



Radioactive Material Transport in Oregon 2007-08

Report to the 2009 Oregon Legislature



OREGON
DEPARTMENT OF
ENERGY

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Executive Summary

This report is submitted to the Oregon Legislature, as required by Oregon Revised Statute 469.617. It reports on the transport of radioactive material in and through Oregon during 2007 and 2008. It also summarizes Oregon's radioactive material transport safety program.

The program's mission is to help prevent accidents involving the transport of radioactive material and to prepare for and handle mishaps if they occur. The Oregon Department of Energy is the lead state agency for this program. The Department of Energy works with other state and local agencies to carry out this mission.

During 2007 and 2008, 947 shipments of radioactive materials entered or traveled in Oregon under authority of the state's radioactive material permit program. This is the highest two-year total of shipments in Oregon since 2000-2001. These shipments represented a wide range of materials and hazards, from barely contaminated soil to long-lived transuranic waste and irradiated nuclear fuel.

There were no transport accidents in Oregon in 2007 or 2008 that resulted in spillage or injury from radioactive material. However, there was one accident involving a shipment of low-level radioactive waste and another accident involving a portable gauge device. These are explained in more detail on pages 6 and 7.

Oregon Law Regulating Radioactive Material Transport

The 1981 Legislature passed ORS 469.603 through 469.621 to regulate the transport of radioactive material. The law also mandates effective emergency response to transport mishaps. Oregon's rules are consistent with federal safety standards.

Certain shipments of radioactive materials – depending on radiation levels and whether the vehicle is used to haul other materials – require warning signs called “placards.” Oregon statutes require carriers of all radioactive placarded shipments to obtain a state permit prior to transport through Oregon. This permitting authority is assigned to the Department of Energy, which is authorized to delegate the authority to the Oregon Department of Transportation (ODOT). Since ODOT operates the state's ports-of-entry, they are best able to track compliance with the permitting regulation.

Permit holders are charged a fee for each placarded shipment that travels through the state. The fees support part of the state's transport emergency preparedness program. The fee is \$70 for most shipments; \$500 per year for some medical and industrial shipments.

The statutes further require the Oregon Department of Energy to ensure the best and safest routes are used, directs the Department to work with Oregon Health Services to ensure adequate training and emergency planning is conducted along the transport routes, and requires Health Services to maintain a radiation emergency response team.

The Oregon Energy Facility Siting Council (EFSC) develops rules to implement the statutes. The statutes allow EFSC the following rulemaking authority:

Set requirements for notification, record keeping, reporting, packaging and emergency response. The rules require notification for inspection of certain radioactive material shipments. The rules also require notification to the state of any vehicle accidents, loss of any radioactive material or tampering or obstruction of any shipments.

Designate acceptable routes. Rules require routing of spent nuclear fuel to follow federal regulations (interstate highways whenever possible).

Specify conditions of transport for certain classes of radioactive materials. Rules require motor vehicles to avoid movement during a road condition advisory unless vehicles have traction tires or devices. The Director of the Oregon Department of Energy may halt the transport of radioactive material if he or she believes there is a clear and immediate danger to public health or safety. The Oregon Department of Energy may impose civil penalties for violation of rules.

Establish requirements for insurance, bonding or other indemnification. The rules require carriers to maintain a certain amount of insurance and pay for costs associated with response to an accident and indemnifies the State from claims arising from the release of radioactive material during transportation.

Shipment Activity

Radioactive materials travel in Oregon on a daily basis. Small amounts of radioactive materials are hauled on Oregon highways for industry and medicine. Industrial gauges with radioactive sources are also routinely transported to work sites throughout the state. Many of these shipments do not require placards.

Shipments which do require placards and therefore a permit include the truckloads of radioactive waste which are shipped to and from the Hanford Site in Washington state. Nuclear waste cleanup and other activities at Hanford and throughout the country often result in the shipment of radioactive materials through Oregon. While most of these materials pose a low risk, some of the wastes present unique hazards.

Attachments 1 and 2 show the number of placarded radioactive material shipments through Oregon from 1982 through 2008, and a listing by route of shipments during 2007 and 2008. Attachment 3 shows how different routes have been used over the years.

Low-level waste

Low-level waste shipments traditionally make up a large majority of the placarded radioactive material shipments that travel through Oregon. Both government and commercially-generated waste is buried at Hanford. Low-level waste generated at federal Department of Energy (DOE) nuclear weapon production and research sites throughout the country has been shipped to government burial trenches at Hanford for decades, although in greatly reduced numbers during most of the past decade because of litigation and an agreement by DOE to suspend most shipments until related environmental studies are completed.

Low-level waste from hospitals, nuclear power plants and universities in 11 Western and Rocky Mountain states – including Oregon – is buried in a commercial disposal site at Hanford operated by US Ecology. An increasing amount of low-level waste is also treated at a commercial facility near Hanford.



U.S. Ecology Low-Level Radioactive Waste Disposal Trench

Transuranic waste

DOE is disposing of transuranic waste by burial at the Waste Isolation Pilot Plant (WIPP) in southeast New Mexico. Transuranic waste includes lab equipment, tools, rubble and sludges tainted with small amounts of plutonium and other radioactive materials.

Limited shipments from Hanford began in July 2000 but had become a significant percentage of the radioactive material shipments that traverse the state. WIPP shipments through Oregon are restricted to Interstates 82 and 84 in Northeast Oregon.

Number of WIPP shipments from Hanford:

2000	5	2005	100
2001	5	2006	79
2002	3	2007	75
2003	48	2008	51
2004	66		

Through January 28, 2009, the WIPP site has accepted 7,063 shipments from nine DOE sites – 432 from Hanford.

Oregon worked with other Western states and DOE to develop a comprehensive transport safety program for these shipments. This program includes: higher standards for the drivers and trucking companies; a “defect-free” standard for inspections; procedures to keep the trucks off the road when weather conditions are especially hazardous; training of first responders and hospital emergency room personnel along the shipping routes; advance notice of shipments provided to the states; and near-real time tracking of the shipments through the use of satellite tracking systems. DOE has also agreed to these above-regulatory protocols for certain other shipments.

Other Hanford Shipments

From October 2007 through April 2008, DOE made 11 shipments of nuclear fuel from Hanford to the Idaho National Laboratory. An additional shipment was made in October 2008. Those shipments were made by truck.

Also in the fall of 2007, DOE received approval to begin the shipment of surplus plutonium at Hanford to DOE’s Savannah River Site in South Carolina. These shipments are considered “national security” shipments. Shipment schedules and other information related to them is classified although they are on-going.

Naval nuclear reactor compartment shipments

Since 1986 the U.S. Navy has disposed of 118 reactor compartments from deactivated nuclear submarines and cruisers at Hanford. The Navy removes the spent nuclear fuel from the reactors, cuts out a section of the submarine or cruiser containing the reactor compartment, and welds steel plates over any openings to seal the compartments. The compartments are then shipped by barge up the Columbia River to Hanford for disposal. These shipments are low-level waste.

Through most of the 1990s and into the early part of this decade, the Navy made between seven and 10 shipments on average each year. Only two compartments were shipped during each of 2003 and 2004. No shipments were made during 2005. One compartment was shipped in 2006, two in 2007 and one in 2008.

Notification to local and state emergency response agencies along the Columbia River is provided prior to each shipment.

The Washington Department of Health and Oregon Health Services periodically inspect these shipments prior to their departure to ensure they meet state and federal transport regulations. Oregon inspected the one shipment in October 2008.

Rail shipments

Spent nuclear fuel from Navy ships is periodically sent by rail from Puget Sound Naval Shipyard in Bremerton, Washington, to the Idaho National Laboratory. These shipments travel through about 200 miles of northeast Oregon. The Oregon Department of Energy works with the Navy to provide information on these shipments to state and local emergency responders.

Other radioactive materials are also occasionally shipped by rail through the state.

Summary of Transport Accidents & Incidents

There were no transport accidents in Oregon in 2007 or 2008 that resulted in spillage or injury from radioactive material. However, there was an accident involving a semi-truck carrying low-level radioactive waste and an accident involving a vehicle carrying a portable radiation gauge device.

On December 22, 2008, a truck hauling radioactive low-level waste to a commercial treatment facility in Richland, Washington jack-knifed on black ice just west of La Grande, Oregon on Interstate 84. There were no injuries and there was no release of radioactive material. La Grande Fire Department personnel conducted a radiological survey at the scene before the tractor and trailer were towed.



Accident Involving a Low-Level Waste Shipment Near La Grande, Dec 22, 2008

The Oregon Health Services' Radiation Protection Services (RPS) responded to a variety of transportation-related incidents in Oregon in 2007 and 2008 involving radiological material. Among the incidents were:

- A vehicle carrying a portable gauge device was involved in a minor traffic accident. No spillage or leakage of the source was reported.
- Steel mills reported 34 instances of low-level radioactive contamination in loads of steel or scrap steel. The mills have radiation detectors that examine each load upon arrival. The loads were returned to the places of origin. There is no hazard to the workers or to the public during transportation.

One case involved RPS responding to a report of a truck alarm at Schnitzer Steel in Portland. While off-loading scrap metal from a barge, RPS personnel discovered a severed fixed gauge with Cesium 137 exposing workers and the work site. Sources and surrounding materials were isolated and removed from public exposure. The work site and barge required survey for

contamination. Oregon National Guard's 102nd Civil Support Team responded and provided mutual aid and assistance to mitigate the incident. The sources originated from a Vancouver Island, B.C. scrap metal collection site.

- Waste transfer stations and commercial garbage incinerators discovered small amounts of radioactive materials mixed in with garbage on 16 occasions. The majority of these reports involved low level radioactive material mixed with biological hazardous waste received from medical facilities. The waste was either segregated until the radioactive materials decayed away or returned to the sender. One incident involved a breached safe found at a landfill with "Radioactive Materials" labels. RPS staff responded and discovered a small amount of exempt radiological sources. The origin of the container is unknown.
- There were two incidents involving contaminated waste. One incident involved a state of Washington bio-hazard receiving facility that detected radiological material received from an Oregon medical facility. The materials were transported back to the sender for isolation and appropriate disposal/decay of materials. Another incident involved a small radiation source discovered at a garbage incinerator facility. The source was picked-up by RPS staff.

Compliance and the Effectiveness of Enforcement Activities

Since the establishment of its program, Oregon has experienced few compliance problems regarding the state's regulation of radioactive material transport. The carriers have generally met our standards, have applied for and carried our permits, and have paid their fees.

Inspections both within the state and nationally have shown that trucks carrying radioactive materials are, on average, better maintained than trucks carrying other hazardous materials. We believe this difference is the result of the special attention paid to radioactive material shipments. ODOT personnel randomly stopped and inspected on average, one WIPP shipment per month as it entered Oregon at Umatilla. A sampling of other radioactive material shipments was also inspected.

Future Shipments

Low-level waste

Low-level waste shipments will continue through Oregon to Hanford. Shipment numbers are difficult to predict.

Oregon could see major new shipping campaigns associated with Hanford during the next several years. Hanford was selected in 1999 as a primary disposal site for significant amounts of the nation's low-level and mixed low-level waste, which could result in many thousands of shipments over the next several decades. Litigation has so far prevented DOE from following through with these plans but the scheduled completion of a major Environmental Impact Statement in 2009 could result in shipments beginning later this year.

We've also seen increased transport related to the operation of a radioactive low-level waste treatment facility in Richland, Washington. That increased level of transport is expected to continue.

Transuranic waste

Major changes are anticipated in shipping plans from Hanford. DOE is currently projecting up to a five year halt to WIPP shipments from Hanford. Problems at other DOE shipping sites could result in Hanford resuming a limited number of WIPP shipments, but at the moment, it is off the schedule until at least 2014. The last WIPP shipment from Hanford occurred in September 2008.

Other Hanford Shipments

DOE is expected to complete shipment of surplus plutonium from Hanford to the Savannah River Site sometime in mid-2009.

Naval nuclear reactor compartment shipments

Shipments of submarine and cruiser reactor compartments on the Columbia River are expected to continue in 2009 and beyond. The number of shipments – like in recent years – will be only a few per year.

Spent nuclear fuel and high-level waste

The federal government's plans to build and operate a geologic repository for the nation's spent nuclear fuel and high-level nuclear waste are very

much up in the air. Senate Majority Leader Harry Reid of Nevada has promised to severely cut or even eliminate funding to the Yucca Mountain Project – the current choice for a repository location. If that does occur, it seems likely that spent nuclear fuel stored at the shut-down Trojan nuclear plant northwest of Portland will remain at the site indefinitely.

Eventually, if the federal government is able to open a repository or a consolidated storage facility, spent nuclear fuel from Trojan and from the Columbia Generating Station nuclear plant near Richland, Washington would be shipped through Oregon to the repository or storage facility. Immobilized high-level waste and spent nuclear fuel from Hanford would also be transported to such a facility.

Extensive planning and training will occur before these shipments occur in Oregon – regardless of the destination.

Emergency Preparedness and Response Activities

The Oregon Department of Energy contracts with Oregon Health Services to provide radiological training to first responders and hospital emergency room personnel. During 2007 and 2008, about 566 persons received this training throughout the State of Oregon. In addition, the Oregon Department of Energy contracts with Oregon State University's Radiation Center to annually provide advanced training in radiological response to members of Oregon's regional Hazardous Material Response Teams. State Police officers and emergency responders from other state, federal and local agencies also occasionally participate in this training. About 45 people received this advanced training in 2007 and 2008.

Public Information/Regional Planning

The Oregon Department of Energy participated in a number of regional and national forums to help develop transportation policies that are consistent with Oregon policy. During 2007 and 2008 Oregon Department of Energy staff participated in the following transportation groups:

- The Western Governors' Association Technical Advisory Group for WIPP Transport

- The Western Interstate Energy Board's High-level Radioactive Waste Committee
- DOE's Transportation External Coordination/Working Group
- State and Tribal Government Working Group

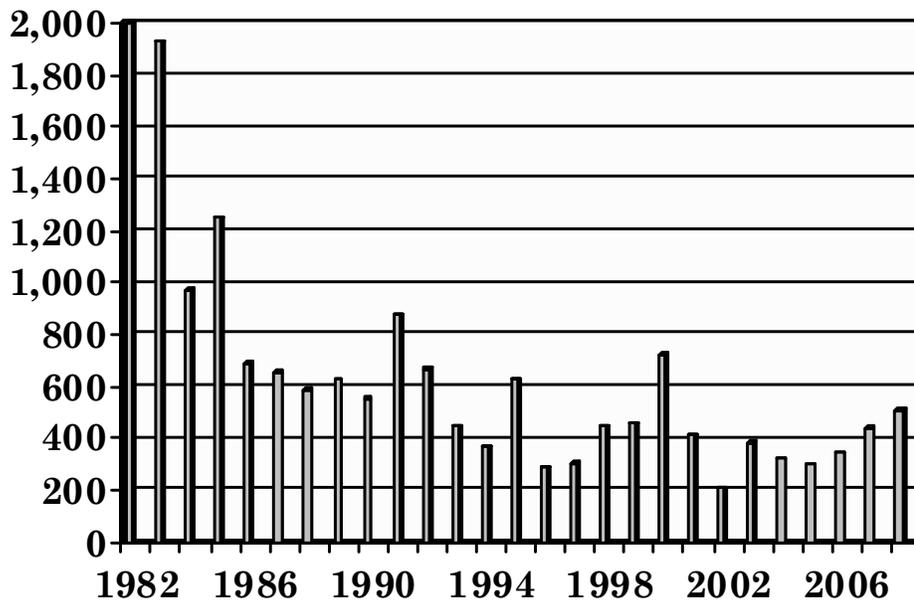
In addition, the Oregon Hanford Cleanup Board, a policy advisory group on Hanford issues to the Governor, Legislature and the Oregon Department of Energy, maintains involvement with radioactive material transport issues.

Information materials about this program were updated on the Oregon Department of Energy web site:
(<http://oregon.gov/ENERGY/NUCSAF/nucsafe.shtml>)

Attachment 1

**Placarded Radioactive
Material Shipments
Through Oregon**

1982	2,000+	1996	290
1983	1,928	1997	304
1984	973	1998	444
1985	1,250	1999	459
1986	690	2000	724
1987	653	2001	410
1988	588	2002	211
1989	629	2003	385
1990	551	2004	324
1991	876	2005	300
1992	664	2006	345
1993	447	2007	438
1994	369	2008	509
1995	628		



Attachment 2

Placarded Radioactive Shipments by Route 2007

	I-5 Ashland	I-84 Cascade	I-84 Farewell	US-97 Klamath	US-730 Umatilla	I-5 Woodburn	Total
January	0	0	21	0	17	5	43
February	2	0	7	0	14	4	27
March	3	0	5	0	35	6	49
April	0	0	9	0	11	6	26
May	0	0	8	0	14	3	25
June	0	0	20	0	29	4	53
July	1	0	16	0	15	2	34
August	1	0	15	0	18	8	42
September	0	0	10	0	17	7	34
October	1	0	18	0	25	6	50
November	0	0	11	0	13	5	29
December	0	0	10	0	14	2	26

Total	8	0	150	0	222	58	438
Percent	2	0	34	0	51	13	

Placarded Radioactive Shipments by Route 2008

	I-5 Ashland	I-84 Cascade	I-84 Farewell	US-97 Klamath	US-730 Umatilla	I-5 Woodburn	Total
January	0	0	7	0	16	7	30
February	1	0	11	0	18	5	35
March	0	0	15	0	22	6	43
April	0	0	15	0	18	5	38
May	0	0	15	0	37	8	60
June	0	0	24	0	20	9	53
July	0	0	18	0	36	0	54
August	0	0	12	0	17	3	32
September	0	0	7	0	20	6	33
October	0	1	12	0	34	9	56
November	0	0	23	0	15	5	43
December	0	0	11	0	20	1	32

Total	1	1	170	0	273	64	509
Percent	<1	<1	33	0	54	13	

Attachment 3

Placarded Radioactive Shipments % by Route

	I-5 Ashland	I-84 Cascade	I-84 Farewell	US-97 Klamath	US-730 Umatilla	I-5 Woodburn	Misc Shipments
2008	<1	<1	33	0	54	13	--
2007	2	0	34	0	51	8	--
2006	<1	<1	29	0	49	19	--
2005	1	<1	21	3	49	25	--
2004	2	7	18	2	32	38	--
2003	1	6	20	4	37	32	--
2002	2	10	38	2	27	19	--
2001	3	16	51	4	15	11	--
2000	2	30	43	3	15	7	--
1999	2	25	54	2	9	2	5
1998	5	38	33	8	7	5	4
1997	1	30	35	5	20	0	8
1996	3	25	39	7	24	0	1
1995	2	12	52	2	19	4	1
1994	3	12	57	7	11	8	1
1993	4	26	46	5	5	1	14
1992	3	18	67	11	1	--	--
1991	2	16	76	6	--	--	--
1990	3	13	72	12	--	--	--
1989	9	5	70	16	--	--	--
1988	7	--	72	21	--	--	--
1987	2	--	95	4	--	--	--
1986	3	--	86	11	--	--	--
1985	3	--	79	18	--	--	--