LOW-LEVEL WASTE STORAGE AND DISPOSAL: UNDERLYING SOCIOPOLITICAL ISSUES

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ABSTRACT

Legal mandates notwithstanding, many people in the United States are skeptical of authority when it is asserted in new and controversial domains such as radioactive waste management. Then, those in charge of different aspects of the management process must prove that they can be trusted to act competently and in the best interests of those affected; they must prove that the risks of their favored management approach are small; they must prove that their proposed distribution of burdens and benefits is fair. All of these proofs are difficult to make. This paper reviews these difficulties and then discusses some implications for interim low-level waste management.

INTRODUCTION

By now, it is clear that attempts to site disposal facilities for low-level radioactive waste (LLW) are virtually always fraught with sociopolitical problems. It is less clear whether similar problems will be encountered in attempts to temporarily store LLW, but some can be expected.

Drawing upon an extensive analysis of value conflicts over LLW disposal facilities (1), I will argue here that for a public policy or plan of action for LLW management to be successfully implemented it must be widely regarded as legitimate. In other words, it must have more than legal backing; it must be widely accepted as principled and appropriate. But legitimacy is difficult to attain on contentious public issues such as radioactive waste management. After describing these difficulties, I will suggest two complementary ways in which they might be addressed by those devising interim LLW management strategies.

THE PROBLEM OF LEGITIMACY

With policies and plans of actions concerning the storage or disposal of LLW, legitimacy results if certain values are widely shared. For a stable, successful LLW management process, at least one of the following conditions must be present at each stage in the process, among those involved in or affected by that stage: (1) acceptance of the authority embodied in the process, (2) trust in the people in charge of the process, (3) widely shared evaluations of risks, or (4) a widely shared conception of distributive justice.

Acceptance of Authority

If the process of developing and implementing a public policy is recognized as legitimate, then the actions of those in charge of the process are likely to be accepted because they emanate from positions of authority; they will not require further justification. But if the legitimacy of the process is in doubt or if the people in charge are seen as overstepping the bounds of their authority, then those people will not be given the benefit of the doubt. Instead, they must prove that their decisions -- or their qualifications to make decisions -- are good. This is often the case with groundbreaking, confict-ridden issues such as LLW storage or disposal, where appeals to authority cannot be grounded in either precedent (longstanding, widespread practice) or normative consensus (agreement in principle).

Trust in Those in Charge

If people regard a process as legitimate, they will be predisposed to trust those in charge of that process. They will be inclined to believe that those in charge have attained their positions because of their competence and good character, as evidenced by certification exams, peer evaluations, etc. But, especially when authority is not readily accepted, attainment of a position of authority may not be a sufficient indication of trustworthiness. Then, it is more likely that the people in charge will have to actively and continually prove that they are trustworthy. But proving trustworthiness can be a difficult task, especially on issues such as LLW management.

Trustworthiness means, in part, having integrity and competence. While most people presume that others have integrity unless evidence indicates otherwise, the burden of proof is reversed concerning competence. Then, one must have demonstrated knowledge and ability. But when issues entail a high level of scientific controversy, demonstrations of knowledge and ability are often challenged and met with skepticism.

In addition, trustworthiness in its strongest sense means looking after the interests and supporting the views of those to whom one is responsible. It means trying to uphold and further their visions of how the world should be. But this can be an impossible task, especially when the trust of diverse groups is sought. For example, it is difficult for a state LLW agency to win the trust of both nuclear and anti-nuclear advocates.

Widely Shared Evaluations of Risk

Projects such as LLW storage or disposal facilities pose costs and offer benefits both to society as a whole and to members of the host community.* Generally, however, such projects are seen as benefiting society while placing a burden on the community and, possibly, on nearby communities. Because of scientific uncertainty, the nature, magnitude, and probability of the costs and benefits may be unclear. Furthermore, personal and culturally-determined differences--differences that arise from a person's geographic and/or group

* While the oversimplifying term "community" will be used here, please note that a community can be difficult to define -- it doesn't always follow jurisdictional boundaries -- and its views are never uniform.

affiliations -- will affect how people evaluate the costs and benefits of a risk. Technological optimists are much more likely to be sanguine about projects such as LLW facilities than are technological pessimists.

A Widely Shared Conception of Distributive Justice

The greater the diversity in evaluations of risk, the more *likely it is* that passions will run high concerning, on the one hand, the potential harm to those affected by the risk, and on the other, the responsibility of risk imposers and managers to prevent that harm from occurring. Then, a widely shared conception of distributive justice become all the more important. Even if a person or group feels that they have "lost" on a particular issue, they can then feel that in an important sense justice has been served.

But different people hold different conceptions of justice. One is the utilitarian conception: what is best for society as a whole overrides concerns about individual rights and welfare. Another is the libertarian conception: individual rights should be upheld, but societal goals can be realized through marketplace mechanisms. Finally, there is the contractarian conception: procedures developed under neutral and fair conditions should dictate how individual rights and societal goals are balanced. These different conceptions of justice can easily lead to fundamental conflicts on issues such as LLW management.

Summary

There are four different, although not mutually exclusive, routes to legitimacy with public policy issues such as LLW management. The first is widespread and full acceptance of authority; the second is widespread and unquestioning trust. These two tend to go together: more acceptance of authority results in more unquestioning trust in those in charge, and vice versa; less acceptance of authority results in less unquestioning trust, and vice versa. The third route is consensus on the benefits and burdens of a risk. This route is related to the first two. If authority and trust are present, widely shared evaluations of risk are more likely, if only because the "greater wisdom" of those in charge is likely to be accepted. The fourth route is agreement about what counts as justice.

In a pluralistic society such as ours, limited acceptance of authority, lack of trust, and conflicts about risk are likely, especially on new and unsettled issues such as waste management. Then, agreement about principles of justice offers the most promise. But, as suggested above, this agreement is not readily forthcoming.

IMPLICATIONS FOR INTERIM LLW MANAGEMENT

Elsewhere (2), I have argued that the readiness of community members to accept LLW storage in their midst will depend in part upon the storage arrangement -- where it falls *on a spectrum* of possibilities ranging from on-site storage to a dedicated, centralized facility -- and in part on the host community -- whether it is culturally predisposed to be hostile or receptive to a storage facility. In addition, another factor must be considered: the decisionmaking process by which interim (and permanent) LLW management arrangements are developed.

Alternative Storage Arrangements

For states in compacts, decisions about storage are complicated by questions about interstate responsibility: e.g., should the host state take responsibility for the region's waste; should some other centralized, regional solution be sought; or should each state determine how best to manage its waste until the region has disposal capacity? But even without these complications, individual states are faced with hard decisions concerning interim LLW management measures.

In deciding which storage approach to adopt, cost and safety concerns as well as potential sociopolitical problems must be addressed. Storage at the point of LLW generation avoids the costs and difficulties of siting and building a dedicated storage facility and of packaging and transporting wastes to it. However, on-site storage may be the least safe option, especially for small LLW generators. In addition, this approach may constrain the quantity, type, and duration of LLW storage. In contrast, a single, centralized storage facility for a state or region's LLW could be the most secure and flexible option, but it would necessitate finding a storage site -- an enterprise that could be nearly as difficult as finding a disposal facility site. In addition, as with a disposal facility, complicated substantive and procedural issues (e.g., siting criteria; compensation to the host community; allocation of liability among generators) would have to be worked out. Developing a centralized storage facility could take several years and cost millions of dollars (3). Intermediate options --e.g., storing nuclear power LLW on-site, with other types of LLW stored either at a small centralized facility or at the nuclear power plants -- have their own logistical, economic, and regulatory pros and cons.

There is no ideal LLW storage solution, in part because decisions about storage must deal with the question of time. Approaches such as on-site storage may be workable for a few years at most; approaches such as centralized, dedicated facilities take longer to realize but could be workable for indefinite periods. (This is both an advantage and a disadvantage of dedicated storage facilities: as a temporarily adequate substitute for disposal, they may dilute the political will to develop permanent solutions.) The approach that is preferable today thus may not be suitable five years from now, especially if -- as can be anticipated -- there are protracted delays in the availability of permanent disposal capacity. While on-site storage is now the favored approach, in the not-too-distant future it may prove necessary to shift to other LLW management approaches.

Alternative Host Communities

If an on-site storage approach is adopted, the members of the community in which a *LLW* generator is located are likely to be unaware of modifications in the generator's operation to allow for increased LLW storage. In contrast, if a dedicated, centralized storage facility becomes necessary, the problem of siting that facility must be faced. Permanent

* They may become aware, however, and perhaps should be told upfront. See, e.g., Christopher Collins, "Defusing Hysteria: How Institutional Generators of LLRW Can Make Allies not Adversaries of their Residential Neighbors," Proceedings of the Fourteenth Annual U.S. DOE Low-Level Waste Management Conference (forthcoming).

disposal facilities, with their 500-year time horizons, must meet exacting hydro-geological siting requirements; temporary storage facilities, with their relatively short time horizons, need not be as locationally constrained. With the latter, it is worth finding out whether some communities are more predisposed than others to accept a storage facility in their midst.

Economic benefits, particularly jobs and special payments, are often a prime determinant of community acceptance of a LLW facility. But economic persuasion, while important, is frequently not sufficient. Of possibly equal importance are attitudes concerning, e.g., the risks of the proposed storage arrangement, the benefits of that arrangement and of the nuclear industry in general, and the competence and integrity of scientists and risk managers. Research indicates that communities with extensive prior involvement in the nuclear industry are more likely to be open to the idea of a LLW facility in their midst (4,5). They are more likely to presume that a LLW management process is legitimate. While these communities should not be automatically drafted, their suitability and receptivity may be worth exploring. This leads, however, to a third consideration: the process by which major LLW management decisions are made.

Alternative Decisionmaking Processes

In making major decisions about how LLW should be stored, disposed of, or otherwise managed, the attitudes of the public at large in the affected state or region should be taken into account. In addition, of particular importance are the views of stakeholder groups: first, special interest or public interest groups such LLW generator associations and statewide environmental groups; and second, the communities in which the LLW is to be stored, treated, or disposed of. Through an open process, these stakeholder groups should have a say in major decisions that may potentially affect them. An open decisionmaking process is no panacea, but it does improve the odds that the LLW management effort as a whole will be regarded as legitimate and will lead to durable, widely accepted solutions. In designing the decisionmaking process, the following general points should be kept in mind:

- No process can be completely open and participatory; everyone cannot be involved in all decisions. However, while all processes entail some measure of authority and representative decisionmaking, they still can be made somewhat open by allowing stakeholders to review, advise, and voice concurrence or dissent.
- Just as all processes entail some degree of authority, they also rely to some degree upon trust. However, the need for trust can be minimized through both institutional substitutions for trust -- e.g., processes that invite outsiders to assess the merits of proposed players and actions -- and technical substitutions for trust -- e.g., back-up safety features built into the proposed system.
- Whether anyone -- "insiders" or "outsiders" -- can be fully objective is doubtful, since everyone brings to bear their own culturally-acquired values, even on issues that seemingly are purely scientific. However, outside assessors, by applying their own experience and analytical approaches, may expose errors that seem obvious in retrospect but have previously gone unrecognized. And even if they don't uncover errors, analysis from different vantage points helps to establish the validity of conclusions reached.
- The heated debate in the United States over issues such as nuclear power and radioactive waste disposal illustrates that there is no single, shared vision of what is desirable for this society. It also illustrates that parties with opposing visions may suspect the other sides of being wrong-headed or two-faced: of holding inappropriate views or of tailoring them to fit particular situations. However, if antagonistic, over-simplifying charges are avoided, dialogue may lead to greater mutual understanding, if not agreement.
- Negotiated solutions are not always an option, especially if one or more stakeholders is unwilling to bend on certain principles. In addition, many negotiated solutions fully satisfy no one. However, in some instances, stakeholders may agree that compromise is better than nothing, and in other instances, negotiations may lead to mutually advantageous solutions.
- It is unlikely that abstract notions of procedural justice will persuade people to totally disregard the actual outcomes of a decisionmaking process. However, an open and fair process (one which corrects for imbalances in knowledge, money, and access to the process) will help to promote the acceptance of adverse outcomes, especially if the "losers" have reason to believe that in other situations they may be the "winners."
- An open and fair process does not guarantee a rapid, successful mission fulfillment. Instead, it may mean conflicts, stalemates, and delays. However, in the long run it offers the best possibility for stable solutions that are widely regarded as legitimate.

The specific design of the process must be tailored to the circumstances. There is no single procedural model that can be prescribed ex ante. In a project currently underway at the University of Tennessee's Waste Management Research and Education Institute, we are analyzing the practical and ethical pros and cons of some key alternative stakeholder involvement mechanisms. (While this project is focused on stakeholder involvement in Superfund site cleanup decisions, it will have broader applicability.) The project results should be available in the fall of 1993.

CONCLUSION

All players in a public policy issue such as LLW management must establish their legitimacy in the eyes of others. LLW generators must establish that their products are necessary and that they are making good-faith attempts to minimize their waste. Waste management companies must establish that they will carry out their tasks with honesty and competence. LLW regulators must establish that their regulations are appropriate and that they will be enforced. Local officials must establish that they speak on behalf of their communities. And private citizens -- either individuals or groups -- who support or object to a proposed policy or plan of action must establish that they have "standing"; that their interests and opinions should be taken into account.

Furthermore, legitimacy is not a static, all-or-nothing proposition. There are degrees of legitimacy, and they can change over time. Some start with the presumption of

legitimacy; others with the presumption of illegitimacy... but, especially in a multi-cultural society such as ours, all must continually reaffirm for others the rightness of their positions. And the best route to legitimacy is a fair and open process.

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