

Radioactive Material Transport in Oregon 2011

Report to State and Local Governments



Inside this report:

- Regulating Radioactive Material Transport
- Shipment Activity
- Transport Accident Summary
- Emergency Preparedness



OREGON
DEPARTMENT OF
ENERGY

Radioactive Material Transport in Oregon 2011

Report to State and Local Governments

January 2012

Submitted by:

Ken Niles, Division Administrator
Nuclear Safety & Energy Emergency Preparedness



Oregon Department of Energy
625 Marion St. N.E.
Salem, OR 97301
503-378-4040 or toll-free in Oregon 1-800-221-8035
Hermiston Field Office
541-567-3840
www.oregon.gov/energy



Radioactive Material Transport in Oregon 2011

Acknowledgements

Cover photo: a truck carrying reactor fuel from the Reed College research reactor in Portland awaits inspection prior to its departure in June 2011 to a federal facility in Idaho.

Radioactive Material Transport in Oregon 2011

Contents

- Executive Summary.....1
- Regulating Radioactive Material Transportation.....1
- Summary of Transport Accidents & Incidents.....5
- Emergency Preparedness & Response Activities.....5
- Attachment A.....7
- Attachment B.....8



Truck being inspected at port of entry in Woodburn, Oregon

Radioactive Material Transport in Oregon 2011



Oregon Department of Transportation weigh station

Radioactive Material Transport in Oregon 2011

Executive Summary

This report is submitted to interested state and local government agencies as required by Oregon Revised Statute 469.609. The report provides information on the transport of radioactive material in and through Oregon during calendar year 2011. It also summarizes Oregon's Radioactive Material Transport Safety Program.

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

During 2011, 570 shipments of radioactive materials entered or traveled in Oregon under authority of the state's radioactive material transport permit program. This is the largest number of these shipments transported in Oregon since 2000. The shipments represent a wide range of materials and hazards.

For the period, there were no transport accidents that resulted in spillage or injury from radioactive material.

Regulating Radioactive Material Transportation

The 1981 Legislature passed ORS 469.603 through 469.621 to regulate the transport of radioactive material. The law 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.

Permitting authority is assigned to ODOE, which is authorized to delegate the authority to the Oregon Department of Transportation (ODOT). ODOT operates the state's ports-of-entry and tracks 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 and \$500 per year for some medical and industrial shipments.

The statutes further require ODOE to ensure that the best and safest routes are used.

In addition the statutes:



Packaging for hazardous materials

- Direct ODOE to work with local, state and national governments to ensure a swift and appropriate response to any accident.
- Direct ODOE to work with the Oregon Health Authority to ensure that adequate training and emergency planning is conducted along the transport routes.
- Require the Health Authority to maintain a trained and equipped radiation emergency

Radioactive Material Transport in Oregon 2011

response team.

The state's Energy Facility Siting Council (EFSC) develops rules to implement the statutes that offer 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, and tampering or obstruction of any shipments.
- ✓ **Specify conditions of transport for certain classes of radioactive materials.** Rules require motor vehicles to avoid movement during adverse road conditions unless vehicles have traction tires or devices. ODOE's director may halt the transport of radioactive material if he, or she, believes there is clear and immediate danger to public health and safety. ODOE 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, pay for costs associated with response to an accident and indemnifies the State from claims, arising from the release of radioactive material during transport.

Shipment Activity

Radioactive materials travel in Oregon daily and include small amounts of radioactive materials 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 that require placards and a

permit include truckloads of radioactive waste, shipped to and from the Hanford Nuclear Site and nearby facilities located 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 low risk, some of the wastes present unique hazards.

Attachments A and B show the number of placarded radioactive material shipments through Oregon from 1982 to 2011 and a listing by route of shipments during 2011.

Low-level waste and materials

Low-level waste and low-level material continue to make up a large majority of placarded radioactive shipments that travel through Oregon.

Low-level waste from hospitals, nuclear power plants, industries, and universities in 11 Western and Rocky Mountain states—including Oregon—is buried in a commercial disposal site at Hanford operated by a company called US Ecology. The volume of waste shipped to the US Ecology site in recent years has declined from significantly larger volumes in the 1980s and early 1990s.

For decades, U.S. Department of Energy (DOE) shipped low-level waste generated at the nuclear weapon production and research sites throughout the country, to government burial trenches at Hanford.

Hanford was selected in 1999 as a primary disposal site for significant amounts of the nation's low-level and mixed low-level waste that could have resulted in many thousands of shipments over the next

Radioactive Material Transport in Oregon 2011

several decades.

Litigation has prevented DOE from following through with these plans. The settlement of separate litigation extends the moratorium on most waste shipments to Hanford through 2022.

An increasing amount of low-level waste is treated at Perma-Fix Northwest, a commercial facility near Hanford. Waste is transported to Perma-Fix from around the nation. Then it is treated and returned to the sender, or sent to disposal sites.

In addition, fuel for nuclear reactors is fabricated at the Areva facility in Richland, Washington. Trucks carrying raw materials and finished products related to this facility travel through Oregon.

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 sludge tainted with small amounts of plutonium and other radioactive materials.

Limited shipments from Hanford began in July 2000 but grew to be 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.

Beginning in 2010, Hanford also began making shipments of transuranic waste to the Idaho National Laboratory for repackaging before it is sent on to WIPP. These shipments traveled along the same routes in Oregon as WIPP-bound shipments.

Through January 24, 2012, the WIPP site accepted 10,284 shipments from 11 DOE sites; 572 were from Hanford. An additional 77 shipments of transuranic waste traveled from

2000	5	2006	79
2001	5	2007	75
2002	3	2008	51
2003	48	2009	0
2004	66	2010	113
2005	100	2011	104

Transuranic waste shipments from Hanford

Hanford through Oregon to the Idaho National Laboratory.

Oregon worked with other Western states and DOE to develop and implement a comprehensive transport safety program for these types of shipments.

The 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;
- Near-real time tracking of the shipments through the use of satellite tracking systems.

DOE has also agreed to these regulatory protocols for other types of shipments.

Hanford has large quantities of transuranic waste to dispose of at the WIPP site. Due to focusing on shipments from other DOE sites,

Radioactive Material Transport in Oregon 2011

DOE currently anticipates that no transuranic waste shipments will depart Hanford during the next few years. Beginning in about 2014 or 2015, DOE expects shipments from Hanford to resume at significantly higher numbers than before.

At some point, Hanford will begin shipping “remote-handled” transuranic waste. All transuranic waste shipments from Hanford, so far, have been of “contact-handled” waste, which has very little penetrating radiation. Remote-handled waste does contain penetrating radiation and requires heavy lead shielding in the transportation container. As a result, a reduced amount of waste is carried in each shipment.

Other shipments

In June 2011, the reactor core from the research reactor at Reed College in Portland was transported by truck to the Idaho National Laboratory.

Naval nuclear reactor compartment shipments

Since 1986, the U.S. Navy has disposed of 123 reactor compartments from deactivated nuclear submarines and cruisers at Hanford. The Navy removes the irradiated nuclear fuel from the reactors, cuts out a section of the submarine or cruiser containing the reactor compartment, and welds steel plates over any opening to seal the compartments. The compartments are then shipped by barge up the Columbia River to Hanford for disposal. These shipments are considered low-level waste.

During the 1990s and into the early part of 2000s, on average, the Navy made between 7 and 10 annual shipments. Currently, the average number of shipments is between zero and two per year. Only one

compartment was shipped in 2011.

Occasionally, the Washington Department of Health and Oregon Health Authority’s Radiation Protection Services (RPS) inspects these shipments prior to their departure to ensure they meet state and federal transport



Vancouver Fire Dept. personnel check radiation levels of a Navy spent fuel shipping container during a July 2011 exercise at the Vancouver rail yard.

regulations.

Rail shipments

Periodically, spent nuclear fuel from Navy ships is sent by rail from Puget Sound Naval Shipyard in Bremerton, Washington, to the Idaho National Laboratory. These shipments travel about 200 miles through northeast Oregon.

ODOE works with the Navy to provide information on these shipments to state and local emergency responders, though specific shipment information is not provided to the state by the Navy.

During 2011, the Navy worked with Oregon and Washington, along with local agencies in the Vancouver/Portland area, to conduct a transportation exercise involving one of these shipments.

Spent nuclear fuel and high-level waste

The federal government’s decision to cancel plans to build and operate a geologic repository in Nevada for the nation’s spent nuclear fuel and high-level nuclear waste will potentially leave highly radioactive waste

Radioactive Material Transport in Oregon 2011

“stranded” in both Oregon and Washington for years.

Irradiated nuclear fuel is stored at the shutdown Trojan nuclear plant northwest of Portland and at the Columbia Generating Station nuclear plant near Richland, Washington.

In addition, highly radioactive waste at Hanford is eventually destined to go to a geologic repository. Once such a facility is sited and built, it is anticipated that these materials will then be transported through Oregon for disposal. Extensive planning and training will occur before these materials are transported, regardless of the destination.

Summary of Transport Accidents & Incidents

There were no transport accidents in Oregon in 2011 that resulted in spillage or injury from radioactive material.

RPS investigated a total of 39 events that required their staff to respond and investigate. These events ranged from informational notifications to requests for a physical response by the RPS emergency response team.

Below is a summary of some of the events:

Construction Site Accident: 1

RPS received a call from a licensee that a portable density/moisture gauge containing radioactive material was damaged in a construction site accident. RPS verified that there were no material leaks and ensured that the device was secured.

An investigation determined that the device was left unattended while out of the storage container. Oregon Administrative Rules direct the licensee to

secure the device in the appropriate transportation storage container when unattended.

Waste Monitor Alarms: 5

RPS responded to five alarms at various waste receiving sites throughout Oregon. RPS investigates when calls are received from a waste site operator that radiation sensors are alarming due to possible radioactive material in the waste stream. In some cases, the waste is transported back to the original shipping facility for appropriate disposal, or is placed into the RPS storage facility to allow for radioactive decay.

Scrap Monitor Alarms: 13

RPS investigated 13 scrap alarms throughout Oregon. Naturally occurring radioactive material can develop in scrap iron which is used to develop new metals. When radioactive materials within the scrap activate the sensor alarms, RPS investigates and identifies the isotope. The material is then transported back to the sender for appropriate disposal.

Loss of Materials: 1

RPS investigated one incident of a lost device containing radioactive materials. A radioactive materials licensee requested that their license be terminated due to the fact they could not locate the device, no longer in use. RPS did not terminate the license until an investigation was completed. Six months later, RPS located the device and disposed of it properly.

Emergency Preparedness and Response Activities

ODOE contracts with RPS to provide radiological training to first responders and hospital emergency room personnel. RPS provided *basic radiation materials transportation classes* for awareness and

Radioactive Material Transport in Oregon 2011

initial mitigation, to the following public safety agencies:

- Multnomah Fire District #1
- American Medical Response
- Pendleton Fire Department
- Hermiston Fire District
- River Bend Hospital, Springfield

RPS also established the Radiation Response Volunteer Corps (RRVC). The mission of the RRVC is to involve local county health agencies, county emergency operations staff, health care professionals, and radiation professionals, who can provide radiation monitoring when local public safety agencies are overwhelmed from a radiation accident. Approximately 130 people were trained for *population monitoring and surveying* of radioactive material contamination.

During 2010 and 2011, RPS developed and conducted an advanced radiation operations training program designed to provide Oregon's Regional Hazardous Materials Response Teams with advanced skills and equipment knowledge.

Participating departments include:

- Ontario Fire Hazmat Team
- Hermiston Fire Department Hazmat Team
- Portland Fire Bureau Hazmat Team
- Salem Fire Department Hazmat Team
- Astoria Fire Department Hazmat Team
- Oregon Fire Marshal's Office Hazardous Materials Conference

In 2011, RPS continued relationships with municipal, county, state, and federal law enforcement agencies with the mission to seek their assistance in the event of a large scale radiation materials incident. RPS participated in exercises designed to identify operational gaps between responding agencies and offer specific

radiation training with the following agencies:

- Eugene Police Department
- Port of Portland Police Department
- Portland Police Bureau
- Salem Police Department
- Oregon State Police
- Federal Bureau of Investigation
- U.S. Coast Guard, Portland

ODOE also contracts with Oregon State University's Radiation Center to provide an annual 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 participate in this training. About 25 people received the advanced training in 2011.

Conclusion

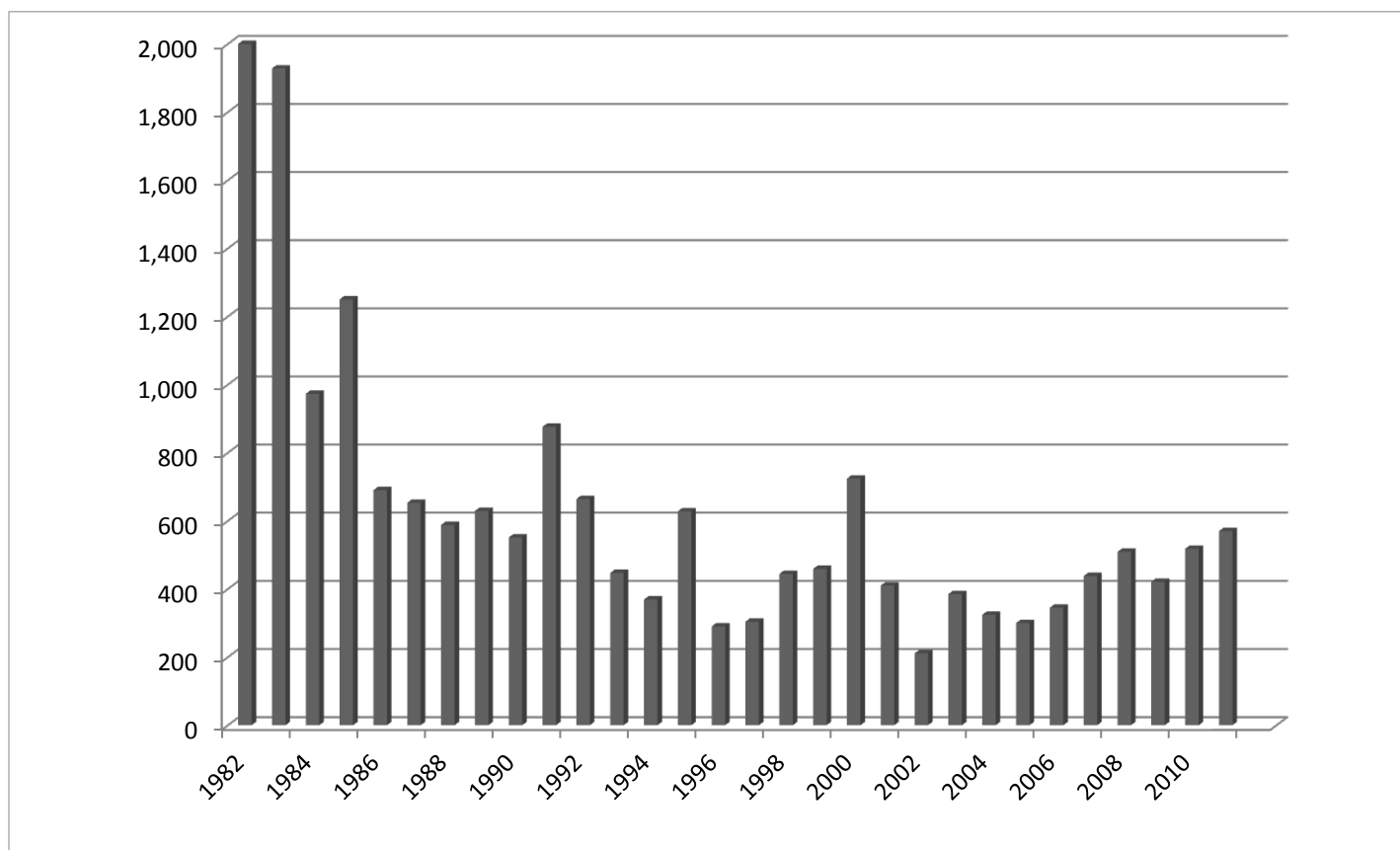
Nearly 570 placarded shipments of radioactive materials traveled safely through Oregon during 2011. Emergency preparedness training was conducted throughout the state.

Radioactive Material Transport in Oregon 2011

Attachment A

Placarded Radioactive Material Shipments transported through Oregon

1982	2,000+	1997	304
1983	1,928	1998	444
1984	973	1999	459
1985	1,250	2000	724
1986	690	2001	410
1987	653	2002	211
1988	588	2003	385
1989	629	2004	324
1990	551	2005	300
1991	876	2006	345
1992	664	2007	438
1993	447	2008	509
1994	369	2009	421
1995	628	2010	518
1996	290	2011	570



Radioactive Material Transport in Oregon 2011

Attachment B

	Interstate 5 thru state	Interstate 5 Portland area and/or to Eugene	Interstate 84 Columbia Gorge	US Highway 97	Interstate 84 Eastern Oregon	Total
January	1	11	0	0	47	59
February	2	10	2	1	19	30*
March	1	6	1	0	44	50*
April	1	5	1	0	33	40
May	0	6	1	0	36	42*
June	3	6	6	2	36	47*
July	0	6	0	0	21	27
August	1	10	4	1	56	67*
September	1	7	1	1	42	51*
October	0	12	2	0	51	63*
November	1	6	5	0	28	36*
December	2	5	4	1	49	58*
Total	13*	90*	27*	6*	462*	570*
Percent	2%	16%	5%	1%	81%	100%

***some shipments show up on more than one route.**

