are concerned about the New Mexico site—is that the Department of Energy, or the Nuclear Regulatory Commission, for political or expeditious reasons, might choose to locate a facility for political reasons also in a particular area, and not because it is technically the most proficient.

And so we certainly do have a controversy here, and a political football of some sort, and I believe that ultimately we are going to have to look at the political process now.

Perhaps down the road there may have to be Federal intervention.

Senator PACKWOOD. I think it is not beyond the realm of possibility that every State would reject it. It might be on a one-at-a-time or twice, two-States-a-year basis, in which case you would have a long process before you would finally come to Federal preemption, but I can foresee the possibility of every State rejecting a site in their State.

Mr. POLLOCK. I believe that that is conceivable, but I believe that it is important at least in this stage to allow the maximum amount of State participation and the ability to exercise their rights to do what they believe they must do to protect their citizens.

Ultimately there may have to be another solution, if that eventuality should occur or if all of the States where there was acceptable sites had in fact vetoed it. We would not be in favor of course of just going to an inferior site because that State permitted the installation of such a facility.

Returning to the transportation issue, I would like to direct your attention, Mr. Senator, I don't think if there were appendices that were handed out to all of the members, but there is one table which I think is very interesting and I just wanted to bring it to your attention.

Senator Packwood. Which table is it? There are a number of attachments.

Mr. POLLOCK. There is one that's entitled "Table 1, Shipment Data Base."

Senator PACKWOOD. Right.

Mr. POLLOCK. I would just like to direct your attention to that because I think it is very instructive, and I hope that the other committee members look at that, concerning what kinds of radioactive materials we should be concerned about.

If you notice, 68 percent of all transportation shipments will be related to the fuel cycle; where only 12 percent, in terms of curies, will be related to medical uses and 20 percent, for industrial uses.

This means that the fuel cycle, the nuclear fuel cycle, will pose the dominant risk that we will be facing in terms of the use of radioactive substances.

In terms of the mode, 85 percent of all shipments will be transported by truck, and we should be concerned primarily, we believe, about highway transportation.

And finally, by package type, again you can see, 69 percent is by spent fuel cask.

Now this does not mean that we should be indifferent to the shipment of other radioactive substances, but I think that this presents a very interesting profile of what we should be primarily concerned about in terms of the shipment of radioactive materials.

This material was developed by Sandia Laboratories in the course of our work as advisory task force members. So I merely just wanted to present a profile of the kind of problems that we might face.

Now there are also six questions that were presented to us, and I'd like to take the first two concerning lead agency authority. And I might say, Mr. Senator, that we do not believe the Department of Transportation should be the lead agency.

The Department of Transportation has, throughout the last 15 to 20 years, demonstrated an attitude of neglect and indifference concerning this whole matter. But even more important, there is a level of incompetency within the Department of Transportation which I believe S. 535 must address.

We must not simply assign authority to a department. We must determine what is necessary to make sure that that department carries out its mandate. Can it carry out its mandate?

I cite only one example as evidence of the kind of incompetence and ineptitude within this particular Department. In 1972, the International Atomic Energy Agency promulgated rules for the packaging and labeling of radioactive substances. To date, the U.S. Government, through the Department of Transportation, has not adopted the 1972 rules. We are one of only two countries in the world among the IAEA members—which constitute approximately 90 countries—that has yet to ratify the 1972 IAEA transportation requirements.

Now interestingly enough, the Department of Transportation believes that perhaps this year they may get around to endorsing those regulations. But we found that in 1978 IAEA has issued new transportation regulations. And when we asked the Department of Transportation, "when will they get around to 1978 regulations," they throw their hands up and they say, "perhaps in 4 or 5 years."

Now these particular regulations are merely rulemaking procedures. They are not radical or controversial procedures that IAEA has proposed. Nevertheless, we think that it is indicative of the kind of footdragging, the kind of lethargy, the kind of procrastination that we find that this Department has demonstrated through-out many administrations.

And so we believe that at the Department of Transportation there needs to be some demonstration that if the Materials Transportation Bureau or some other entity within the Department of Transportation is awarded "lead agency" authority, that in fact they can carry that out. And this bill does not provide those assurances.

Quite frankly, I am not sure what we can do to assure that merely providing authority means that there will be follow-through, but it is a very serious attitudinal problem among the staff of the Materials Transportation Bureau.

I might also add that there perhaps might be other credible independent agencies within the Federal Government that could undertake such activity. I just throw out as an example the National Transportation Safety Board. They have been interested in expanding their role in the area of hazardous materials transportation.

Perhaps there should be some authority that is transferred to them in this particular area. Senator Schmitt, I want to commend you—while you were out, I would just like to say I would like to commend you for the initiative that you have taken in sponsoring this bill, and of all of the committee members in looking at this area.

I do believe, however, that there needs to be some kind of greater assurance that if we say DOT is the lead agency, that in fact they will carry it out. And there is no assurance at present. If there is a mechanism that you have, Mr. Senator, that you know of to put a fire under these people and get them to do it, then I know our organization would be fully supportive of your efforts.

And that also involves the question of any other separate offices. If there is another office that has demonstrated a credible track record in working in this area, we would be very supportive of lead agency authority there. But there needs to be some kind of credible track record, and it is not evident within the Department of Transportation.

And I might add that, as of this morning, I suppose we don't know exactly who is heading up the Department of Transportation, and also in terms of the other staff areas. Perhaps this might be an opportunity for some change.

The third question that the committee asked me to answer was the question of categories of radioactive materials beyond radioactive waste. And I will say that I think this committee should consider, in terms of data collection, in terms of emergency preparedness, in terms of safety, that there should be the consideration of weapons-grade material, known as special nuclear material.

We discovered, for example, that special nuclear material was being transported out of O'Hare International Airport on commercial airliners, and when we discovered this we went to Chicago, we

met with Mayor Bilandic at the time, and the mayor instituted a ban on such commercial shipments.

We have indicated, for example, that we believe that special nuclear material, weapons-grade material, should be transported through military air bases aboard military aircraft of either the U.S. Government or the host country that will be receiving this if it's international flights, which predominantly they are. But we would hope that this bill would address the issues of special nuclear material and other radioactive substances, industrial use, and radiopharmaceuticals, particularly for data collection and emergency response preparedness.

Finally, with respect to routing, we believe radiopharmaceuticals should be exempt from all routing requirements. If you look at radiopharmaceuticals, you will note that they are in very discrete size in terms of the volume of curies, usually under one curie.

In addition, they have very short half-lives, sometimes toxic for only hours, or perhaps several days. In other words, getting the material for life-saving purposes to the hospital while the material is still potent is very important. And even if there was a 100 percent release of radiopharmaceuticals, it is estimated that the health risks to the exposed population would be very small indeed.

So we believe all routing requirements should be exempted for nuclear medical commodities.

There is a question in the fourth question concerning the grant program, and we just merely would like to state: We believe that grants should be given to all States in which radioactive materials are routed through that State, particularly to upgrade emergency response capabilities.

For the question of the NRC interim rule, we have indicated that Sandia Laboratories and the city of New York have made estimates of very high public health costs if there was a deliberate act of sabotage against spent fuel casks. Those calculations are in my statement.

However, we have just a few comments concerning the rule. One is that we are told that there should be two armed escorts concerning urban transport of spent fuel. We don't understand how the NRC has arrived at its "two armed escort" figure.

In other words, what is the credible level of attack? We know that between 3 and 15 members are the credible level of attack forces for fixed nuclear facilities. Will two armed escorts be an adequate deterrent? NRC has not brought forth any calculations as to whether two, or four, or perhaps only one armed escort would be adequate.

Also, they have indicated that the casualties concerning spent fuel sabotage attacks for rail casks are four to five times the casualties that would be incurred following attacks on trucks or attacks on spent fuel by truck. We believe that since you cannot reroute rail transports, away from densely populated areas and since they can only go where the tracks are, that there should be no rail transportation of spent nuclear fuel.

If you look at the differences between casualties based on truck versus rail mode, you will notice that there is a wide divergence there.

There are a few other questions, and that is: the question of training and certifying drivers. NRC I believe does not state who should certify them. That needs to be spelled out.

And there is a question of concentrating shipments along a single route, the whole notion of routing. I think there are some very important questions as to whether or not that tips the hand of potential saboteurs, whether or not that increases the risk of people adjacent to that particular route if there's a great frequency in shipments. There's an equity question that has to be resolved, and we believe NRC has to address those questions.

Finally, there is the question, Mr. Senator, of the routing of radioactive materials. We believe—and perhaps we might differ here—that until the Federal Government can demonstrate that they can effectively monitor, surveil, enforce the regulations that are currently in effect to give some level of assurance that they are safe shipments, we believe States and local governments should have the right to impose restrictions.

Now it's very important to note that in terms of all hazardous materials, States and cities do have particular requirements. There are requirements for routing. There are tunnels that don't allow hazardous materials. There are bridges that prohibit it. There are highways that prohibit it, and these are done by either port authorities, highway authorities, States, or local governments.

And all of the hazardous materials industry has been able to comply with these kinds of restrictions. We believe until there is some kind of correction in this area, that there needs to be the empowerment, of State and local governments or the transfer to State and local governments, of the power to regulate routing.

And that is why the Department of Transportation itself said that the New York City ban was valid; because DOT had yet to stipulate or spell out what the rules are governing the routing of this material.

One final comment. And that is, the question of emergency response plans, an area which I know that you yourself have been taking a very commendable leadership role in.

That is, we believe that it is not enough merely to ask the Secretary of Transportation to devise a plan. There needs to be, on the local level, implementation of those plans. There needs to be training. There needs to be drills. There needs to be money provided to local and State authorities to make sure that they can carry out such a plan.

In Colorado, in September 1977, there was an accident involving uranium. Uranium, as you know, is not a terribly toxic material, but it was interesting to note that it took 3 days before the State of Colorado, Federal officials, the carrier, and the owner of the commodity, Exxon Nuclear, could agree as to whose responsibility it was to clean it up, and how should it be cleaned up, and who should foot the bill. And that shipment had gone through Denver, Colo., before the accident reaching a very desolate area of southeastern Colorado where the accident occurred.

But that illustrates the kind of confusion on the local level. There was also a 27-car train derailment in Rockingham, N.C. in which several cars burned for 7 hours; there was one car involving flammable material, and there was uranium hydrofluoride.

And it was interesting to note that for 7 hours they didn't even realize there was any radioactive material on board the train. There was a fire that ensued. And finally they brought some people from Fort Bragg, N.C. to check the radioactive levels once they located one of the canisters, and discovered that the meter went off the gauge.

At that point, the National Transportation Safety Board, which eventually investigated the accident, said that the rescue units—and there were 21 rescue units on Federal, State, and local levels—that all of the rescue units undertook what they referred to as an expeditious withdrawal from the area, which is another way of saying that they fled the area, once they heard that there was high radioactive readings.

And finally, there had to be a group flown in from Oak Ridge National Laboratory, and they discovered that the high readings were due to the fire, not to the radioactivity.

But again, there was chaos and confusion at the site. Rather than dealing with the problem, we found that the rescue units panicked and left the area. There needs to be training on the local level.

And that basically concludes my comments. I have asked that my entire set of testimony be submitted for the record. There are three—there are a number of different attachments which I also would like to have submitted to the record, Mr. Senator, there's also a report that we have involving that Colorado accident which I would like to have placed in the record at this time, if there's no objection.

Senator SCHMITT. Thank you very much. I would have two questions for you.

Do you have any suggestion on where we might look within the government for demonstrated competence in these kinds of technical matters?

Mr. POLLOCK. In a general way that's a very tough question, Mr. Senator, but I believe that there are perhaps—I indicated the National Transportation Safety Board, which has had—at least in an investigatory way, I think they have a good deal of credibility with Congress; they have a good deal of respect among the carriers. I believe that they are considered an impartial group. I know that the NTSB, the board members have been informally querying both Congress as well as those outside of the Federal Government, as to whether or not their roles should be expanded for data collection. NTSB for example, has been leaning on the Department of Transportation to start a data compilation system for radioactive materials transport.

That might be one candidate, but I hesitate. I'm not in any way pushing that strenuously. I think that that should be investigated.

The Office of Radiation programs at the Environmental Protection Agency has also been somewhat lackluster, but perhaps in an agency such as that perhaps a transportation unit might be workable. But again, I say that with a caveat, with some hesitation, because their track record has not been admirable, either.

It is possible that maybe a separate new entity could be created. But you know what you risk, what happens is if you start moving people around. You're just shuffling boxes, and you want to make

sure that you're going to do something to improve the situation, not merely creating an illusion that you're doing something when in fact very little has changed.

Perhaps an independent agency perhaps involving all hazardous material as well as radioactive materials might be a way of pulling out the political infighting, and the pressures within the Department that the MTB apparently has succumbed to.

So these are some suggestions. I certainly am not going to suggest that our organization has all the answers to this very tough problem.

Senator SCHMITT. Nobody has all the answers, but sometimes we have different insights into what those answers might be.

Your suggestion that we might look at a separate entity for all hazardous materials transport and bulk handling at least, is one that has occurred to me and others. There is no question that I think part of the Department of Transportation's problem is that, as a political department rather than an independent agency, they have tremendous pressures from all directions on other issues. It is very difficult to get the high-level management attention given to this problem that it deserves, in view of the anticipated growth of transportation volume.

I can imagine myself being in the Secretary's position paying attention to the wheel that is squeaking the loudest, and he would find that there is absolutely no obvious current problem, relative to his other problems, in nuclear materials transportation.

Mr. POLLOCK. Yes.

Senator SCHMITT. It's not squeaking very loud.

Mr. POLLOCK. That's right.

Senator SCHMITT. And hopefully that's an advantage for us, because we may be able to permanently grease that wheel so it never squeaks. I hope we're capable of doing that.

Do you recall the quantities of special nuclear material involved in the Chicago situation of air transport into O'Hare?

Mr. POLLOCK. They were very significant quantities. I could provide you with the accurate volume of material, but they were—each shipment, and there were I believe 13 shipments over an 11-month period, each shipment exceeded 100 kilograms of—I think there might have been one shipment that was smaller than that, but almost all of them exceeded 100 kilograms.

In other words, there was enough highly enriched uranium there that had a terrorist or saboteur intercepted this material they would have had weapons-grade material, or material to manufacture a nuclear weapon.

Senator SCHMITT. Could you provide what information you have to us?

Mr. POLLOCK. We surely will.

Senator SCHMITT. Do you feel that, rather than specifically saying that States have a veto or a preemption over Federal activity in this, that we could depend on negotiated agreements between the responsible Federal agencies and the States?

That's basically what's happening right now in New Mexico relative to the waste isolation pilot plant site. The State has taken the legislative lead to develop a mechanism by which they now can negotiate with the Federal Government. We call it a "concurrence

process," but it doesn't really constitute a veto in a legal sense, although New Mexico has been assured repeatedly over the last several years that they do have a veto. Whether that is true legally or not we're still trying to find out.

But nevertheless, their negotiation process is going forward. I am optimistic that we are going to work out a reasonable arrangement so that the project can proceed. The people of the State are also confident that the process of waste disposal has been well thought through and well conceived and will not cause any public hazards.

Do you think that is possible in the transportation area? Rather than trying to set up some kind of a legal mechanism, a preemption mechanism?

Mr. POLLOCK. I believe that there needs to be constant consultation between the Federal Government and the States that are involved where the routing of radioactive materials is located.

Very often those in Washington are not able to assess the unique problems that local officials believe they face, or that State officials believe that they may encounter.

Just as one example, during the Three Mile Island accident it was interesting to note that the Nuclear Regulatory Commission told the State of Pennsylvania on March 30 that they should be prepared to evacuate Harrisburg within 2 hours, at one precise moment. And the State people just looked at them, and they said, "That's ridiculous. Even during rush hour, one would not be able—without panic and the other considerations—to evacuate this area."

And at a later point, Mr. Collins, who is with the Nuclear Regulatory Commission, indicated he thought a four-county area, involving 600,000 people, could be evacuated in under 1 hour.

Well, we believe that there need to be people at the local level and at the State level who can assert what they believe are the actual conditions that they are facing. And so there needs to be some mechanism where they can prevail, to a certain extent.

Now there needs to be this kind of cooperation, though, between the two, and I believe there needs to be a lot more Federal aid to States to allow them to upgrade their emergency response capabilities. You have to give them tools, in other words, to cope with an added risk if it's going through their community.

Senator SCHMITT. Do you think that should be integrated with a general upgrade of our local civil defense capabilities? I don't mean "military defense," so much as just generally being able to react to emergency situations.

Mr. POLLOCK. Yes. Absolutely.

Senator SCHMITT. We are looking at that, also, in the context of another bill.

I thank you very much. We may have some questions from other members for the record. I hope that you will give us those answers.

Mr. POLLOCK. Thank you very much, Senator.

[The statement follows:]

STATEMENT OF RICHARD P. POLLOCK, DIRECTOR, CRITICAL MASS ENERGY PROJECT

Mr. Chairman, subcommittee members, thank you for the opportunity to comment on the transportation of radioactive materials and the Nuclear Waste Transportation Act of 1979.

For over three years, the critical mass energy project has been involved in this field. In 1976 we accepted an invitation to join an Advisory Task Force on the

transportation of radioactive substances through urban areas. The Task Force was organized by Sandia Laboratories on behalf of the U.S. Nuclear Regulatory Commission. I served on that panel and supervised a Task Force social impact study of the shipment of radioactive materials. That study is now in the final stages of completion.

CMEP is also involved in other transportation issues. In 1977 we filed a formal rulemaking petition with the NRC to compel the agency to clarify to responsibilities of the carrier, the shipper, and federal, state and local governments. That petition is still pending before the Commission.

We also involved in the air shipments of weapons-grade uranium out of Chicago's O'Hare International Airport. There is now a ban on such shipments out of O'Hare. It is extraordinary to find that thirty years after the birth of the atomic age, the federal government has yet to devise clear rules for the shipment of radioactive materials as they travel over our nation's highways, rails and through our airports.

Surprisingly, there is no federal requirement that drivers, rail engineers or pilots carrying these toxic materials receive special training. There are no routing requirements. There are no emergency response procedures spelled out to cope with an accident. There is no clear delineation of local, state and federal lines of authority. There is no comprehensive testing program for packaging. There is no enforcement mechanism to ensure that the few packaging standards in effect are being implemented.

There isn't even a basic data collection effort by the federal government to determine how much is being shipped, what is being shipped, where it is being shipped and how many accidents are occurring. The U.S. Department of Transportation believes that only one-third of all transportation accidents involving radioactive materials are being reported to federal authorities.

Hence, once a nuclear shipment leaves the loading dock of a licensee, it is a free commodity. And it is free to cause public injury or damage to property. This is why states and cities have elected to devise their own set of regulations.

Neither the NRC, DOT or the Interstate Commerce Commission monitor these hazardous shipments once they leave the possession of a nuclear licensee. NRC says its jurisdiction ends at the gate. ICC does not impose any special licensing requirements on the carrier. And while DOT has jurisdiction, it has refused to use its authority to draft minimum shipping requirements.

There is chaos here, Mr. Chairman. And we hope that your Committee can help to bring about some calm and rationality to this area.

Before commenting on the main questions before this Committee, I would like to take a few minutes to review the state of affairs.

First, over the last five years, there have been at least 328 transportation accidents involving radioactive materials. Of those, one third, or 118 accidents released radiation into the environment. This was data compiled by our organization from raw DOT statistics that were obtained under the Freedom of Information Act. A copy of our report was released February 23 of this year.

Significantly, the study shows that the frequency of reported nuclear shipping accidents is rising. In 1974 1.2 mishaps were reported each week. In 1978, 1.9 accidents were reported each week to DOT.

And one of the clearest trends shows that the sharpest increase in accidents is among highway carriers. In 1974, highway accidents involving radioactive substances constituted 39 percent of all nuclear incidents. In 1978 that figure rose to 87 percent.

Since DOT estimates that the reported data reflects only one-third of all accidents, the actual number is more likely to be about 1,100. NRC projects that the number of shipments linked to the nuclear fuel cycle will quadruple between 1975 and 1985.

I would also like to point to one other set of figures. During our Task Force study, Sandia Laboratories tried to get a profile of the state of affairs regarding the shipment of radioactive materials. They arrived at some interesting data. As can be seen in Table 1, in terms of Curies the nuclear cycle constitutes about 70 percent of all shipments. Truck is the main mode of transportation, representing 85 percent of all shipments. And spent nuclear fuel casks will be the most prevalent package type.

Now, let's examine the proposed Nuclear Waste Transportation Act of 1979, S.535.

First I would like to commend Senator Schmitt for the initiative and interest he has devoted to this area. I believe he has been deliberative and thoughtful. It is a credit to him and to the bill's sponsors that they have sought to bring some rationality to this volatile area.

Yet I believe that the sponsors of this bill and those who sit on this committee must consider whether this legislation will bring about the type of corrective changes which they so desperately envision. The Committee asked me to answer several specific questions. Let me address them one by one.

Question 1. Will the proposed clarification of DOT as the "lead agency" improve the ability of state and local governments to coordinate and resolve the problems regarding radioactive materials transport?

As the Committee members well know, DOT's performance in this area has been one of neglect and indifference. The Materials Transportation Bureau has been slow in recognizing that there is a need for action and it has been unable to act once that need is identified.

In 1972, for instance, the International Atomic Energy Agency (IAEA) promulgated packaging standards for the transportation of radioactive materials. As of early this year, only two IAEA countries had yet to ratify the standards. One was the United States.

DOT was trying to adopt the 1972 standards by the end of this year. But in the interim IAEA now has published 1978 packaging standards for nuclear shipments. DOT believes they might be able to address them in a number of years.

DOT has also refused to develop a data collection base so that federal officials can begin to obtain a picture of what is happening in this area. The National Transportation Safety Board has been pushing DOT to collect this data for some time. Yet the NTSB recommendation has only been met by DOT resistance.

While S. 535 will end years of ambiguity, there are no assurances that DOT is capable of managing an effective program. Thus, we could be creating the illusion that we have corrected a problem when in fact the problem may still persist.

Our proposal is that lead agency authority be vested in another federal entity. The National Transportation Safety Board or the Environmental Protection Agency are two possible alternatives.

Question 2. Would the establishment of a separate office for radioactive material transport within DOT be desirable or necessary?

As just noted, the Materials Transportation Bureau within DOT has demonstrated a unique capability for ineptitude. We strongly urge that it be stripped of this authority.

But because of the disturbing history throughout MTB's life, and throughout the term of its predecessor offices, we believe that it would not be desirable to keep nuclear transport regulation within the department. As the Committee Members well know, merely shuffling the boxes around does not solve the problem unless it can be shown with some measure of confidence that other substantive changes will bring about more effective management.

Question 3. What categories of radioactive materials should or should not be encompassed by the provisions of the bill?

The provisions for data collection, emergency preparedness, safety and routing in bill S. 535 now apply only to spent nuclear fuel. Yet there are other waste materials and other radioactive substances that are shipped throughout this country. There is low level waste material from nuclear utilization facilities. There are radiopharmaceuticals for nuclear medicine. There are radioactive substances used for industrial purposes.

These materials should be covered by some of the provisions of the Act. Data collection, packaging requirements and emergency preparedness plans should be applied to all forms of radioactive materials.

But because radioactive materials for medical purposes are in such discreet amounts and because their half-lives are extremely short, we believe that these commodities should be exempt from all routing requirements.

Question 4. Should the Grant Program specified in Section 5 be restricted to those states where there is storage, reprocessing or disposal facilities?

The grant program should be greatly expanded to include those states where there are routes for large curie shipments of radioactive materials. As the NRC interim rule for spent nuclear fuel protection stipulates, only approved routes must be used by the transport licensees. This interim rule probably suggests the direction NRC and DOT will take for future routing decisions. If that is the case, then the grant program should apply to all states where there are pre-designated routes.

The grants should be used for upgrading emergency response plans in addition to other proposed projects.

Question 5. Are the new NRC interim rules for routing and security necessary, desirable or adequate?

There is a vital need to upgrade the physical protection of irradiated fuel shipments.

Sandia Laboratories and the City of New York postulated the health consequences of a deliberate sabotage effort against a spent fuel cask. In November, 1977 Sandia estimated that there could be upwards of 1,600 early deaths following an attack and upwards of 11,000 latent cancer deaths. New York City's Bureau for Radiation Control projected 1,300 early deaths and upwards of 169,000 latent cancer deaths. Both figures were based on high population densities typical of about 140 American urban areas.

The penetration of the typical spent fuel cask is deemed credible. It would release radioactive solid material and respirable gases and other radioactive particulate matter. Cesium, Iodine, Xenon and Krypton are some of the principal elements that would be released. Surface winds and later upper atmospheric winds will disperse the radioactive "plume" or cloud over large distances, contaminating large numbers of people not in the vicinity of the attack. Street caverns, subway tunnels and office buildings can capture and concentrate some of the radioactive materials. In the average city, there can be upwards of 115,000 persons per square mile. In hyper-urban areas such as New York City, the population density can be as high as 500,000 persons per square mile.

In this context, the interim NRC rule appears to be needed. But there are some questions that we have about its adequacy.

According to the rule, armed escorts are only to be used when a shipment is in an urban area. But there are certainly non-urban areas where a sabotage effort could cause significant health consequences. Therefore, as a deterrent, we recommend armed escorts for all spent fuel shipments.

It is noted that the Nuclear Regulatory Commission postulates the breaching of a 10 element rail cask can cause significantly more injury than highway shipments. NRC estimates that there could be as many as five times the number of early fatalities and four times the latent cancer deaths in a rail attack versus an attack against a truck. This ratio, incidentally, assumes average values. If maximum, worst case assumptions are adopted, the ratio between rail and highway modes are even wider.

Since most rail shipments cannot avoid urban areas, we recommend that spent fuel casks be banned from the rail mode.

The NRC rule is also ambiguous on a number of matters. The rules do not cite what is the level for a credible attack, and therefore, it is difficult to assess whether two armed escorts are adequate or inadequate. For fixed nuclear facilities, a credible number of attackers involve as many as 15 persons, equipped with heavy weapons.

NRC does not state who is to train and certify drivers. Is it the carrier, state or NRC?

The NRC staff also does not evaluate the desirability of concentrating shipments along a single route. Does this increase the population risk for those adjacent to the route while reducing the risk for those outside of the route? Is there an equity question here? Do predesignated routes help potential saboteurs? What does the NRC do if a community refuses to permit their highways to be used as a route?

It is clear that the transportation of spent nuclear fuel constitutes great public safety and health risks heretofore underestimated by federal regulators and the nuclear industry. But much more attention and study needs to be undertaken until the full merits of the NRC's proposed rule are settled.

Question 6. Do Section 6 and Section 7 of S. 535 appear reasonable and adequate?

It is clear that much more data must be collected and much more testing of packaging needs to be undertaken before new rules and regulations can be adopted by DOT. For instance, the standards adopted by NRC and DOT appear inadequate. They constitute an occupational hazard for drivers who are continuously exposed to the releases permitted under federal regulations.

Moreover, the packages are tested under unrealistic conditions which do not reflect the stresses they will be subjected to after an accident. The fire, submersion, and crush tests are too lax.

Testing should not be conducted by DOT, but by a separate, independent agency that is familiar with typical accident conditions. The NTSB is one candidate agency for the task. Tests conducted by private associations, such as the Airline Pilots Association and the Association of American Railroads should be utilized and studied.

With respect to federal routing requirements, Section 6(8): it is clear that the Federal Government has failed to devise adequate provisions to protect the public. It is in this context that many cities and states have enacted their own routing rules and restrictions.

This might be viewed as an unfortunate development in some quarters. But it is the direct consequence of federal neglect. Most local and state actions actually have upgraded public health and safety, and forced the Federal Government to address the consequences of this important commercial activity. We believe the sponsors of this bill should reduce federal involvement in this area and promote greater exercise of state and local rights.

Until it is demonstrated that the Federal Government is capable of managing the nuclear transport issue, local and state government authority in this area should be preserved. Mayors and Governors should not expose their citizens while DOT attempts to get itself organized.

There is one final comment regarding this bill: While lead authority might be given to a federal agency, the responsibility for emergency response is still unclear. This confusion must be addressed for industry as well as for local, state, and federal agencies. Actual drills should be required to make sure the local and state plans in fact work. Training and equipment for accident preparation must also be instituted. This crucial element appears to have been avoided by the bill.

There is now a virtual explosion in the volume of radioactive materials shipments that traverse this nation's roads, rails and airports. No effective rules are in place. Responsibilities are splintered and confused. Emergency response plans are non-existent. Training for drivers hasn't been mandated.

Senate bill 535 is a good beginning. Its sponsors are to be commended. But it needs to be upgraded to make sure that the goals professed by its sponsors materialize.

Otherwise, the public will be comforted when in fact great—and unnecessary—risks will still exist.

Thank you.

Senator SCHMITT. It has been suggested that Mr. Leo Macklin and Dennis Maxwell might want to appear jointly as a panel to present statements, and then submit to questions and maybe even a little debate.

Mr. Macklin and Mr. Maxwell, would you come forward, please.

Mr. Macklin is president of Trans Nuclear, Inc. Mr. Maxwell is general manager, Nuclear Division, NL Industries. Generally, you gentlemen will discuss with us the subject of spent fuel and nuclear waste shipping casks.

Mr. Macklin?

STATEMENTS OF LEO MACKLIN, PRESIDENT, TRANS NUCLEAR, INC., WHITE PLAINS, NEW YORK; AND DENNIS G. MAXWELL, GENERAL MANAGER, NUCLEAR DIVISION, NL INDUSTRIES; ACCOMPANIED BY GEORGE L. STUKENBROEKER, MANAGER, NUCLEAR TRANSPORTATION

Mr. MACKLIN. Thank you, Senator.

Senator SCHMITT. Do you want to identify whose company you're with?

Mr. MAXWELL. If I may, this is George Stukenbroeker who is manager of Nuclear Transportation for NL Industries. He's a better technician than I am. If the questions go in that direction, I wanted to have him with me.

Senator SCHMITT. All right. Mr. Macklin?

Mr. MACKLIN. Trans Nuclear is a New York State corporation that is owned by French, German, and United States shareholders. And because of that, perhaps I have a wider perspective than most in this overall nuclear fuel transport business.

I note, Senator, that you asked me to talk about spent fuel casks, but I did in my written statement cover a few of these other items, and I will very quickly summarize and not spend too much time—

Senator SCHMITT. Your statement will be made a part of the record, and your summary would be appreciated.

Mr. MACKLIN. Thank you.

I feel that there's a lack of understanding as to what our current system is in transport of radioactive materials, and I would like to point out that this is a system that has evolved over 30 years and is working, not only here, but on an international basis.

In the United States, the system says: The NRC does the licensing, the review of all the high technology cask and container items. The DOT regulates the transportation. The system has worked. There has not been a significant accident, or a fatality, in the 30 years that the system has been in effect.

The problem that I think we're not recognizing is that the system is one that defends the public by virtue of the packaging. It does not preclude accidents. It says: We will design, test, and manufacture packagings that can be put into the normal transport system. And if there is an accident, it will not create any serious jeopardy to the general public.

So when it comes to low-level activity material, these packagings are not designed to withstand serious accident conditions. Yellow cake containers, for example, are not designed to withstand our Colorado accident.

I don't want to say they're allowed to spill, but they can spill, and there is no significant risk to the public; whereas, spent fuel cannot spill in any significant quantity and the casks are designed for it.

We can design containers for uranium—natural uranium such as the uranium-238 that spilled in Colorado—or for low-level activity material to have the accident resistance of spent fuel casks. We certainly can do it. It's going to cost a lot of money, and I don't think that factor is understood; nor are the NRC criteria for testing understood, in the sense that we talk about a 30-foot drop on an essentially unyielding surface—underscore the words “essentially unyielding surface.”

The equivalence of that in terms of impact energies and G forces are so enormous that it leads Bob Jefferson of Sandia to say that the drop from 2,000 feet up over the desert of New Mexico onto the surface was a less severe accident. And it's true; it is a less severe accident than the 30-foot drop test on an essentially unyielding surface. But this is not understood.

And how to get these criteria understood is a problem. Maybe it's too sophisticated a set of design criteria.

I was also going to talk briefly about the New York City ban on—

Senator SCHMITT. I just might interject there. I think like any new idea or new technology or new anything, it takes time and discussion like we're having here today.

Mr. MACKLIN. I appreciate that.

Senator SCHMITT. We have never had a bill come out of this committee on this subject. The net value of your testimony and that of all the witness is that it is contributing to education. And hopefully, everybody is being as factual as they possibly can, although their interpretation of the facts will vary. People in general, and the Congress more specifically, will become educated.

So don't think that it's just a waste of words, no matter what we may do with this bill.

Mr. MACKLIN. Senator, I tried these very words on the New York City authorities and got nowhere. They still went on the radio and TV programs and said the same things: These casks were only designed for——

Senator SCHMITT. You probably got farther than you think.

Mr. MACKLIN [continuing]. They can only withstand a 30-foot drop; which is not true.

And likewise, with the fire condition, with the emissivity factors and all the inputs that go into that set of criteria, these are very severe tests. I will get off of that subject now.

With respect to the New York City ban of certain types of radioactive material transports and the similar ban in Chicago at the airport, and the proliferation of these restrictions, I feel that we are rapidly reaching a point where the nuclear effort of this Nation is being thwarted. And I don't know at what point it's "no go," but I can see a few pinchpoints where we might be reaching that situation.

To that extent, I would appreciate if we could do what we can to get DOT to make its rulemaking as soon as possible.

The current bill that is being proposed, S. 535, I think emphasizes the role of DOT, and that's good. It still has the high technology items in the hands of NRC, where I believe it does belong, and notwithstanding some of the criticisms of my colleagues and myself have had with respect to NRC's regulations, I think NRC is doing a very good job.

I think we do need to do more work on the emergency response plans and to support the States financially for this. I think we're perhaps a little misguided if we try to get the DOT involved in the import licensing process.

Right now the NRC grants imports licenses after much review at the executive branch, et cetera, and the system works.

Insofar as the NRC interim rule is concerned, I believe that NRC perhaps has moved a little too rapidly in this instance. In my discussions with the Sandia people who have conducted these tests, it appears that, although breaching casks by terrorists is a distinct possibility, if you can get the right weaponry and the right trained personnel, on a practical basis it's hardly a likely target.

These casks are very formidable items. In the case of my company, we are now developing and building a series of rail casks that have 12- to 13-inch forged steel walls. That's as strong a structure as you can ever put together, and it's hard to visualize a terrorist really breaching that kind of a vessel wall.

With respect to the other kinds of cask designs that I'm familiar with, including those of my competitors here, they are mighty difficult to breach.

To suddenly come up with a fearsome scenario of terrorists attacking one of these casks and releasing all kinds of activity, I think is highly unrealistic. However, I can see the political need to do something once a report like the Sandia report does come out.

I think the steps being proposed by NRC are implementable. They're going to be costly. We don't know how costly they're going to be; it's going to take some time.

I don't believe for a moment that these are realistic scenarios. I don't believe that if a cask is breached there will be more than a minor release of activity in the immediate vicinity, if that at all. And we are now focusing once again on the old terrorist scenario that is raised up in our country from time to time—what if they do this, and what if they do that?

What we're really talking about is a threat against our whole society, and I don't know how to react to such a threat. If terrorists want to attack, they can attack the New York City water supply and put it out of commission in no time at all.

They can go to any of these reactor sites and lob a few mortar shells into the sites and destroy the pools—the spent fuel pools.

However, we can implement, and will implement the new rule—I am worried about avoiding the urban areas because of the rather remote probability of these scenarios, and because once you start using the side roads you have other problems.

With respect to the casks of today, their adequacy in terms of quality and number, I have had an opportunity to look at Mr. Maxwell's written statement and I can't agree with the number problem that he sees. I am firmly convinced that through the end of the 1980's with what we have in existence today and what we are building—today and with the reracking that is going on in the spent fuel pools in our reactor stations—I say that we can meet the capacity requirements right to the end of the 1980's.

And if we should need some more casks on a 3- to 4-year notice period, at least my company can go ahead and produce four or five of the big ones per year.

With respect to the adequacy of these casks, I alluded briefly to the NRC criteria being very severe criteria. They are technical criteria and often the layman cannot understand them. I heard remarks this morning from the AAR representative that those tests are not adequate; yet, when you take that 30-foot drop test, you've got a very severe test in the actual real world.

The fire test is a very severe test. And what we have not succeeded in doing as an industry is taking these criteria and translating them into the infinite number of real accident scenarios. Perhaps that's a deficiency in what we have done or should have done.

With respect to regulations changing, I can't foresee how they can change significantly enough where anything challenging the basic viability of the existing cask fleet is likely to occur. I think they are very well designed; they can withstand the most severe accident conditions; and as I said before, there's a surplus of these casks today.

As a matter of fact, we are looking for customers, and as far as I know there is only one utility on the market right now for casks. And if the disastrous situation as far as cask supply were real, I would expect to see a half-dozen or a dozen inquiries right now on my desk.

I will now turn this over to Dennis.

Senator SCHMITT. Yes, I wish you would. We're going to have a vote in about 3 or 4 minutes, and maybe we can proceed through your formal testimony and then evaluate the question and answer situation when I have to go to vote.

[The statement follows:]

STATEMENT OF LEO MACKLIN, PRESIDENT OF TRANSNUCLEAR, INC.

I am Leo Macklin, President of Transnuclear, Inc. a fuel cycle service company specializing in all activities involving the transportation of spent fuel and other radioactive materials on a domestic and worldwide basis. The company, incorporated in New York in 1965, is a member of the Transnuclear Group comprised of Transnuclear, S.A., Paris; Transnuklear GmbH, Frankfurt; Transnuclear, S.A. Madrid; Transnubel, Belgium; and associated companies in Italy and Japan.

In close cooperation with these companies, Transnuclear designs, owns, leases, operates, and maintains special casks and containers utilized in the transportation of nuclear fuel and other radioactive materials. For more than a decade the Transnuclear Group has been involved in the movement of over a hundred shipments yearly of spent nuclear fuel from research and power reactors to reprocessing plants in the United States and Europe. Most of the shipments have been in casks designed and owned by the Transnuclear Group.

I am Chairman of the Transportation Subcommittee of the Atomic Industrial Forum's Committee on Nuclear Fuel Cycle Services, and also serve on several Forum committees including those on Nuclear Export Policy, Safeguards Policy and Financial Considerations. I was a consultant to the International Atomic Energy Agency Study Group on Regional Nuclear Fuel Cycle Centers and was a U.S. representative to the first International Atoms-for-Peace Conference held in Geneva in 1955.

I have been involved in the design, manufacture, operation and economic evaluation of power generation facilities and related equipment over a period of thirty years. I was employed by Ebasco Services Incorporated from 1946 to 1955 as project manager, and then by Combustion Engineering, Inc. as manager of their nuclear power sales. From 1958 to 1973 I served in various project and marketing positions including vice president at both United Nuclear Corporation and Gulf United Nuclear Fuels Corporation.

I am a registered professional engineer, a charter member of the American Nuclear Society and a member of both ASME and the National Society of Professional Engineers.

I appreciate your invitation to testify on S-535, the Nuclear Waste Transportation Safety Act of 1979 and to comment on the NRC's new rule on the physical protection of spent fuel in transit. Any positive cost-effective step in the direction of enhancing the safety or simplifying regulations pertaining to the transportation of nuclear waste and commercial spent fuel is both welcome and needed.

Since the ban imposed by New York City on the transportation of certain classes of radioactive materials there has been a proliferation of local rules and regulations at a pace, which if continued, will bring to an effective halt the nation's nuclear energy production programs. If this is truly the intent of the nation, a direct and forthright ban on further nuclear energy production and research should be enacted by the Congress. If this is not the intent, then logical programs to improve our current procedures should be taken as our understanding of the industry increases. In this direction, DOT should be directed to expedite its current rule making with respect to highway routing. I believe that the rule making should be completed by March 31, 1980 at the latest.

It must be emphasized and made clear to the public that over a thirty year period of radioactive materials transport not one fatality or significant injury has been recorded. From technological and regulatory points of view, our system in place has done and is doing a commendable job. From a sociological/political point of view, the system in place leaves something to be desired—and it is doubtful with the current emphasis on every reportable incident—no matter how minor—that any technological/regulatory system will be permitted to operate effectively.

We should understand that the current system—which has evolved over the last thirty years both here and abroad—is designed to protect the public against unacceptable risks in the event of accident conditions. The system was never designed to prevent accidents from occurring—a practical impossibility. In the case of low level activity materials, the packaging is not designed to withstand severe accident conditions; the philosophy being that no significant risk to the public can result from release of low level activity material. In the case of spent fuel and high level wastes no release of packaging contents is permitted even under the most severe accident conditions. The model and full scale spent fuel cask tests which were conducted at Sandia Laboratories over the last two years has, in my opinion, provided evidence that spent fuel packaging is indeed capable of withstanding accident conditions well beyond the credible. If a spill of yellow cake, or other low level activity material, is considered to be an unacceptable risk, our design, manufacturing and testing programs would need to be changed. It certainly is possible to

go to the extreme of providing the equivalent of spent fuel casks for yellow cake transport—if we are willing to pay the attendant costs and if we really believe that absolutely no release of low level material is to be permitted under any circumstance.

But we must face up to the fact that there is no way of precluding accidents; they will occur, but we can reduce the risks to the general public to acceptable levels.

When the issue of terrorist attack is raised, the viability of modern society is subject to questions. Hazardous materials transportation in its entirety—not just the limited radioactive materials segment—becomes one of the focal points for such questioning. By singling out the safest segment of hazardous materials transport for special treatment, we are perhaps handicapping a vital energy source without the benefit of proper evaluation of alternatives and their attendant risks.

Today, we have a workable system. NRC is responsible for the licensing of packagings and where safeguards are required, establishes rules and regulations for such safeguards including routing approvals. Where import licenses pertain to spent fuel, NRC has in place a system of pre-notifications and inspections. The DOT/NRC Interagency agreement is the link that allow DOT to utilize the high technology capabilities of NRC in approving certain classes of packagings for more hazardous materials. DOT is clearly responsible for the regulation and safety of transport of radioactive materials and for all other hazardous materials, and as the “competent authority” of the U.S. under IAEA rules, validates spent fuel packagings licensed by the regulatory authorities of foreign governments when such foreign licensed packagings are destined for import into the U.S. and/or export from the U.S.

S-535 calls for DOT to have responsibilities already within the province of DOT; however, it requires that DOT should assume some responsibilities with respect to imports of nuclear waste and commercial spent fuel into the U.S. I believe the current system as it pertains to spent fuel—including the validation of foreign licensed packages and pre-notification of imports of irradiated spent fuel from abroad has been in accord with, and protective of U.S. nuclear energy policy and regulations. If it is considered desirable for DOT to enter the procedures for pre-notification of imports, liaison with the current NRC procedures would appear to be a logical and effective mechanism for bringing DOT into the picture. However a new procedure whereby the Secretary of Transportation is required to report all notifications of imports to the Congress would impose an undue burden on the import licensing process—already subject to time-consuming review by NRC.

With respect to the safeguards aspects of waste and spent fuel transport, I believe that the new rule of NRC is implementable—although at increased costs, yet to be determined, and at some possible overall time delay in the implementation of a campaign or series of shipments. To the extent that the new rule leads to expeditious routing through urban areas, I believe it is a positive action by the NRC.

With respect to emergency response capabilities, I believe the bill should restrict grants to one-time generic studies by the states of their capabilities, notification needs, etc. The proposed program of educating state and local officials with respect to possible hazards and of actions to be taken in the event of an accident or emergency situation is a necessary step to assure that emergency response capabilities are developed on a uniform and acceptable basis.

As to the availability and adequacy of spent fuel casks and problems pertaining to imports and international transport, there has been considerable discussion and an abundance of DOE sponsored studies. Programs have also been proposed searching for cask “optimization and/or cask “standardization.” Today’s suppliers of cask systems have stated publicly that industry’s current licensed cask fleet together with the units currently under construction is more than adequate to meet potential requirements to the end of the 1980’s. At such time as it is apparent that customer needs for cask capacity are in excess of the existing or planned availability, I am confident that industry can and will provide the necessary capacity. Likewise, if NRC should revise the rules pertaining to the licensability of casks, there is no reason to assume that industry would not or could not meet those revised requirements. I therefore am of the opinion that DOE should complement not compete with industry’s efforts and should concentrate on more urgent problems facing the back end of the fuel cycle. By recognizing industry’s knowledge and experience in cask design, manufacture and operations; and by recognizing that spent fuel is being transported today on an international basis, significant savings should be realizable.

I am very much aware of the distrust by some of the general public as to the adequacy of our current system; however, this distrust—so long as it is based on a belief that nuclear energy is intrinsically dangerous and/or immoral and should be removed from the face of the earth—will never be dispelled by S-535 or similar measures.

I trust my views, which basically endorse the adequacy of our current regulatory system, are not regarded as a narrow conviction that no improvements need ever be made to this system. Thank you for allowing me to state my views. I will be pleased to respond to any questions.

Mr. MAXWELL. All right, sir. I will indeed summarize for both brevity and emphasis.

As indicated by our testimony, we regard availability of casks with equal concern to safety. The point—and I will make this point only, because our written testimony stands on its own behalf—the point that is overlooked by Mr. Macklin, as well as others such as the Electric Utility Companies Ad Hoc Nuclear Transportation Group which addressed this whole problem, is that Government programs, from the cask standpoint, will at least equal the demand on the part of the private sector—that being the utilities—and may double it.

And when I talk about Government programs, I am talking specifically about three types of programs. I am talking about the return of foreign spent fuel; I'm talking high-level waste, because there's no reason why high-level waste can't be transported in modified spent fuel casks; and I'm talking the eventual emptying of AFR's, if an AFR comes onstream. And I simply will let that issue stand on that basis.

The Government demand will at least equal, and perhaps double, what the utility demand will be.

Now so far as safety, I would offer these observations at the risk of sounding indifferent to safety—and I don't mean in any way to be indifferent to safety. I am indeed concerned that safety be casually—casually used—as a reason for going back to the drawing board and reinventing the wheel.

Now the problem here is that there are in place today four licensed and operational cask systems in this country which represent millions of dollars of investment by the private sector—my company's, Mr. Macklin's company, General Electric, and several others.

These systems have been rigorously examined by the Nuclear Regulatory Commission. I want to come to that in about 30 seconds. That's point No. 1.

Point No. 2 is the fact that the industry does indeed have a 25-year perfect record—not “accident free,” but perfect from the standpoint of no released radioactive material and injury to the public.

There are indeed going to be accidents, just as sure as you and I walk out of this room there are going to be accidents. The problem is not whether or not there are accidents—obviously we want to minimize them—but the effect on the public.

Now the third point that I would make, is the Sandia test crash series. If you have not seen the movies which Sandia has on these tests, I would encourage that you do so. They're very powerful.

Those casks, by the way, were built—designed and built by my company. They're unlicensable today due to more stringent regulations, yet there was no breach in the course of those accidents.

The fourth point is that I have myself gone through the licensing process with the Nuclear Regulatory Commission in the case of our rail cask which took nearly 5 years to license.

Senator SCHMITT. Did you pass?

Mr. MAXWELL. Yes, sir, and I can assure you, sir, that the Nuclear Regulatory Commission is doing a commendable job of looking after the interests of the general public. Never have I been so exercised.

We did indeed get our license, but believe me it would be I think of great benefit to any member of the public who has any question about the Nuclear Regulatory Commission's discharge of its responsibilities, to sit in on one of those meetings as I did for nearly 2 years.

Now as a summary of our general view of things, I will borrow, if I may from Samuel MacCracken, assistant to the president of Boston University, who makes the very good observation that if the standards to which the nuclear industry is being held were to be generalized, we not only wouldn't have any energy in this country, we wouldn't have many of the things that we buy and sell.

I think perhaps we have a tendency not to give the public adequate credit for its understanding of the fact that there is no such thing as "zero risk." There's no such thing as "absolute certainty."

As regards the Nuclear Regulatory Commission's physical protection rules, I would only point out one implication: Which is, that there is no way that those rules can effectively be implemented without special trains. And the cost of special trains could, by one estimate, add as much as \$600 to \$700 million to the cost of transportation over the next 20 years.

Thank you very much.

[The statement follows:]

STATEMENT OF DENNIS G. MAXWELL, GENERAL MANAGER, NUCLEAR DIVISION OF NL INDUSTRIES, INC.

My name is Dennis G. Maxwell and I am General Manager of the Nuclear Division of NL Industries, Inc. NL Industries is a manufacturer and supplier of petroleum services and equipment, chemicals and metals with sales of approximately \$2 billion annually. The Corporation is headquartered in New York City.

NL has a long history in the nuclear business, dating from 1946, principally as an operator of various Government nuclear facilities. We currently operate DOE's Feed Material Production Center in Fernald, Ohio.

NL's Nuclear Division is currently engaged in two activities: (1) designing, manufacturing and supplying spent fuel shipping casks and transportation services, and (2) the decontamination and decommissioning of reactor sites and other contaminated facilities. NL entered the spent fuel shipping cask and transportation business in 1965. Since that time we have designed, obtained Certificates of Compliance for, manufactured and operated most of this Country's spent fuel shipping casks. We were well underway on a fleet of 30 spent fuel shipping casks for Allied General Nuclear Services when President Carter declared a moratorium on commercial reprocessing of spent fuel. Our investment in the program is \$15 million, represented by Certificates Of Compliance for both a truck cask and a rail cask, 5 completed truck casks, 2 completed rail casks, and another 10 rail casks in various stages of completion. Senator Long was referring to NL at hearings before this Committee nearly a year ago (August 16, 1978) when he said "I see the leading manufacturer of complex transportation casks, which, incidentally, require more time for certification and licensing than a modern transport aircraft, confronted with the possible shutdown of its cask production capability". This unfortunate possibility has become a reality. NL closed its plant in Wilmington, Delaware, on February 18, 1979. This plant was the only plant in the country dedicated to the production of spent fuel shipping casks. There is a cask crunch coming, and it is indeed unfortunate that the nuclear industry has lost this resource.

S. 535 indicates that your Committee shares this concern, specifically, in Section 6, subsection (2), item 9 of the bill which calls for an assessment of the nation's cask inventory. In Part 2 of the record of your hearings last year, the Committee

reprinted our presentation called "The Coming Nuclear Transportation Crises" in its entirety. A copy is attached for convenience. In summary, that presentation says that the cask business is at a standstill and that if orders are not forthcoming now there will not be an adequate supply of casks for Government and utility needs within the time frame in which demand will materialize. In our presentation, we show a need for as many as 85 casks by 1985, and nearly 500 casks by the year 2000, as compared to an existing fleet of just 17 casks. These figures are more than a year old. The supply figure is now 18 casks, and the demand figures may be somewhat high in the light of the slowdown which has beset the nuclear industry in the past 12 months, but the disparity is obvious. Moreover, the supply figure is misleading because the majority of the existing casks are truck casks, whereas the majority of shipments will be made by rail.

NL recommends, therefore, the provisions be added to S.535 which authorize the Government to start procurement of casks at once. This action would serve three purposes: first, it would ensure that a transport capability exists for the Government's own programs, such as return of foreign spent fuel; second, it would provide a business lifeline to the cask industry while the disposition of commercial spent fuel is being determined; and third, it would help to avoid what is certain to become head-to-head competition for the few existing casks between the Government and the utilities in the near future.

With regard to another of the bill's provisions, Section 6, subsection (2), items (6) and (7), that there be a review of shipping safety requirements and a compilation of data, it is again appropriate to quote Senator Long in last year's hearings: "The required transportation system elements, including technology, safety standards, procedures, regulatory control, and operating experience, exist today". We certainly agree that safety should be under constant scrutiny but we would urge that extreme care be exercised by both the Government and the cask industry not to go "back to the drawing board" and "reinvent the wheel". There are already four cask systems which have been issued Certificates Of Compliance and are operational in this country, with two more in the lengthy certification process. It is of deep concern to us that the Government, through the Department of Energy and the Interagency Review Group on Nuclear Waste Management, has taken the position that more cask testing and evaluation is necessary. This position ignores stringent compliance review and the millions of dollars of private sector investment in spent fuel shipping casks on which, by the way, there has been precious little return to date. You can be sure that a healthy private sector cask industry which is realizing a fair return on its investment will improve its product over the years, and provide any new products required. Safety is not the problem. Availability is the problem.

The bill's Emergency Response Plan provisions, Section 5, subsection 2, are good ones. NL suggests that they be expanded to include as "emergency situations" attempts by nuclear opponents to impede shipments by such means as obstructing the highways. To prevent success of such attempts, the Committee might wish to give state governors the authority they may need to provide National Guard escort for such shipments.

The Committee asked for comment on the Nuclear Regulatory Commission's Interim Final Rule on the Physical Protection of Irradiated Reactor Fuel in Transit (44 Fed. Reg. 34466-68, June 15, 1979). Our position is "Why?". There is practically no spent fuel being transported at this time, thus no real need for precipitous rulemaking. Clearly, the rule will add yet another layer of time and cost on the transportation of nuclear materials. Spent fuel shipping casks are not only very heavy, but are designed to withstand tremendous abuse, and the nature of the cargo all but rules out hijacking. We question whether the remote risk of public exposure due to sabotage justifies the cost of NRC's requirements; for example, dedicated trains, which will probably be necessary under the new rules. Cost of special trains alone could add millions of dollars to the cost of nuclear transportation over the next 20 years and in our opinion is an unnecessary use of the nation's energy reserves.

NL Industries and I appreciate the opportunity to offer the above comments which we hope will be helpful. Please let us know if we can be of further service to the Committee in any way.

Senator SCHMITT. Thank you, gentlemen.

Do you think there are design improvements that could be made that would essentially make casks sabotage or terrorist resistant? And by that, I mean not just that they would be impossible to get into—which I know is not possible, but which would so discourage

such acts that the saboteur or the terrorist would go to other endeavors, such as indicated by Mr. Macklin?

Mr. MACKLIN. I think they're already there. And I don't want to be smug about it, but these are formidable pieces of structure.

Mr. MAXWELL. You said "resistant." I think that's the important thing. If we say "proof," no. I don't think there's anything that can be built that somebody can't get into. But I think if we're talking—

Senator SCHMITT. But can they be so resistant as to, for all intents and purposes, discourage any sabotage attempt?

Mr. MAXWELL. I think we're there. We also want to keep in mind the nature of the cargo, which rules out any direct handling.

Senator SCHMITT. OK, now let's take it the next step. So resistant to accident damage, that for all intents and purposes the situation would be under control before there was any potential for leak through melting or otherwise.

Mr. MAXWELL. To "accident," did you say, Senator?

Senator SCHMITT. Yes.

Mr. MAXWELL. I think that, again, we're there. We—and I point to the Sandia test crash series—if we're talking conceivable accident scenarios—

Senator SCHMITT. Excuse me for interrupting, but it's my understanding that we don't yet fully have the quality assurance system in place to insure that every time a cask is used it in fact meets the same criteria as it did the day it was shipped.

Mr. MACKLIN. Well, I would like to address that one. You know, the quality assurance criteria that exists today are very, very rigid. And going through a cask building program right now in my company, I can tell you that it couldn't be anymore rigid.

Senator SCHMITT. OK, what about after it leaves your company?

Mr. MACKLIN. It's still subject to the maintenance and operational QA program.

Senator SCHMITT. And are you satisfied, based on your knowledge, that that postmanufacture program maintains the same level of quality assurance as you maintained when you built it?

Mr. MACKLIN. I believe it should.

Senator SCHMITT. It should, but does it?

Mr. MACKLIN. I won't say it doesn't; I don't know. It takes a real QA program operating there by the user, the licensee, et cetera.

Senator SCHMITT. So that is something maybe we ought to look into?

Mr. MACKLIN. I think that would be worthwhile.

Mr. STUKENBROEKER. I think from our experience, and we have been operating casks for 15 years, we've been transporting nuclear fuels in the United States, and not only are we quite confident of our QA program that we use in the manufacture, but we also have of course a regular QA program for operation.

And any time that the cask is subjected to anything of what we might call an incident, that would be anything that would contribute to the integrity of the cask, any time anything like this happens, the cask is totally QA'd again.

So we feel that our QA program, from an operational basis, is in place and is adequate and it does provide safety to the environment.

Senator SCHMITT. Tell me, were any of you in the Air Force? There's a form called a form 1—I can't remember the real number, but they called it the form 1 in flying airplanes, and it represents in its entirety the recorded history of the airplane. Everything that's happened to it, the maintenance that was done on it, and so forth.

Is such a record kept on a—particularly the type B cask?

Mr. MAXWELL. Yes.

Mr. STUKENBROEKER. Yes.

Mr. MACKLIN. Yes.

Mr. STUKENBROEKER. We have a complete record on every piece of equipment. We have traceability of all the hardware that goes into it. In other words, we have a pedigree.

Senator SCHMITT. Independent QC checks? That is, were repairs made, and then that's inspected by an independent inspector?

Mr. STUKENBROEKER. We do not have an independent inspector to check it, mainly because the NRC has approved our QA program, and we implement it. We are audited by NRC to see that we're in compliance to our QA program.

Senator SCHMITT. You see, QC or QA in the space program in military aircraft generally involves some independent person approving the work. There are two steps, usually, in the space program. Actually, I guess we usually had three steps. Even then, every once in a while something would creep through.

But do you think that level of quality assurance is necessary?

Mr. MACKLIN. Senator, I think we have it, and maybe we're playing on semantics. Within the QA program, at least the one my company operates with, you can have an inspector within your company inspect, but he reports differently from the man who is the project man, or the design man.

Senator SCHMITT. That's usually adequate?

Mr. MACKLIN. Yes.

Senator SCHMITT. In our case, of course in NASA we usually had contractor QC, and then a NASA QC following along behind. It can work either way.

I have about 3 or 4 minutes left, so if you can make your answers brief I would appreciate it. The IRG report concluded that a large increase in the inventory of casks and vehicles was needed to ship the Department of Energy's transuranic waste and spent fuel later in this decade.

The report also said: "It is expected that the U.S. industry will meet this need once DOE has established a firm implementation program for spent fuel storage and nuclear waste management."

Would you please comment on this? Is there a policy vacuum that's making your life very uncertain, and therefore possibly going to create a cask problem at some time in the future?

And let's don't argue when that time might be; just: Is there such a time?

Mr. MAXWELL. Yes; we see that, for this reason: Not because of a theoretical capability of American industry to respond to the clear and present danger of there not being enough casks. Quite obviously the American industrial base has this capability.

The problem right now is timing. The existing industry is without any kind of lifeline to give it continuity, to give it a reason to continue, a viability as a business.

Now my company has \$15 million invested in the cask business, principally in connection with its now-canceled contract with Allied General Nuclear Services. Our position is that we simply cannot invest anymore money without a clear indication that we're going to go forward in this business.

When we had to terminate our contract with AGNS, we spent better than a year attempting to merchandise directly to the utilities, pointing out that if all utilities waited until the last minute, that there would be a crunch, without question. And the utilities simply took the position: We hear what you're saying, we're sympathetic to the problem, but there is not a program in place which tells us: (a) Where spent fuel is going to go; and (b) what's going to happen to the fuel values, because we don't want to overlook the fact that most utilities have spent fuel on the books as assets, and they're not about to let go of their spent fuel until irrevocably and forever they know that they're not going to get those fuel values back.

If there's any possibility of recovery of the fuel values, the fuel is going to stay where it is.

Senator SCHMITT. An excellent point, Mr. Maxwell.

Mr. MACKLIN. My view is that, given 4 years notice, we can bring four to five big casks on the line without any trouble at all. We are now in the process of constructing four truck casks, and we're going to be placing an order before the end of the year for two to six of the big rail casks.

So we're going ahead, even though the market isn't finely developed.

Senator SCHMITT. Can you see a point where continuation of the policy might cause problems?

Mr. MACKLIN. Oh, yes; very definitely. And I think Mr. Maxwell is quite right. We should try to define an AFR and where the spent fuel is going to as soon as we can.

Senator SCHMITT. Quickly, gentlemen, do you think we ought to look to the Department of Transportation to begin the serious coordination of this and other hazardous materials problem? Or should we create another agency?

Mr. MACKLIN. I don't believe in the creation of another agency. I would try to work with what we have. I would try to beef them up manpower wise, if I could.

Mr. MAXWELL. As to what agency does this, our view is, what agency is going to have the most manageable and viable plan for improving the business? We have no particular feeling as to whether it should be the Department of Energy, or the Department of Transportation.

Mr. STUKENBROEKER. The question is: Who is going to most effectively benefit the business?

Senator SCHMITT. Gentlemen, I appreciate your hurrying through the testimony in this way, but I think we got most of the material out that we wanted. Again, I appreciate not only the witnesses here today, but those in the last 3 days of hearings. I frankly think

that we have a great deal to think about now with respect to this bill that we didn't have before.

I suspect we'll be able to come up with another draft and we'll probably be submitting that for your written comments sometime in the not-too-distant future.

Thank you, gentlemen.

Mr. MACKLIN. Thank you.

Mr. MAXWELL. Thank you.

Senator SCHMITT. I've got to run.

The hearing is adjourned.

[Whereupon, at 11:45 a.m. the hearing was adjourned.]

ADDITIONAL ARTICLES, LETTERS, AND STATEMENTS

LONG ISLAND LIGHTING CO.,
Hicksville, N.Y., April 27, 1979.

HON. HARRISON SCHMITT,
U.S. Senate, Washington, D.C.

DEAR SENATOR SCHMITT: In response to your letter of April 3, 1979, I welcome the opportunity to comment on S. 535, "The Nuclear Waste Transportation Act of 1979." The transportation of radioactive materials is one of the vital issues that confronts the nuclear power industry today. To date, there has been a lack of strong unified leadership by the Federal Government on this issue which has resulted in the adoption by state and local governments of a variety of restrictive ordinances which they view as necessary for public safety. Your Bill could help in reestablishing the proper Federal Government leadership role in interstate transportation of radioactive materials.

One comment I have on the Bill is that in its present form it focuses exclusively on nuclear waste and spent fuel. This is interpreted to include waste from government facilities and I would agree that this should be included. The Department of Transportation should be designated as the lead agency with responsibility for regulating transportation of all radioactive materials rather than limiting the scope to transportation of nuclear waste and spent nuclear reactor fuel. Although the present focus of public attention lies in the areas of waste and spent fuel shipment, studies such as "Transport of Radionuclides in Urban Environs: Working Draft Assessment", (SAND 77-1927), and "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes", (NUREG-0170), indicate that (transportation of other radioactive materials pose greater radiological risk to the public due primarily to the large number of shipments that routinely occur.) Although the current public concern lies in the areas of spent fuel and waste transportation, that concern could well be extended to include other parts of the nuclear fuel cycle (natural and enriched uranium shipments) or radioactive materials associated with medical and other industrial applications.

As I indicated in testimony before your Committee in August, 1978, the principal radioactive materials transportation problem confronting Long Island Lighting Company in its efforts to obtain permits and licenses for its nuclear units is the adoption by New York City of an ordinance which prohibits the transportation of spent reactor fuel through the City and the subsequent failure by the Department of Transportation to find that ordinance inconsistent with Federal regulations governing the shipment of hazardous materials. There is a need for action on the part of the Department of Transportation to reassert the leadership of the Federal Government in regulating interstate transportation of radioactive materials.

Toward this end, and in order to counteract the proliferation of local bans, such as New York City's, which threaten the continued operation of nuclear plants in this country, we urge you to insert a provision in your Bill directing the Department of Transportation to conclude its ongoing highway rulemaking proceeding for radioactive materials by a specific date. We believe that if the agency is directed to act expeditiously on this important matter, it could realistically conclude the rulemaking by March 31, 1980.

I wish you success with this important piece of legislation, and if I can be of further assistance, please advise me.

Very truly yours,

MATTHEW C. CORDARO, PH. D.,
Vice President.

ALLIED CHEMICAL,
CORPORATE HEADQUARTERS,
Morristown, N.J., April 30, 1979.

Hon. HARRISON SCHMITT,
Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, D.C.

DEAR SENATOR SCHMITT: Thank you for your April 4 letter inviting me to comment on S. 535, the Nuclear Waste Transportation Act of 1979. I have reviewed the legislation and believe that it offers an excellent vehicle for clarifying the confusion and indecision that now dominates the transportation of nuclear materials. The legislation is timely in that Congress is also focusing on management of nuclear wastes and spent nuclear fuel.

One very commendable feature of S. 535 is the recommendation to establish Federal routing guidelines as a means of alleviating the need for state and local restrictions on the transportation of nuclear wastes and spent fuel. Without sound Federal leadership in this area, any policy that evolves will be haphazard and inefficient. You are to be commended for your leadership in co-sponsoring this legislation.

Sincerely,

L. J. COLBY, Jr.

NIAGARA MOHAWK POWER CORP.,
Syracuse, N.Y., April 30, 1979.

Hon. HARRISON H. SCHMITT,
U.S. Senate, Washington, D.C.

DEAR SENATOR SCHMITT: Thank you for your letter of April 4, 1979, affording me an opportunity to comment on your bill, S. 535 (the "Bill"), which would amend the Hazardous Materials Transportation Act (49 U.S.C. § 1801, *et seq.*) (the "Act"). I offer these comments as the Chairman of the Ad Hoc Electric Utilities' Nuclear Transportation Group, comprised of 20 utilities which together are operating, constructing or planning roughly half of this country's nuclear capacity. The Group was formed early in 1978 because of our concerns for the transportation problems confronting the nuclear industry.

We wish to congratulate you and your co-sponsors for taking the initiative in preparing the Bill. Also, we strongly support key provisions of the Bill, namely (1) designation of the Department of Transportation as the agency with principal responsibility for regulating, monitoring and ensuring the safety of transportation of radioactive materials, and (2) establishment of a firm timetable and allocation of responsibilities for development of emergency planning. These provisions of the bill are entirely consistent with positions we and others have advocated in testimony before your Subcommittee on Science, Technology and Space and Surface Transportation on August 16, 1978.

Moreover, we wholeheartedly agree with the features of the Bill which:

- (1) require notification to a State that nuclear waste or commercial spent nuclear fuel will be transported within that State as the result of plans to develop a storage or disposal facility (proposed section 116(a) of the Act; section 5(2) of the Bill); and
- (2) require notification to the Secretary of Transportation when foreign spent fuel or nuclear waste shall be imported into the United States and direct the Secretary to ensure that such materials are properly packaged and shipped (proposed sections 117 (a) and (c) of the Act; section 5(2) of the Bill).

There are certain respects, however, in which we believe the Bill could be improved. These areas are as follows:

- (1) The most serious nuclear transportation problem confronting the utility industry today is the proliferation of State and local restrictions on the transportation of spent nuclear fuel and other fuel cycle materials. This has been exacerbated by the perceived lack of direction and fragmented responsibility at the Federal level for nuclear transportation safety, problems which the Bill should go a long way to cure. (The failure of the Department of Transportation to rule that the New York City Health Code ordinance, which bans transportation of spent fuel through the City, is inconsistent with the Hazards Materials Transportation Act has encouraged many States and localities to follow new York City's lead.) Although the DOT has commenced a rulemaking proceeding to establish Federal routing requirements, the proceeding is moving much too slowly. Attached hereto is our latest list of State and local restrictions on transportation of radioactive materials, many of which have been adopted since the DOT announced in April 1978 that it would conduct its

routing rulemaking. There is no technical or practical reason why the DOT cannot complete this proceeding by March 31, 1980, if sufficient resources and priority are assigned to this task. We therefore strongly recommend that the Bill require the DOT to complete the proceeding by this date.

(2) With respect to section 115(b) of the Act (added by section 5(2) of the Bill), whereas (we heartily agree there is a need for a Congressional mandate to the DOT to improve emergency response planning at the Federal, State and local level, and particularly to define the role of Federal, State and local governments in responding to a transportation emergency, we recommend certain clarifications of the Bill.) First, we believe it would be preferable to require continuing reports to Congress on emergency planning activity as part of the annual report of the Secretary under section 109 of the Act, rather than a one-time report after 18 months. This would enable Congress to remain informed of important developments in this area. Second, we believe emergency response planning for radioactive materials shipments needs to be considered in the context of planning for shipments of all hazardous materials. The same network of Federal, State and local officials are involved and similar principles of planning and response must be applied. Indeed, planning for all emergencies—including those involving transportation hazards—needs to be coordinated, a point which has been recognized in the recent establishment of the Federal Emergency Management Agency.

Accordingly, we recommend that proposed section 115(b) of the Act/section 5(2) of the Bill (and section 109(3) of the Hazardous Materials Transportation Act as it would be amended by section 6 of the Bill) be amended to require the Secretary of Transportation to include in his next annual report a clear definition of the role of Federal, State and local governments in responding to transportation emergencies involving radioactive and other hazardous materials. In that report and in succeeding annual reports the Secretary should also be required to assess the adequacy of the organizational structure at the Federal, State and local levels to respond to transportation emergencies; to assess the response to particular accidents that have occurred during the years; and to make recommendations for improvements. These reports would encompass but not limited to radioactive materials.

(3) We believe the State grants provisions of sections 116(b) through (d) of the Act (added by section 5(2) of the Bill) should be modified. It is entirely logical that States should be granted funds to implement emergency response planning consistent with Federal guidelines. This concept is implied in proposed section 115(a) of the Act and we support it as well as the mechanism for issuance of the grants set forth in proposed section 116(d) of the Act. However, we do not believe it is necessary to provide grants to all the States within which nuclear waste or commercial spent fuel would be shipped as provided in proposed sections 116(b), (c) and (d) of the Act. This could result in grants to a very large number of States, some of which may not be well equipped or motivated to use the grants. Moreover, it does not seem desirable for each State to conduct "an independent State review of the safety and logistics of shipments associated with any proposal to develop" a disposal facility. Such a grant program would appear to call for many duplicative State reviews which should properly be conducted comprehensively at the Federal level.

Accordingly, we recommend that any programs for grants to States to review transportation aspects of radioactive waste disposal facilities, other than grants to implement emergency planning, (1) be limited to those States in which the disposal facility will be located and (2) be for support of the State's participation in or comment upon the Federal siting or licensing proceeding. We suggest that using the grant for this purpose would markedly improve the quality of the Federal review.

(4) With respect to proposed section 115(a) of the Act (added by section 5(2) of the Bill), as we understand the phrase "logistical aspects of the shipment of nuclear waste and commercial spent fuel," it would seem reasonable to assign responsibility for such matters, insofar as the Federal government is concerned, to the Department of Energy as opposed to the Department of Transportation. This would be consistent with that Department's responsibilities for radioactive waste management and disposal and for energy-related matters generally. Furthermore, we believe it would be consistent with the expertise and experience of both the Department of Transportation and the Nuclear Regulatory Commission if this section were clarified so that the primary responsibility for regulating and certifying shipping casks and packages for fissile and large quantity materials remained with the Nuclear Regulatory Commission.

(5) We agree with you that the primary problems being encountered today relate to proposed shipments of spent nuclear fuel and that secondary problems arise from shipments of nuclear waste materials. However, it is also true that shipments of other fuel cycle materials, e.g., uranium concentrates and other forms of enriched

uranium, sometimes present problems of a related character. We believe it would therefore be useful if section 2 of the Bill (as well as proposed section 115(a) of the Act, added by section 5(2) of the Bill) were broadened to include all nuclear fuel cycle materials within the scope of the Department of Transportation's responsibilities. In this connection, it is not clear what advantage is gained by amending section 104 of the Act as is proposed by section 4 of the Bill.

We would be happy to meet with you or your staff to discuss this matter in further detail, including any necessary drafting changes to carry out the suggestions we have made.

Once again, I congratulate you on making a major contribution toward maintaining the use of nuclear power as one source of energy for the nation.

Sincerely,

GERALD K. RHODE,
Chairman, Electric Utility Companies'
Ad Hoc Nuclear Transportation Group.

ATOMIC INDUSTRIAL FORUM, INC.,
Washington, D.C., May 1, 1979.

Hon. HARRISON SCHMITT,
U.S. Senate, Washington, D.C.

DEAR SENATOR SCHMITT: Your letter of April 4 relating to the subject bill was received by several members of the Subcommittee on Transportation of AIF's Committee on Nuclear Fuel Cycle Services and by the AIF staff. We are pleased to have this opportunity to comment. The following statement represents the consensus opinion of the Subcommittee.

The Atomic Industrial Forum, Inc. is an international association of organizations and individuals interested and active in the commercial development and use of nuclear energy for peaceful purposes. Established in 1953, AIF has over 600 organization members, including electric utilities, manufacturers, engineers, constructors and numerous other organizations, both private and governmental.

We generally support the provisions of the bill and commend you and your associates for its sponsorship. On this particular subject we point out the proliferation of local restrictions relating to the shipment of spent fuel and certain other radioactive materials. The forerunner of such actions was the ban on transportation of certain radioactive materials by the City of New York. We believe that the proposed DOT rulemaking relating to the Hazardous Materials Transportation Act (Docket No. HM-164), if properly promulgated, would eliminate many of the problems we are encountering. To this end, we would like to include a requirement that the rulemaking be completed by March 31, 1980. A copy of our comments on this subject submitted to the U.S. Department of Transportation on December 29, 1978, is attached hereto.

On the subject of foreign shipments (Section 117.(a), page 8), the specified prior notification and reporting should prove workable so long as the requirement is for a campaign of shipments rather than for each individual shipment. It should be noted that NRC, as the agency that grants the import licenses for such materials, currently requires prior notice before arrival of each such shipment into the States. It might be profitable to coordinate NRC and DOT requirements in this connection rather than introduce an entirely new approach.

Although the bill basically corroborates the procedures in place today, it contains the implication that current procedures, whereby the competent authority of the U.S., DOT, validates casks licensed by the responsible authority of a foreign nation for transport of radioactive material into the United States, should no longer be applicable. We have found current procedures satisfactory and consistent with IAEA rules. Any change in current procedures could create difficulties in international commerce of radioactive material.

We suggest that the Department of Transportation utilize surveys being made by industry and DOE on a continuing basis rather than start from ground zero with a new set of surveys.

We believe the bill should restrict state grants to one-time generic studies by the state of their emergency response capability, notification needs, etc., instead of making state grants contingent on the construction of storage or disposal facilities.

Sincerely,

EDWIN A. WIGGIN,
Executive Vice President.

ASSOCIATION OF AMERICAN RAILROADS,
Washington, D.C., May 17, 1979.

HON. HARRISON SCHMITT,
U.S. Senate, Washington, D.C.

DEAR MR. SCHMITT: In response to your recent letter, I have sought the advice of several colleagues in order to respond to S. 535, the "Nuclear Waste Transportation Act of 1979."

It does seem appropriate and it is highly desirable to establish more clearly the relationship of responsibilities between the secretary of the Department of Transportation and the Nuclear Regulatory Commission in regard to the issue of safe transportation.

There is no doubt that a better emergency response plan is necessary in all hazardous materials spills. There has been some confusion as to the relative responsibility of the federal agencies. As a result, the railroad officials and the local agents who are accustomed to working together find their work on occasion frustrated and less effective than it should be. It is possible that such a situation would also arise under current circumstances if there were a railroad accident involving nuclear materials.

In regard to information on the problem of release of hazardous materials, the Coast Guard has been designated as a coordinating agency. Therefore, the Coast Guard may be brought into play a role with respect to emergency situations involving the transportation of radioactive materials.

Radioactive material received from foreign countries has been handled by the railroads for a number of years. In this instance, it has been difficult to enforce requirements specified by railroads. Radioactive material improperly secured in a closed van container found at dockside does present a problem in terms of who has the responsibility for securement. The shipper who normally bears this responsibility is in a foreign country and is not readily available. Few companies will volunteer to arrange for proper shipping securement if they are not the shipper.

Considering our responsibilities in interstate commerce, it would seem preferable to have the bill stipulate that Department of Transportation regulations would preempt state regulations.

Since 1973, the railroads have studied the problem of rail transport of nuclear materials. Our position set forth in the attached document continues to be held by the industry. While the Nuclear Regulatory Commission has specified a demanding set of tests for casks, their limits of time duration for fires and their impact conditions can be exceeded in railroad accidents. Furthermore, human error can reduce some of the protective characteristics of casks. For example, failure to properly secure the end of the cask can make it vulnerable to loss of containment during an accident. Accordingly, we believe it is essential to provide a transportation environment that is compatible with the test requirements for casks. To that end, we have continued to seek recognition of the need for use of dedicated trains for movement of these products.

Use of these trains also recognizes the increasing concern by local communities and states in regard to the proper movement of these containers. The location of dedicated trains carrying only spent fuel elements or casks could be easily determined. There would be full opportunity to control the movement of such a train.

I would hope this position is recognized in future study of the processes of safe rail transportation of nuclear materials.

We shall be very happy to offer additional comments to you to the extent they can be helpful in consideration of S. 535.

Sincerely yours,

WILLIAM J. HARRIS, Jr.,
Vice President.

MOVEMENT OF SPENT NUCLEAR FUEL ELEMENTS

Small shipments of spent nuclear fuel elements in relatively small casks have been moved by railroad in limited service for a number of years. With the advent of second generation power reactors and the increase in the number of these reactors, there will be an increase in the number and size of spent fuel elements moved from nuclear reactors to fuel processing plants. These spent nuclear fuel elements are highly radioactive. Casks for their transportation have been designed to meet a variety of AEC requirements. In general, these requirements stipulate a very low level of radiation and casks of sufficient strength to withstand certain drop and fire tests. The drop and fire tests represent nominal design requirements.

Railroad accidents can and do take place in which more energy is involved or fires last longer than was assumed in the AEC certification and testing process. In the interest of maximum safety in the future transportation of these nuclear fuel elements, two courses of action are open to the railroad industry.

Under the first, a series of costly tests could be run impacting heavy trains and affixed casks and exposing them to fires lasting several days. The consequence of this course of action would undoubtedly be changes in the cask design requirements and an increase in the weight of the casks. Some of the new casks, and cars required to transport them, already weigh in excess of what is normally moved in regular train service. Accordingly, an increase in the weight to overcome the hazards involved in railroad accidents not only would further complicate the movement of these casks but would increase the risk of a railroad accident.

The second possible approach is to control the railroad environment so as to reduce both the potential and intensity of railroad accidents involving such shipments. By controlling the speed of the train and reducing its size acceptable limits of impact energy could be achieved and the potential for fires of long duration would be eliminated. Such a course of action leading to a controlled transportation environment can accommodate both proposed and present casks.

In an accident involving nuclear fuel elements, there is general concern over possible breaching of a cask and the release of radiation, or even the spent fuel elements themselves, with the consequence of a nuclear incident. Evidence available indicates a substantial period of time is required after an accident to insure that there has been no leakage of radiation or of radioactive products. During this extensive testing period, control and service restoration measures cannot be performed at the site of the accident and the railroad operations must be suspended. Substantial evacuations have been required under these circumstances.

The interests of public safety appear to dictate that members of the railroad industry consider measures designed to achieve maximum feasible safety and efficiency in the movement of spent nuclear fuel elements, particularly those moving in the second generation of heavy cars and heavy casks now coming into service. Such is entirely consistent with the apparent commitment on the part of the Federal government to reduce the probability of railroad accidents by the introduction of strict controls. To this same end, operating practices designed to achieve a controlled transportation environment have been identified and recommended to the industry by the Board of Directors of the AAR. Those operating practices are that: Shipments of casks containing irradiated spent fuel cores should move in special trains containing no other freight, not faster than 35 MPH. When a train handling these shipments meets, passes or is passed by another train, one train should stand while the other moves past not faster than 35 MPH.

The circumstances underlying the recommendation of such operating practices may be stated as:

1. the introduction of very much heavier casks and larger quantities of irradiated fuel elements as a result of changes in nuclear technology;
2. the increasing public concern over environmental consequences of accidents involving the shipment of any hazardous material; and
3. the recognition that the transportation environment can be controlled thus reducing the probability of accidents and the intensity of the accident event.

ASSOCIATION OF AMERICAN RAILROADS.

CRITICAL MASS ENERGY PROJECT,
Washington, D.C., June 20, 1979.

MICHAEL D. CRISP,
Senate Commerce, Science, and Transportation Committee,
U.S. Senate, Washington, D.C.

DEAR MR. CRISP: Pursuant to our telephone conversation, enclosed are a number of comments pertaining to S. 535, the proposed Nuclear Waste Transportation Act of 1979. As we mutually noted during our discussion, there are a number of common perspectives shared with respect to the issue of the transportation of radioactive substances. In addition, there are some areas where we may differ. These particular differences, however, might be easily incorporated into the bill itself at a later date if the sponsors believe they are noteworthy.

Our comments are:

Section 2. This section assigns the Department of Transportation the responsibilities of lead agency. Comment: While this clarification will end the years of ambiguity over federal jurisdiction, there must be assurances that DOT is capable of

managing an effective program. At present, those assurances are not evident. Perhaps the Environmental Protection Agency's Office of Radiation Programs or the National Transportation Safety Board might be possible alternatives. The DOT's Materials Transportation Bureau is inept, lethargic and indifferent to the matter of ensuring public and occupational health and safety.

Emergency Response Plan: This section requires the Secretary of DOT to draft and submit to Congress an emergency response plan within 18 months of enactment of the Act. **Comment:** While there is a requirement that there be a clear definition of Federal, State and local government responsibilities, there is no mention of either carrier, shipper or consignee obligations, if any. Second, while an estimate of the cost of equipment and training is required and recommendations of potential future funding to local and state governments, there is no explicit requirement that state and local governments actually test their paper plans to determine if, in fact, they work. The Disaster Research Center in Ohio has repeatedly noted that most emergency plans are impractical and need to be tested and updated.

Foreign Spent Fuel: This section directs the Secretary to basically ensure that imported spent fuel will be safely transported. **Comment:** There should be a requirement that the importation of spent nuclear fuel is in fact necessary and that the routes used are pre-designated and that the final destination is closest to the port of entry.

We additionally have other comments which relate to items not addressed in the proposed Act:

Federal Pre-emption: Under the current scheme, states and sub-divisions of states can enact routing restrictions for the highway shipment of radioactive materials. This was permitted by an administrative panel at DOT in April, 1978 after the panel members discovered that there were no restrictions or conditions placed on carriers of nuclear substances in federal regulations on routing. Thus, the decision of which route to take was purely up to the whims of the driver and of carrier convenience. **Proposal:** We propose that the DOT or some other designated federal agency specify a minimum number of requirements and/or restrictions carriers must follow when shipping large quantities of radioactive materials. But local and state officials best understand the problems or unique demographics of their particular area of jurisdiction. Thus, there should be explicit empowerment of state and local authorities to enact measures which are deemed necessary to protect their citizens. In effect, this is a states' rights approach to regulation, minimizing federal red tape and bureaucracy.

Training for drivers: Related to the above passage on emergency response plans is a mandatory requirement that drivers of carriers be certified as drivers capable of handling emergencies and capable of safety shipping the cargo. There are no training requirements at all.

Air Transportation of Special Nuclear Material: Shipments of Highly-Enriched Uranium (HEU), weapons grade material, are often flown out of unsecured commercial airports and aboard commercial aircraft. **Proposal:** We propose that all weapons-grade radioactive material be shipped only through secured military air bases and flow on military aircraft of either the United States Government or of the recipient government. This can ensure that SNM will not be able to be easily obtained by terrorists or criminal elements and that innocent civilians will not be caught up in an incident.

Data collection: Unless we are mistaken, there appear to be no meaningful provisions to require the lead agency to collect, analyze and distribute information about the amount, frequency and character of shipments of radioactive materials. There should be similar data collection efforts for accidents. In addition, it should be required, under penalty of law, for all carriers to promptly report to the federal government any and all incidents involving nuclear shipments. Astonishingly, no such requirement exists today and DOT officials believe that radioactive shipping accident are under-reported.

I believe that you can see by the tone of the comments that we find little that is objectionable in the proposed Act. Rather, we believe that there can be efforts to further strengthen the Act so that the general public can rest assured that it is being fully protected and so that industry can understand their obligations and requirements in a predictable way under the law.

Having read Senator Schmitt's comments in the March 5, 1979 Congressional Record, I can say that I agree with all of his comments without reservation. I believe he has a firm grasp of the problem areas and that he is committed to bring some reason and rationality to an area now unregulated, haphazardly organized and chaotically overseen.

If, after reviewing our remarks you wish to testify on behalf of the minority side, we'd be willing to extend whatever expertise and observations we have amassed. If, on the other hand, you believe other witnesses might better serve your efforts, we still stand ready to assist minority counsel and the minority Members in their endeavor to bring some sensibility to this potentially risky transportation activity.

I hope you find some of our remarks useful and that we might be able to obtain a response from your office within the future.

Very truly yours,

RICHARD P. POLLOCK, *Director.*

DEPARTMENT OF THE NAVY,
NAVAL SEA SYSTEMS COMMAND,
Washington, D.C., July 13, 1979.

HON. ADLAI E. STEVENSON,
Chairman, Subcommittee on Science, Technology and Space, Committee on Commerce, Science and Transportation, U.S. Senate, Washington, D.C.

DEAR SENATOR STEVENSON: This is in reply to your letter of June 28, 1979 to the Secretary of Defense in which you invited me to testify at your hearings on Senate Bill S535 "The Nuclear Waste Transportation Safety Act of 1979." In a telephone conversation on July 6, 1979 with Mr. Smick of your staff, I pointed out that I was not an expert in nuclear shipment regulations as the Naval Nuclear Propulsion program uses the existing regulations as a basis for nuclear shipments. It was agreed that in lieu of testifying, I would send you a letter which would describe how spent naval fuel is shipped. We also agreed that I would provide any other comments I might have with respect to the questions contained in your letter. I should point out my comments will be my own and will not necessarily represent those of the Department of Defense or the Department of Energy.

Spent nuclear fuel in the Naval Nuclear Propulsion Program originates from the defueling of reactors on nuclear powered ships. Owing to the development of long-life cores which are used on all but a few of the earlier submarines, we now are using cores that will enable the ships to operate 10 to 15 years without refueling. This means we have reduced the number of shipments of spent fuel considerably from what otherwise would have been necessary.

Spent naval fuel is transferred to U.S. Department of Energy (DOE) for shipment. As director of the Division of Naval Reactors of DOE my division is responsible for these shipments. The fuel is sent to the Department of Energy's facilities in Idaho by railroad in specially designed shielded shipping containers. Although naval spent fuel shipments are not subject to the Federal system of hazardous materials regulations promulgated and administered by the Department of Transportation (DOT) and the Nuclear Regulatory Commission (NRC), the shipments are, as a matter of practice, carried out in conformance with the safety requirements in the Federal Regulations. The shipping containers are specifically designed to withstand extreme accident impacts, fire or water emersion and prevent the release of the material to the environment in the event of an accident. The shipping containers are certified by the DOE as meeting Federal standards and concurred in by the NRC. The containers conditions and demonstrated to be safe. The cargo is non-explosive and non-flammable.

Naval reactor fuel, due to its military application, is different than commercial fuel. The fuel design provides a high degree of strength and integrity. The inherent containment provide by the massive shielded shipping container, which weighs more than 100 tons and which is welded to the railroad car used to transport the fuel, provides adequate protection against acts of sabotage or attempts to steal the fuel during shipment.

Because of the classified nature of the fuel and the desire to assure expeditious transport of the fuel, a courier is provided for these shipments. In addition, to assure prompt assistance in the event of an accident or other event during shipment an emergency communication system is provided. This communication system is used to monitor the progress of the shipment and provides the ability to request emergency response from Federal and State sources should that ever be needed.

With regard to your questions, as I indicated I am not expert in the specifics of the regulatory process so that I am not able to give you a complete analysis of S.535 and its impact. I understand both the Department of Energy and Department of Defense have been asked to review the bill and I expect they will give you more thorough comments. However, my general impression is that the bill tends to confuse the already existing regulatory arrangements and introduces some new requirements that I do not consider would be helpful if they were applied to naval

activities. For example, while not clear, the bill could be interpreted as no longer permitting DOE to certify its shipping containers. If this is the case, such action could have a potentially serious impact on the shipment of naval fuel. It is conceivable that at some time in the future, because of the unique form of naval fuel, existing regulatory requirements may not be applicable. In addition, it is conceivable that scheduler requirements for shipping this fuel might preclude a regulatory review in order to meet defense needs. DOE should retain its current authority to certify its shipping containers.

Another potential problem arises from the bill's definition of "shipment" which could be taken to require extension of the Federal Regulations to movement of radioactive materials within facilities such as bases and shipyards. Such an action would be burdensome, unnecessary, and difficult to administer.

The bill also appears to imply that States and local governments have the authority to regulate radioactive material shipments. If there is any area where legislation may be appropriate, it would be to confirm that regulation of shipments of hazardous materials such as spent fuel are under the sole jurisdiction of the Federal Government. There has been an increasing trend for some States and cities to enact their own legislation governing nuclear shipments and this has significant potential for disruption of normal commerce as well as essential defense shipments. If we allow this area to be subject to a multitude of many regulators with some areas being restrictive and others simply prohibiting shipments, it will adversely affect essential activities, including the Naval Nuclear Propulsion Program.

The safety record for fuel shipments is a good one. In my program we have never had a shipment accident that has adversely affected the public or the environment. Achieving this has been possible only through the ability to exercise central control. A myriad of State and local controls will, I think, achieve the opposite of their intent. They will create a system of such fragmented, inconsistent rules that safety will be impaired. Experience has shown that other hazardous material shipments represent a greater potential safety concern to the public. To single out radioactive material shipments for this kind of attention does not make sense. I believe this is a central issue for nuclear shipment regulation and one which the Congress should take a lead in resolving.

You asked about the new NRC rule issued in June 1979. This rule applies specifically to irradiated fuel shipments for commercial licensed activities and so it does not apply to naval spent fuel shipments. Nonetheless, since it has been my practice to apply DOT and NRC rules for shipments in my program, the rule is of some concern to the Naval Nuclear Propulsion Program.

From the information I provided previously regarding the measures taken in shipping spent naval fuel, we already meet or exceed the security precautions incorporated into the new rules. However, I consider these measures a prudent means of controlling a high value classified shipment and not something that is really necessary to ensure safety of the shipment.

In addition to specifying security provisions for spent fuel shipments, the proposed NRC rule requires that NRC be provided with routing information. NRC will, in turn, use this information to inform local jurisdictions that spent fuel will be shipped through their area. I am concerned with this proposed action and I do not believe it should be included within the rule. To do so only further dilutes maintaining Federal government control over the safety of these shipments.

As written, NRC appears to have been concerned with truck shipments where routes can be selected to by-pass population centers. Hence, the number of local jurisdictions involved would be small. To route rail shipments around population centers, even where it might be possible, could mean using less reliable track to the detriment of shipment safety. In addition, the number of local jurisdictions involved in a rail shipment can be very large. It is not practical to communicate at the local level with this number of jurisdictions and doing so will only cause unnecessary concern and possible interference with the shipment as has already happened in several cases. The cited reason for giving local notification is so they can be prepared in case of an accident. Effective emergency procedures have been developed at State and Federal levels and that is where they should be. If any action is taken it should be to strengthen Federal and State jurisdiction in emergency response actions and not take actions that introduce undue concern and confusion at every town a nuclear shipment may pass through.

You also asked if based on experience with naval shipments there is a need to further define agency responsibilities for transportation of nuclear spent fuel and waste shipments. It has been my experience that the NRC, the DOE and the DOT have been able to clearly define their respective responsibilities in this area. From my viewpoint I see no need to provide additional statutory clarification in this area.

It seems to me the main thing needed is to ensure outside jurisdictions are not able to interfere with and thus undermine the established regulatory process. There should of course continue to be congressional oversight to monitor agency actions.

I trust that you will find this information of some help to your deliberations. I appreciate the opportunity to provide you with my perspective on this issue.

Respectfully,

H. G. RICKOVER.

UNION PACIFIC RAILROAD CO.,
Omaha, Nebr., July 20, 1979.

Senator HOWARD W. CANNON,
Chairman, Committee of Commerce, Science, and Transportation,
Dirksen Senate Office Building, Washington, D.C.

DEAR SENATOR CANNON: Hearings are currently being held by your committee on S. 535, the Nuclear Waste Transportation Act. As the major rail carrier of nuclear waste material, Union Pacific Railroad Company feels that it has a responsibility to make known its views on S. 535. Although precise figures are not available, it is our rough estimate Union Pacific accounts for 35 percent of the nation's rail mileage in forms of nuclear waste (and irradiated spent fuel) which require heavy protective shielding. The railroad's traffic includes substantial shipments of spent fuel from Government and military reactors.

Both the general public and the railroad have a substantial stake in assuring that the transportation of nuclear waste materials is conducted with all possible safety. The recent events at Three Mile Island and their aftermath should demonstrate the public's concern with safe nuclear energy. Faced with the prospect of substantial petroleum and other energy shortages, the nation simply cannot afford accidents producing severe radiological effects which might foreclose use of one of our key domestic energy sources, nuclear power.

I do not pretend to be an expert in nuclear energy. However, attached to my testimony are excerpts from the Atomic Energy Commission's WASH-1238 Report of December 1972 entitled "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants." Page 87 indicates that if seven irradiated (spent) fuel elements were released from a transportation cask the radiation level at 100 feet could be as much as 1,000 rems per hour and that, if the fuel elements remained unshielded for 10 hours, persons within a one mile radius (a 3.14 square mile area) might receive a cumulative dose of about 1,000 man-rems within 10 hours. WASH-1238 does not describe the consequences of this dosage, but another AEC report does. "Radiological Emergency Procedures for the Non-Specialist" dated January 1969 indicates at pages 10 and 11, which I am attaching, that 300 to 500 rems (or Roentgens) produce "illness and possible death", that survival is "possible" at the 500-1,000 rem level, and that survival is "improbable" when the dosage exceeds 1,000. It is my understanding that a whole-body dose of 750 rems is generally lethal. WASH-1238 suggests that in the event of the type of accident described, remote equipment would be required to erect a shield around the fuel elements or to place them in a shielded box or to repackage them. This could be a most difficult task owing to the extremely high levels of radiation involved.

We have therefore analyzed S. 535 with considerable interest as well as the statement being provided to your committee on behalf of the Association of American Railroads. We are in general agreement with the AAR's statement and have the following comments on S. 535.

We strongly agree with the designation of the Department of Transportation in Section 2 of S. 535 as having the principal responsibility for insuring the safety and security of the transportation of nuclear waste including irradiated fuel. We also agree that it should consult with the Nuclear Regulatory Commission in fulfilling this responsibility. However, the point I wish to emphasize is the appropriateness of designating DOT as the lead agency in view of its experience with the transportation of other hazardous materials. The hazards of the transportation environment make the transportation of nuclear materials fundamentally a transportation problem which differs materially from insuring radiological safety at fixed sites. Primary responsibility should be in DOT, not NRC.

We are therefore seriously concerned by the split in responsibilities which later appears in Section 5 of S. 535 which would adopt a new Section 115(a). Although this provision gives DOT primary responsibility for the safety, regulation, and logistical aspects of the shipment of nuclear waste and spent fuel, it gives NRC the primary responsibility for regulating and certifying the safety of shipping casks and packages. It should be emphasized that these are transportation casks. The concept

embodied in current Section 105 of the Hazardous Materials Transportation Act (49 U.S.C. 1804) that authority over packaging and containers should be placed in DOT remains valid.

NRC has no adequate appreciation or understanding of the risks of operating in the railroad environment or of the tremendous forces exerted by collisions or the lengthy fires which can occur. NRC's cask specifications reflect its lack of transportation expertise. To cite just one example, NRC requires that a cask be able to sustain exposure to fire at a temperature of 1,475 degrees for 30 minutes. 10 C.F.R. Part 71, Appendix B (1979). This is oblivious to the facts that trains and the terrain in which they move contain ample combustible materials which allow railroad fires to burn for days at high temperatures. Extensive fires have been known to occur even in railroad tunnels which have been turned into ovens by intense heat driving local firefighters from the accident. There may be limitations in the extent to which shielded casks can be made safer. However, the public can be safeguarded by controlling the transportation environment, which the NRC does not understand, through special handling of casks containing nuclear materials. If the NRC is given primary responsibility for regulating and certifying the safety of transportation casks, DOT's primary responsibility for safety, regulation, and logistical aspects of the transportation of nuclear waste and spent fuel would exist in name only, and it is unlikely that any significant safety improvements would occur. We strongly oppose the present wording of proposed Section 115(a) which would give DOT a back seat role on transportation cask safety.

If the safety and security of the transportation of nuclear materials is to be properly advanced, there should be no artificial distinctions drawn between different types of highly radioactive material. Section 3 of S. 535 refers to "commercial spent fuel", a phrase repeatedly thereafter used in the bill. Spent fuel from government reactors has been inexplicably omitted. Spent fuel is dangerous regardless of whether it has been irradiated in a commercial or a government reactor, and it is even my understanding that spent fuel from many government reactors is more highly radioactive than fuel from commercial reactors. All references to "commercial spent fuel" in S. 535 should be changed to refer simply to "spent fuel". "Spent fuel" should be defined as "any reactor fuel which has become radioactive as a result of its use and irradiation in a nuclear reactor".¹

Section 6 of S. 535 would amend Section 109(e) of the Hazardous Materials Transportation Act to provide a new paragraph (8) which would direct the DOT Secretary to make recommendations to the President for Federal routing guidelines or requirements to alleviate the need for additional state and local restrictions on shipments of nuclear waste, spent fuel, or radioactive materials. Because the railroads operate in many jurisdictions and find it difficult to comply with a multiplicity of differing requirements, we support this provision. Beyond that, we would favor complete preemption of all state and local regulations. Although paragraph (8) if read by itself might be interpreted as reducing the extent of the existing federal preemption, we do not believe that it has that effect. S. 535 contains no provisions which would alter Section 112 of the Hazardous Materials Transportation Act which provides for federal preemption of inconsistent state and local regulations except in those specific instances set forth in subsection (b) of that section.

Union Pacific has no objection to the emergency response and other provisions of S. 535.

I hope these comments have been of assistance to you and request that they be made part of the record of the hearings being held by your committee on S.535.

Very truly yours,

C. BARRY SCHAEFER,
Vice President—Law.

ENVIRONMENTAL SURVEY OF TRANSPORTATION OF RADIOACTIVE MATERIALS TO AND FROM NUCLEAR POWER PLANTS

If seven irradiated fuel elements were released from a cask in an unusual accident, the radiation level at 100 feet could be as much as 10^4 r/hr. Assuming the fuel elements remained unshielded for 10 hours, approximately 30,000 persons within a mile radius (based on 10^4 persons/square mile) might receive a cumulative dose of about 1000 man-rem. If a person remained unshielded at an average distance of 100 feet from the fuel elements for 6 minutes, he might receive a dose of as much as 1000 rem. Persons remaining near the exposed fuel for any appreciable length of

¹ The word "operating" used to modify a "commercial nuclear reactor" seems to be surplusage and should be eliminated. If, on the other hand, it is intended to exclude reactor fuel irradiated in an experimental reactor which is not "operating" in a commercial sense, for example by generating power for public use, the word creates an unjustifiable loophole.

time may receive large doses of radiation. Someone at a distance of 10 feet from the exposed fuel for about a minute, would receive a dose of 1000 rem. Remote equipment would be required to erect a shield around the fuel elements or to place them in a shielded box or to repackaging them.

* * * * *

RADIOLOGICAL EMERGENCY PROCEDURES FOR THE NONSPECIALIST

20. The table also furnishes a basis upon which to compare the radiation exposures permitted to people employed in the atomic energy industry, a maximum of 5 roentgen (5,000 milliroentgen) of gamma or X-radiation per year, to the much greater exposures required before we can detect an effect on the human body.

Fig. 4—Radiation Effects on the Body

Single dose over whole body		Effect
In roentgens	In milliroentgens	
Less than 25.....	Less than 25,000.....	Clinically not detectable.
25 to 100.....	25,000 to 100,000.....	Blood changes but no illness expected.
100 to 300.....	100,000 to 300,000.....	Slight to severe illness.
300 to 500.....	300,000 to 500,000.....	Illness and possible death.
500 to 1,000.....	500,000 to 1,000,000.....	Survival possible.
Over 1,000.....	Over 1,000,000.....	Survival improbable.

FEDERAL EMERGENCY MANAGEMENT AGENCY,
Washington, D.C. July 27, 1979.

HON. ADLAI E. STEVENSON,
Chairman, Subcommittee on Science, Technology, and Space, Committee on Commerce, Science, and Transportation, Dirksen Senate Office Building, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This responds to your recent letter requesting a statement by FEMA on S. 535, "The Nuclear Waste Transportation Safety Act of 1979." This measure was considered by your Subcommittee at hearings held on July 18, 19 and 20.

As agreed with Mr. Ed Smick of your staff, I am submitting the enclosed statement expressing this Agency's position on S. 535. The statement has been cleared by OMB as consistent with the Administration's legislative program.

If we can be of further service in your consideration of this proposal, please advise.

Sincerely,

GEORGE JETT, General Counsel.

STATEMENT BY GORDON VICKERY, ACTING DIRECTOR, FEDERAL EMERGENCY MANAGEMENT AGENCY

Mr. Chairman and Subcommittee Members: Thank you for the opportunity to present testimony on S. 535 to your Subcommittee. These hearings are particularly important in that the purpose of the proposed legislation before you is to protect the American people from the potentially devastating hazards of a transportation accident involving radioactive materials. At the recent National Governors Conference, this topic was particularly critical to the State leaders in their concerns about the shipment of nuclear fuels within states.

In your invitation for our agency to participate, you requested we give special attention to several sections of the proposed legislation. However, before responding to these questions, I would like to summarize background information concerning FEMA which may help you and the other Subcommittee members to understand better the role of our new agency.

FEMA was created April 1, 1979 by Executive Order 12127, pursuant to President Carter's Reorganization Plan No. 3 of 1978, which was approved by Congress on September 14, 1978.

The reorganization provides for a comprehensive restructuring of the Federal government's emergency-preparedness and disaster-response programs, through consolidation of five agencies and six additional disaster-related responsibilities into a single structure (FEMA), whose Director reports to the President.

It merges into one agency coordination and management of closely allied Federal programs involved with preparedness, mitigation and response to national emergencies ranging from natural and man-made disasters to nuclear attack. Execution of the preparedness, mitigation and response activities will continue to remain in the Federal agencies charged with the responsibilities.

Two of the five agencies were brought into FEMA on April 1: the United States Fire Administration, from the Department of Commerce, and the Federal Insurance Administration, from the Department of Housing and Urban Development.

A second Executive Order, now on the President's desk for signature, completes the reorganization by transferring to FEMA the Defense Civil Preparedness Agency, from the Department of Defense; Federal Disaster Assistance Administration, from the Department of Housing and Urban Development; and the Federal Preparedness Agency, from the General Services Administration.

On assuming the functions and authorities of those five agencies, FEMA will be responsible for setting policy for and coordinating all Federal plans and preparedness for natural and man-made disasters and for nuclear attack. It will manage our civil defense and national crisis preparedness programs, as well as Federal programs for flood, riot and crime insurance; mitigation of damages likely to result from a wide range of natural and man-made hazards including earthquakes and dam failures, and coordinate the response to and recovery from other emergencies and disasters.

Other closely related functions now to be consolidated into FEMA are: the community-preparedness programs for weather emergencies, the Federal emergency broadcast system oversight, coordination of emergency warning and Federal response to consequences of terrorist incidents.

While just in its formative stage, the reorganization of these programs and authorities in FEMA is designed to achieve several objectives:

Make a single agency, and a single official, accountable to the President and the Congress for all Federal emergency-preparedness, mitigation and response activities.

Create a single point of contact for State and local governments, which have urged strongly the consolidation of Federal emergency programs.

Enhance the dual use of emergency-preparedness and response resources at all levels of government by taking advantage of similarities in planning and response activities for peacetime and attack emergencies.

Provide an improved basis for determining the relative benefits and cost-effectiveness of spending for hazard mitigation, preparedness planning, relief operations and recovery assistance.

To meet those goals, FEMA will not only manage important emergency planning, mitigation and response programs but also act for the President to establish policy for and coordinate all of the Federal government's emergency-related activities involving those Federal agencies, which have statutory program responsibilities, but also will act as focal point to coordinate and direct agency emergency response programs which involve the participation of State and local governments.

In short, FEMA's coordinating role is to simplify, streamline and bring order and cohesion to the Federal side of the three-way partnership, which involves local, State and Federal governments in the full range of natural, peacetime and enemy-attack emergency activities.

With that background, I would now like to address the specific issues you raised concerning S. 535.

In your letter requesting our participation in these hearings, you asked that we address our attention to Sections 5 and 7 of the proposed Nuclear Waste Transportation Safety Act of 1979. S. 535, which would amend the Hazardous Materials Transportation Act of 1974, gives the Department of Transportation (DOT) the principal responsibility for assuring the safety and security of shipments of nuclear waste and radioactive commercial spent fuel.

Section 5 of this bill assigns the Secretary the lead role in providing for the safety, regulation and logistical aspects of the shipment of nuclear waste and commercial spent fuel, except the responsibility for regulating and certifying the safety of shipping casks and packages which remains with the Nuclear Regulatory Commission (NRC).

To this end, the Secretary would be authorized to formulate a national emergency-response plan to deal with the many contingencies which may occur during a shipment of radio-active materials.

Specifically, the Secretary is to include in the plan:

- provisions for a program of educating State and local officials with respect to possible hazards associated with shipments of radio-active materials;
- steps that should be taken in case of an accident or emergency situation which occurs during a shipment;
- a definition of the respective roles of Federal, State and local governments in responding to an emergency situation;
- an estimation of the cost of the equipment and training of emergency-response personnel which the Secretary determines necessary to prepare local officials to deal promptly with the immediate problems associated with an emergency situation.

In addition, the Secretary may make recommendations to the Congress regarding funding or assistance the Federal government may supply to State and local governments to "improve their ability to respond to an emergency situation." Section 5 also authorizes the establishment of a grants program to support their efforts to develop emergency-response plans and Section 7 of the bill authorizes appropriations for fiscal years 1980-1982 to carry out the purpose of Section 5.

We defer to DOT as to whether these provisions are necessary. However, if the Congress decides to take action on the Bill, we believe it should be amended.

We believe that the emergency planning authorities in the Bill duplicate in many important respects the functions and responsibilities of FEMA and are inconsistent with the thrust of the President's reorganization initiatives endorsed so strongly by the Congress.

The authority to develop national contingency plans and preparedness programs to respond to emergencies and disasters such as an accident involving the transportation of nuclear materials stems from several important functions and responsibilities now transferred to FEMA. Previously, these functions were vested in the Federal Preparedness Agency, the Federal Disaster Assistance Administration and the Defense Civil Preparedness Agency—all of which have been transferred to FEMA. These reside by law in the President and were founded in the series of legislative and reorganization authorities cited in the new Executive Order assigning the responsibilities to FEMA.

In carrying out these authorities, the Federal Preparedness Agency has developed and issued a national plan for peacetime nuclear emergencies—the Federal Response Plan for Peacetime Nuclear Emergencies. This plan provides important coverage for transportation accidents involving nuclear fuels and specifies its role to be played by Federal agencies, including the Department of Transportation, in a comprehensive and integrated program for readiness and response to these emergencies. Most important is the fact that FPA—now FEMA—coordinates the assignments for all Federal agencies which assures a consistent and orderly response with minimum overlaps or inconsistency.

The Federal Response Plan for Peacetime Nuclear Emergencies is currently under the President's Commission on review of the Three-Mile Island Incident.

We recognize that the coordination and administration of programs dealing with the transportation of nuclear materials are divided among FPA, NRC, EPA, DOT and DOE among others, with the result that their energy response efforts may sometimes be different and duplicative. However, the consolidation of the important coordination and oversight roles of FPA and FPAA with the nuclear incident plans and preparedness-operational programs of DCPA at the National and State and local levels in FEMA will equip the new agency to serve as an effective Federal focal point for planning and coordination in the full range of nuclear-incident emergencies. FEMA will proceed in the near future to review and update, as necessary, the current Federal plans to prepare for and respond to these incidents. Department of Transportation as well as other agencies will have a major part in this effort.

To update current response plans, FEMA, in conjunction with Department of Transportation and other involved agencies, under FEMA's coordination, will be working closely with State and local emergency management leaders. This is consistent with the President's reorganization goal that FEMA act as the focal point to coordinate the involvement on emergency-planning and response initiatives of all Federal agencies with these jurisdictions. FEMA will have offices in each of ten Federal regional cities to work directly with State and local officials and to assist Federal agencies at the regional level in carrying out the policies established through this inter-agency effort. This coordination by a single responsible agency—FEMA—will simplify and provide uniformity in Federal planning and State and local officials. It will also provide assurances that the peculiar nature of emergencies such as nuclear-transportation accidents are well reflected in the common

aspects and control, emergency response, emergency medical services, shelter and evacuation.

In summary, it is the recommendation of FEMA that S. 535 if action is taken as it should be significantly modified in two principal points.

First, FEMA should be charged with the continuing and primary Federal responsibility to develop and coordinate national plans for the preparedness and response to transportation accidents involving radioactive materials. This program should be carried out as a part of the overall national planning for readiness and response to all peacetime nuclear accidents with important involvement by DOT, EPA and other Federal agencies.

Second, FEMA should be given primary authority to work with State and local governments on their emergency planning and response programs for nuclear-transportation accidents. This must include the determination of specific needs in terms of Federal financial and technical support required to augment for nuclear-transportation preparedness the general-use emergency-readiness resources now provided these jurisdictions. Again, the Department of Transportation, the NRC, EPA and others involved in this area of national concern would have principal roles in determining these questions.

This outcome will be consistent with the goals of the Reorganization Plan creating FEMA and ward off pressures to create separate disaster plans for the whole host of potential emergency conditions which confront the public each day. Multiple-use planning and all-risk use of resources at all levels of government will assure efficient response to emergencies at reasonable cost levels.

As one final note, I would call to the attention of the Subcommittee the fact that the General Accounting Office has recently issued a report on the issues addressed in this legislation. In this report, entitled "Federal Actions are Needed to Improve Safety and Security of Nuclear Materials Transportation," GAO recommends that the Director of FEMA "assume the responsibility for making policy and coordinating radiological emergency response planning for nuclear transportation accidents. We have concurred in this recommendation as has the Department of Transportation.

Again, thank you for the opportunity to testify on this important legislation.

TRANS NUCLEAR, INC.,
White Plains, N.Y., August 29, 1978.

Senator HARRISON SCHMITT,
U.S. Senate, Washington, D.C.

DEAR SENATOR SCHMITT: A report of the August 16, 1978 hearing on nuclear waste management held by the Subcommittee on Science, Technology and Space and the Subcommittee on Surface Transportation has just been brought to my attention. In this report, you are quoted as saying in your opening remarks:

"Transportation of spent fuel and high levels wastes is threatening to be a limiting factor in both the current operations and in maintaining the nuclear option for the future. The current commercial shipping cask inventory is capable of shipping only one-third of the spent fuel output from our operating nuclear power plants. At present there are no industry commitments to build more shipping casks."

I believe you may have been misinformed as to the status of industry commitments to build more shipping casks. Transnuclear, Inc. is undertaking a major, internally-funded investment program designed to provide significant spent fuel transportation capability in the near future. At the present time we are having five truck casks fabricated with the first unit scheduled for delivery this year and the other four within the next two years.

The schedule for our rail cask system calls for the purchase order for six units to be placed early next year with the first deliveries in 1981. A detailed status report is given in the enclosure.

I would look forward to meeting with you or your staff, at your convenience, to assist in clarifying the cask availability picture.

Very truly yours,

LEO MACKLIN, President.

SAVANNAH, GA.

Senator HOWARD W. CANNON,
Chairperson of Commerce, Science, and Transportation Committee.

DEAR SENATOR CANNON: I am writing in reference to the Nuclear Waste Transportation Safety Act, S. 535. I have been informed that your committee will be holding public hearings on it.

I am sorry that I will not be able to attend, but I am a mechanic and hold down a 45/hr/week job with not much time for an active role in politics.

I am very glad to see a bill introduced dealing with transportation of radioactive waste. It will be very important for the Savannah area as Savannah may be the port that handles a lot of shipments of nuclear materials to and from the Savannah River Plant and the Barnwell South Carolinian area, (Particularly Allied General Nuclear Services).

There are a number of points you must consider while the bill is in your committee.

1. The bill needs to specify and recognize the authority of local governments to enact more stringent regulations on shipments through their area.

2. The shippers should be well educated on what they are carrying (Not true in the past) and should prepare emergency response plans for approval by the DOT and the governors of the states involved.

3. The bill should provide for effective involvement of local and state agencies for planning for present and future nuclear waste transportation, and a public hearing process to give people the opportunity in making the decisions.

4. Radioactive shipments made by the DOE should come under the same regulations and public scrutiny as shipments from commercial sources.

There are a lot of uncertainties involved in radioactive waste. Nobody knows what to do with it as a permanent disposal. I think that domestic spent fuel should stay at the reactor site until a permanent and safe disposal site has been set up. The more shipping that takes place before then will increase the likelihood of accident.

I hope these comments will help you. I would enjoy hearing from you and getting news of S. 535

Very sincerely,

NATHAN C. WEEKS.

STATEMENT OF THE NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

The National Society of Professional Engineers welcomes this opportunity to comment on safe nuclear waste transportation. NSPE is a non-profit, nationwide organization representing nearly 80,000 individual members engaged in virtually every discipline of the engineering profession. Many of our members are directly involved with the important technical aspects of radio-active waste disposal and have been since the inception of the nuclear industry years ago. They are uniquely qualified to research and develop the technical expertise necessary for safe and effective nuclear waste management.

In light of the recent rise of OPEC oil prices, the turmoil in Iran, the diplomatic problems surrounding oil trade with Mexico, and other domestic and foreign uncertainties, NSPE believes it essential that America lessen its dependence upon foreign energy sources. To do this, America must continue to rely on nuclear power reactors to fill a significant percentage of its energy demand. However, a major stumbling block to nuclear power development is America's failure to establish a safe, coherent nuclear waste transportation policy.

It is essential that the Federal government demonstrate a safe and coherent nuclear transportation policy. The Federal government's responsibility is clear since the bulk of existing wastes are the by-products of a federal military-defense program. Without considering commercial reactor fuel, many millions of gallons of liquid fuel and solidified nuclear waste already exists and these wastes must be shipped to depositories around the nation. We are all aware of the dangers involved with trains and trucks carrying dangerous chemicals through many rural areas of the country. Many times, these vehicles have become involved in accidents which spread thousands of harmful chemical substances over acres and acres of inhabited areas. There has not yet been such an accident involving nuclear wastes—we have been lucky. Yet we cannot expect this luck to continue forever. There is a great need for a unified government policy to safely transport hazardous nuclear waste. NSPE, therefore, supports the action of Senator Schmitt in introducing S. 535 which will require the Secretary of Transportation to send to Congress a national emergency response plan to deal with emergency situations that may occur during the shipment of nuclear wastes, commercial spent fuel or other radio-active material.

This plan will be effective for it allows the education of state and local officials regarding possible hazards associated with these shipments and steps that should be taken in case of an accident or emergency situation occurring during any such shipment. We cannot over-emphasize the importance of the federal government's role in the political aspects of the current situation. In 1978 California and several other states passed legislation which bans the construction of new nuclear plants until the federal government adopts a policy to permanently deal with nuclear wastes. This policy will include a provision for the safe transport of nuclear wastes from domestic and, in some cases, foreign nuclear sites. In order to preserve nuclear energy as an option therefore it is essential that the federal government, demonstrate that we can safely and effectively ship and deposit nuclear wastes.

Economically, the cost of establishing and operating an effective radioactive waste transportation system is substantial in terms of today's dollars. This bill calls for the authorization of almost 6 million dollars for each of the fiscal years 1980, 1981, and 1982 to carry out all of its provisions. However, this cost is small in terms of the enormous and essential contribution of a safe and reliable nuclear waste transportation system to our nation's goals of energy independence.

NSPE believes it essential that America lessen its independence upon foreign energy sources. This can be accomplished by developing and utilizing technologies which better use our domestic energy resources. For the short range, we must make better use of our more abundant resources such as nuclear energy. However, we cannot continue to build upon our nuclear industry unless and until we can assure the people of America that we will safely transport nuclear waste through their towns and cities.

NSPE wishes to assure the Subcommittee of our continued interest in this subject and of our willingness to be of service to the Subcommittee in whatever way possible. We appreciate this opportunity to express our views on this topic.



