

# RADIOACTIVE MATERIAL TRANSPORT IN OREGON 2011-12

Report to the Oregon Legislative Assembly 2013



## Inside this report:

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



**OREGON**  
DEPARTMENT OF  
**ENERGY**

# Radioactive Material Transport in Oregon 2011-12

## Table of Contents

Executive Summary ..... 1

Regulating Radioactive Material Transportation ..... 1

Shipment Activity ..... 2

Summary of Transport Accidents & Incidents ..... 4

Emergency Preparedness & Response Activities ..... 5



**Radioactive Material Transport  
in Oregon 2011-2012**

**Submitted by Ken Niles, Division  
Administrator, Nuclear Safety and  
Emergency Preparedness**

**Oregon Department of Energy  
625 Marion Street N.E.  
Salem, Oregon 97301**

**1-800-221-8035  
Oregon.gov/ENERGY**

# Radioactive Material Transport in Oregon 2011-12

## EXECUTIVE SUMMARY

Oregon Revised Statute 469.617 requires the Oregon Department of Energy to submit a Radioactive Material Transport biennium report to the Oregon Legislature. This document provides comprehensive information on radioactive material transport in and through Oregon during the calendar years of 2011 and 2012, including a safety program summary.

The Radioactive Material Transport Program helps prevent accidents involving the transport of radioactive material and prepares for and handles mishaps if they occur. The Oregon Department of Energy is the lead state agency for the program and works with other state and local agencies to carry out the program's mission.

During this report period, 1,036 shipments of radioactive materials entered or traveled in Oregon under authority of the state's radioactive material transport permit program. This compares to a similar number of shipments in recent years and represents a wide range of materials and hazards.

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

## REGULATING RADIOACTIVE MATERIAL TRANSPORT

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 the radiation levels and if a carrier

uses its vehicle 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. ODOE is the permitting authority authorized to delegate the authority to the Oregon Department of Transportation.

ODOT operates the state's ports-of-entry; therefore it can effectively track compliance with permitting regulations. ODOE charges permit holders a fee for each placarded shipment that travels through the state. The charge is \$70 for most shipments and \$500 annually for some medical and industrial shipments. The fees help defray some of the costs to operate the state's transport emergency preparedness program.

Additionally, the statutes require ODOE to:

- Ensure truckers use the best and safest routes.
- Work with appropriate agencies of government at the local, state and national levels to ensure a swift and appropriate response to any accident.
- Work with the Oregon Health Authority to ensure adequate training and emergency planning is conducted along the transport routes.

The statutes also require OHA to maintain a trained and equipped radiation emergency response team.

The Oregon Energy Facility Siting Council develops rules to implement the statutes, providing rulemaking authority to:

1. **Set requirements for notification; record keeping; reporting; packaging and emergency response.** The state must be notified to allow inspection of certain radioactive material shipments; of any vehicle accidents; loss of any radioactive

# Radioactive Material Transport in Oregon 2011-12

material; or tampering or obstruction of any shipments.

- 2. Specify conditions of transport for certain classes of radioactive materials.** Motor vehicles must avoid transport movement during a road condition advisory unless vehicles have traction tires or devices. If the ODOE Director believes there is clear and immediate danger to public health or safety, the director may halt the transport of radioactive material. ODOE may also impose civil penalties for violation of rules.
- 3. Establish requirements for insurance, bonding or other indemnification.** Carriers must maintain a certain amount of insurance, pay for costs associated with response to an accident and indemnify the State from claims arising from the release of radioactive material during transport.

In 2012, ODOE proposed changes that would slightly modify the existing rules. These changes would:

- Clarify the reporting requirements for individual shipments.
- Allow an option for electronic reporting of the information.
- Adjust civil penalties for failure to report this information.

## SHIPMENT ACTIVITY

Carriers transport radioactive materials in Oregon on a daily basis, including small amounts for industry and medical use. They also routinely transport industrial gauges with radioactive sources to work sites throughout the state. Many of these shipments do not require placards.

Currently, commercial nuclear facilities near the Hanford nuclear site in southeast Washington make up a significant number of the radioactive

material shipments through Oregon. While most shipments pose a low risk, some do present unique hazards.

Attachments 1 and 2 show the number of placarded radioactive material shipments transported through Oregon from 1982 through 2012. Also included is a list of shipments by route during 2011 and 2012.

### Low-level radioactive waste

Perma-Fix Northwest, a commercial facility in Richland, Washington treats low-level radioactive waste from around the nation. Perma-Fix returns the treated waste to the sender, or to disposal sites.

US Ecology, a commercial disposal site at Hanford, manages the low-level waste sent from hospitals, nuclear power plants, industries and universities in 11 Western and Rocky Mountain states, including Oregon. They dispose of wastes by burying it in trenches. The volume of waste shipped to the US Ecology site in recent years has declined significantly from the 1980s and early 1990s.

U.S. Department of Energy nuclear weapon production and research sites throughout the country previously shipped low-level waste to government burial trenches at Hanford for decades.

In 1999, DOE selected Hanford as the primary disposal site for significant amounts of the nation's low-level and mixed low-level waste. This DOE decision could have resulted in thousands of shipments over the next several decades. However, litigation prevented DOE from shipping these wastes to Hanford. A separate litigation settlement extended the moratorium on waste shipments to Hanford through at least 2022.

### Commercial nuclear fuel fabrication

The AREVA facility in Richland, Washington,

# Radioactive Material Transport in Oregon 2011-12

fabricates fuel for use in commercial nuclear reactors. Trucks carrying these facility-related raw materials and finished products travel through Oregon.

## Transuranic waste

DOE buries transuranic waste at the Waste Isolation Pilot Plant in southeast New Mexico. Transuranic waste includes lab equipment, tools, rubble, soil and sludges tainted with small amounts of plutonium and other radioactive materials.

In July 2000, Hanford began limited transuranic waste shipments to WIPP. For a time, these shipments represented a significant percentage of the radioactive material that traversed the state. The state restricts WIPP shipments through Oregon to Interstates 82 and 84 in northeast Oregon.

Beginning in 2010, Hanford sent shipments of transuranic waste to the Idaho National Laboratory for repackaging, before sending it to WIPP. These shipments traveled along the same route in Oregon as WIPP-bound shipments.

The following table shows the number of Hanford transuranic waste shipments from 2000-2012:

<b>2000</b>	<b>5</b>	<b>2007</b>	<b>75</b>
<b>2001</b>	<b>5</b>	<b>2008</b>	<b>51</b>
<b>2002</b>	<b>3</b>	<b>2009</b>	<b>0</b>
<b>2003</b>	<b>48</b>	<b>2010</b>	<b>113</b>
<b>2004</b>	<b>66</b>	<b>2011</b>	<b>104</b>
<b>2005</b>	<b>100</b>	<b>2012</b>	<b>0</b>
<b>2006</b>	<b>79</b>		

Through Jan. 21, 2013, the WIPP site accepted 11,112 shipments from 12 DOE sites – 572 of

those shipments from Hanford. An additional 77 shipments of transuranic waste traveled from 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 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 agreed to the above-regulatory protocols for certain other shipments as well.

Although Hanford has large quantities of transuranic waste to dispose of at WIPP, DOE has decided to focus on shipments from other DOE sites. Therefore, DOE anticipates that there will be no transuranic waste shipments from Hanford during the next few years. Commencing in 2014 or 2015, DOE expects that shipments from Hanford will resume at significantly higher numbers than before.

At some point, Hanford will begin shipping “remote-handled” transuranic waste. So far, Hanford has only shipped “contact-handled” transuranic waste, which has very little penetrating radiation. Remote-handled waste does contain penetrating radiation and requires heavy lead shielding in the transportation container. The need



# Radioactive Material Transport in Oregon 2011-12

for shielding results in significantly less waste in each shipment.

## Other shipments

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

## Naval nuclear reactor compartment shipments

Since 1986, the U.S. Navy disposed of 125 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 Navy conducts this work at the Puget Sound Naval Shipyard in Bremerton, Washington. The Navy then sends these compartments, classified as low-level waste, by barge up the Columbia River to Hanford for disposal.

Through most of the 1990s and into the early part of the 2000s, the Navy averaged between seven and 10 shipments a year. Currently, the average number of shipments is between zero and two per year. The Navy shipped one compartment in 2011 and two in 2012.

The Washington Department of Health and Oregon Health Authority's Radiation Protection Services periodically inspect these shipments, prior to departure, to ensure they meet state and federal transport regulations.

## Rail shipments

The Navy periodically ships spent nuclear fuel from its Navy ships by rail from Puget Sound Naval Shipyard, to the Idaho National Laboratory. These rail shipments travel through about 200 miles of northeast Oregon. ODOE works with the Navy to provide information

about these shipments to state and local emergency responders. The Navy does not share shipment schedules with the state.

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 canceled plans to build and operate a geologic repository in Nevada for the nation's spent nuclear fuel and high-level nuclear waste. This decision potentially leaves highly radioactive waste "stranded" in Oregon and Washington state for years to come.

Portland General Electric stores irradiated nuclear fuel at the shut-down Trojan nuclear plant northwest of Portland. Energy Northwest stores nuclear fuel at the Columbia Generating Station nuclear plant near Richland, Washington. DOE also stores nuclear fuel at Hanford and eventually will have immobilized high-level nuclear waste in temporary storage.

DOE will at some point transport this highly radioactive waste through Oregon to a geologic repository, assuming DOE is successful in siting such a facility. ODOE will be involved with extensive planning and training before DOE transports these materials, regardless of the destination.

DOE has developed a preliminary strategy to develop an interim storage facility for a limited amount of commercial spent fuel, while they locate and study a new geologic repository site. Should DOE open an interim storage facility, the initial spent fuel could come from shut-down nuclear reactors such as Trojan. DOE would like to begin shipping to an interim storage facility in 2021.

# Radioactive Material Transport in Oregon 2011-12

## SUMMARY OF TRANSPORT ACCIDENTS & INCIDENTS

RPS reported that there were no transport accidents in Oregon in 2011 or 2012 that resulted in spillage, exposure or injury from radioactive material.

RPS did investigate or respond to 86 events, ranging from low-level radioactive material found, to staff responding and mitigating an incident. Below is a summary of some of the events:

### **Construction Site Accident: 1**

A licensee reported possible damage to a portable density/moisture gauge containing radioactive material from a construction site accident.

RPS determined that a worker left the device unattended while out of the storage container. Oregon Administrative Rules direct the licensee to secure any unattended device in the appropriate transportation storage container. RPS further determined that the material was not leaking and the device was secure.

### **Waste Monitor Alarms: 5**

RPS responded to five radiation sensor alarms at various waste receiving sites throughout Oregon, due to possible radioactive material in the waste stream.

In some cases, RPS sends the waste back to the original shipping facility for appropriate disposal. And in others, RPS places the waste into its storage to allow radioactive decay.

### **Scrap Metal Monitor Alarms: 37**

Naturally occurring radioactive material can develop in scrap iron. Or, the scrap metal can have radioactive materials. RPS investigates and identifies the isotope when radioactive

materials within the scrap activate the sensor alarms. The sender is then responsible to transport the material to appropriate disposal.

Meanwhile, RPS is working with the industry to establish a training curriculum to prevent and reduce such incidents.

### **Loss of Materials: 3**

RPS investigated an incident about a lost device containing radioactive materials. A radioactive materials licensee asked RPS to terminate their license because they could not locate the device and it was no longer in use. RPS did not terminate the license until they finished the investigation. RPS ultimately located the device approximately six months later and properly disposed of it.

RPS received a report from a radioactive material licensee, who during routine inventory discovered a missing laboratory device known as an Electron Capture Device. RPS discovered that an employee, unauthorized by the licensee to transfer and use radioactive material, took the device to a metal broker. RPS anticipates that the receiver smelted the device.

RPS received a report from a licensee, who during routine inventory discovered a missing low-level radioactive material source. RPS determined that the material posed no threat to the environment or to public health and safety.

### **Break in and Theft: 1**

An unidentified person broke into a parked mobile Positron emission tomography mobile unit. PET services assist providers with imaging cancer cells to determine their growth patterns. RPS found that there were no missing radiopharmaceuticals and the inventory was secure.

### **Possible Contaminated Consumer Products: 1**

RPS learned that Cobalt 60 was used in manufacturing Dual Ridge Tissue Box covers

# Radioactive Material Transport in Oregon 2011-12

imported from India and distributed to stores in the United States. RPS concluded that the manufacturer did not distribute this product to Oregon stores.

## EMERGENCY PREPAREDNESS AND RESPONSE ACTIVITIES

ODOE contracts with RPS to provide radiological training to first responders and hospital emergency room personnel. RPS provides basic and advanced radiation emergency response courses.

RPS teaches a tiered system when responding to a radiation transportation emergency. Initially, local fire service or state police respond to the emergency. Both learn basic radiation knowledge, enabling them to quickly assess the situation and conduct any life-saving rescue or first aid. The Oregon State Fire Marshal's Office regional hazmat teams throughout Oregon provide the second-tier response; RPS is also a second-tier responder. Federal partners provide third-tier response.

RPS offers basic radiation materials transportation classes on awareness and 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
- Stanfield Fire District
- Polk County Fire District #1
- Annual Oregon Tribal Emergency Preparedness Conference
- Ashland Fire District #5

The advanced radiation operations training program is designed to provide Oregon's Regional Hazardous Materials Response Teams

with advanced skills and equipment knowledge. Participating departments included:

- Ontario Fire Hazmat Team
- Hermiston Fire Department Hazmat Team
- Portland Fire Bureau Hazmat Team
- Salem Fire Department Hazmat Team
- Astoria Fire Department Hazmat Team
- Clackamas Fire
- Gresham Hazmat Team
- Oregon Fire Marshal's Office, Hazardous Materials Conference
- Sacred Heart Medical Center at River Bend, Springfield

In 2011, RPS established the Radiation Response Volunteer Corps, which monitors radiation activities. RRVC consists of local county health agencies, county emergency operations staff, health care professionals and radiation professionals who assist local public safety agencies should a radiation accident deplete local resources. RPS trained approximately 130 people to monitor and survey radioactive material contamination.

RPS also maintained relationships with municipal, county, state and federal law enforcement agencies for support in case of a large-scale radiation materials incident. RPS participated in exercises to identify operational gaps between responding agencies and provided specific radiation training for 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

The national Radiation Emergency Assistance Center/Training Site provided RPS staff emergency medical care training to handle radiation incidents.



# Radioactive Material Transport in Oregon 2011-12

In addition, ODOE 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 participate in this training. OSU provided this advanced training to about 25 people both in 2011 and 2012.

## Public Engagement

DOE continues to name Hanford as a potential disposal site for a variety of different waste materials. Some of these actions could potentially result in tens of thousands of transported waste shipments to Hanford for disposal. While Hanford has yet to see such an increase in shipments - it seems unlikely that will occur - this issue concerns Oregonians because of the potential risks in transporting radioactive waste.

To address some of these concerns, ODOE conducted four public meetings in 2012 on radioactive material transportation: Two in Portland and two in Hood River. The presentations showed why these and other communities in Western Oregon currently aren't, and likely never will be, major transportation routes for radioactive materials.

Thirty-five people attended the public meetings. Those attending had previously been told that carriers planned to transport thousands of truckloads of waste through Oregon and Washington cities to Hanford. ODOE used 30 years of data obtained through the state's radioactive transport permit program, to show that carriers infrequently used these routes for radioactive material transport.

## CONCLUSION

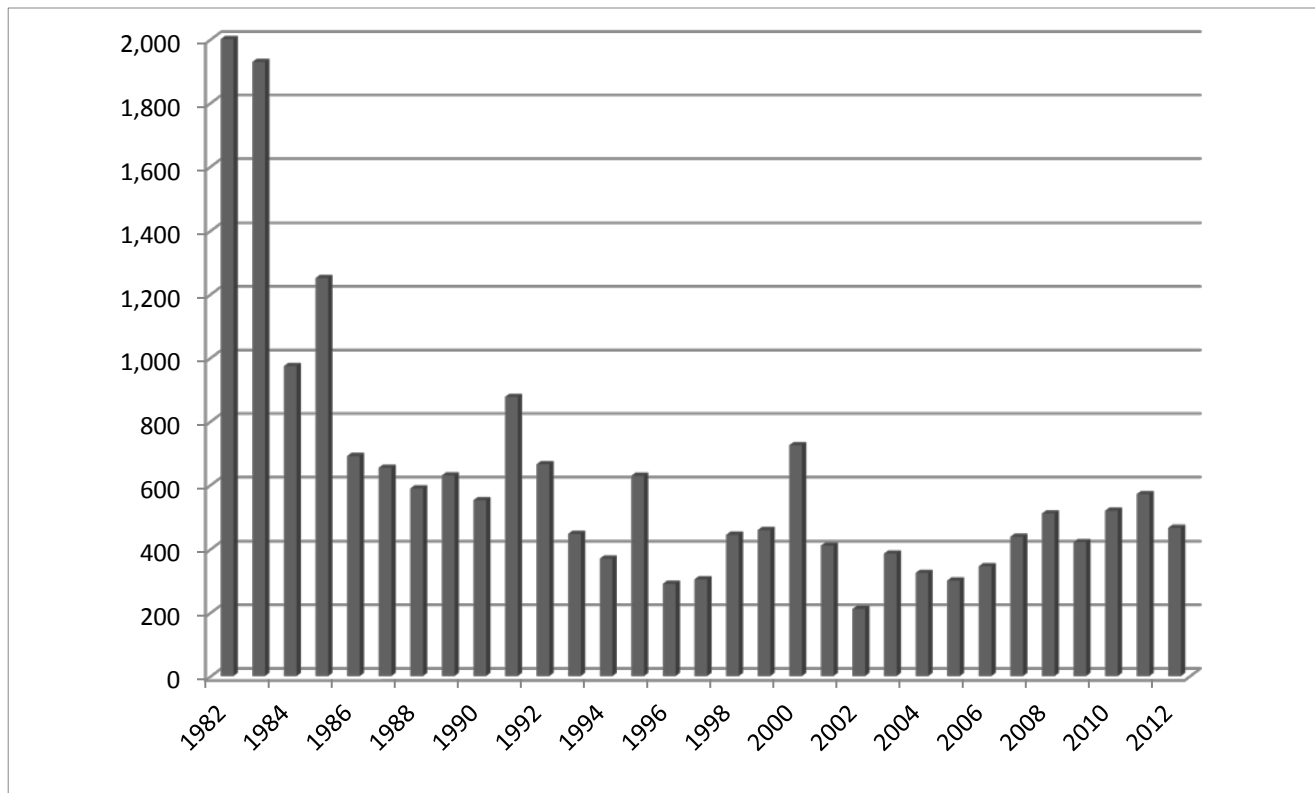
Carriers transported about 1,036 placarded shipments of radioactive materials safely through Oregon during 2011 and 2012. RPS provided comprehensive emergency preparedness training throughout the state. There were no serious shipment accidents or violations.

# Radioactive Material Transport in Oregon 2011-12

## 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
		2012	466



# Radioactive Material Transport in Oregon 2011-12

## ATTACHMENT 2

### Placarded Radioactive Shipments by Route - 2011

	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*
<b>Total</b>	<b>13*</b>	<b>90</b>	<b>27*</b>	<b>6*</b>	<b>462*</b>	<b>570*</b>
<b>Percent</b>	<b>2%</b>	<b>16%</b>	<b>5%</b>	<b>1%</b>	<b>81%</b>	

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

# Radioactive Material Transport in Oregon 2011-12

2012

	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	0	6	0	0	29	35
February	3	8	6	0	34	45*
March	1	4	4	1	32	39*
April	0	3	2	0	28	33
May	1	0	0	0	23	24
June	3	5	4	0	42	48*
July	3	8	1	0	16	30
August	2	8	1	0	30	39*
September	2	7	1	0	42	51*
October	4	8	2	0	34	46*
November	3	6	6	0	28	36*
December	2	7	4	2	30	40*
<b>Total</b>	<b>24*</b>	<b>70</b>	<b>31*</b>	<b>3*</b>	<b>368*</b>	<b>*466</b>
<b>Percent</b>	<b>5%</b>	<b>15%</b>	<b>6%</b>	<b>&lt;1%</b>	<b>79%</b>	