

PUBLIC EDUCATION ON NUCLEAR WASTE TRANSPORT

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ABSTRACT

The acceptance or rejection of nuclear power depends on the public's ability to sort out and balance the benefits of nuclear power against the risks. Experience in addressing the waste transportation issue in Iowa, Nebraska, California and New York demonstrates that we must seize the initiative from our opponent at every opportunity. Using our collective creative skills we must deliver messages dramatically, because nuclear power is indeed a dramatic story.

In the past we have ignored or dismissed our opponents. But, today we must study our opponents carefully and listen to their message. This gives further insight into attitude formation and suggests ways and means of countering anti-nuclear arguments.

We must convince the public that if science has brought us problems, then the answer can be only more knowledge--not less. If nuclear technology has brought us problems, then the answer must be better management of such technology, not a slow slide backwards to poverty and squalor which people so easily forget they had to endure in the falsely idealized past.

Nuclear energy has been a major step in our progress, yielding a wide range of benefits. But, continued use of nuclear power is contingent upon the ability to transport nuclear waste materials. We know it; the public does not!

This paper describes the successful techniques developed by pro-nuclear forces, including the American Nuclear Society, to successfully prevent the passage in various communities of restrictive transportation requirements for nuclear materials.

The Transportation Issue

The Department of Energy (DOE) and other government agencies have known for some time that some people consider the transport of radioactive material to be very hazardous.

The March 1979 "Report to the President," by the Interagency Review Group on Nuclear Waste Management stressed the group's strong concern about the transportation link in nuclear waste management. The authors clearly predicted that the transportation issue would be a primary topic in future waste management policy discussions with the states. At the same time a number of local and state citizens began expressing concern about transportation accidents involving radioactive materials. During 1980 and 1981 these concerns led to a considerable body of proposed state and local restrictions including bans in certain jurisdictions.

By the end of 1981 the Nuclear Regulatory Commission (NRC) issued a new rule on pre-notification of radioactive shipments, which requires the governor, or governor's designee, in each state to be notified of radioactive waste shipments for: (a) large quantity materials in type B packages and (b) spent fuel shipments larger than 100 grams. In 1981 the Department of Transportation (DOT) announced a similar pre-notification proposal in the Federal Register.

Opposition Tactics

The January 1982 "Council on Economic Priorities" newsletter was devoted to the perils of waste shipments. The council even convinced the New York Times to publish an article on spent fuel transport. The article equated the public impact of a spent fuel shipment accident at 57th Street and Broadway to the detonation of a nuclear weapon.

During 1982 anti-nuclear forces elevated the topic of transportation of nuclear material to one of major concern. Their contention that a shipment of irradiated fuel could go awry and create a serious public hazard alarmed the public sector. The opposition cultivated unwarranted fear of accidents by enflaming the public's misconception that the fuel is in the form of a liquid or powder. Taking advantage of this fear, the opposition continued to push for the passage of ordinances in targeted local communities that would seriously hinder or prohibit transit of irradiated fuel shipments. But they were not always successful.

In 1983 the Sierra Club's Radioactive Waste Campaign intends to organize a grass roots effort "from New York to South Carolina" to extend a recent U.S. District Court ruling which halted waste shipments through densely populated areas. The campaign is also arguing that Price-Anderson liability coverage does not apply to transportation accidents unless the radioactive materials are bound for an NRC licensed facility.

Pro-Nuclear Tactics

At a public hearing held June 21, 1982, the City Council of Burlington, Iowa, defeated an ordinance to restrict rail shipments of spent fuel through their city. After hearing assurances of safety from the shipper, carrier, General Electric and experts from the American Nuclear Society, three out of the five councilmen voted the ordinance down.

The Burlington ordinance was to have been the centerpiece of a MacNeil/Lehrer broadcast, but was displaced by an analysis of the Hinckley acquittal. The anti's hope of triggering a groundswell across middle America was extinguished.

Using a similar strategy at a hearing in Watertown, New York, July 5, 1982, three pro-nuclear advocates were again victorious even though 150 anti-protestors were present.

Pro-nuclear forces also successfully placed their story before the public during seven public hearings on the waste transport issue held by the California highway patrol.

These successes document the ability of pro-nuclear forces to win such public confrontations. But they also demonstrate that the acceptance or rejection of nuclear power issues will depend on the public's ability to sort out and balance the "real" benefits of nuclear power against the risks. How well we conduct our participation in public hearings will greatly influence that perception in the public arena in the future.

Speaking with Style

Usually when speaking before city councils or other official bodies, you are trying to persuade people of the worth of your ideas. Therefore, you must be well organized and establish your point by use of facial expression, gestures, words and props. Paint word pictures that will emphasize and dramatize the facts. Move from fact to fascination, from logic to emotion, from model to blackboard, from blackboard to pictures.

Effective presentation. That's the bottom line. The first rule--know your audience. Remember the average person is not that sophisticated. I can best illustrate my point with an example. John A. Williamson and Rusking Teeter documented the following "classic" excuses parents provided schools for their children's absences:

Dear School: Please ackuse John for bean absent on January 28, 29, 30, 32 & 33.

My son was under the doctor's care and should not take P.E. Please execute him.

Dilia was absent from school yesterday as she had a gang over.

Please excuse Joey friday. He had loose vowels.

Please excuse Joyce from jim today. She is administrating.

Carlos was absent yesterday because he was playing football. He hurt in the growing part.

My daughter was absent yesterday because she was tired. She spent the weekend with the marines.

Please excuse Carol from being absent yesterday. She was in bed with gramps.

Please excuse Johnny for bing. It was his father's fault.

The "ABC's"

Peter P. Jacobi, North Western University Medill School of Journalism, developed a program for good writing. I believe speaking with style requires using the same techniques in giving oral presentations. The professor starts with "ABC's".

Use the following ABC's when making presentations where anti-nuclear groups will be present:

"A" is for accuracy. No amount of checking and double checking is too much. Make sure you know the transportation issue. An opponent is always ready to pounce on a wrong fact or an improperly made assumption.

"B" is for brevity. The official body will appreciate short statements. Usually their agendas are tight so you gain points by keeping your speech short and to the point.

"C" is for clarity. Choose your language carefully. Avoid technical jargon. Gustave Flaubert makes a valid suggestion, "Whatever the thing you wish to say, there is but one word to express it, but one verb to give it movement, but one adjective to qualify it. In preparing for your presentation, you must seek until you find this noun, this verb, this adjective."

The "I" Factor

"I" is for information. If you believe information is power, and I do, then anytime you change the information flow to benefit your position, you create a flow of power from the anti to the pro-cause. But make sure your information is accurate, factual and timely. Don't forget the need for brevity in some situations. Information can be used to paint the broad picture. The anti's always try to keep the issue narrow and minutely focused. When presenting the pro side of the transportation issue, make the following points: During the last 30 years the transport of such material has become more and more common, has grown to over 8 million shipments per year, and yet no accidents with serious consequences for the public have occurred. The other side always tries to leave the impression that we have little experience with such transport.

"I" is for intelligence. Use your special sources to obtain key pieces of information that will be missing. Make the hearing body feel that it is getting the inside tips and tidbits that are being suppressed by the anti's. The anti's will have left the impression that fuel rods contain a powder or a liquid. Use the ANS fuel pellet card. Present one to each member of the hearing panel. Emphasize that the pellet is a solid ceramic. Make it quite clear the opposition is aware of this fact. An incredible number of individuals assume the rod contains something other than a solid.

"I" is for interpretation. Use interpretation to give meaning to stray facts. When presenting the fact that 8 million shipments are made per year or that fuel rods contain a solid, provide an interpretation of the safety significance.

Most of all "I" is for interest. You must have interest before you can keep the attention of the hearing body, the audience and the news media.

Information, intelligence and interpretation interestingly offered.

Interest Factors

Each presentation should include what Peter Jacobs labels interest factors. Strive to use one or all of the interest factors listed below:

Competition:

The sports pages are proof that competition interests people. There is no other reason for their existence. Individuals are interested not only in competition as it relates to sports, but business and interpersonal relationships as well.

When time permits, gain your audience's attention by making the point that everyone of us is in competition with the other. Our fellow humans are more menacing than environmental forces, not only as direct inflictors of harm through violence, but as competitors for limited food or as spreaders of disease. These threats are increased by people taking measures to protect themselves from external danger by crowding into cities or creating powerful institutions for social control.

If adequate energy supplies are not available in the future to keep the world's major cities and their institutions functioning, destructive unrest could occur. Our message is simple. Curtailment of radioactive materials transport can eliminate the nuclear option. Yet the passing of the hydrocarbon era makes newer technologies such as nuclear power necessary for our social survival.

Conflict:

Look at a newspaper or watch television news almost any day, any year, any location. Conflict is in the news. Conflict between nations or groups of people--armies or labor and management--is newsworthy. Bring out the conflict between pro and anti-nuclear forces. The hard vs soft technology story. While they are trying to

kill the nuclear option in the United States by choking off transportation routes, other countries are encouraging the use of nuclear power to provide the energy for new technologies--technologies such as electronics and fiber optics based on silicon as plentiful as beach sand and genetic engineering which depends on the near-infinite supply of microbes.

Controversy:

Election campaigns are proof that we have an interest in differing opinions. Arguments attract. But be careful. Arguments can attract repellingly in some cases.

But in all cases, clarify the argument between pro and anti-groups on transportation accident scenarios. The opposition tries to leave the impression that radioactive material can be widely dispersed in the event of an accident. However, the fuel is in the form of a solid ceramic. It's not a powder that can be blown about by the wind. In addition, the other side always describes an accident with irradiated fuel that has been removed from the reactor for only a short period of time. Fuel that requires water in the cask for heat removal. Make sure the audience and hearing panel are aware of the true facts.

- o The design philosophy for modern casks is for zero release. This normally means dry shipment.
- o Regulations specify that independent spent fuel storage facilities cannot store spent fuel that has not been cooled at least one year at the reactor.
- o The radioactivity level after one year's time has decayed tremendously and gasses such as I¹³¹ have decayed away.

Quote literature from the other side to show how misinformed they really are. For example: the anti-nuclear document "More Than You Ever Wanted to Know About Nuclear Waste Transports," House Printing, Watertown, New York, states "There is also the possibility that given a serious collision on U.S. 81 resulting in a prolonged fire, a chain reaction could occur resulting in a nuclear explosion."

Consequences:

If an audience considers the subject important, they will listen. Health, food, shelter, income, family and community welfare are of consequence. Of course energy is also of consequence and affects each of the above items.

Transportation of radioactive material is a pre-requisite to continued operation of nuclear power plants and in turn is of consequence. Closure of the plant can impact energy supplies and price. The Nebraska Public Power District effectively used this interest factor in an appearance before the Burlington, Iowa City Council in June 1982.

Familiar or Famous Person:

Convince Jane Fonda to embrace your belief, as the anti-nukes have and suddenly more people are interested. Get a Redford to embrace your belief as the environmentalists have, and the world begins to burn wood.

Use the Sandia test film at a public hearing, and watch the hearing panel's eyes open wider. The anti-nuclear folk can attack the credibility of the film to their hearts content, but they cannot erase the image of a complete full scale crash test.

Heart Strings:

A family overcoming terrible handicaps, a third world nation finding ways to produce food for its starving citizens, a child made well through the treatment of a new drug, as all journalists know, creates news. Newspapers and magazines are filled with such stories. Use the radioisotope story to create interest in a similar manner.

Many people are now keenly aware that more energy must be provided to supply the food that is needed for the undernourished portions of the world. Few realize that various kinds of waste and spoilage result in the loss of 25 percent or more of our harvested foods. Food preservation is no less important than food production. To supply the world's demand for food, it is more reasonable to conserve what is produced than to produce more to compensate for subsequent losses. Food preservation is an even greater problem for the developing countries, not only because of their chronic problems of undernourishment but because most of them are in tropical or sub-tropical regions where food spoilage is rapid.

Irradiation of food with radioisotopes has an important role to play in this context. In dozens of countries vegetables, fruits or meats bought today may have been packaged last year using a process that does not rely on freezing, canning nor drying.

The irradiation process not only extends foods freshness, but the process can cut dramatically the cost of storing most of what we eat. It could reduce the amounts of toxic chemicals and carcinogens in our diets. The process even has energy conservation implications. One hundred times more energy is needed to store potatoes and onions at 4 degrees centigrade for six months to inhibit sprouting than that required from an irradiation source used for the same purpose. Of course none of this can take place unless we have the ability to transport radioactive materials.

Problem:

Once people recognize there is a problem, they will listen intently. A hearing body usually is eager for clarification of the cask problems raised by our opponents. In all cases provide needed clarification.

For Example: The opposition usually refers to the Sandia movie as simply the documentation of a series of PR stunts:

- 1 The opposition often states that its obvious the flames were superimposed over the cask during the fire test.
- 2 Test cask pressure was 26 PSI. A real cask would reach 300-350 PSI.
- 3 The cask contained fresh nuclear fuel which is one-millionth as radioactive as spent fuel.
- 4 The truck hits the wall at 84 MPH but the cask is restrained by moorings etc. Terminal velocity of the cask at impact was only 20 MPH.
- 5 Government documents show that if a cask were to strike a bridge abutement sideways at 12.5 MPH the pressure relief valve would open.
- 6 The jet fuel in the fire shown in the film averaged 1400 to 1500 degrees F. Most pyrotechnicians agree that the average temperature will exceed 1850 degrees.

These are just a few of the charges. The list goes on. The responses can and should be given succinctly:

- 1 Not true. What is their basis for such a statement.
- 2 Because of the long decay time irradiated fuel is normally shipped dry. There is no water in the cask and no way to achieve pressures exceeding a few PSI.
- 3 The radiation level inside the cask has no measurable or theoretical effect on the behavior of the materials from which the cask is made.
- 4 In the 84 MPH impact the cask impacted the wall at 65 MPH. A 60.5 MPH cask impact at the wall was 28 MPH.
- 5 Normally, the cask is shipped dry. In this case, relief valves are not needed.
- 6 The flame temperature in the test was 2000 degrees F.

Accidents and Incidents

Accidents do happen and accidents in the transport of hazardous goods are no exception to the rule.

According to the U.S. Department of Transportation, tanker trucks that carry gasoline and other flammable liquids kill at least one person every three days in the United States.

These accidents injure five people every other day, cause fire every tenth day and result in \$40,000 in property damage every day.

Flammable petrochemicals can disperse quickly over a wide area when the container is damaged. Probably, the worst demonstration of this occurred at the height of the 1978 summer holiday season when a tank truck filled with propylene went off the road which ran alongside a camping site in Spain and exploded, killing more than 200 vacationers.

In 1979 a train accident at Mississauga near Toronto, Canada, prompted one of the largest peacetime evacuations in North American history. Just under 250,000 people were evacuated due to the derailment and rupture of tank cars carrying liquid fuels, petro chemicals and chlorine.

The public is aware that accidents can and do happen during the transportation of radioactive materials. Unfortunately, the public is convinced that any exposure to radiation is an overexposure and, in a sense, fears this type of accident more than the petrochemical accident. The opposition tries to convince the public that we try to hide the real risk.

Therefore we must answer the questions that are asked. For example: the opposition often cites an accident where spent fuel falls on a roadway and a motorcyclist passing by at 90 miles per hour drops dead instantly as the headlight melts on the cycle.

Our response is often defensive. We state, that is impossible. The cask cannot split open like a ripe melon. We refuse to consider the question. The audience is left with the impression that the fuel, however, does have that potential.

We should respond with the following points:

- The radioactive level of fuel that has been out of the reactor one year is much lower.
- In most cases the fuel will be cooled at least one year before shipment.
- For example: suppose a BWR spent fuel bundle (35,000 MWD/MTU) cooled for one year was placed on a roadway at a reactor site and a motorist passed by ten feet from the bundle at 25 MPH. His exposure would be about 190 MRem. The equivalent of spending eight days and nights in the catacombs in Rome, Italy.

Conclusion

The 80's will be the era of instant information. People will be able to follow news events as they happen from locations thousands of miles away. How boldly and creatively the nuclear establishment participates in the communications revolution will determine in great measure the success of nuclear power programs whether they be local, national or international. Messages and techniques of public communication must be as contemporary as today's information transmission technologies.

This is not an easy task. Nearly everyone has an idea of what doctors do. Most people can describe what bus drivers, lawyers, actors and policemen do. But what does the nuclear engineer and technician do? They are an unknown. They must sell themselves and their technology.

We are just now beginning to learn proper communication techniques. Unfortunately the anti-nuclear crowd learned these same techniques years ago.