NUREG-0725
Rev. 7

Public Information Circular for Shipments of Irradiated Reactor Fuel

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards

9102060142 910131
PDR NUREG
0725 R PDR

AVAILABILITY NOTICE

Availability of Reference Materials Cited in NRC Publications

Most documents cited in NRC publications will be available from one of the following sources:

1. The NRC Public Document Room, 2120 L Street, NW, Lower Level, Washington, DC 20555
2. The Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082
3. The National Technical Information Service, Springfield, VA 22161

Although the listing that follows represents the majority of documents cited in NRC publications, it is not intended to be exhaustive.

Referenced documents available for inspection and copying for a fee from the NRC Public Document Room include NRC correspondence and internal NRC memoranda; NRC Office of Inspection and Enforcement bulletins, circulars, information notices, inspection and investigation notices; Licensee Event Reports; vendor reports and correspondence; Commission papers; and applicant and licensee documents and correspondence.

The following documents in the NUREG series are available for purchase from the GPO Sales Program: formal NRC staff and contractor reports, NRC-sponsored conference proceedings, and NRC booklets and brochures. Also available are Regulatory Guides, NRC regulations in the Code of Federal Regulations, and Nuclear Regulatory Commission issuances.

Documents available from the National Technical Information Service include NUREG series reports and technical reports prepared by other federal agencies and reports prepared by the Atomic Energy Commission, forerunner agency to the Nuclear Regulatory Commission.

Documents available from public and special technical libraries include all open literature items, such as books, journal and periodical articles, and transactions. Federal Register notices, federal and state legislation, and congressional reports can usually be obtained from these libraries.

Documents such as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings are available for purchase from the organization sponsoring the publication cited.

Single copies of NRC draft reports are available free, to the extent of supply, upon written request to the Office of Information Resources Management, Distribution Section, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at the NRC Library, 7920 Norfolk Avenue, Bethesda, Maryland, and are available there for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

NUREG-0725
Rev. 7

Public Information Circular for Shipments of Irradiated Reactor Fuel

U.S. Nuclear Regulatory Commission

Office of Nuclear Material Safety and Safeguards

9102060142 910131
PDR NUREG
0725 R PDR

AVAILABILITY NOTICE

Availability of Reference Materials Cited in NRC Publications

Most documents cited in NRC publications will be available from one of the following sources:

1. The NRC Public Document Room, 2120 L Street, NW, Lower Level, Washington, DC 20555
2. The Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082
3. The National Technical Information Service, Springfield, VA 22161

Although the listing that follows represents the majority of documents cited in NRC publications, it is not intended to be exhaustive.

Referenced documents available for inspection and copying for a fee from the NRC Public Document Room include NRC correspondence and internal NRC memoranda; NRC Office of Inspection and Enforcement bulletins, circulars, information notices, inspection and investigation notices; Licensee Event Reports; vendor reports and correspondence; Commission papers; and applicant and licensee documents and correspondence.

The following documents in the NUREG series are available for purchase from the GPO Sales Program: formal NRC staff and contractor reports, NRC-sponsored conference proceedings, and NRC booklets and brochures. Also available are Regulatory Guides, NRC regulations in the Code of Federal Regulations, and Nuclear Regulatory Commission issuances.

Documents available from the National Technical Information Service include NUREG series reports and technical reports prepared by other federal agencies and reports prepared by the Atomic Energy Commission, forerunner agency to the Nuclear Regulatory Commission.

Documents available from public and special technical libraries include all open literature items, such as books, journal and periodical articles, and transactions. Federal Register notices, federal and state legislation, and congressional reports can usually be obtained from these libraries.

Documents such as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings are available for purchase from the organization sponsoring the publication cited.

Single copies of NRC draft reports are available free, to the extent of supply, upon written request to the Office of Information Resources Management, Distribution Section, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at the NRC Library, 7920 Norfolk Avenue, Bethesda, Maryland, and are available there for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

NUREG–0725
Rev. 7

Public Information Circular for Shipments of Irradiated Reactor Fuel

Manuscript Completed: November 1990
Date Published: January 1991

Division of Safeguards and Transportation
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

PREFACE

This circular has been prepared to provide information on the shipment of irradiated reactor fuel (spent fuel) subject to regulation by the U.S. Nuclear Regulatory Commission (NRC). It provides a brief description of spent fuel shipment safety and safeguards requirements of general interest, a summary of data for 1979–1989 highway and railway shipments, and a listing, by State, of recent highway and railway shipment routes.

The enclosed route information reflects specific NRC approvals that have been granted in response to requests for shipments of spent fuel. This publication does not constitute authority for carriers or other persons to use the routes described to ship spent fuel, other categories of nuclear waste, or other materials.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

The Nuclear Regulatory Commission (NRC) is authorized under the Atomic Energy Act of 1954, as amended, to regulate the commercial nuclear industry for the purpose of protecting the public health and safety and the common defense and security of the United States. Included in this authority is the regulation of certain aspects of the transportation of irradiated reactor fuel (spent fuel). NRC's role in this regard is explained in Section 2 of this report. Section 3 provides descriptive statistics on spent fuel shipments in the commercial nuclear industry for the period 1979–1989. Section 4 contains a listing, by State, of highway and railway segments used in each State for transporting spent fuel in recent years (1987–1989).

2 REGULATORY REQUIREMENTS FOR SPENT FUEL SHIPMENTS

Spent fuel shipments are regulated from both the safety and safeguards standpoints. Safety deals with protection of public health and safety during routine transport as well as in the event of handling or transportation accidents, whereas safeguards deals with the protection of shipments against deliberate, malevolent acts by persons.

2.1 Safety Requirements

Federal regulatory responsibility for spent fuel transportation safety is shared by NRC and the U.S. Department of Transportation (DOT). Basically, NRC's safety role is to ensure that the spent fuel packagings meet strict regulatory design rules, and includes approving packaging designs and Quality Assurance Programs, and conducting inspections. NRC packaging requirements are specified in 10 CFR Part 71. The DOT role in regulating spent fuel shipment safety is broad, and covers all aspects of actual transportation, including route selection, vehicle condition and placarding, driver training, package marking, labeling, other shipping documentation, etc. These requirements are specified in 49 CFR Parts 171–178. Of the NRC and DOT safety requirements for spent fuel shipments, NRC's packaging standards and DOT's routing rules have been of most general interest, and are briefly described below.

2.1.1 Packaging Standards

The basic strategy for regulating spent fuel shipments is to rely on the packaging to protect the public health and safety during transportation. The packaging standards that have been established in the regulations provide that a spent fuel packaging (cask) shall prevent the loss or dispersion of the radioactive contents, provide adequate shielding and heat dissipation, and prevent nuclear criticality under both normal and accident conditions of transportation. The normal conditions of transportation that 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 that must be considered are specified in terms of impact, puncture, fire conditions, and immersion.

The NRC initially reviews the cask design to verify its resistance to accidents. NRC must issue a certificate before a cask fabricated from the reviewed design can be used to transport spent fuel.

The ability of packaging to provide protection has been demonstrated by the responses of packaging during actual traffic accidents. For example, an accident occurred on December 8, 1971, on a major highway near Oak Ridge, Tennessee. In this accident, the driver of a vehicle carrying a spent fuel cask swerved to avoid colliding with an oncoming vehicle, lost control, and overturned off the roadway. The cask assembly was thrown into a ditch, traveling more than 100 feet before coming to rest. No release of contents or release of radiation occurred. The outer surface of the cask substained minor damage. The spent fuel cask was placed on another trailer and taken to its destination. The cask was returned to service after repair of the minor damage and inspection.

The accident resistance of casks has also been demonstrated in controlled tests. In one test, sponsored by the U.S. Department of Energy (DOE), a truck bearing a cask was deliberately placed in the path of and struck by a 120-ton locomotive traveling about 80 miles per hour. In another DOE test, a cask aboard a truck moving about 80 miles per hour was deliberately crashed into an immovable concrete structure. Subsequent examination in both these tests confirmed that no radioactive material would have been released from the casks had they been loaded with spent fuel. Thus, both field experience and controlled tests have substantiated the strategy of depending on packaging design for safety in transit.

For further information on spent fuel shipment safety, please consult NUREG/BR–0111, "Transporting Spent Fuel—Protection Provided Against Severe Highway and Railroad Accidents."

2.1.2 Routing Requirements

DOT requirements in 49 CFR 177.825(b) designate the use of the Interstate System of highways and available city beltways as the primary roadways over which radioactive material shipments under an NRC safeguards-approved route plan are to be carried. There is no routing rule for rail shipments. The general designation as preferred highways is given to roadways, based on their capacity for reducing transit times. Appropriate State routing agencies, following prescribed criteria, may designate an

alternate route to the preferred Interstate System. It is the responsibility of spent fuel carriers to abide by the routing rule when they transport spent fuel by highway.

2.1.3 Spent Fuel Shipment Safety Record

The safety record for spent fuel shipments in the U.S. and in other industrialized nations is enviable. Of the thousands of shipments completed over the last 30 years, none has resulted in an identifiable injury through release of radioactive material.

2.2 Safeguards Requirements

In May 1979, NRC adopted new regulations, in 10 CFR 73.37, for strengthening the protection of shipments of spent fuel against radiological sabotage. These regulations were subsequently revised in May 1980, in response to public comments. The regulations require, among other actions, NRC approval of routes for the transportation of spent fuel, to ensure adequate planning for physical protection against actual or attempted acts of radiological sabotage. Physical protection requirements for NRC licensees who transport or deliver spent fuel to a carrier for transport include: shipment prenotification to NRC; procedures for coping with emergencies; a communications center; contact with the communications center every 2 hours; a written log of shipment events; arrangements with local law enforcement agencies (NRC often coordinates this item); avoidance of intermediate stops; surveillance of the shipment vehicle while stopped; armed escorts in heavily populated areas; escort training; onboard communications; immobilization devices on trucks; driver training; and notification of State governors before shipments. Of these safeguards requirements, route approval and State notification have been of most general interest, and are briefly described below.

2.2.1 Route Approval

NRC licensees planning to ship spent fuel are required to submit proposed routes for such shipments to the NRC for approval, from the safeguards standpoint, before the use of a given route. For highway shipments, the licensee must propose a route that conforms with DOT's routing rules. NRC surveys proposed routes for communication reception, location of safe havens, etc. Routes may be approved for a single shipment, or a specified series of shipments. Once a shipment series is approved, the route may be used for all shipments, without reapproval of the route for each shipment, provided that NRC is notified in advance of each shipment. The route approval is for a stated series of shipments only; any subsequent shipments not part of an approved series must be individually approved. NRC approval authorizes only spent fuel shipments, and does not include other categories of nuclear waste material. From time to time, NRC may authorize alternate routes or detours, as circumstances dictate at the time of shipment. Also, detours may be taken without prior approval, in response to unforeseen circumstances that arise during a shipment. Criteria for determining when and how such detours may be taken are provided in published regulatory guidance ("Physical Protection of Irradiated Spent Fuel," NUREG-0561, Rev. 1).

2.2.2 Notification of State Governors

NRC requires its licensees to notify the governor or the governor's designee before the transport of spent fuel within or through the State [10 CFR 73.37 (f)]. Spent fuel is identified in 10 CFR 73.37(a) as "... net weight of irradiated fuel, exclusive of cladding or other structural or packaging material...." The notification must be in writing and postmarked at least 7 days before transport, if mailed, or delivered at least 4 days before transport, if sent by messenger. The notification must include:

- the name, address, and telephone number of the shipper, carrier, and receiver
- a description of the shipment, as specified by DOT
- a listing of the routes to be used within the State
- a statement that NRC requires that shipment schedule information (provided as an enclosure) be protected from unauthorized disclosure.

The enclosure to the notification provides:

- the estimated date and time of departure from the point of origin of the shipment
- the estimated date and time of entry into the governor's State
- a statement that schedule information must be protected from unauthorized disclosure until at least 10 days after the shipment (or 10 days after the last shipment of a series) has entered or orginated within the State.

The licensee must also notify the governor of schedule changes that differ by more than 6 hours from the furnished schedule. Subsequent distribution of the schedule information is at the governor's discretion, but NRC regulations require all persons who receive the schedule information to protect it from unauthorized disclosure.

2.2.3 Spent Fuel Shipment Safeguards Record

Safeguards incidents for spent fuel shipments are those that involve attempts at radiological sabotage of spent fuel, or purposeful acts that threaten or result in significant degradation of the safeguards system used to protect

the shipment. Licensees are required, under existing regulations, to immediately notify law enforcement authorities upon the occurrence or discovery of a safeguards incident, for the purpose of initiating an appropriate response. In addition, licensees are required to promptly report safeguards incidents to NRC by telephone, followed by a written report.

To date, no safeguards incidents involving the shipment of spent fuel have occurred. However, one NRC licensee was cited, during an inspection in 1987, for two minor infractions of procedural compliance with spent fuel transportation safeguards regulations.

3 DESCRIPTIVE STATISTICS FOR 1979–1989 HIGHWAY AND RAILWAY SPENT FUEL SHIPMENTS

NRC began approving spent fuel shipments in 1979. This section provides descriptive statistics on the shipments that have occurred through 1989. Only shipments of academic, industrial, and utility irradiated reactor fuel subject to NRC regulation are included; DOE shipments are excluded. Figure 3.1 and Table 3.1 provide a geographical perspective for spent fuel shipments. Figure 3.1 shows the highway and railway routes used for spent fuel transport during 1979–1989. Table 3.1 shows the number of shipments and quantity of spent fuel shipped between specific organization/destination pairs for the period.

Table 3.2 and Figures 3.2–3.9 provide more detailed spent fuel shipment information, including mode of shipment (highway or railway) and shipment trends over time. Table 3.2 provides a summary of spent fuel shipment data for the 1979–1989 period. For each year, the table provides four variables that describe shipping activity by mode. Data for shipment miles are taken primarily from road atlases, and have been rounded to the nearest hundred miles for each year. Data on quantity of spent fuel shipped were provided by shippers, and have been rounded to the nearest hundred kilograms for each year. The kilogram-miles data are derived from shipment quantity and distance data, and have been rounded to the nearest hundred thousand.

Figure 3.2 shows that most (93.1 percent) of the nearly 1,200 spent fuel shipments during the 1979–1989 period were completed over highways. Figure 3.3 shows that most of the shipping activity occurred during 1980–1987, with a generally decreasing trend in the number of shipments since 1984.

Figure 3.4 shows that the larger quantity (56.6 percent) of spent fuel was shipped by railway, which reflects the greater capacity of rail spent fuel containers versus that for trucks. In addition, a few rail shipments included multiple spent fuel containers, further increasing the rail shipment payload. The figure indicates that 820,300 kilograms, or about 820 metric tons, of spent fuel were shipped. Figure 3.5 shows that greater quantities of spent fuel were shipped during 1984–1987, than before or after those years. The figure also shows that 1985 was the peak year for quantity of spent fuel shipped, and that, particularly in recent years, most spent fuel has been shipped by rail.

Figure 3.6 shows that the highway mode accounted for most (95.1 percent) of the 759,800 spent fuel shipment miles. Figure 3.7 shows that shipment mileage peaked in 1984, with a general decline in subsequent years.

Figure 3.8 shows the cumulative movement of spent fuel, calculated by summing the product of quantity and distance for all shipments, and is expressed in kilogram-miles. This unit is analogous to "ton-miles," a unit commonly used to measure the flow of commodities. The figure shows that the railway mode accounted for the majority (62.1 percent) of the 367.2 million kilogram-miles associated with spent fuel shipments. Figure 3.9 shows the kilogram-miles distribution by year.

Finally, Figures 3.10 and 3.11 provide an operational perspective for the spent fuel shipments. Figure 3.10 shows the distribution of shipments by individual shipment quantity, and the corresponding total quantity shipped. The individual shipment quantities have been grouped into ranges, with highway shipments most frequently falling within the 0–10, 400–500, and 1300–1400 kilogram ranges, and with most railway shipments within the 6000–7000 kilogram range. The smallest quantity range accounts for the largest number of shipments (470, or 40 percent of highway and railway shipments combined), yet comprises only 2,000 kilograms (0.2 percent) of the combined quantity shipped. Conversely, the 54 railway shipments in the 6000–7000 kilogram shipment range comprise only 4.6 percent of the combined total shipments, but 44 percent of the combined quantity of spent fuel shipped. (All shipments less than 1400 kilograms were shipped by highway, and all shipments greater than 1400 kilograms were shipped by railway.)

Figure 3.11 shows the distribution of shipments by distance range, and the corresponding total quantity of spent fuel shipped. For highway shipments, the number of shipments generally decreases with shipment distance, although a significant number of shipments exceeded 900 miles. Of the 356 metric tonnes shipped by highway, 173 tonnes (49 percent) traveled less than 200 miles. The number of rail shipments was somewhat uniform over the ranges, with 400–700 mile shipments accounting for 84 percent of the total quantity shipped by rail.

4 ROUTE SEGMENT LISTING FOR RECENT HIGHWAY AND RAILWAY SPENT FUEL SHIPMENTS

Table 4.1 is a listing of highway and railway routes that have been used to transport spent fuel since this publication was last revised (Revision 6, September 1987) through December 1989. The table identifies the spent fuel shipments that occurred in each State. The table also lists the highway or railway route segments within the State that were used for each shipment, and when the shipment was completed. The table shows that highway spent fuel shipments were made in or through 25 States, and that railway shipments were made in or through 6 States during the period discussed.

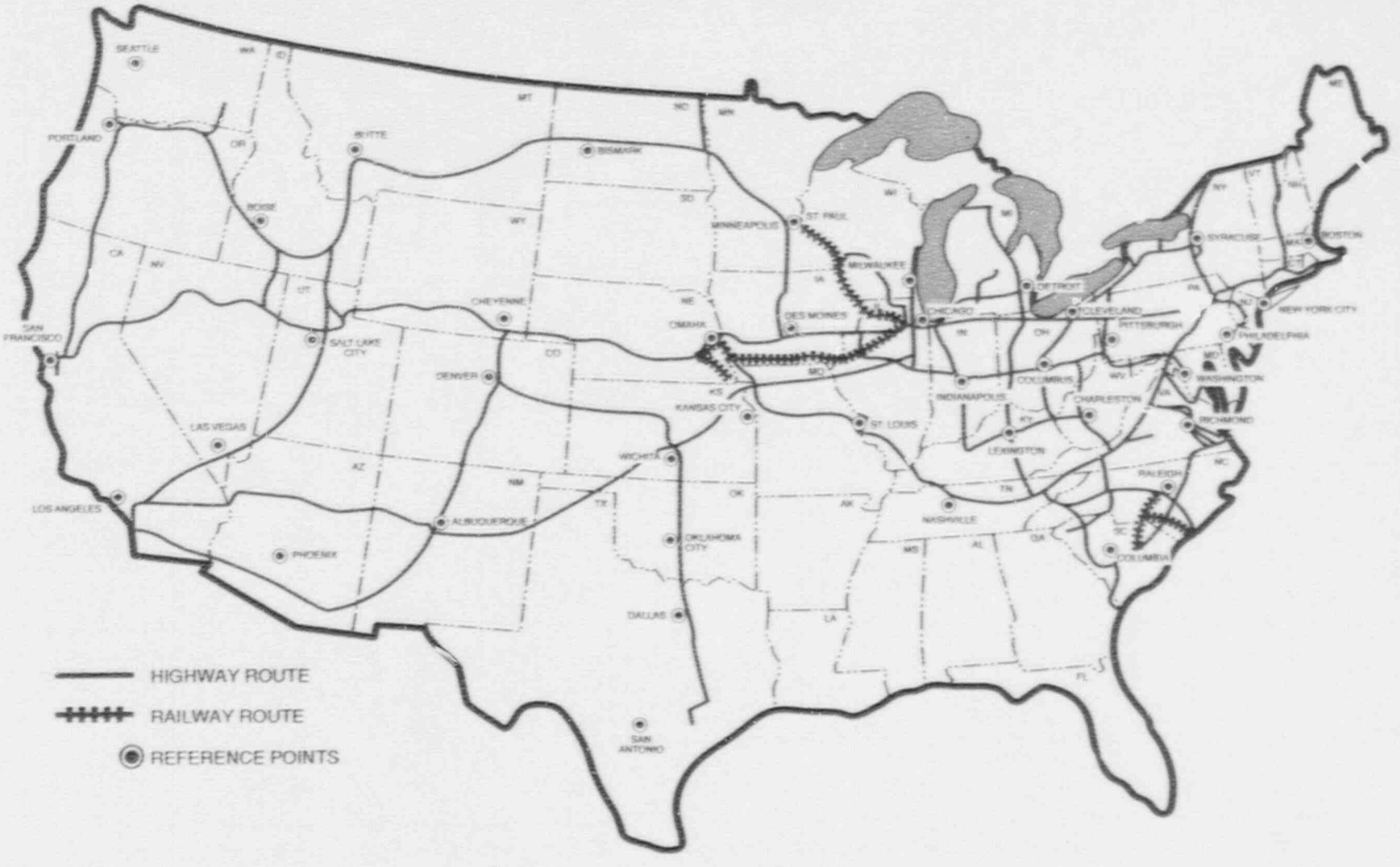

Figure 3.1 Routes Used for Spent Fuel Shipments: 1979-1989.

Table 3.1 Number of Shipments and Quantity of Spent Fuel Shipped for Origination/Destination Pairs: 1979–1989

Origination (Facility, State) / Destination (Facility, State)	Babcock & Wilcox, VA	Battelle-Columbus, OH	Brunswick, NC	Calvert Cliffs, MD	Denver Federal Center, CO	Dresden Station, IL	General Atomics, CA	GE/Morris, IL	GE/Vallecitos, CA	Ginna, NY	Hanford, WA	Idaho National Engineering Lab, ID	La Crosse, WI	McGuire, NC	Oconee, SC	Oyster Creek, NJ	Point Beach, WI	Port of Oakland, CA**	Portland, OR**	Portsmouth, VA**	Quad Cities, IL	Richmond, CA**	Savannah River Project, SC	Shearon Harris, NC	Zion, IL
Alexandria Bay, NY*																							16/277		
Babcock & Wilcox, VA									3/41						3/558						2/486				
Battelle-Columbus, OH				1/72				2/791	3/28	3/2632															2/979
Big Rock Point, MI																									
Brunswick, NC (via railway)		1/38																		2/14				13/2509	
Calvert Cliffs, MD		2/84																							
CINTICHEM, NY												3/15											6/17		
Cooper, NE (via railway)								28/14546																	
Derby Line, VT*																							6/25		
Dresden Station, IL	2/41																			1/6					
Fort Calhoun, NE		1/1																							
Fort Erie, NY*																							1/2		
Fort St. Vrain, CO							2/15					175/486													
General Atomics, CA												2/5													
GE/Morris, IL													6/936				105/48302								
GE/Vallecitos, CA											2/152	19/71						2/57	1/1			2/39			
Haddam Neck, CT		3/1275																							
Michigan State Univ., MI					1/8							2/11													
Millstone, CT									3/43																
Monticello, MN (via railway)		2/87						28/16018	4/55																
Nat'l. Inst. Stds. & Tech., MD																							6/28		
Newport News, VA*																							4/21		
Norfolk Int'l. Terminal, VA*																							1/7		
Oconee, SC	6/877													128/18894											
Ogdensburg, NY*																							14/35		
Oyster Creek, NJ		1/22																							
Pembina, ND*												1/2													
Portland, OR*												28/139													
Portsmouth, VA*									1/5			16/200											166/1157		
Port of Oakland, CA*									3/65																
Port of Savannah, GA*																							3/61		
Quad Cities, IL	2/486	1/16							3/40																
Rhode Island A.E.C., RI																							3/17		
Richmond, CA*									1/12																
Robinson, SC (via railway)			218/4725																						
San Onofre, CA								15/6895																	
Surry, VA		1/26																							
Univ. of California (Berkeley), CA												3/21													
Univ. of Michigan, MI																							8/18		
Univ. of Missouri, MO												15/81											14/74		
Univ. of Virginia, VA																							5/9		
West Valley, NY		8/2877				31/25447				73/32788						12/42850	11/48450								
Wilmington, NC*																							2/19		
Zion, IL		2/926																							

* Port of Entry

** Port of Departure

Table 3.2 Summary Data for 1979-1989 Spent Fuel Shipment Information.

Year	Number of Shipments		Kilograms Spent Fuel Shipped (Thousand)		Shipment Miles (Thousand)		Kilogram-Miles (Million)	
	Highway	Railway	Highway	Railway	Highway	Railway	Highway	Railway
1979	16	11	0.1	30.2	8.0	2.3	0.1	6.2
1980	130	5	10.0	13.6	115.9	1.0	17.2	2.8
1981	81	2	7.9	6.0	38.5	0.4	1.7	1.2
1982	124	0	7.1	0.0	106.8	0.0	1.8	0.0
1983	117	0	36.6	0.0	83.6	0.0	12.7	0.0
1984	245	3	84.5	23.8	181.3	1.6	51.4	12.7
1985	135	18	74.0	119.4	70.9	8.7	28.3	57.8
1986	105	15	40.4	97.5	47.8	8.7	8.8	56.3
1987	107	15	82.3	101.4	41.8	8.4	14.8	56.5
1988	25	7	12.8	41.8	11.4	4.3	2.4	25.7
1989	16	6	0.1	30.8	16.7	1.7	0.1	8.7
TOTAL	1101	82	355.8	464.5	722.7	37.1	139.3	227.9

Figure 3.2 Number of Spent Fuel Shipments by Mode: 1979-1989.

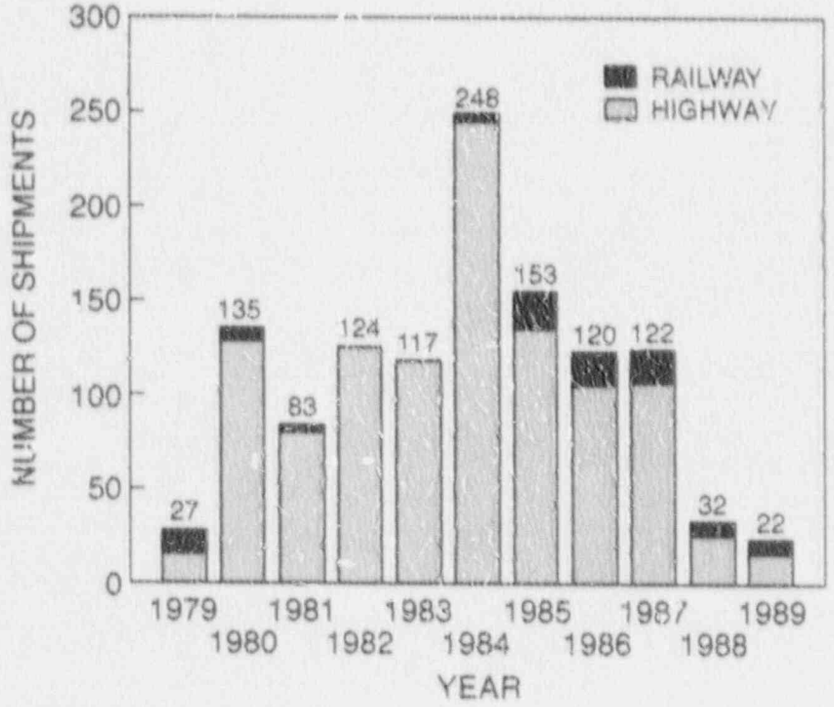

Figure 3.3 Number of Spent Fuel Shipments by Year: 1979-1989.

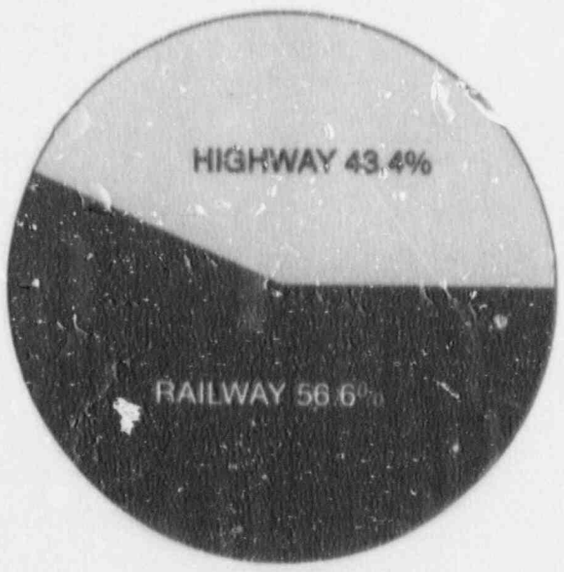

Figure 3.4 Quantity of Spent Fuel Shipped by Mode: 1979-1989.

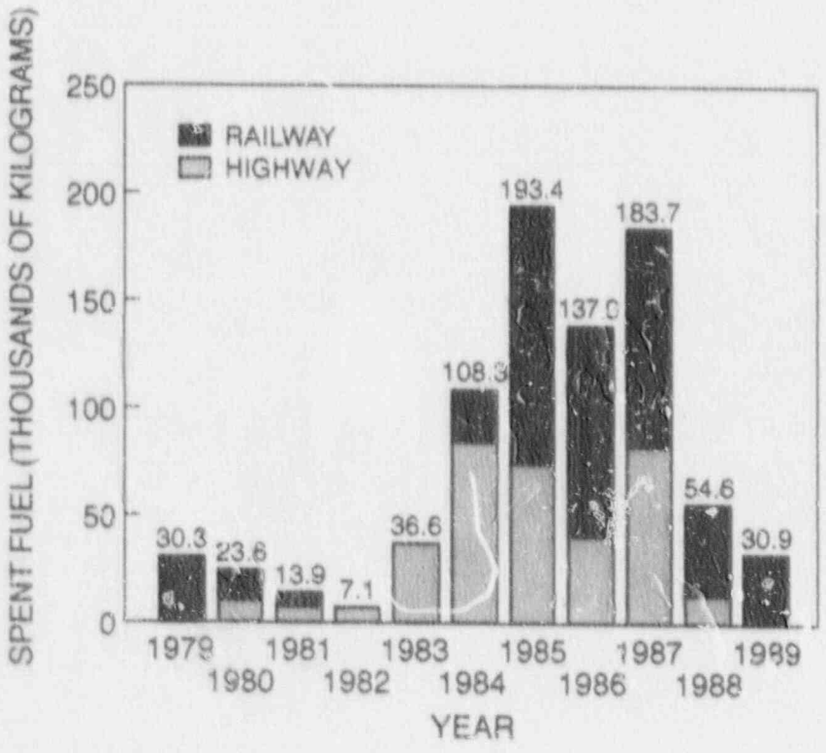

Figure 3.5 Quantity of Spent Fuel Shipped by Year: 1979-1989.

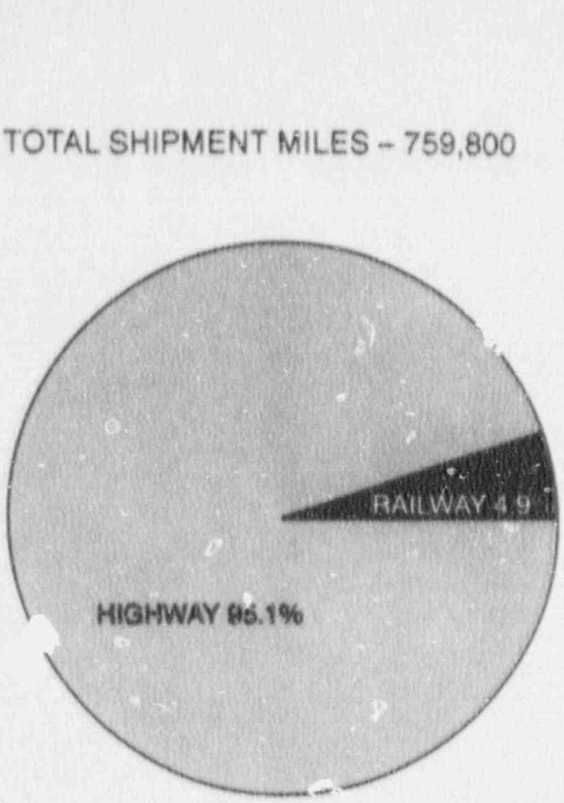

Figure 3.6 Spent Fuel Shipment Miles by Mode: 1979-1989.

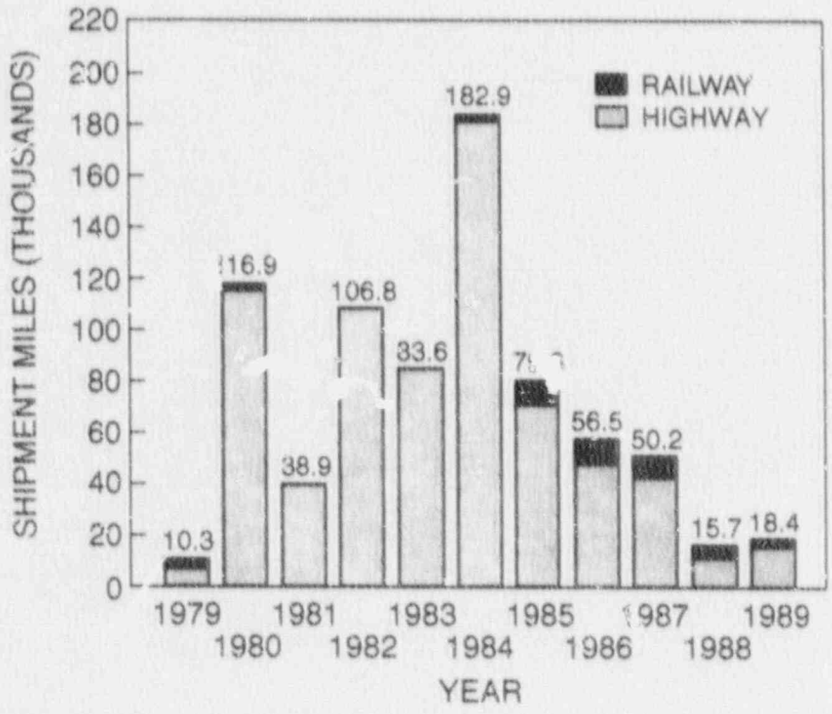

Figure 3.7 Spent Fuel Shipment Miles by Year: 1979-1989.

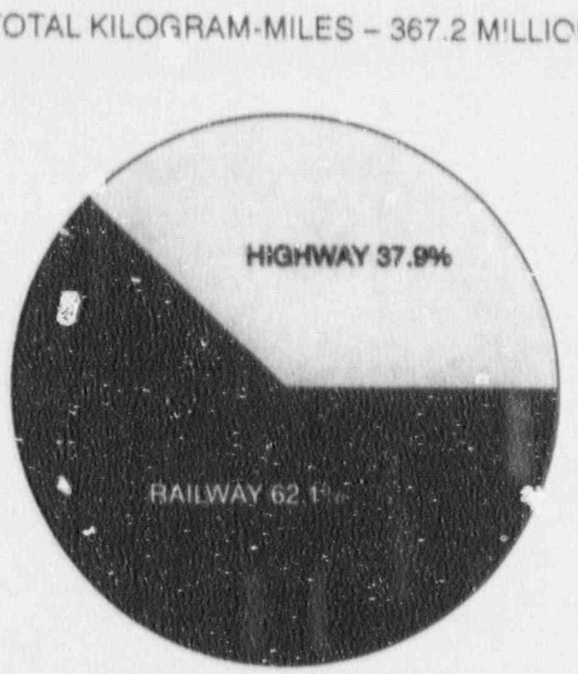

Figure 3.8 Spent Fuel Shipment Kilogram-Miles by Mode: 1979-1989.

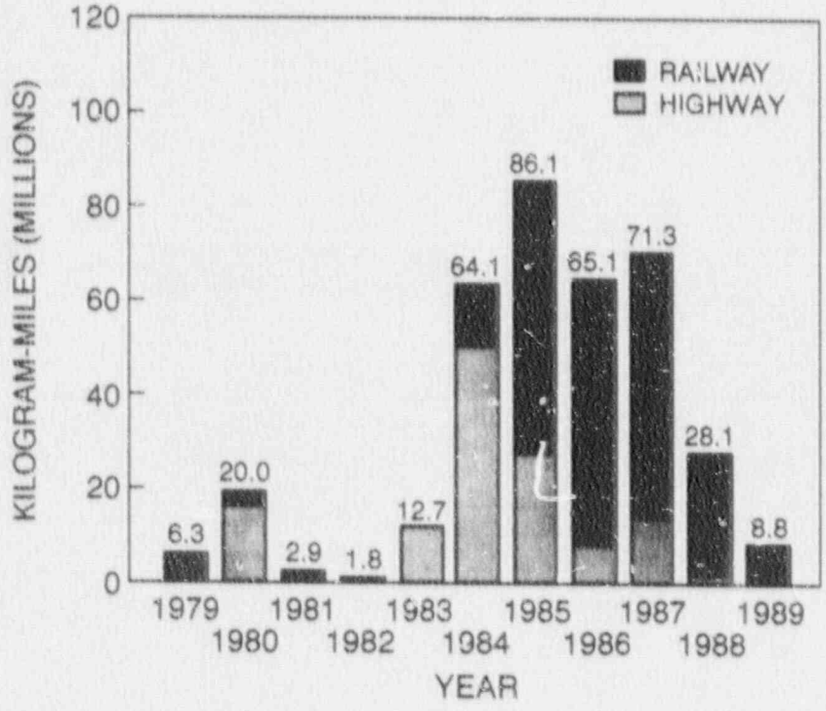

Figure 3.9 Spent Fuel Shipment Kilogram-Miles by Year: 1979-1989.

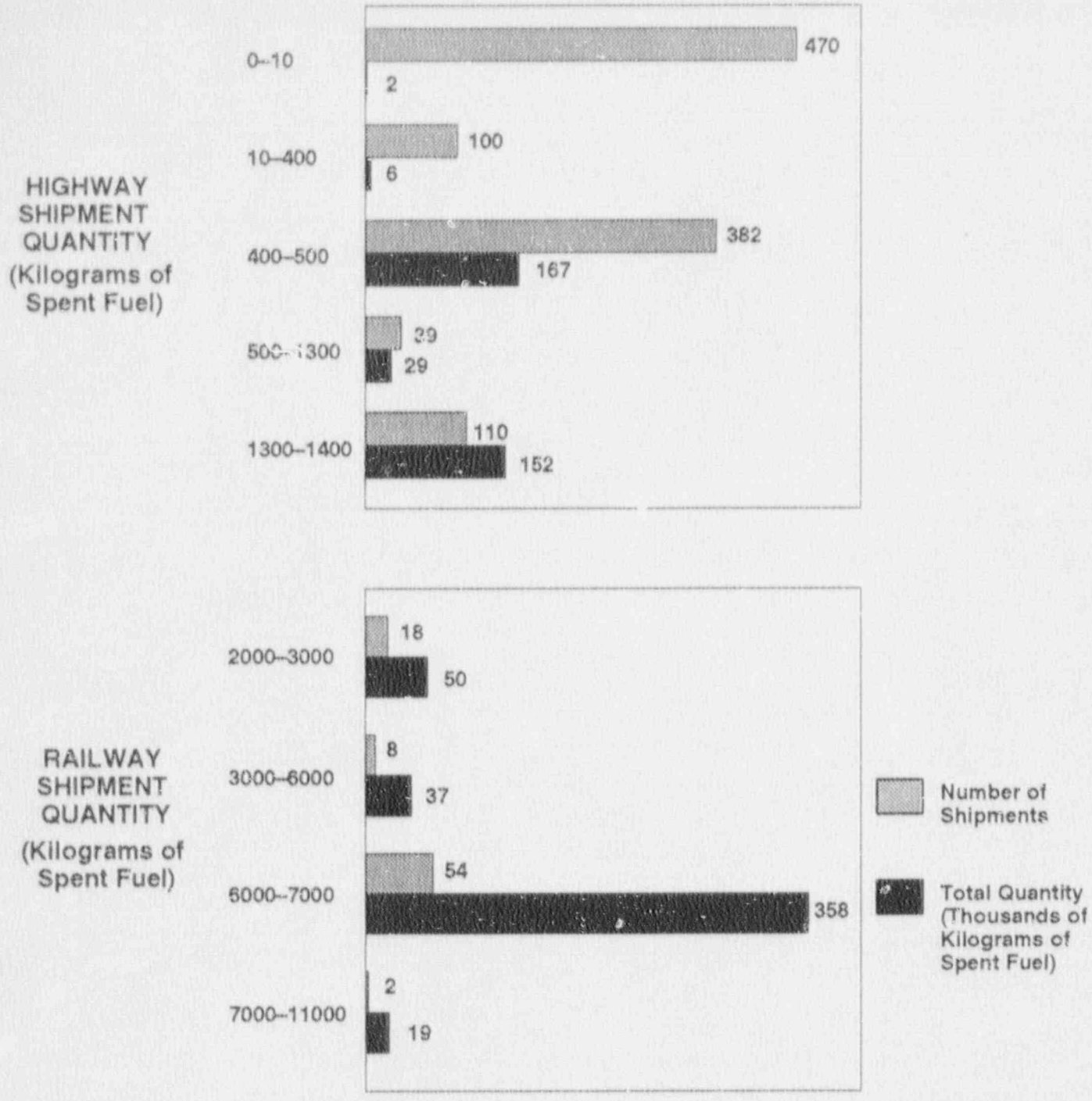

Figure 3.10 Number and Total Quantity of Spent Fuel Shipments by Shipment Quantity Range: 1979-1989.

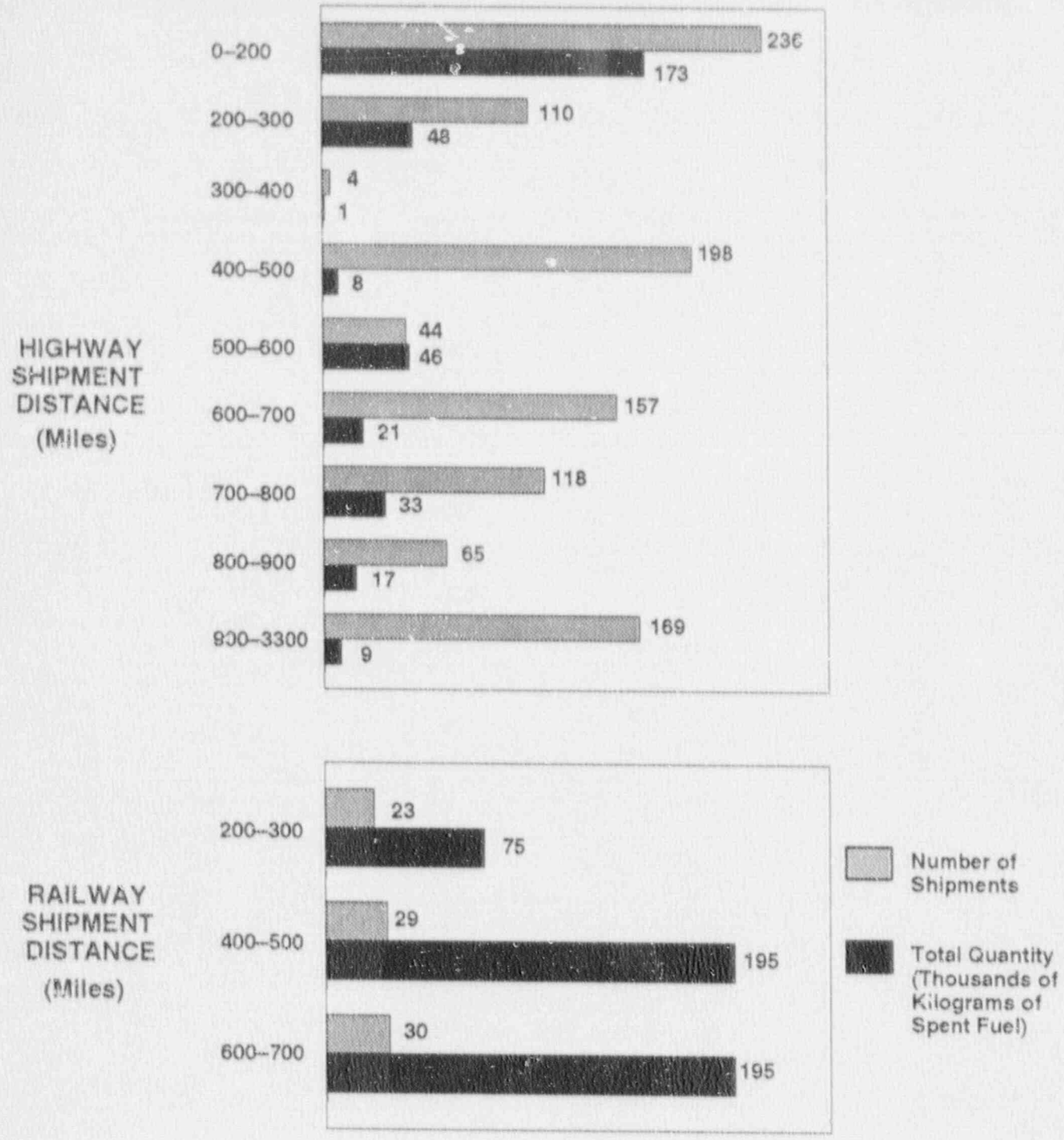

Figure 3.11 Number and Total Quantity of Spent Fuel Shipments by Shipment Distance Range: 1979-1989.

Table 4.1 Highway and Railway Spent Fuel Shipment Routes Used in 1987-1989*

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
AZ	General Atomics to Idaho National Engineering Laboratory (INEL)	NV line	I-15 N	UT line	1987
CA	University of Calif. Berkeley (UCB) to Idaho National Engineering Laboratory	UCB private road I-80 I-880 I-238 I-580 I-205 I-5	private road W I-80 S I-880 S I-238 E I-580 E I-205 E I-5 N I-80 E	I-80 I-880 I-238 I-580 I-205 I-5 I-80 NV Line	1989
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos	NV line I-80 I-5 I-205 I-580 I-680	I-80 W I-5 S I-205 W I-580 W I-680 E CA-84 E	I-5 I-205 I-580 I-680 CA-84 GE/VAL	1989
	GE/Vallecitos to Portland Marine Terminal	GE/VAL CA-84 I-680 I-580 I-205	CA-84 W I-680 N I-580 E I-205 E I-5 N	I-680 I-580 I-205 I-5 OR line	1988
	GE/Vallecitos to Port of Oakland	GE/VAL CA-84 I-680 I-580 CA-238 I-880 Market St. 3rd St. Middle Harbor Rd.	CA-84 W I-680 N I-580 W CA-238 W I-880 N Market St. W 3rd St. N. Middle Harbor Rd. W 7th St. W	I-680 I-580 CA-238 I-880 Market St. 3rd St. Middle Harbor Rd. 7th St. 5190 7th St. Term.** Berth	1987
	Port of Oakland to GE/Vallecitos	Oakland Term. Market St. 5th St. I-880 CA-238 I-580 I-680	Market St. N 5th St. S I-880 S CA-238 E I-580 E I-680 S CA-84 E	5th St. I-880 CA-238 I-580 I-680 CA-84 GE/VAL	1988

*Excludes DOE shipments.
**Term. stands for terminal.

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
CA (Cont.)	General Atomics to Idaho National Engineering Laboratory	GA local road I-5 CA-55 CA-91 I-215	local road E I-5 N CA-55 N CA-91 E I-215 N I-15 N	I-5 CA-55 CA-91 I-215 I-15 NV line	1987
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos	NV line I-80 I-5 I-205 I-580 I-680	I-80 W I-5 S I-205 W I-580 W I-680 S CA-84 E	I-5 I-205 I-580 I-680 CA-84 GE/VAL	1987
CO	Michigan State University (MSU) to Denver, CO, Federal Center	WY line I-25	I-25 S 6th Ave. W.	Exit 209 Denver 6th Ave. Denver Fed. Ctr.	1989
GA	Port of Savannah to Savannah River Project (SRP)	Terminal Port Roads GA-17 GA-21 I-16	Port Roads W GA-17 S GA-21 S I-16 W I-95 N	GA-17 GA-21 I-16 I-95 SC line	1987/88
ID	University of Missouri to Idaho National Engineering Laboratory	UT line I-15 US-26	I-15 N US-26 N US-20 W	US-26 US-20 INEL	1989
	Michigan State University to Idaho National Engineering Laboratory		(same as above route)		1989
	University of Calif. Berkeley to Idaho National Engineering Laboratory		(same as above route)		1989
	General Atomics to Idaho National Engineering Laboratory		(same as above route)		1987
IL	Michigan State University to Idaho National Engineering Laboratory	IN line I-80	I-80 W I-280 W	I-280 IA line	1989
	Michigan State University to Denver Federal Center		(same as above route)		1989

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
IL (Cont.)	University of Missouri to Savannah River Project	MO line I-255 I-64 I-57	I-255 E I-64 E I-57 S I-24 S	I-64 I-57 I-24 KY line	1987
	Dresden Reactor to Portsmouth, Virginia, Marine Terminal	Dresden Lorenzo Rd. I-55	Lorenzo Rd. E I-55 S I-74 E	I-55 I-74 IN line	1987
	Dresden Reactor to Babcock & Wilcox, Lynchburg		(same as above route)		1987
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos	IN line I-74 I-274 I-74	I-74 W I-274 W I-74 W I-280 W	I-274 I-74 I-280 IA line	1987
	Portsmouth, VA, Marine Terminal to GE/Vallecitos		(same as above route)		
	Babcock & Wilcox, Lynchburg, to Quad Cities	IN line I-74 I-474 I-74 IL-80	I-74 W I-474 W I-74 W I-80 N IL-84 N	I-474 I-74 I-80 IL-84 Quad Cities	1987
	Battelle Columbus to GE/Morris	IN line I-74 I-55 Lorenzo Rd.	I-74 W I-55 N Lorenzo Rd. W Dresden Rd. N	I-55 Lorenzo Rd. Dresden Rd. GE/Morris	1987
IN	Michigan State University to Idaho National Engineering Laboratory	MI line I-69	I-69 S I-80 W	I-80 IL line	1989
	Michigan State University to Denver Federal Center		(same as above route)		1989
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos	OH line I-70 I-465	I-70 W I-465 N I-74 W	I-465 I-74 IL line	1988
	Dresden Reactor to Portsmouth, Virginia, Marine Terminal	IL line I-74 I-465	I-74 E I-465 S I-70 E	I-465 I-70 OH line	1987
	Dresden Reactor to Babcock & Wilcox, Lynchburg		(same as above route)		1987

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
IN (Cont.)	Babcock & Wilcox, Lynchburg, to GE/Vallecitos	OH line I-70 I-465	I-70 W I-465 S I-74 W	I-465 I-74 IL line	1987
	Battelle Columbus to GE/Morris		(same as above route)		
	Babcock & Wilcox, Lynchburg, to Quad Cities	KY line I-65 I-465	I-65 N I-465 W I-74 W	I-465 I-74 IL line	1987
IA	Michigan State University to Idaho National Engineering Laboratory	IL line I-280 I-80 I-680 I-29	I-280 W I-80 W I-680 W I-29 S I-680 W	I-80 I-680 I-29 I-680 NE line	1989
	Michigan State University to Denver Federal Center		(same as above route)		1989
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos		(same as above route)		1987
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos		(same as above route)		1988
KY	University of Michigan to Savannah River Project	OH line I-275	I-275 S I-75 S	I-75 TN line	1987
	University of Missouri to Savannah River Project	IL line	I-24S	TN line	1987
	Babcock & Wilcox, Lynchburg, to Quad Cities	TN line I-75 I-64	I-75 N I-64 W I-65 N	I-64 I-65 IN line	1987
MD	Alexandria Bay to Savannah River Project	PA line	I-81 S	WV line	1988
	CINTICHEM to Savannah River Project	New York PA line	I-81 S	WV line	1987
	Dresden Reactor to Portsmouth, Virginia, Marine Terminal	WV line US-48/US-40 I-70	US-48/US-40 E I-70 E I-81 S	I-70 I-81 WV line	1987

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
MD (Cont.)	Dresden Reactor to Babcock & Wilcox Lynchburg		(same as above route)		1987
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos		(reverse of above route)		1988
	National Institute of Standards and Technology (NIST) to Savannah River Project	NIST local roads I-270 I-70	local roads E I-270 N I-70 W I-81 S	I-270 I-70 US-40/48 WV line	1987
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos	WV line I-81 I-70	I-81 N I-70 W US-40/48 W	I-70 US-40/48 WV line	1987
MI	Michigan State University to Idaho National Engineering Laboratory	MSU local roads US-27 I-96 Temp. I-69	local roads W US-127 S I-96 W Temp. I-69 S I-69 S	US-127 I-96 Temp. I-69 I-69 IN line	1989
	Michigan State University to Denver Federal Center		(same as above route)		1989
	University of Michigan to Savannah River Project	University of Michigan Plymouth Rd US-23 I-94 I-275	Plymouth Rd N US-23 S I-94 E I-275 S I-75 S	US-23 I-94 I-275 I-75 OH line	1987
MO	University of Missouri to Savannah River Project	University of Missouri MO-740 I-70 US-40 I-270	MO-740 W I-70 E US-40 S I-270 S I-255 E	I-70 US-40 I-270 I-255 (contin. of I-270) IL line	1987
	University of Missouri to Idaho National Engineering Laboratory	University of Missouri MO-70 I-70 I-435	MO-70 W I-70 W I-435 N I-29 N	I-70 I-435 I-29 IA line	1989

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
NE	Michigan State University to Idaho National Engineering Laboratory	IA line I-680	I-680 W I-80 W	I-80 WY line	1989
	University of Missouri to Idaho National Engineering Laboratory		(same as above route)		1987
	Michigan State University to Denver Federal Center		(same as above route)		1989
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos		(same as above route)		1987
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos		(same as above route)		1988
NV	University of Calif. Berkeley to Idaho National Engineering Laboratory	CA line	I-80 E	UT line	1989
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos		(reverse of above route)		1988
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos		(reverse of above route)		1987
	General Atomics to Idaho International Engineering Laboratory	CA line	I-15 N	AZ line	1987
NY	Alexandria Bay to Savannah River Project	Alexandria Bay I-81 I-481	I-81 S I-481 S I-81 S	I-481 I-81 PA line	1988
	CINTICHEM to Savannah River Project	CINTICHEM Longmeadow Rd NY-210 NY-17	Longmeadow Rd N NY-210 E NY-17 N I-84 W	NY-210 NY-17 I-84 PA line	1987
NC	Oconee Station to Babcock & Wilcox, Lynchburg, Virginia	SC line I-26 I-40	I-26 N I-40 E I-77 N	I-40 I-77 VA line	1989
	Oconee Station to McGuire Station	SC line I-85 I-77	I-85 N I-77 N NC-73 E	I-77 NC-73 McGuire	1987/88

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
NC (Cont.)	Alexandria Bay to Savannah River Project	VA line I-77 I-40	I-77 S I-40 W I-26 S	I-40 I-26 SC line	1988
	NIST to Savannah River Project		(same as above route)		1987
	University of Virginia to Savannah River Project		(same as above route)		1987/88
	Babcock & Wilcox, Lynchburg, to Oconee		(same as above route)		1987
	Portsmouth, Virginia, Marine Terminal to Savannah River Project	VA line	I-95 S	SC line	1987/88
	Norfolk Int'l Term. to Savannah River Project		(same as above route)		1987
	Newport News to Savannah River Project		(same as above route)		1989
	University of Michigan to Savannah River Project	TN line I-40	I-40 E I-26 E	I-26 SC line	1987
	CINTICHEM to Savannah River Project		(same as above route)		1987
	University of Missouri to Savannah River Project		(same as above route)		1987
OH	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos	WV line I-470 I-70 I-270	I-470 W I-70 W I-270 N I-70 W	I-70 I-270 I-70 IN line	1988
	Dresden Reactor to Portsmouth, Virginia, Marine Terminal		(reverse of above route)		1987
	Dresden Reactor to Babcock & Wilcox Lynchburg		(reverse of above route)		1987
	University of Michigan to Savannah River Project	MI line I-75 I-475 I-75	I-75 S I-475 S I-75 S I-275 E	I-475 I-75 I-275 KY line	1987
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos	WV line I-470 I-70 I-270	I-470 W I-70 W I-270 S I-70 W	I-70 I-270 I-70 IN line	1987

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
OH (Cont.)	Battelle Columbus to GE/Morris	Site	OH-142 N	US-40	1987
		OH-142	US-40 N	US-29	
		US-40	US-29 N	I-7	
		US-29	I-70 W	IN line	
OR	GE/Vallecitos to Portland Marine Terminal	CA line	I-5 N	I-205 (Exit 288)	1989
		I-5	I-205 N	Exit 24B Airport Way	
		I-205	Airport Way E	122nd Ave.	
		Airport Way	122nd Ave. N	Marine Dr.	
		122nd Ave.	Marine Dr. W	Portland Rd.	
		Marine Dr.	Portland Rd. S.	N. Marine Dr.	
		Portland Rd.	N. Marine Dr. W	Term. No. 6	
PA	Alexandria Bay to Savannah River Project	NY line	I-81 S	MD line	1988
	CINTICHEM to Savannah River Project	NY line	I-84 W	I-380	1987
		I-84	I-380 S	I-80	
		I-380	I-80 W	I-81	
		I-80	I-81 S	MD line	
	Dresden Reactor to Portsmouth, Virginia, Marine Terminal	WV line	I-70 E	I-79	1987
		I-70	I-79 S	WV line	
	Dresden Reactor to Babcock & Wilcox Lynchburg		(same as above route)		1987
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos		(reverse of above route)		1988
	Babcock & Wilcox, Lynchburg to GE/VAL		(reverse of above route)		1987
SC	Oconee Station to Babcock & Wilcox, Lynchburg	Oconee	SC-130 S	US-123	1988/89
		SC-130	US-123 E	US-76	
		US-123	US-76 S	I-85	
		US-76	I-85 N	I-26	
		I-85	I-26 N	NC line	
	Portsmouth, Virginia, Marine Terminal to Savannah River Project	NC line	I-95 S	US-301	1987/88
		I-95	US-301 W	SC-70	
		US-301	SC-70 W	SC-64	
		SC-70	SC-64 W	SRP	
	Norfolk Int'l Terminal to Savannah River Project		(same as above route)		1987

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
SC (Cont.)	Newport News to Savannah River Project		(same as above route)		1989
	Oconee Station to McGuire Station	Oconee SC-130 US-123 US-76	SC-130 S US-123 E US-76 S I-85 N	US-123 US-76 I-85 NC line	1987/88
	Alexandria Bay to Savannah River Project	NC Line I-26 SC-121 SC-19 SC-118	I-26 S SC-121 S SC-19 S SC-118 W SC-19 S	SC-121 SC-19 SC-118 SC-19 SRP	1988
	University of Michigan to Savannah River Project		(same as above route)		1987
	CINTICHEM to Savannah River Project		(same as above route)		1987
	University of Missouri to Savannah River Project	NC line I-26 SC-121	I-26 S SC-121 S SC-19 S	SC-121 SC-19 SRP	1987
	University of Virginia to Savannah River Project		(same as above route)		1987/88
	NIST to Savannah River Project		(same as above route)		1987
	Port of Savannah to Savannah River Project	GA line I-95 I-26 US-301 SC-70	I-95 N I-26 W US-301 W SC-70 W SC-64 W	I-26 US-301 SC-70 SC-64 SRP	1987/88
	Babcock & Wilcox, Lynchburg, to Oconee Station	NC line I-26 I-85 SC-153 US-123	I-26 S I-85 SW SC-153 N US-123 SW SC-130 N	I-85 SC-153 US-123 SC-130 Oconee Station	1987
TN	University of Michigan to Savannah River Project	KY line I-75 I-640	I-75 S I-640 E I-40 E	I-640 I-40 NC line	1987
	University of Missouri to Savannah River Project	KY line I-24 I-65 I-40 I-640	I-24 S I-65 S I-40 E I-640 E I-40 E	I-65 I-40 I-640 I-40 NC line	1987

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
TN (Cont.)	CINTICHEM to Savannah River Project	VA line I-81	I-81 S I-40 S	I-40 NC line	1987
	Babcock & Wilcox, Lynchburg, to Quad Cities	VA line I-81 I-40	I-81 S I-40 W I-75 N	I-40 I-75 KY line	1987
UT	University of Missouri to Idaho National Engineering Laboratory	WY line I-80 I-84	I-80 W I-84 N I-15 N	I-84 I-15 ID line	1989
	General Atomics to Idaho National Engineering Laboratory	AZ line	I-15 N	ID line	1987
	Michigan State University to Idaho National Engineering Laboratory	WY line I-80 I-84	I-80 W I-84 N I-15 N	I-84 I-15 ID line	1989
	University of Calif. Berkeley to Idaho National Engineering Laboratory	NV line I-80 I-215	I-80 E I-215 N I-15 N	I-215 I-15 ID line	1989
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos	WY line	I-80 W	NV line	1988
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos		(same as above route)		1987
VA	Oconee to Babcock & Wilcox, Lynchburg,	NC line I-77 I-81 I-581 US-460	I-77 N I-81 N I-581 E US-460 E Mt. Athos Rd. E	I-81 I-581 US-460 Mt. Athos Road B&W	1988/89
	Newport News Terminal to Savannah River Project	Term. US-60 US-17 VA-32 US-58	US-60 N US-17 S VA-32 S US-58 W I-95 S	US-17 VA-32 US-58 I-95 NC line	1989
	Portsmouth, Virginia Marine Terminal to Savannah River Project	Portsmouth US-58 US-17 I-264 US-58	US-58 W US-17 S I-264 W US-58 W I-95 S	US-17 I-264 US-58 I-95 NC line	1987/88

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
VA (Cont.)	CINTICHEM to Savannah River Project	WV line	I-81 S	TN line	1987
	University of Virginia to Savannah River Project	UVA	Alderman Rd. N	US-250	1987
		Alderman Rd.	US-250 W	US-29	
		US-250	US-29 S	I-64	
		US-29	I-64 W	I-81	
		I-64	I-81 S	I-77	
		I-81	I-77 S	NC line	
	Norfolk Int'l Term. to Savannah River Project	Term.	Port roads E	Term. Blvd.	1987
		Port roads	Term. Blvd. E	I-564	
		Term. Blvd	I-564 S	I-64	
		I-564	I-64 S	US-58	
		I-64	US-58 W	I-95	
		US-58	I-95 S	NC line	
	Alexandria Bay to Savannah River Project	MD line	I-81 S	I-77	1988
		I-81	I-77 S	NC line	
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos	Ports. Marine Term	US-58 S	VA-17	1988
		US-58	VA-17 S	I-264	
		VA-17	I-264 S	US-460	
		I-264	US-460 W	VA-32	
		US-460	VA-32 N	US-258	
		VA-32	US-258 N	I-64	
		US-258	I-64 W	I-295	
		I-64	I-295 W	I-64	
		I-295	I-64 W	I-81	
		I-64	I-81 N	WV line	
	Dresden Reactor to Portsmouth, Virginia Marine Terminal		(reverse of above route)		1987
	NIST to Savannah River Project	WV line	I-81 S	I-77	1987
		I-81	I-77 S	NC line	
	Babcock & Wilcox, Lynchburg, to Oconee Station	Site W	Mt. Athos Rd. W	US-460	1987
		Mt. Athos Rd.	US-460 W	I-581	
		US-460	I-581 W	I-81	
		I-581 W	I-81 W	I-77	
		I-81	I-77 S	NC line	
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos	Site	VA-726 S	US-460	1987
		VA-726	US-460 W	VA-220 Alt.	
		US-460	VA-220 Alt. N	US-11	
		VA-220 Alt.	US-11 N	I-81	
		US-11	I-81 N	WV line	

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
VA (Cont.)	Dresden Reactor to Babcock & Wilcox Lynchburg	WV line	I-81 S	US-11	1987
		I-81	US-11 S	VA-220 Alt.	
		US-11	VA-220 Alt. S	US-460	
		VA-220 Alt.	US-460 E	Mt. Athos Road	
		US-460	Mt. Athos Rd. E	B&W	
	Babcock & Wilcox, Lynchburg, to Quad Cities	Site	Mt. Athos Rd. W	US-460	1987
		Mt. Athos Rd.	US-460 W	I-581	
		US-460	I-581 W	I-81	
		I-581	I-81 S	TN line	
WV	Alexandria Bay to Savannah River Project	MD line	I-81 S	VA line	1988
	CINTICHEM to Savannah River Project	MD line	I-81 S	VA line	1987
	Dresden Reactor to Portsmouth, Virginia, Marine Terminal	OH line	I-470 E	I-70	1987
		I-470	I-70 E	PA Line	
		PA line	I-79 S	US-48	
		I-79	US-48 E	MD line	
		MD line	I-81 S	VA line	
	Dresden Reactor to Babcock & Wilcox, Lynchburg		(same as above route)		1987
	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos		(reverse of above route)		1988
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos		(reverse of above route)		1987
	NIST to Savannah River Project	MD line	I-81 S	VA line	1987
WY	University of Missouri to Idaho National Engineering Laboratory	NE line	I-80 W	UT line	1989
	Michigan State University to Idaho National Engineering Laboratory		(same as above route)		1989
	Babcock & Wilcox, Lynchburg, to GE/Vallecitos		(same as above route)		1987

Table 4.1 (Continued)

State	Shipment	Highway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
WY (Cont.)	Portsmouth, Virginia, Marine Terminal to GE/Vallecitos		(same as above route)		1988
	Michigan State University to Denver Federal Center	NE line I-80	I-80 W I-25 S	I-25 CO line	1989

State	Shipment	Railway Shipment Route Segment			Shipments Completed
		From:	Route	To:	
IL	Cooper Reactor to GE/Morris	IA line	Burlington Northern	EOLA	1987/88/89
		EOLA	Elgin, Joliet, Eastern	GE/Morris	
	Monticello to GE/Morris		(Same as above route)		1987
IA	Cooper Reactor to GE/Morris	NE line	Burlington Northern	IL line	1987/88/89
MN	Monticello to GE/Morris	Monticello	Burlington Northern	WI line	1987
NE	Cooper Reactor to GE/Morris	Cooper	Burlington Northern	IA line	1987/88/89
NC	Brunswick to Shearon Harris	Brunswick	Military Ocean Terminal	Leland	1989
		Leland Hamlet	CSX CSX	Hamlet Bonsal (Shearon Harris)	
WI	Monticello to GE/Morris	MN line	Burlington Northern	IL line	1987

NRC FORM 335 (2-89) NRCM 1102, 3201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER (Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, If any.)
NUREG-0725, Rev. 7

2. TITLE AND SUBTITLE
Public Information Circular for Shipments of Irradiated Reactor Fuel

3. DATE REPORT PUBLISHED
MONTH: January
YEAR: 1991

4. FIN OR GRANT NUMBER

5. AUTHOR(S)

6. TYPE OF REPORT
Regulatory Report

7. PERIOD COVERED (Inclusive Dates)
10/01/87 to 12/31/89

8. PERFORMING ORGANIZATION – NAME AND ADDRESS (If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)
Division of Safeguards and Transportation
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

9. SPONSORING ORGANIZATION – NAME AND ADDRESS (If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)

10. SUPPLEMENTARY NOTES
Updates expected to be issued periodically

11. ABSTRACT (200 words or less)

This circular has been prepared to provide information on the shipment of irradiated reactor fuel (spent fuel) subject to regulation by the Nuclear Regulatory Commission (NRC), and to meet the requirements of Public Law 96-295. The report provides a brief description of NRC authority for certain aspects of transporting spent fuel. It provides descriptive statistics on spent fuel shipments regulated by the NRC from 1979 to 1989. It also lists detailed highway and railway segments used within each state from October 1, 1987 through December 31, 1989.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)
Spent fuel shipment routes, spent fuel shipment statistics.

13. AVAILABILITY STATEMENT
Unlimited

14. SECURITY CLASSIFICATION
(This Page)
Unclassified
(This Report)
Unclassified

15. NUMBER OF PAGES

16. PRICE

THIS DOCUMENT WAS PRINTED USING RECYCLED PAPER.

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

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

FIRST CLASS MAIL
POSTAGE & FEES PAID
USNRC
PERMIT No. G-67

120555139531 1 1AN1CC1C41XB1
US NRC-OADM
DIV FOIA & PUBLICATIONS SVCS
TPS PDR-NUREG
P-223
WASHINGTON DC 20555

NUREG-0725, Rev. 7

PUBLIC INFORMATION CIRCULAR FOR SHIPMENTS OF IRRADIATED REACTOR FUEL

JANUARY 1991