

NONTECHNICAL ISSUES IN WASTE ISOLATION

John A. Hébert
Battelle Human Affairs Research Centers
Seattle, Washington

Before nontechnical issues are discussed, I would like to define what is meant by the term issue in this context. I would then like to distinguish between a technical and nontechnical issue. Finally, I will discuss some selected issues and their implications for society.

Issue carries two connotations: the first is a point of contention and the second is a broad interest in some defined community, be it a group of experts or the general public. For example, people disagree on the nature of the risk of nuclear waste to future generations. Note there is usually no solution to an issue in the sense that technical problems are solved; issues get resolved, most often through a complex set of institutions which embody our political process.¹

Conflict over issues thrive on two sources of disagreement: facts and values. Going back to the risk to future generations example, there could be strong disagreement over the size of the risk (a fact or potential fact) or over whether it is fair to push that risk to future generations (value). Further, facts and values interact. For example, in the presence of substantial uncertainty and/or ignorance over the magnitude of the risk to future generations from nuclear waste, the value differences may shape the perception of the facts, i.e., "It is a big risk" or "It is a small risk."

A technical expert has at least two roles in the resolution of issues dealing with a technology. One is the produce facts via research and analysis and to disseminate this knowledge. A second role is more perilous: socially interpreting (or evaluating) these facts in a leadership role. That is, a technical expert is well-suited to participate in the public debate by virtue of his/her understanding of the technology. The peril lies in not being sensitive to divergent values in the society, because it is just these values which are used to give social meaning to the facts. Unless there is an unusual diversity of values within the expert's peer group, there is no

^aSponsor for the work performed was U.S. Department of Energy.

guarantee that sensitivity to cultural diversity will be maintained by the normal critical challenges of peer review.

Social scientists, who could be characterized as technical experts in the social values area, spend their careers measuring divergent social values, yet rarely know much about technology. Clearly, collaborative research and education between the social sciences and engineering, life and physical sciences is needed to fully understand public policy aspects of technology.

Against this background of the "facts and values" approach to understanding issues, the distinction between technical and nontechnical issues become blurred and artificial. As seen below, many of the nontechnical issues are ultimately dependent on technical concerns about health, safety, pollution, and so forth.

Nealey and Radford have provided a thorough going analysis of the public policy issues surrounding nuclear waste.² They identified four major issue areas: temporal equity, geographic and socioeconomic equity, implementation, and public involvement issues. For brevity, I intend to concentrate on subissues from three of the areas: (1) risks to future generations; (2) institutional concerns; and (3) public involvement. The most potent of the public issues appears to be risks to future generations.³ What is at issue here?

The notion is simple: we are currently receiving the benefits of nuclear power in this generation and deferring the radioactive hazard to many future generations. The potential ethical or moral problem rests on the fact that the yet-unborn cannot participate in the decision and the fact that we know that radioactive wastes are potentially dangerous. We have the ethical responsibility to act both in the interests of the current and future generations.⁴

One needs more information to think deeply about the problem. We need to know how important the use of nuclear power is to the current generation and weigh this against the estimated risk to the health and safety of future generations. Brown and Rankin point out that if minor or trivial costs to this generation could be borne to prevent serious risk to future generations, then they ought to be borne.⁵ So, at least with this utilitarian approach, the ethical issue of nuclear waste depends on having

some knowledge or facts: "How necessary is nuclear power today and just how big is the risk to future generations?" Clearly the scientific and technical community must take the lead in providing this knowledge.

But there are some value differences affecting this issue as well. In an early study of public values in nuclear waste disposal, Maynard, Nealey, Hébert, and Lindell noted that public groups differed markedly from nuclear technologists on the relative importance of long-term safety (risks to future generations).⁶ That is, both environmental and other groups of the public placed higher importance on long-term safety than on short-term safety, while nuclear technologists felt short-term safety was more important. We further asked what a satisfactory performance in long-term safety would be in terms of deaths per unit time. Fig. 1 shows a substantial difference between environmentalists and nuclear technologists in what constitutes a satisfactory performance: a factor of at least 100 separates the two groups. The "others" (students, civic organizations, church groups, and public utility employees) fell just about in between. These data clearly indicate that conflict over the issue of risk to future generations is possible regardless of agreement on the facts of the matter, indicating that a political resolution of the problem is necessary.

A second issue area is the concern about institutions. Discussions in this area are usually separated into current institutions and long-term institutions.⁷ I would like to make a few brief points about current institutional issues and then concentrate on the long-term issues.

The first point is that we do not have a long history of a stable institutional framework for dealing with nuclear waste; indeed it appears to be continually evolving. The Nuclear Regulatory Commission is a very recent institution and the Atomic Energy Commission to Energy Research and Development Administration to Department of Energy change is dizzyingly rapid by any institutional standards. In addition, we have the recent emergence of private institutions such as the Natural Resources Defense Council as an important voice in the debate. Further, there are proposals for a single, independent waste management authority to deal with the problem.⁸ An optimistic interpretation of this chronic change is that we are a flexible enough society to change institutions to solve our problems. The pessimistic view, of course, is that we don't seem to have

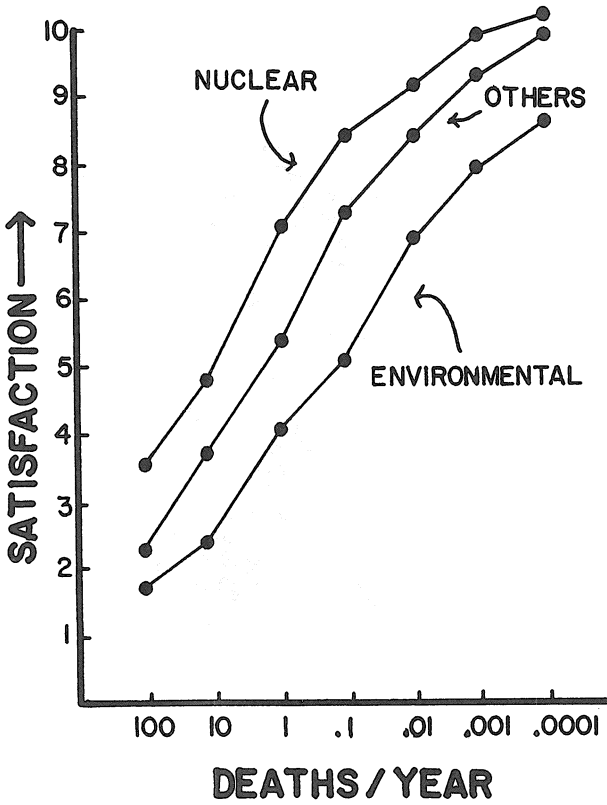


Fig. 1. Satisfaction with Long-term Safety Performance in Deaths per Year.

the institutional stability to solve the problem. But, it is against this background that people will assess the ability of society to maintain effective long-term institutions to deal with nuclear waste.

In a study just completed by my colleague Mike Lindell and others, we asked various citizen groups to assess both the need for and the likelihood of success in performing various functions: site control, monitoring, and information transfer. The groups of citizens varied in terms of attitudes toward nuclear power from strongly for to strongly against. To quickly characterize the results, there was more disagreement about the need for such long-term institutional functions than whether society would be successful in performing those functions. That is, pronuclear respondents felt that the functions were less necessary than antinuclear respondents. There was general agreement, however, that it was not likely that these functions could be maintained for many hundreds of years. It seems that the long-term institutional debate rests on the need for such institutions. This issue, in turn, seems dependent on just how big is the risk to future generations? Again, the need for factual information is great.

A final issue area, I want to discuss is public involvement. Nealey and Radford have outlined the issue clearly in terms of should the public be involved, what are the benefits and risks of involvement, what are the factors affecting the appropriateness of involvement, and what is the best process for involvement?⁹ I don't intend to cover all of this territory here, but make a few comments.

We tend to think of public involvement in nuclear waste as some separate event from our normal political process, something extraordinary and outside the process. Of course it isn't. The NEPA, its amendments, and case law make it clear that public involvement is an integral part of the process. Yet, there is a feeling that the involvement we do now have is inefficient and, perhaps, counterproductive. It probably is inefficient if by public involvement we mean adversarial meetings, hearings, and suits.

I feel that public involvement can have a much broader meaning, and that we haven't satisfactorily exploited alternatives to confrontation with disgruntled publics. A specific example might be the systematic measurement of perceptions, attitudes,

and beliefs about the problems of waste isolation (or any technological problem). If such surveying were done in an open (public) manner with results publicly available, I think no negative reaction would be seen. If the polling represented a real desire to understand the many points of view, I think the communication process would be greatly improved and a healthy form of public involvement would be had.

A final note needs to be made concerning public involvement. Merely involving the public by inviting people to a meeting to meet a perceived obligation could backfire. Frustrating involvement, where one doesn't have an opportunity to express a view can be counterproductive for the process, i.e., public involvement can be negative and harm the process of decision making. Serious attention needs to be paid to how the process of public involvement can be made meaningful to all parties, yet preserve the overall social interest in timely and wise decisions.

I've only highlighted three issue areas in waste isolation, none of them appearing very close to resolution. Nonetheless, I would like to close on a note of optimism. One, is that people in general have a belief that we will find a solution to nuclear waste isolation. That is, they have faith in science and technology. They have less faith in government and business institutions. But even there it is hard to see that the dramatic changes in institutions with respect to nuclear waste (NRC, state bodies, NRDC, etc.) won't eventually reassure a concerned public, once a perception of institutional stability for nuclear waste is developed. The very fact that our society can make such rapid changes (with perhaps more to come) is a sign of health.

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