



June 4, 2004

MEMORANDUM

To: Naiem Tanious, U.S. NRC
From: Don Hammer
Subject: Request for information to support completion of FOIA request
CC: Judith Blinn, Stephen Wyngarden

In response to a request for information under the Freedom of Information Act related to NRC's final rule amending regulations in 10 CFR Part 71, the NRC has asked ICF to provide information in response to a request for certain records related to NUREG/CR-6711, "Environmental Assessment of Major Revision of 10 CFR Part 71, Final Rule."

Specifically, NRC has asked ICF to respond to the following request:

2. Reference is made to NUREG/CR-6711, *Environmental Assessment of Major Revision of 10 CFR Part 71*, Final Rule, Manuscript Completed: December 2003, Date Published -----2004, Prepared by D. Hammer, K. Blake, ICF Consulting, Inc. for Division of Industrial and Medical Nuclear Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, NRC Job Code J5236. This document states:

"ICF reviewed information contained in DOE's Shipment Mobility/Accountability Collection (SMAC) database in an attempt to identify technical information on exempted shipments of fissile materials and fissile material shipments of exempted quantities, or those made under a general license. In addition, extensive searches were conducted via the Internet. Each search was targeted at obtaining specific information related to a proposed change." (*Id.* At pp. 44-45.)

Please provide any and all memoranda, correspondence, work papers, calculations, spreadsheets, e-mail, or other documents created or obtained by your agency in connection with the referenced review of the DOE's Shipment

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Mobility/Accountability Collection (SMAC) database and searches of the Internet.

ICF has reviewed all files related to the development of the Environmental Assessment in its possession related to the above. The following documents (attached as separate files) are being forwarded in relation to the review of the DOE SMAC database referenced in the FOIA request.

- SMAC922.doc – An introduction to the database
- SMACRpt.doc – An overview of reported shipment activity for the U.S. Department of Energy (DOE) during Fiscal Years (FYs) 1995 and 1996

No other information on the SMAC database is in ICF's possession.

With respect to the request for information on Internet searches, no such documents are in ICF's possession. These searches were conducted as part of ICF's methodology for collecting information to form a quantitative baseline from which to conduct an analysis. As is discussed in NUREG/CR-6711, there existed at the time, a serious lack of available information concerning shipments of fissile materials and fissile materials in exempted quantities. The Internet searches conducted did not result in any data collection. Therefore, there are no memoranda, correspondence, e-mails, or other information related to these searches in ICF's files.

I hope that this fulfills your request for information. Should you have questions regarding any of the information provided here, please do not hesitate to call me.

Attached electronic files: Two (2)

Introduction

This U. S. Department of Energy (DOE) Transportation Activities Summary Report for Fiscal Years 1995 and 1996 is based on data submitted through the Shipment Mobility Accountability Collection (SMAC) system. SMAC is an unclassified, computer-based historical transportation information system funded by DOE Office of Environmental Management, Office of Transportation, Emergency Management, and Analytical Services.

Two primary needs contributed to the requirement for a computerized data base transportation management system:

- ▶ Access to accurate commercial shipment information became increasingly important as a budget and operations management tool.
- ▶ Heightened public awareness of nuclear and hazardous materials issues resulted in many requests for shipment information from Congress, regional and local municipalities, the general public, and DOE and its predecessor agencies, Atomic Energy Commission (AEC) and Energy Research and Development Agency (ERDA), required the ability to respond to these requests in a timely and accurate manner.

DOE transportation and logistics managers face many choices regarding available carriers, transportation costs, and service requirements. In addition to cost and service, other factors to be considered when selecting a carrier areas follows: (1) financial stability; (2) safety performance; (3) tracking and emergency response capabilities; (4) representation in the local area; and, (5) timeliness in handling claims and responses to billing inquiries. Since transportation costs represent a significant portion of DOE program budgets, transportation managers are mandated by the Code of Federal Regulations to ensure lowest overall costs while selecting the optimal combination of cost and service for each shipment.

DOE receives numerous requests for information each year regarding transportation activities. These requests come from private citizens, special interest groups, Congress, and Federal, tribal and state agencies. Because of extensive current and planned cleanup and restoration activities conducted by the Department, requests are escalating. The magnitude of the environmental management and restoration tasks facing DOE places new challenges on the information reporting capabilities at contractor sites.

SMAC contains data provided by DOE facilities nationwide and is used by the Department and its Transportation Managers to do the following: analyze historical trends; track traffic flows; evaluate commodity shipment patterns, carrier performance, shipment costs, and other transportation related factors; and, to respond to inquiries from Federal, tribal, state, and local government agencies, and the general public. The

data also contains comprehensive information on the Department's off-site hazardous materials shipments (including hazardous substances and hazardous wastes) moved by commercial carriers, vendor equipment, and government-owned vehicles. Data for hazardous waste shipments is submitted separately through the Waste Manifest System (WMS).

This report provides an overview of DOE shipment activity for Fiscal Years 1995 and 1996. *Statistics include mode, tonnage, total transportation cost, carrier utilization and cost, discounts, and commodity flows by mode for DOE facilities.*

The Department has provided historical transportation statistics utilizing SMAC data since 1989. Individuals and groups requiring information regarding DOE transportation activities may request information from the Office of Transportation, Emergency Management, and Characterization Management on (301) 903-1969.

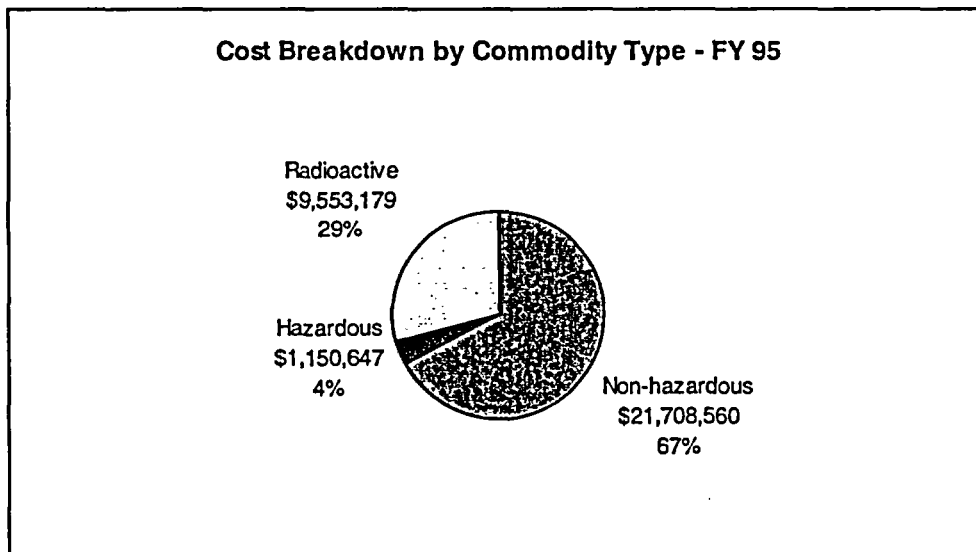
Annual Summary of Shipments, Tonnage, and Costs

The following information provides an overview of reported shipment activity for the U.S. Department of Energy (DOE) during Fiscal Years (FYs) 1995 and 1996. Activity totals shown are compared with previous years to indicate trends in transportation activity. The information provided should not be considered as a complete representation of DOE shipping activity, since all facilities do not report to Shipment Mobility Accountability Collection (SMAC) or through the Automated Transportation Management System. Additionally, some facilities report only certain types of materials shipments, such as waste or hazardous materials.

Data in Figures 1 and 2 (FY 1995) and Figures 3 and 4 (FY 1996) includes approximately 85% of all DOE shipping activities. Information includes commercial and private carrier shipments for air, truck, water, and rail modes. Commercial shipments were moved by for-hire carriers, while private carriers were primarily vendor, environmental contractor, or government-owned shipments.

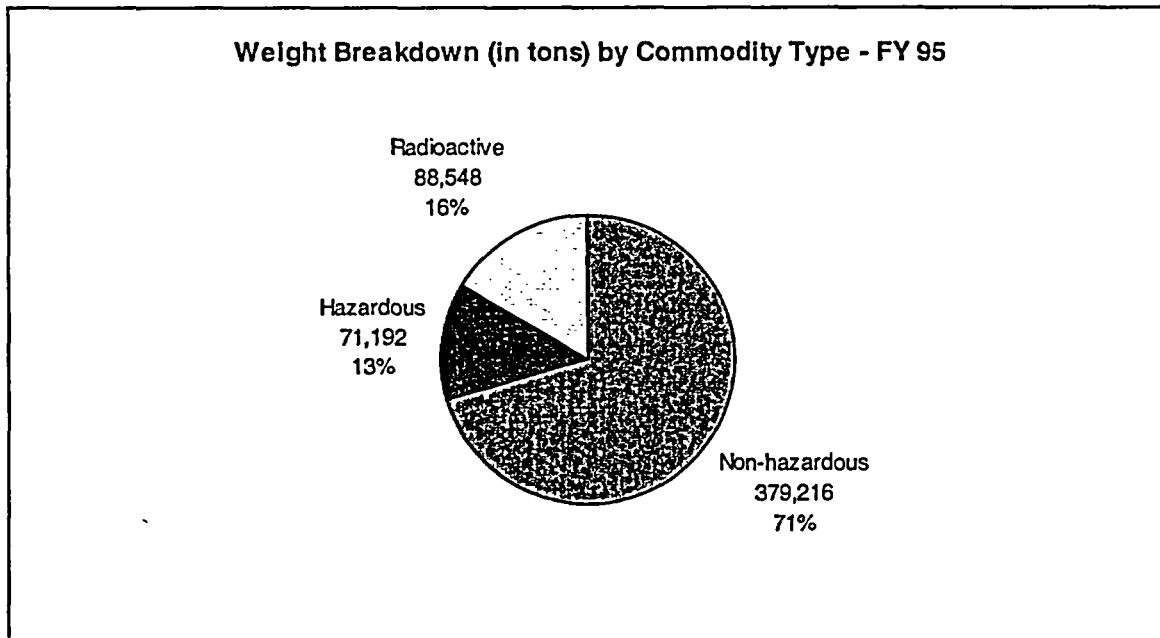
In FY 1995, there were 550,000 reported shipments weighing over 540,000 tons. DOE directly paid for approximately 60% of these shipments. The remaining shipments were outbound collect or inbound prepaid.

Figure 1. Cost Breakdown by Commodity Type - FY 95



Annual Summary of Shipments, Tonnage, and Costs (cont.)

Figure 2. Weight Breakdown (in tons) by Commodity Type - FY 95



In FY 1996, there were 430,000 reported shipments weighing 250,000 tons. The decrease in tonnage and corresponding expenditures in FY 1996 resulted from a reduction in rail shipments of coal and bulk waste materials. DOE directly paid for 59% of these shipments. The remaining shipments were outbound collect or inbound prepaid.

Costs paid by DOE for shipments reported in FY 1995 totaled \$32,234,282, and in FY 1996, the reported total costs were \$18,297,569. Reported discounts for FY 1995 and 1996 totaled \$6,354,078 and \$3,073,813 respectively.

Annual Summary of Shipments, Tonnage, and Costs (cont.)

Figure 3. Cost Breakdown by Commodity Type - FY 96

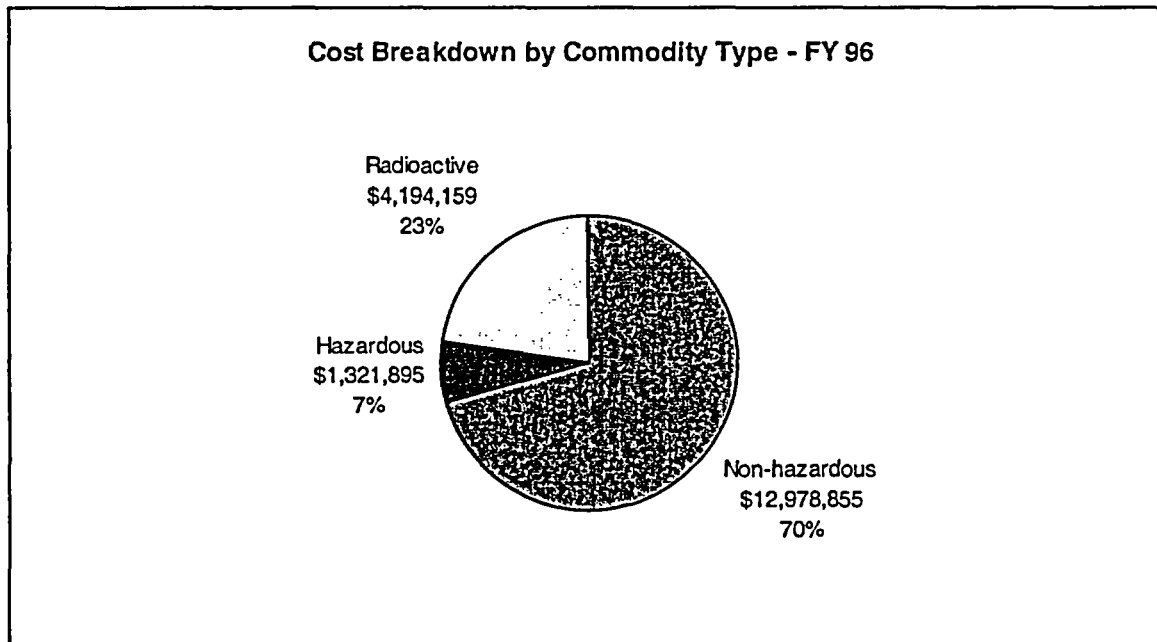
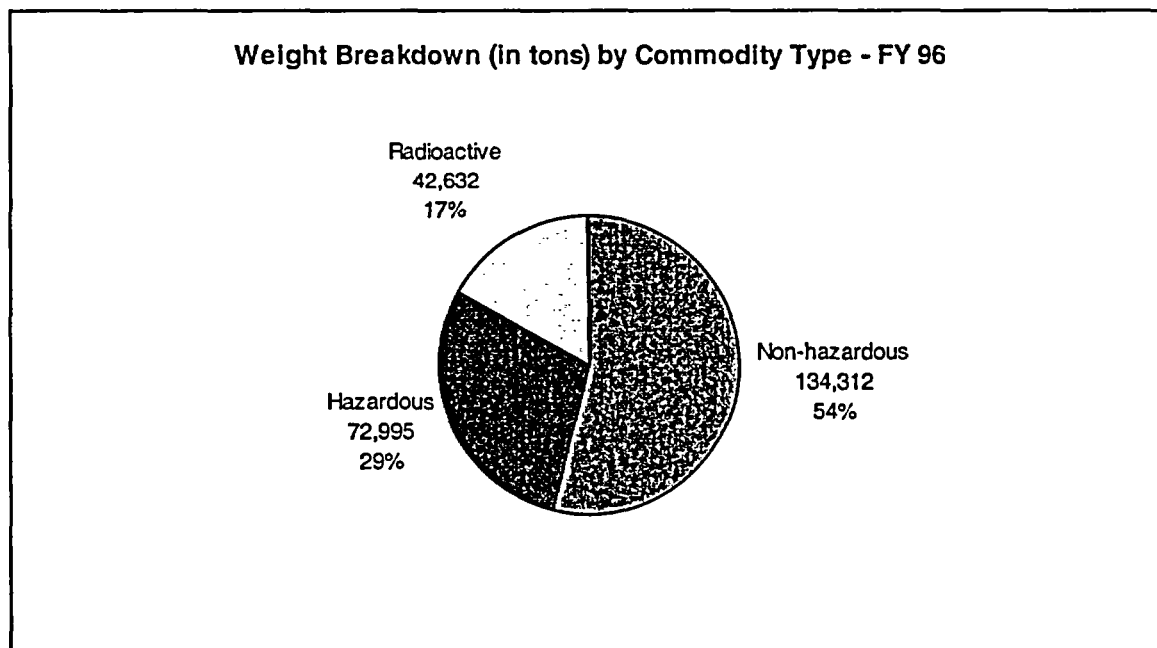


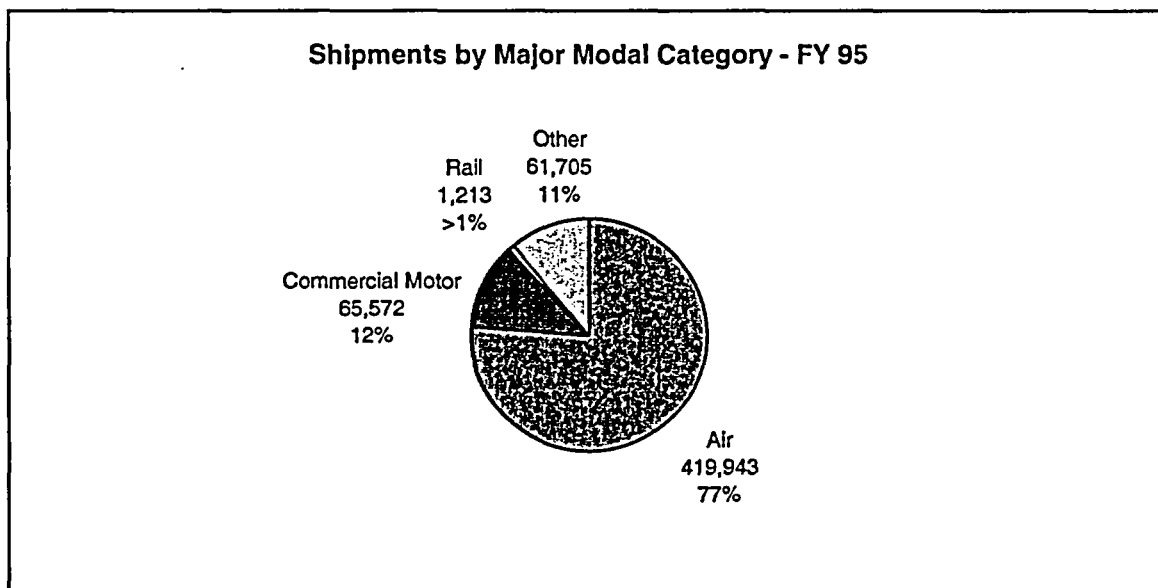
Figure 4. Weight Breakdown by Commodity Type - FY 96



Activity by Primary Transportation Modes

The following information provides an aggregate of reported DOE shipment activity by the three major modal categories which are air, commercial motor, and rail. Combined, these three modal categories account for 89% of the total number of shipments, and 80% of the tonnage for FY 1995. For FY 1996, 89% of the shipments, and 68% of the tonnage were attributed to air, commercial motor, and rail. Remaining shipments were made by freight forwarder, water vessel, private motor carrier, government vehicles, or parcel carriers. Air shipments continued to dominate total DOE shipping activities due to the low-cost General Services Administration negotiated rates for letters and documents. As previously addressed in the Annual Summary of Shipments, tonnage and costs decreased noticeably in FY 1996 due reduction in shipments of coal and bulk wastes by rail.

Figure 5. Shipments by Major Modal Category - FY 95



Activity by Primary Transportation Modes (cont.)

Figure 6. Weight Breakdown by Modal Category - FY 95

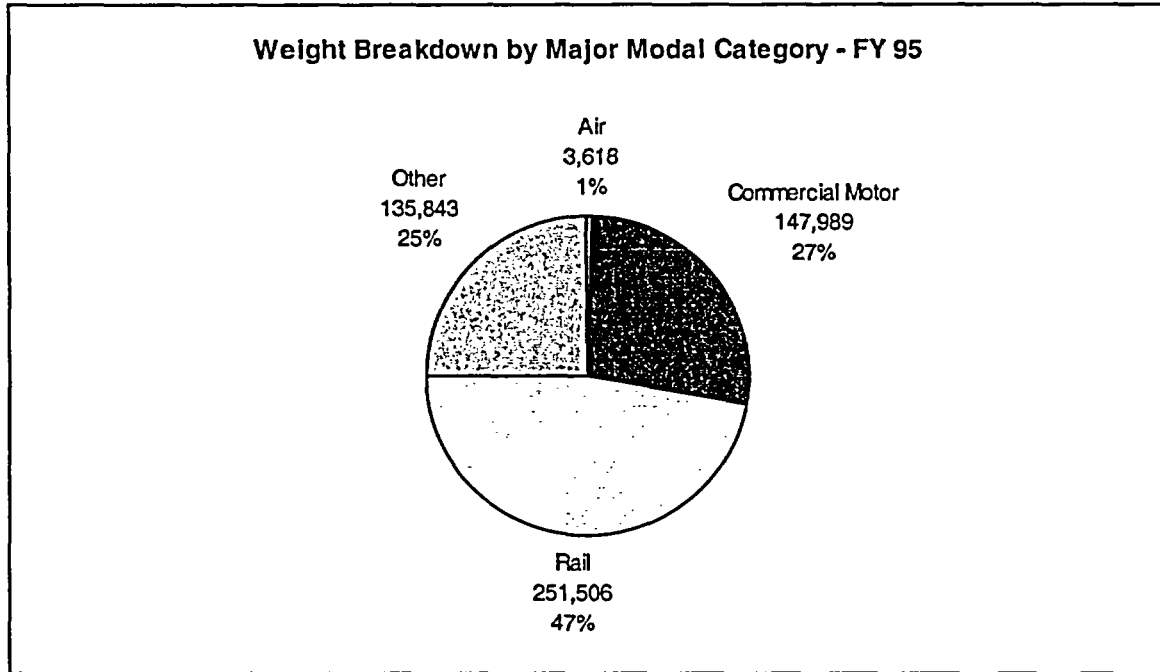
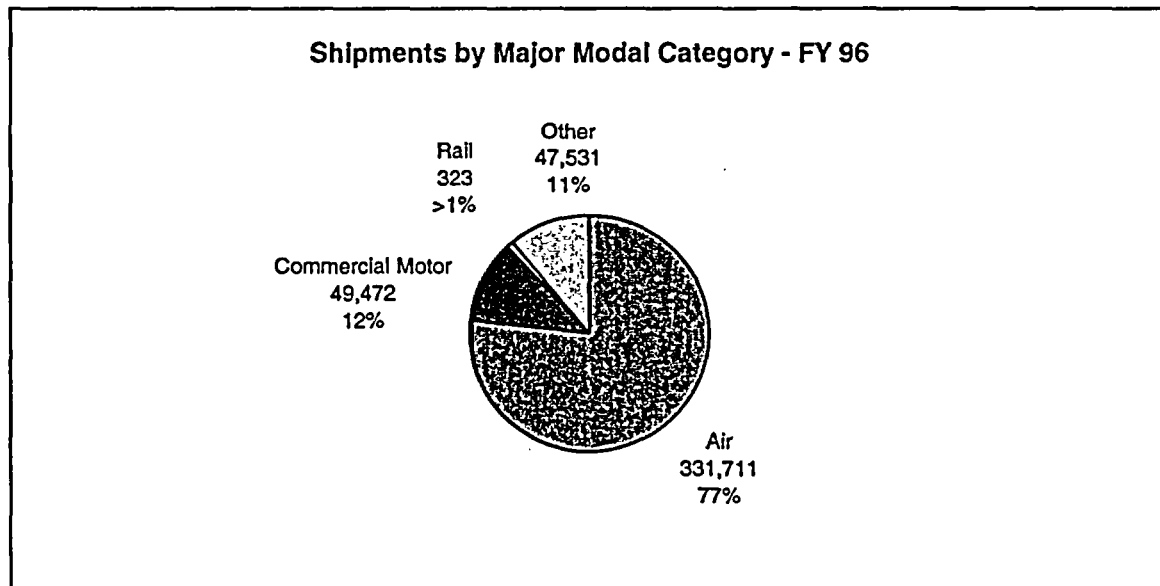
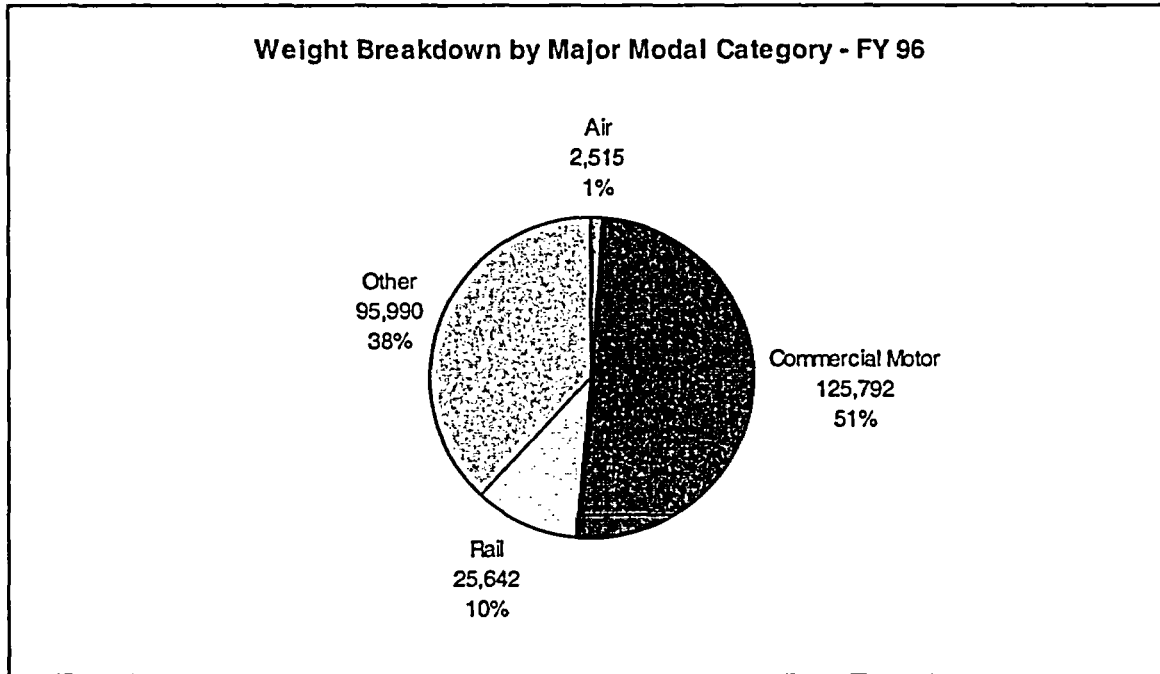


Figure 7. Shipments by Major Modal Category - FY 96



Activity by Primary Transportation Modes (cont.)

Figure 8. Weight Breakdown by Modal Category - FY 96



Deviations in motor freight vary from year-to-year based on programmatic requirements, such as environmental cleanup and restoration. Tables 1 and 2 provide number of shipments by major mode for non-hazardous, radioactive, and other hazardous material shipments during FYs 1995 and 1996, respectively. The largest amount of tonnage, 70% for FY 1995 and 52% for FY 1996, of reported shipments were non-hazardous, which has been the historic pattern of DOE shipments.

Table 1. Weight Breakdown by Mode and Commodity - FY 95

	Air	Motor	Rail	Other
Non-hazardous	3,348	74,896	201,789	99,182
Hazardous	143	31,629	5,540	33,836
Radioactive	127	41,464	44,177	2,780
Total (in tons)	3,618	147,989	251,506	135,843

Activity by Primary Transportation Modes (cont.)

Table 2. Weight Breakdown by Mode and Commodity - FY 96

	Air	Motor	Rail	Other
Non-hazardous	2,354	58,331	8,904	64,325
Hazardous	93	32,992	11,263	29,045
Radioactive	68	34,469	5,475	2,620
Total (in tons)	2,515	125,792	25,642	95,990

Tables 3 and 4 represent shipments and weight, by air, for non-hazardous, hazardous, and radioactive shipments. Figures 9 and 10 provide an illustration of tonnage shipped by air for each of the commodity categories.

Table 3. Air shipments by Commodity Type - FY 95

Commodity Category	Number of Shipments	Weight (tons)	Shipments (%)	Tonnage (%)
Non-hazardous	415,383	3,348	98.91%	92%
Hazardous	2,149	143	0.51%	4%
Radioactive	2,411	127	0.58%	4%
Total	419,943	3,618	100%	100%

Table 4. Air shipments by Commodity Type - FY 96

Commodity Category	Number of Shipments	Weight (tons)	Shipments (%)	Tonnage (%)
Non-hazardous	328,345	2,354	98.98	93%
Hazardous	1,645	93	0.50	4%
Radioactive	1,721	68	0.52	3%
Total	331,711	2,515	100%	100%

Activity by Primary Transportation Modes (cont.)

Figure 9. Air Shipment Tonnage by Commodity Type - FY 95

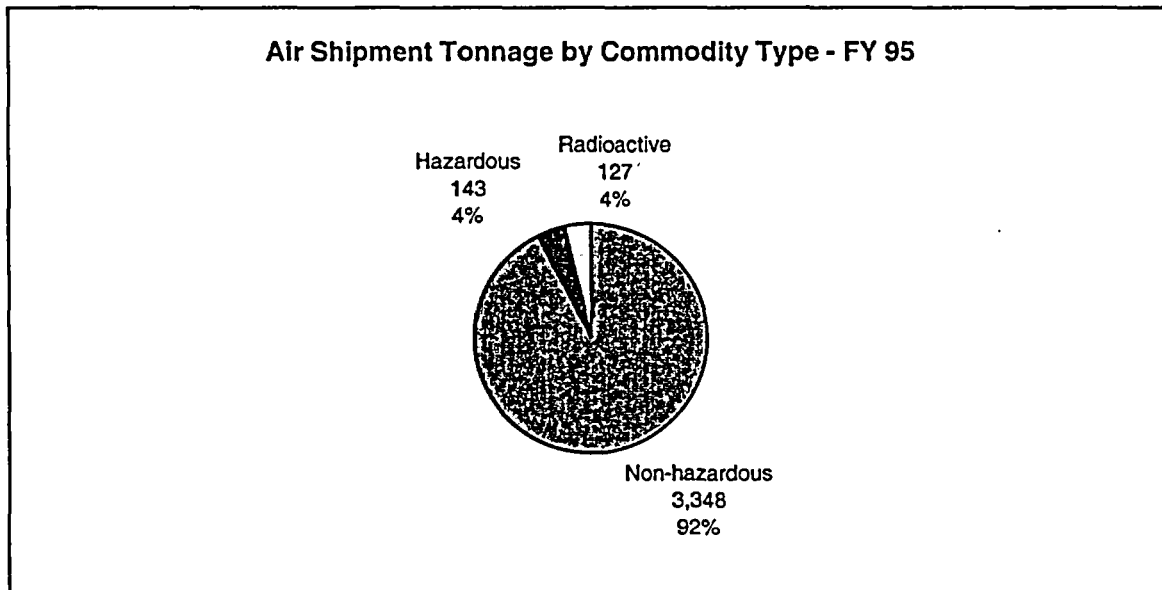
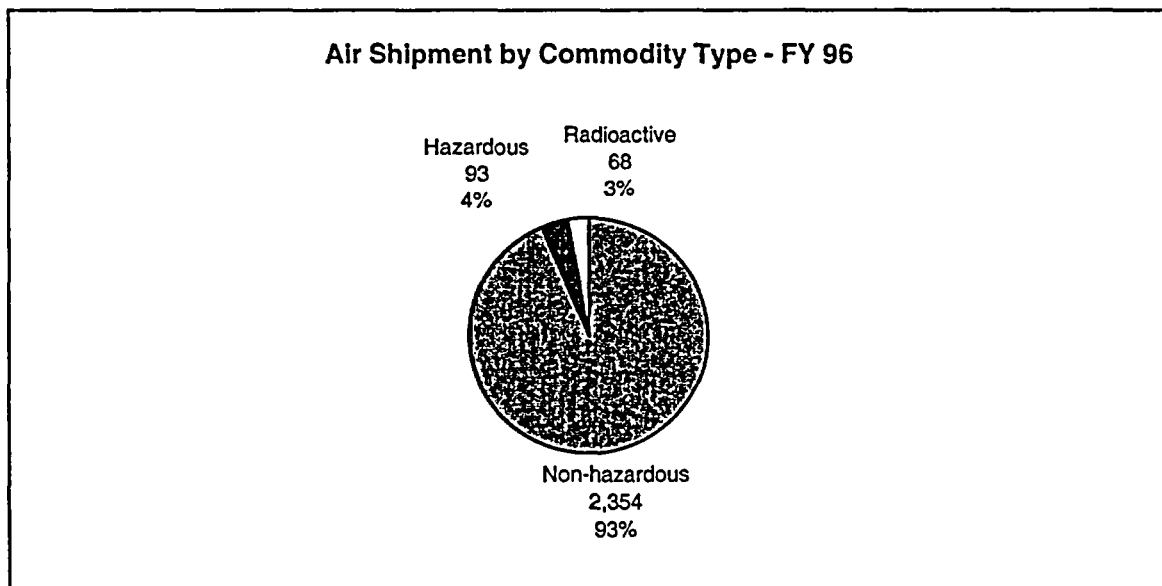


Figure 10. Air Shipment Tonnage by Commodity Type - FY 96



Air Shipments

Tables 5 and 6 contain statistics for reported inbound collect and outbound prepaid air shipments, and the cost to DOE for these shipments.

Table 5. Breakdown of DOE Paid Air Shipments - FY 95

Shipment	Number of Shipments	Number of Packages	Weight (tons)	DOE Cost (\$)	Reported Discount (\$)
Inbound Collect	56,879	70,248	833	\$1,739,425.66	\$827,934.09
Outbound Prepaid	223,887	370,487	1,422	\$3,630,902.84	\$1,749,755.09
Total: DOE Paid	280,766	440,735	2,255	\$5,370,328.50	\$2,577,689.18

Table 6. Breakdown of DOE Paid Air Shipments - FY 96

Shipment	Number of Shipments	Number of Packages	Weight (tons)	DOE Cost (\$)	Reported Discount (\$)
Inbound Collect	36,197	43,838	574	\$1,103,415.38	\$341,269.38
Outbound Prepaid	184,025	339,197	1,116	\$2,729,056.99	\$729,599.20
Total: DOE Paid	220,222	383,035	1,690	\$3,832,472.37	\$1,070,868.58

Air Shipments (cont.)

Table 7 reflects cost and weight trends for air shipments within the U.S. over the past seven years, other than documents and overnight letters.

Table 7. Domestic Air Freight Averages for Last Seven Years.

Fiscal Year	Average Cost Per Shipment (\$)	Average Weight Per Shipment (lb)	Average Cost Per Pound (\$)
1990	\$24.70	23	\$1.07
1991	\$21.50	22	\$0.96
1992	\$18.82	19	\$1.00
1993	\$17.42	18	\$0.99
1994	\$18.01	18	\$1.02
1995	\$15.90	16	\$1.01
1996	\$14.42	15	\$0.99

For FYs 1995 and 1996, the majority of DOE paid air express shipments was transported by the carriers reflected in Tables 8 and 9.

Table 8. Air Carriers - FY 95

Carrier	Number of Shipments		Number of Packages		Weight (lbs)	
	Total	IC/OP	Total	IC/OP	Total	IC/OP
Federal Express	345,532	236,380	381,989	253,041	4,026,444	2,560,083
Emery Worldwide	2,063	1,746	4,538	3,867	546,467	463,995
Burlington Northern	2,860	2,118	6,196	4,536	598,157	458,011
Associated Air Freight	778	741	2,607	2,208	375,059	347,278
Airborne Freight	49,958	31,194	186,558	164,661	459,344	204,745
DHL Corporation	6,265	3,644	6,796	4,048	53,401	41,186

Air Shipments (cont.)

Table 9. Major Air Carriers - FY 96

Carrier	Number of Shipments		Number of Packages		Weight (lbs)	
	Total	IC/OP	Total	IC/OP	Total	IC/OP
Federal Express	273,552	188,794	298,464	199,780	3,067,444	2,044,690
Burlington Northern	1,879	1,362	3,492	2,435	475,395	342,490
Emery Worldwide	1,171	924	2,493	2,015	363,864	299,283
Associated Air Freight	478	416	1,169	1,021	193,512	177,551
Airborne Freight	39,732	23,326	188,773	170,135	221,394	121,493
DHL Corporation	5,168	2,846	5,473	3,043	42,472	29,218

**Table 10. International Air Shipments by Top Five Countries for FY 1995
Inbound Collect and Outbound Prepaid.**

Country	Number of Shipments	Weight (lbs)	Cost (\$)
United Kingdom			
Non-hazardous	1,584	25,371	\$113,870
Hazardous	2	24	\$784
Radioactive	7	506	\$13,425
Total	1,600	28,575	\$115,254
Canada			
Non-hazardous	1,636	25,007	\$75,896
Hazardous	2	24	\$141
Radioactive	7	506	\$794
Total	1,645	25,537	\$76,831
Russia			
Non-hazardous	1,214	70,902	\$213,603
Hazardous	0	0	\$0
Radioactive	3	4,794	\$13,140
Total	1,217	75,696	\$226,743
Germany			
Non-hazardous	80	1,417	\$6,598
Hazardous	0	0	\$0
Radioactive	0	0	\$0
Total	80	1,417	\$6,598
France			
Non-hazardous	711	12,543	\$45,161
Hazardous	2	330	\$603
Radioactive	3	47	\$944
Total	716	12,920	\$46,708

Air Shipments (cont.)

*Table 11. International Air Shipments by Top Five Countries for FY 1996
Inbound Collect and Outbound Prepaid.*

Country	Number of Shipments	Weight (lbs)	Cost (\$)
United Kingdom			
Non-hazardous	1,477	41,823	\$89,904
Hazardous	5	45	\$566
Radioactive	2	205	\$503
Total	1,484	42,073	\$90,973
Canada			
Non-hazardous	1,348	20,593	\$79,905
Hazardous	9	177	\$499
Radioactive	8	812	\$1,153
Total	1,365	21,582	\$81,557
Russia			
Non-hazardous	1,013	59,467	\$203,462
Hazardous	0	0	\$0
Radioactive	0	0	\$0
Total	1,013	59,467	\$203,462
Japan			
Non-hazardous	807	12,240	\$49,223
Hazardous	1	2	\$68
Radioactive	5	1,423	\$4,276
Total	813	13,665	\$53,567
Germany			
Non-hazardous	536	12,764	\$21,776
Hazardous	1	5	\$53
Radioactive	0	0	\$0
Total	537	12,769	\$21,829

Air Shipments (cont.)

Table 12. International Air Carriers - FY 95

Carrier	Number of Shipments		Number of Packages		Weight (lbs)	
	Total	IC/OP	Total	IC/OP	Total	IC/OP
Federal Express	6,647	5,241	6,986	5,496	62,212	52,555
DHL Corporation	5,057	3,588	5,748	3,982	43,472	39,924
Associated Air Freight	123	121	456	448	80,373	77,885
American Overseas Transport	99	87	181	168	34,672	34,101

Table 13. International Air Carriers - FY 96

Carrier	Number of Shipments		Number of Packages		Weight (lbs)	
	Total	IC/OP	Total	IC/OP	Total	IC/OP
Federal Express	7,336	5,932	8,018	6,138	59,082	41,623
DHL Corporation	4,235	2,806	4,417	2,973	31,575	28,374
American Overseas Transport	113	111	182	180	156,239	156,224
Associated Air Freight	104	93	226	210	51,755	50,058

Less-Than-Truckload (LTL) Shipments

DOE shipments of LTL freight (as utilized in this report, denotes shipments weighing less than 10,000 pounds), represent 14% of total reported commercial motor carrier (highway) shipment weight for FY 1995, and 12% for 1996. Tables 14 (FY 95) and 15 (FY 96) summarize the type of motor shipment, number of shipments, and weight. The large majority of shipments (88% in 1995, 89% in 1996) were non-hazardous, while 2% were radioactive, and 10% and 9%, respectively, were non-radioactive hazardous.

Table 14. LTL Shipment Breakdown by Commodity Category - FY 95

Commodity Category	Number of Shipments	Weight (tons)	Shipments (%)	Tonnage (%)
Non-hazardous	51,309	18,517	88%	87%
Hazardous	5,538	2,071	10%	10%
Radioactive	940	668	2%	3%
Total	57,787	21,256	100%	100%

Table 15. LTL Shipment Breakdown by Commodity Category - FY 96

Commodity Category	Number of Shipments	Weight (tons)	Shipments (%)	Tonnage (%)
Non-hazardous	38,598	13,914	89%	86%
Hazardous	4,054	1,615	9%	10%
Radioactive	775	622	2%	4%
Total	43,427	16,151	100%	100%

Less-Than-Truckload (LTL) Shipments (cont.)

Tables 16 and 17 provide a breakdown of inbound collect and outbound prepaid shipments and tonnage transported by the nationwide LTL carriers, for which reduced rates have been negotiated and paid by DOE . The "other LTL carrier" category represents regional and local carriers, whose rates and services are generally negotiated by individual sites.

Table 16. LTL Carriers - FY 95

Carrier	Number of Shipments		Weight (tons)		Cost (\$)
	Total	IC/OP	Total	IC/OP	IC/OP
Yellow Freight Systems	7,130	4,170	2,504	1,428	\$618,709.52
Consolidated Freightways	4,867	2,174	1,742	814	\$331,070.60
Roadway Express	3,725	1,933	1,268	686	\$310,713.86
Overnight Transportation	2,952	1,248	1,218	628	\$189,662.64
ABF Freight System	1,599	658	732	347	\$166,567.85
All Other LTL Carriers	37,514	13,709	13,792	5,317	\$3,052,036.25
Total	57,787	23,892	21,256	9,220	\$4,668,760.72

Table 17. LTL Carriers - FY 96

Carrier	Number of Shipments		Weight (tons)		Cost (\$)
	Total	IC/OP	Total	IC/OP	IC/OP
Yellow Freight Systems	5,467	3,388	2,114	1,335	\$539,911.56
Consolidated Freightways	4,057	2,069	1,585	813	\$333,825.09
Roadway Express	3,124	1,598	1,063	533	\$245,232.77
Overnight Transportation	1,708	691	704	389	\$71,453.47
ABF Freight System	1,432	615	608	278	\$104,065.29
All Other LTL Carriers	27,639	9,543	10,077	3,914	\$2,690,367.12
Total	43,427	17,904	16,151	7,262	\$3,984,855.30

Truckload (TL) Shipments

TL shipments constituted nearly 86% of all reported commercial motor shipment tonnage in FY 1995 and approximately 88% in FY 1996. Table 18 (FY 95) and Table 19 (FY 96) reflect number of shipments and weight by commodity category.

Table 18. TL Shipment Breakdown by Commodity Category - FY 95

Commodity Category	Number of Shipments	Weight (tons)	Shipments (%)	Tonnage (%)
Non-hazardous	2,955	51,976	44%	43%
Hazardous	1,314	29,588	20%	24%
Radioactive	2,412	40,796	36%	33%
Total	6,681	122,360	100%	100%

Table 19. TL Shipment Breakdown by Commodity Category - FY 96

Commodity Category	Number of Shipments	Weight (tons)	Shipments (%)	Tonnage (%)
Non-hazardous	2,254	42,228	41%	39%
Hazardous	1,430	31,377	26%	29%
Radioactive	1,818	33,847	33%	32%
Total	5,502	107,452	100%	100%

Truckload (TL) Shipments (cont.)

Tables 20 and 21 provide statistics for DOE paid shipments and tonnage for inbound collect and outbound prepaid TL shipments for FY 95 and FY 96, respectively.

Table 20. TL Carriers - FY 95

Carrier	Number of Shipments		Weight (tons)		Cost (\$)
	Total	IC/OP	Total	IC/OP	IC/OP
Landstar Ranger	1,234	635	20,663	10,798	\$1,684,653.25
Tri-State Motor Transit	707	416	11,431	6,684	\$1,958,800.94
Autumn Industries	335	167	5,924	2,958	\$491,250.00
All Other TL Carriers	4,405	1,624	84,342	26,423	\$4,127,229.29
Total	6,681	2,842	122,360	46,863	\$8,261,933.48

Table 21. TL Carriers - FY 96

Carrier	Number of Shipments		Weight (tons)		Cost (\$)
	Total	IC/OP	Total	IC/OP	IC/OP
Landstar Ranger	857	714	16,854	13,475	\$1,784,703.00
Tri-State Motor Transit	673	318	11,249	5,305	\$1,192,639.34
A.J. Mettler	289	144	3,161	1,602	\$255,783.24
All Other TL Carriers	3,683	1,387	76,188	22,367	\$ 2,634,143.72
Total	5,502	2,563	107,452	42,749	\$5,867,269.30

Household Goods (HHG) Shipments

Reported household goods (HHG) shipments may include employee moves or specialized equipment or materials moves. HHG shipments reported to the SMAC system accounted for less than 2% of total commercial motor freight shipments during FY 1995, and 2.5% of total reported tonnage. Not all DOE sites report HHG moves to SMAC.

For Fiscal Year 1996, HHG accounted for 1% of commercial motor shipments, and 1.5% of freight tonnage. Table 22 gives a breakdown of household goods movements for FY 1995. Table 23 gives the corresponding figures for FY 1996.

Table 22. 1995 Household Goods Carriers

Carrier	Number of Shipments		Weight (tons)		Cost (\$)
	Total	IC/OP	Total	IC/OP	IC/OP
United Van Lines	208	199	850	812	\$635,217.70
Graebel Van Lines	159	158	724	715	\$549,163.65
Allied Van Lines	154	152	524	518	\$501,238.27
North American Van Lines	111	107	412	408	\$418,652.86
Atlas Van Lines	69	65	298	280	\$295,830.00
All Other HHG Carriers	403	344	1,575	1,486	\$1,290,354.21
Total	1,104	1,025	4,383	4,219	\$3,690,456.69

Table 23. 1996 Household Goods Carriers

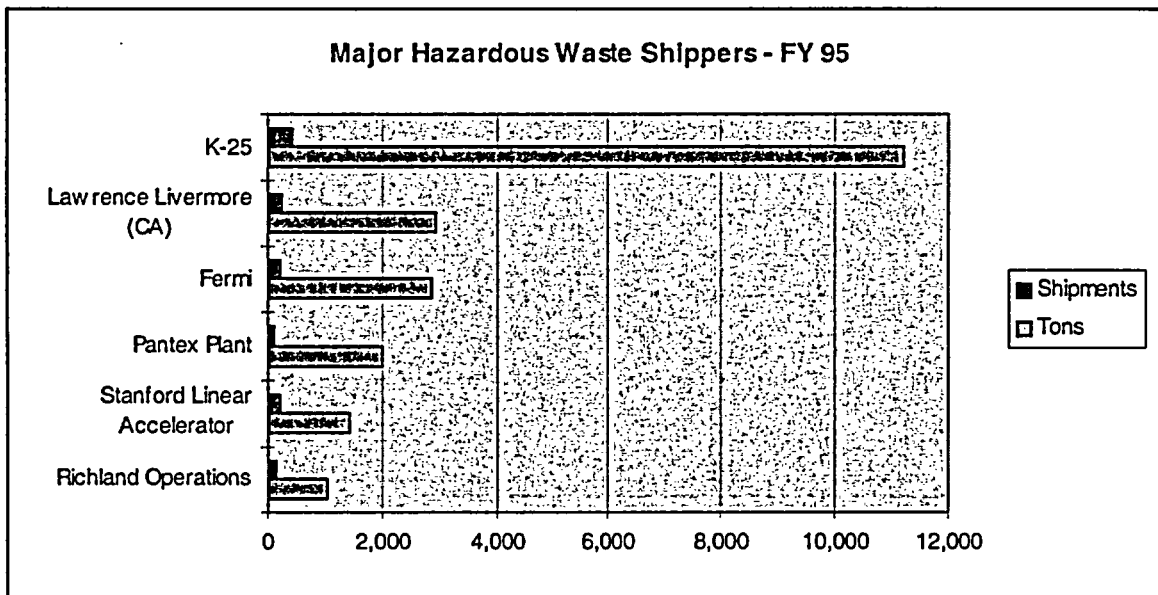
Carrier	Number of Shipments		Weight (tons)		Cost (\$)
	Total	IC/OP	Total	IC/OP	IC/OP
United Van Lines	154	153	575	571	\$540,797.32
North American Van Lines	113	113	530	530	\$456,638.96
Graebel Van Lines	96	96	391	391	\$332,681.00
Allied Van Lines	37	35	141	132	\$110,985.52
Mayflower Moving and Storage	22	22	110	110	\$98,666.36
All Other HHG Carriers	121	104	452	427	\$397,458.41
Total	543	523	2,199	2,161	\$1,937,227.57

Hazardous Waste Manifest Shipments

Reporting of hazardous waste manifest shipments began in FY 1992. Shipment and tonnage is based on whether the shipment is inbound (shipped from a non-DOE site to a DOE site), outbound (shipped from a DOE site to a non-DOE site), or intra-DOE (shipped from one DOE site to another DOE site). Less than 1% of shipments were inbound; 66% were outbound; and 33% were intra-DOE.

Forty DOE sites reported hazardous waste shipments in Fiscal Year 1995, compared to 31 sites shipped hazardous waste in 1996. The number of hazardous waste shipments for FY 1995 were 3,318, and for FY 1996, there were 2,440 shipments.

Figure 11. Major Hazardous Waste Shippers - FY 95



Hazardous Waste Manifest Shipments (cont.)

Figure 12. Major Hazardous Waste Shippers - FY 96

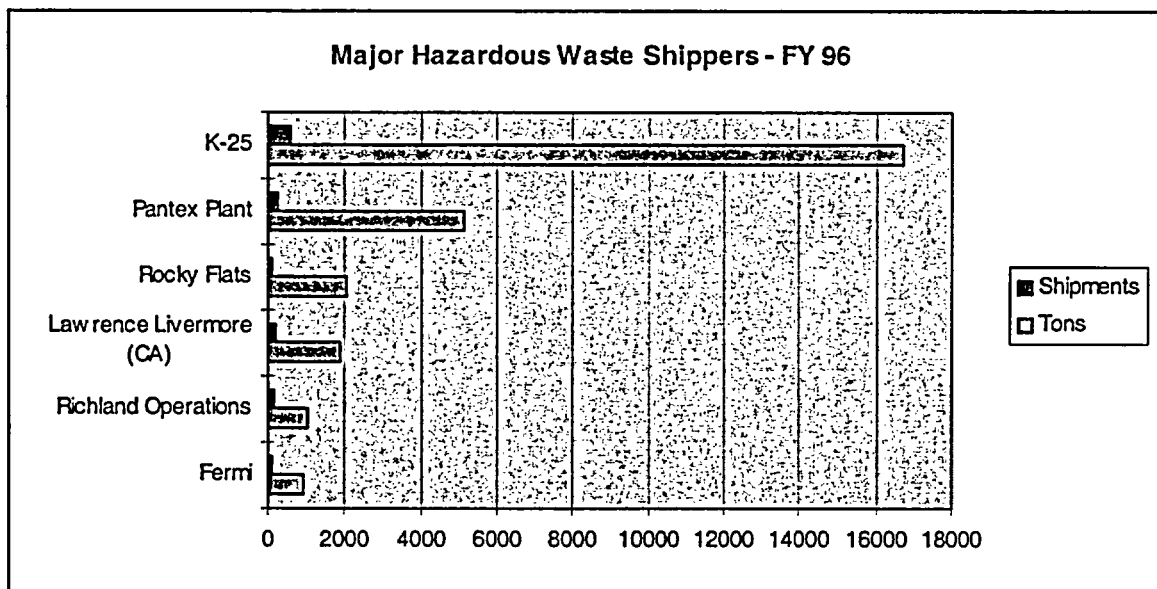
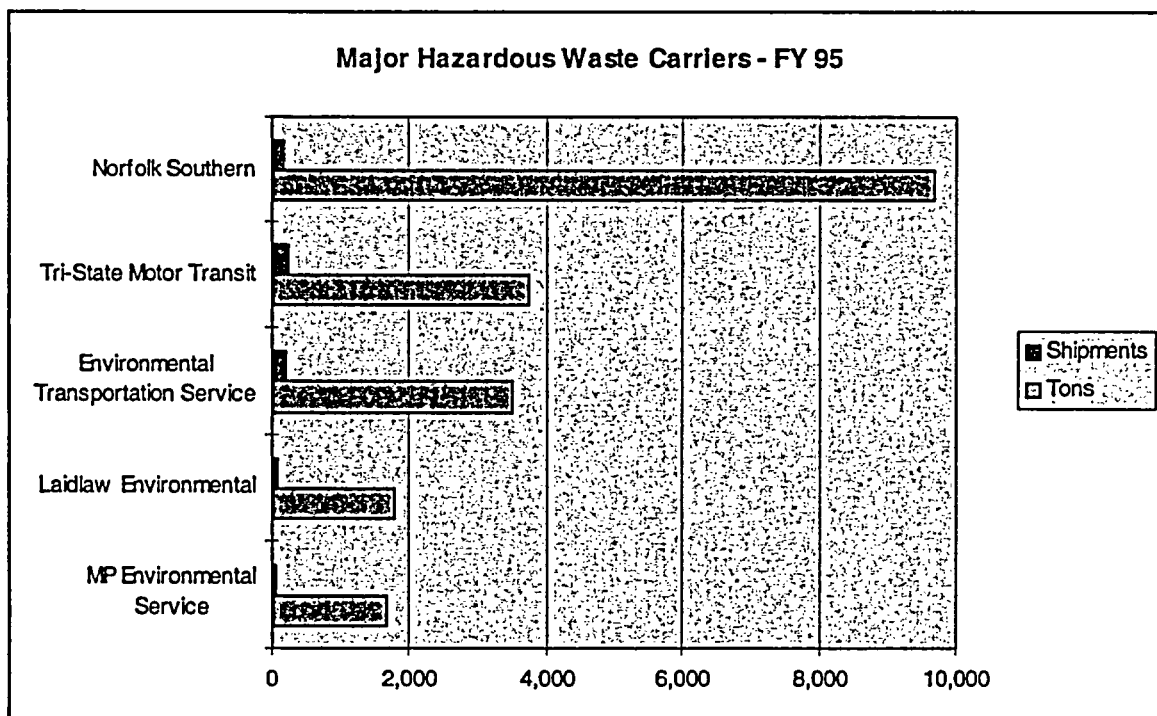
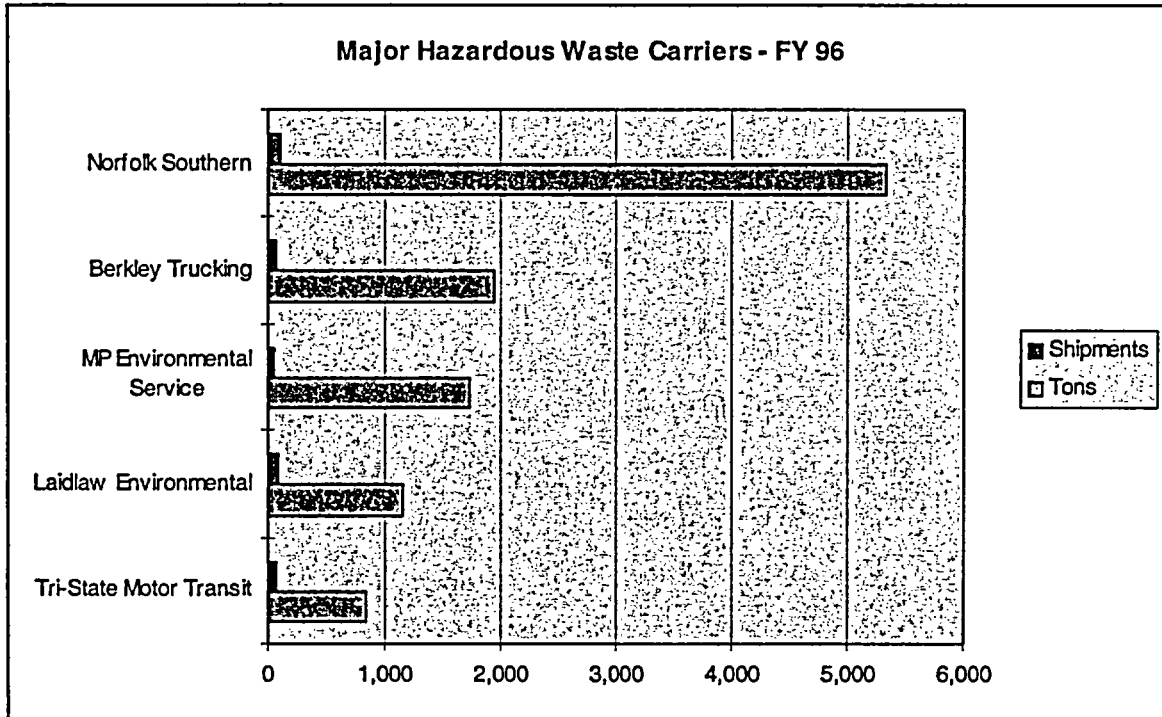


Figure 13. Major Hazardous Waste Carriers - FY 95



Hazardous Waste Manifest Shipments (cont.)

Figure 14. Major Hazardous Waste Carriers - FY 96



Major Radioactive Commodity Flows

The following information provides eight categories of radioactive materials with brief examples:

Table 24. Radioactive Materials Categories

Category	Example
Irradiated Fuel	Spent nuclear fuel assemblies
Medical/Research Isotopes and Test Samples	Relatively small quantities of special nuclides, instrumentation, tools, and test samples
Unirradiated Fissile Materials	Unirradiated fuel pins, enriched U-235, uranium oxides, and uranium metal (items include highway route controlled quantities)
Uranium Compounds	Uranium fluorides and uranyl nitrates (intermediates in the enrichment process)
Radioactive waste	Any form of radioactive waste
Miscellaneous Highway Route Controlled Quantities	Not Otherwise Specified HRCQ, Special Form HRCQ
Empty Containers	Empty, used radioactive material packaging containing residue
Miscellaneous Radioactive Materials	Shipments of other radioactive commodities including Low Specific Activity

Major Radioactive Commodity Flows (cont.)

The following is a summary of each of the eight groups:

Table 25. Radioactive Shipments Summary - FY 95

Category	Shipments		Weight	
	Number	Percent	(tons)	Percent
Irradiated Fuel	17	>1%	199	>1%
Med/Research/ Samples	2,434	32%	2,749	3%
Unirradiated Fissile	34	>1%	333	>1%
Uranium Compounds	4	>1%	0.5	>1%
Waste	2,741	36%	76,444	86%
Misc HRCQ	24	>1%	244	>1%
Empty Containers	308	4%	1,450.5	2%
Miscellaneous	1,987	26%	7,128	8%
Total	7,549*	100%	88,548	100%

*Combined shipments of different categories of radioactive material cause the total to be higher than the actual number of shipments, 7,504.

Table 26. Radioactive Shipments Summary - FY 96

Category	Shipments		Weight	
	Number	Percent	(tons)	Percent
Irradiated Fuel	10	>1%	119	>1%
Med/Research/ Samples	1,915	36%	2,640	6%
Unirradiated Fissile	10	>1%	36	>1%
Uranium Compounds	12	>1%	68	>1%
Waste	1,228	23%	27,903	65%
Misc HRCQ	4	>1%	0.5	>1%
Empty Containers	261	5%	1,223	3%
Miscellaneous	1,865	35%	10,642.5	25%
Total	5,305*	100%	42,632	100%

*Combined shipments of different categories of radioactive material cause the total to be higher than the actual number of shipments, 5,242.

Radioactive Materials (RAM) Carriers

Some Radioactive Materials (RAM) shipments require special packaging to reduce radiological risks involved in transporting these commodities. This packaging often weighs substantially more than the RAM contents. Extremely heavy RAM shipments are moved by truck or rail. Radioactive materials shipments with short half-lives or requiring timely results, such as medical and research nuclides or test samples, are generally moved by air. Major carriers used to transport DOE direct paid inbound collect/outbound pre-paid (IC/OP) RAM shipments are presented below:

Table 27. Major Rail and Motor RAM Carriers - FY 95

Carrier	Number of Shipments		Weight (tons)	
	Total	IC/OP	Total	IC/OP
Norfolk Southern Railroad	728	727	32,503	32,417
Tri-State Motor Transit	552	315	8,150	4,469
Ranger Nationwide	1,091	576	19,317	10,428
Burlington Northern Railroad	125	124	11,663	11,577
Autumn Industries Inc.	336	168	5,920	2,958
All Other RAM Carriers	4,672	2,180	10,995	5,611
Total	7,504	4,090	88,548	67,460

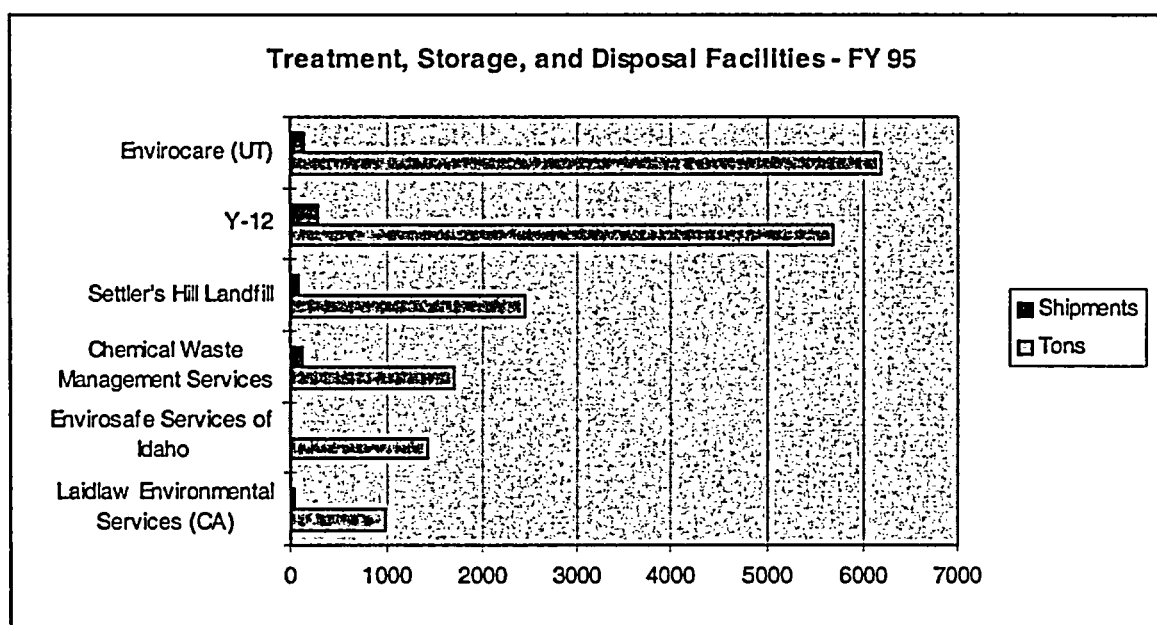
Table 28. Major Rail and Motor RAM Carriers - FY 96

Carrier	Number of Shipments		Weight (tons)	
	Total	IC/OP	Total	IC/OP
Ranger Nationwide	764	630	15,579	12,259
Tri-State Motor Transit	580	288	8,778	3,977
Autumn Industries Inc.	119	68	2,333	1,240
Consolidated Rail	28	28	2,520	2,520
Burlington Northern Railroad	25	25	2,360	2,360
All Other RAM Carriers	3,728	1,380	11,062	2,894
Total	5,244	2,419	42,632	25,250

Treatment, Storage, and Disposal Facility (TSDF) **Summary**

During FY 1995, 114 treatment, storage, and disposal facilities (TSDF) received DOE-generated hazardous wastes, and in FY 1996, there were 98. This is compared with 135 in FY 1994. Envirocare, of Utah, received the greatest number of DOE hazardous waste shipments and tonnage in Fiscal Years 1995 and 1996. The major facilities listed below account for 68% of the hazardous waste tonnage FY 1995, and 80% of the tonnage for FY 1996.

Figure 15. Treatment, Storage, and Disposal Facilities - FY 95



Treatment, Storage, and Disposal Facility (TSDF) Summary (cont.)

Figure 16. Treatment, Storage, and Disposal Facilities - FY 96

