

PUBLIC CONCERNS ABOUT RADIOACTIVE WASTE TRANSPORT THROUGH OREGON

Mary Lou Blazek
Janet E. Franco
Robert W. Robison
Oregon Department of Energy
625 Marion St. NE
Salem, Oregon 97310

Stephen E. Binney
Brian Dodd
Department of Nuclear Engineering
Oregon State University
Corvallis, Oregon 97331-5902

ABSTRACT

Nuclear waste management, disposal and transport are important issues for Oregonians, primarily due to the nearby Hanford Nuclear Site. The Oregon Department of Energy and Oregon State University have designed a program to look at how public opinion is affected, if at all, by addressing and identifying public concerns and systematic public involvement. The components of the project are 1) state policy and citizen advisory organizations, 2) transport safety program, 3) formal public opinion and attitude/value surveying, and 4) public information. Results and analyses of a baseline survey and values study are discussed. The response rate for interviews was low and results may not necessarily be generalized for all Oregonians. However, the findings are significant. A majority (55.7%) of respondents felt the risks of transport are greater than the risks of continued waste storage at Hanford. The values survey revealed some correlation between certain values and perception of risk of nuclear waste transport through Oregon.

INTRODUCTION

Oregon Department of Energy (ODOE) is the state's lead agency for nuclear waste policy analysis and transport safety. It has a multi-year contract with the Oregon State University (OSU) Department of Nuclear Engineering for technical support on the safe transport of nuclear materials.

ODOE and OSU designed a program to look at how information and public involvement affect public concern about nuclear waste management and transport. Addressing these concerns will help officials make decisions on nuclear waste issues.

Oregon's activity in nuclear waste management issues has increased since 1985 as past environmental practices at the Hanford Nuclear Site have been made public. Waste management at Hanford involves nuclear waste transport through Oregon. Hanford is only 35 miles north of the Oregon border, set along the Columbia River that forms, downriver, 300 miles of the Oregon-Washington border. The river is important to both states for economic and recreational reasons, and contamination of the groundwater, which flows to the river, is feared.

The US Department of Energy (USDOE), its predecessor agencies and their contractors have managed the Hanford Site since it was built in 1943. Until recently, the philosophy of operation of the Hanford facilities has been of secrecy. There has also been denial of human consequences of off-site releases. USDOE has conceded that storage tanks are leaking, threatening groundwater and the Columbia River. Other revelations, such as large airborne

releases to surrounding communities and farms in the 1940s and 50s, have eroded public confidence in USDOE.

USDOE is beginning its cleanup of Hanford, a program massive in effort and expense. Many of the single-shelled tanks used from 1943 to 1980 to store high-level nuclear waste have leaked radioactive liquid to the soil. The remaining liquid was pumped into double-shelled tanks. The salt-cake left in the old tanks must be stabilized, disposed of in place, or sent via Oregon highways to a national repository. Under the Nuclear Waste Policy Act, spent fuel from a commercial nuclear power plant on the Hanford Site must also be shipped to a repository. Transuranic (TRU) waste, now stored in drums and trenches (1), is expected to be transported along Oregon highways to the Waste Isolation Pilot Plant (WIPP) in New Mexico, starting in three to five years.

The state of Oregon supports the nuclear waste cleanup of the USDOE's Hanford facility and the safe, permanent storage of nuclear defense wastes and commercial spent fuel. Both actions require broad public confidence that radioactive wastes can be transported safely. Policies that affect waste transport, contamination of groundwater and the Columbia River, and decisions about on-site waste management are gaining public attention. (See Fig. 1).

Solutions to HLW problems are strongly affected by external factors, including public perceptions; local, state and federal politics; and objectives of special interest groups. There is a lack of accurate information and an abundance of misinformation available to the public.

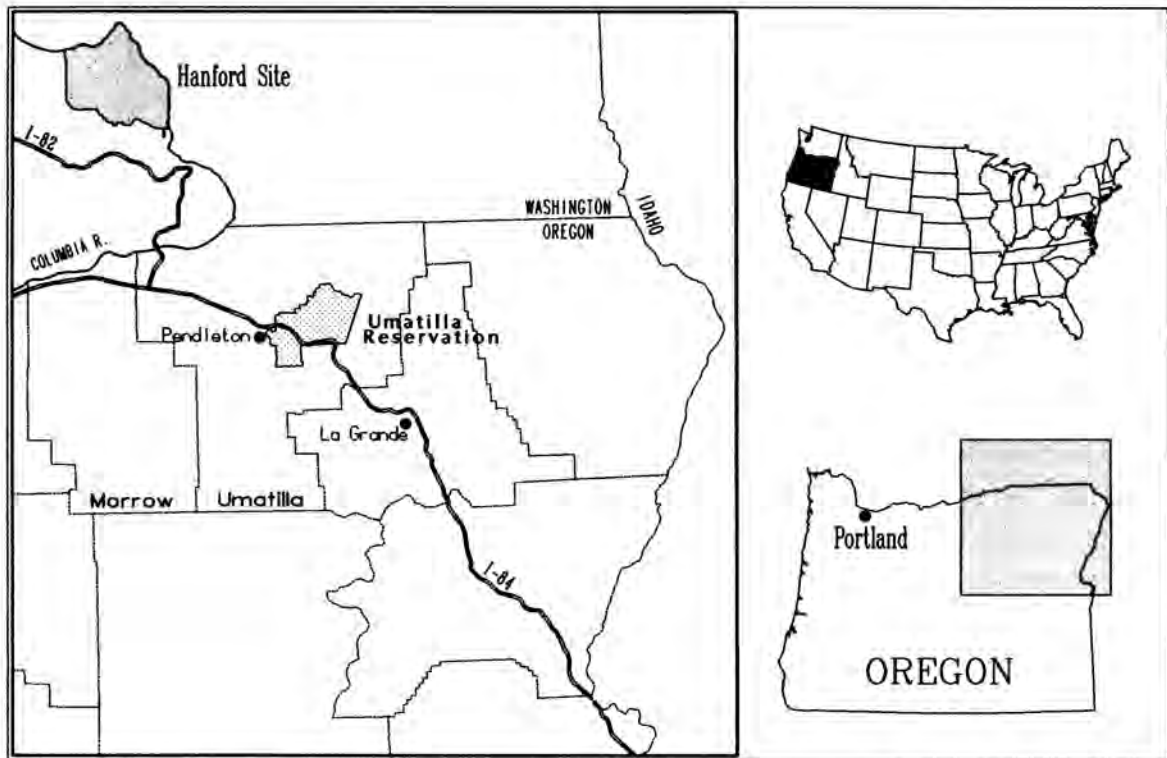


Fig. 1. This map shows the location of the Hanford Nuclear Site relative to northeast Oregon, the Reservation of the Confederated Tribes of the Umatilla Indians, and the I-84 transport route.

Low-level radioactive waste shipments have traveled Oregon highways to Hanford for more than 25 years. However, citizens and public officials still have general fears of radiation and radioactive materials transport, and distrust of USDOE. The differences among low-level, TRU and high-level wastes (HLW) may be relatively unimportant or unknown to them.

For these reasons, ODOE and OSU are using a structured public involvement program to identify and address public concerns and opinions. There are four main components to the program -

1. Public involvement organizations. The Hanford Waste Board (HWB) and Hanford Advisory Committee (HAC) were created to address Hanford issues from two levels. The Board is a policy-making body, composed of state agency heads, state legislative members, a representative of the Confederated Tribes of the Umatilla Indian Reservation, a member of the public, and two liaisons from the Advisory Committee. The HAC is made up of local officials, members of public interest groups, and community leaders from the route communities. Each organization has credibility with local governments, citizens along the transport route, and news media. The Board directed the Committee to develop nuclear waste transport recommendations. The HAC drafted and the Board endorsed recommen-

dations based on comments gathered at public meetings held in route communities. Most of these recommendations were included in the USDOE Transport Safety Plan for Hanford TRU-waste shipments to WIPP.

2. Comprehensive transport safety program, including accident prevention and emergency readiness. The program was designed with the aid of route county citizens, government leaders, truck safety professionals, and emergency responders. It is based on the HAC recommendations, and is consistent with transport safety programs of other western states.
3. Opinion surveys. OSU's Survey Research Center designed a series of public opinion surveys. An initial, baseline survey gathered information about the level of citizens' knowledge about radioactive material transport, specific concerns of Oregonians, and the levels of those concerns. Public attitudes about nuclear waste transport through local communities, and the degree of citizens' confidence in various agencies and groups were also learned. Some respondents volunteered to answer a values survey. Ties between values and opinions in nuclear waste issues may exist. The results and interpretations of these surveys are presented in this paper.
4. Public information and involvement program. The plan is tailored to address and resolve specific concerns

about nuclear defense waste transport safety. It includes town meetings, formal presentations, briefings, fact sheets, and week-long courses for science and social science teachers. The technical information is written and edited by professional journalists and technical specialists to be easy to read and understand.

The main concept behind this work is that an informed citizenry is better able to make decisions than an uninformed one. The intent of this project is not to convince people of a particular viewpoint. The attempt will be made to distinguish between concerns and opinions which are based on personal values as opposed to scientific facts.

SURVEY METHODOLOGY

The Oregon State University (OSU) Survey Research Center conducted a "pre-survey" (2) in May 1990. The objective of the pre-survey was to identify issues and concerns related to the transport of radioactive waste, especially as they pertained to the Hanford Site. The pre-survey was used to prepare questions on the subsequent baseline survey.

The pre-survey had 15 questions and was conducted by telephone. The interviews took about ten to 30 minutes, typically lasting about 15 minutes. Twenty-eight specifically selected individuals from Oregon were surveyed. Each had some degree of interest in and/or knowledge of nuclear waste and waste transport issues.

The 28 individuals interviewed, whose names are confidential, include:

- 5 local emergency government workers
- 4 elected officials
- 3 emergency medical professionals
- 3 public works personnel
- 2 transport specialists
- 2 Indian tribal representatives
- 2 community college faculty members
- 1 newspaper editor
- 1 law enforcement officer
- 5 representatives of public interest groups

Twenty-six of these people were from the four eastern Oregon counties of Umatilla, Union, Baker, and Malheur, through which the transport route passes. The other two individuals live in western Oregon.

The Baseline Survey (3) was designed to determine the current levels of knowledge and concern about and acceptance of shipments of radioactive waste from the Hanford Site. Results from the baseline survey will serve as a benchmark for subsequent annual surveys to identify areas of change. Changes in public perception will be correlated

with other aspects of this project, primarily the public information and involvement program.

A second objective of the Baseline Survey was to learn the specific concerns of the public. A transport safety plan that addresses these concerns will be developed and implemented.

The Baseline Survey was conducted from June 23 to July 12, 1990 using the Random Digit Dialing Technique. One thousand six people completed interviews. This was the goal sample size; however, the completion rate was only 30% due to outright refusals and unavailability of the intended respondent. This may have introduced some bias into the results. The adult with the most recent birthday at each location was selected for interview. The sample included 402 persons from the four eastern Oregon counties along the transport route and 604 persons from the rest of the state as a control group. A typical interview included 33 items and lasted about 30 minutes.

About three-fourths of the respondents were invited to participate in a values study (4). The written questionnaire was completed and returned by 85% of the 526 who agreed to do so. This survey yielded information about how personal values relate to perceptions about risks associated with radioactive waste transport.

RESULTS

Pre-Survey

Significant findings of the pre-survey interviews included the following:

- There was a general uneasiness and worry over Hanford issues, stemming, in part, from past and present USDOE practices.
- Most respondents felt that wastes can be transported safely through the state and that it is better to transport the wastes than to leave them at Hanford. Most voiced special concerns, though, about the transport of nuclear wastes, including the need for a long-term commitment to transport safety.
- ODOE and USDOE were viewed as having significant expertise and response capabilities, but a delay in response to an accident was of concern. Local emergency response capabilities were thought to be generally inadequate for an accident involving nuclear waste.
- A lack of funding to support transport safety at the local level was identified as a major weakness in the USDOE waste management program.
- Respondents believed that the federal government is responsible for producing the waste, and therefore should assume full responsibility for transport safety.

Baseline Survey

The Baseline Survey gave mixed results. Most respondents had heard of the plan to transport radioactive waste through Oregon, but the level of knowledge did not appear to be great. Strong negative images usually associated with nuclear waste were certainly evident.

Attitudes and perceptions, however, did not seem set. One of four scenarios describing a possible truck accident in increasing detail were presented to those surveyed. Responses to related questions showed that the amount of information given in the respective scenarios had marked effects, both negative and positive. Therefore, people's reactions to a transport incident may be affected by knowledge of the transport safety program, and the emergency response to a real accident.

Respondents perceived the risks of waste transport through Oregon as greater than the risks of continued storage at Hanford. Transport of radioactive waste was seen to be on a par with transport of toxic chemicals and explosives on Oregon highways. There was great concern about the possible effects on business and recreation in the transport region.

Specific findings of the Baseline Survey included:

- By far the dominant image associated with the transport of radioactive waste was "dangerous". The terms death, contamination, destroy, and disease were four of the next six most frequently mentioned images.
- Most respondents (69.1%) felt that accidents involving transport of hazardous wastes are inevitable. However, 53.5% still thought that nuclear wastes could be transported in a way that is acceptably safe.
- The majority (55.7%) believed the transport risk to be greater than the storage risk. More respondents thought that transport of nuclear wastes would have harmful effects on them personally (40.5%) than be of benefit (5.4%). A significant majority of those surveyed were concerned about the harmful health and safety effects in the respondent's local area. This included those in the other counties (63.8%) as well as from the four counties through which the waste would be shipped (77.4%).
- In judging personal risk, respondents rated transport of toxic chemicals and explosives, radioactive waste transport, motor vehicle accidents, and chemical pesticides. All rated about a 6 on a scale of 1 (not at all serious) to 10 (very serious). In contrast, prescription

drugs, medical X-rays and travel by airplane were considered significantly less risky and scored 3.8.

Opinions on some precautionary actions such as special training and drug testing for drivers were evaluated. Most precautionary actions tended to be associated with a reduced perception of transport risk. However, respondents felt that police escort near the transport route as indicating a higher level of risk for transport.

- In other surveys, the level of trust in the responsible agencies and officials has been closely linked to perceptions of risk from radioactive wastes. In this survey, 42.5% were confident that the state agencies will provide honest and accurate information about radioactive waste transport. Environmental activists were the most trusted group (6.30 on a scale of 1 to 10), and industries that produce the waste the least trusted (3.79). State and local government officials were rated at 5.49.
- People responded to questions before and after listening to one of four accident scenarios. Their answers indicated that the effect of the scenarios was to increase confidence in Oregon agencies; however, the respondents' levels of concern about harmful effects were increased. This was particularly true for individuals who first expressed relatively little concern.
- In analyzing the responses of groups of people, many interesting differences were noted. Women were more concerned than men about risks of radioactive waste transport. Respondents 45 years of age and older were less concerned. Persons who take a more active role in society tended to see transport risk as greater than storage risk. Finally, opinion leaders* were more concerned than others about the transport of radioactive wastes.

Values Survey

The survey of public values was performed using a modified Rokeach method. The people surveyed were a sub-set of those polled in the Baseline Survey. Therefore, it was possible to obtain information on values priorities, and to investigate correlations between values and concerns with respect to transport of radioactive wastes.

Specific findings of the values survey included:

- The six values (out of 21) in order of importance to respondents were Freedom, Family Security, Health,

* Opinion leaders are described by MacGregor and Slovic (see Ref. 3) as respondents who "...claimed to know state politicians personally and to have been asked for their opinion about the transport of radioactive wastes within recent months by someone outside of their immediate household.

a World at Peace, a Clean Environment, and Self Respect.

- After some statistical analysis, it was possible to group 19 of the 21 values into four sets. These sets were:

A Clean Environment	National Security
Equality	Family Security
A World At Peace	Health
A World Of Beauty	Tradition
Wisdom	Pleasure
Inner Harmony	Social Recognition
True Friendship	A Comfortable Life
Salvation	Mature Love
Self Respect	A Sense Of Accomplishment
	An Exciting Life

The values HAPPINESS and FREEDOM were each associated with two or more groups, and were not clearly related to any set.

- Only a few values were significantly correlated with public perceptions about radioactive wastes. Most clearly related were CLEAN ENVIRONMENT and A WORLD AT PEACE. These were both in the same of the four sets of values.
- Responses to four values (A CLEAN ENVIRONMENT, A WORLD AT PEACE, WISDOM, and NATIONAL SECURITY) were combined in a multiple correlation. The combination related in a statistically significant way with a variety of public perspectives on highway transport of radioactive wastes. The more people value these qualities, the more seriously they judge the personal and public risks associated with such waste transport. They will feel more emotionally anxious, and they are more likely to modify their travel plans to avoid transport routes used for radioactive wastes.

CONCLUSIONS

The data support the ODOE expectation that respondents see little personal benefit from transporting nuclear wastes for disposal. Many are sincerely concerned about the potential for real personal harm.

If WIPP is judged safe ODOE will support hauling TRU wastes through Oregon for permanent disposal. Moving the wastes from improper temporary storage is of benefit to Oregon. We believe transport to be an acceptable risk. Our citizen advisory committee similarly concluded that these wastes can be transported safely. This was after learning about the transport program.

From this, we conclude that the public needs more information and further involvement. There is a large gap between the public's perceptions and judgements of those who have studied the transport hazards.

The baseline public opinion survey is one means by which ODOE will evaluate the effect of the public involvement and information. We are just now learning how to use the information from the baseline survey and the values study. Here are some ways we believe this information will be useful:

- Opinion leaders generally showed more concern than others. Their concerns must be more clearly addressed.
- Environmental groups are trusted by many. They are not a mere "vocal minority".
- Over half of the respondents believed that the transport risk is greater than the storage risk. Further analysis by state and federal agencies is needed to compare these risks.
- The special safety actions planned by USDOE and Oregon for the TRU shipments were generally considered reasonable. These include testing drivers for substance abuse, having radiation detection equipment on the trucks, and training local emergency crews.
- To many respondents, police escorts indicate higher risk. ODOE does not support the need for escorts, unless specific threats are made to the security of the shipment. We now know that escorts also exaggerate the risk in the eyes of many people.
- The accident scenarios tended to increase confidence in state agencies among those who had relatively low levels of confidence. This may indicate that confidence increases if citizens are aware that safety officials recognize that things can go wrong, and prepare for emergencies.
- A truck accident would have a major effect on public confidence. If an accident is mishandled, confidence would decline. This supports our strong belief in quality emergency readiness.

We conclude that there are values that correspond to public concern. Public information will directly address the four values rated high among those most concerned about transport safety: A CLEAN ENVIRONMENT, A WORLD AT PEACE, WISDOM, and NATIONAL SECURITY.

The use of the public survey and values study may be interpreted by some as inappropriate "public relations" or "social engineering". Critics may believe that ODOE is trying to convince people that an unacceptably dangerous activity -- transport of nuclear waste -- is not dangerous. Our

goal is to understand the concerns of the public, and to provide safety programs and information that addresses those concerns.

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