A LOW-LEVEL RADIOACTIVE WASTE DISPOSAL FACILITY SITING SIMULATION EXERCISE[a]

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ABSTRACT

The DOE Low-Level Waste Management Program has developed the Low-Level Radioactive Waste Siting Simulation, a role playing exercise designed to facilitate the process of siting Low-Level Waste (LLW) disposal facilities. This paper describes the development, content, and usefulness of the siting simulation.

The simulation consists of two sessions: in the first, participants negotiate the selection of siting criteria, and in the second, a preferred site is chosen from three suitable candidate sites. Several workshops involving the simulation have been conducted for persons involved in the planning of LLW management activities.

The simulation is useful as (a) a training tool, (b) a vehicle to foster communication, and (c) a step toward consensus building and conflict resolution. The siting simulation is now available through the DOE Low-Level Waste Management Program for use by states, regional compacts, and other organizations involved in the development of LLW disposal facilities.

INTRODUCTION

No site for disposal of low-level radioactive waste (LLW) has been licensed since 1971, and since that time the regulatory and sociopolitical climate for LLW disposal has changed significantly. Now, under the impetus of the Low-Level Radioactive Waste Policy Act of 1980 and subsequent amendments, several states and regional compacts have started planning to establish LLW management facilities for the wastes they generate. The Mock Site Licensing Demonstration Project was undertaken by the National Low-Level Waste Management Program to provide assistance to persons involved in the siting process. The overall goals of the project were to identify potential problems in the siting and licensing process and to demonstrate methods to facilitate the process.

The accomplishments of the Mock Site Licensing Demonstration Project were development of 1) the "Low-Level Radioactive Waste Siting Simulation," a role playing exercise that can be used as a tool for training, communication, and consensus building with persons involved in siting LLW disposal facilities, 2) a document entitled "Licensing Procedures for LLW Disposal Facilities,[1] and 3) a siting simulation information package describing the simulation and its function.[2] This paper describes the siting simulation, summarizes its development, and discusses its usefulness.

a. Research performed by Oak Ridge National Laboratory for the National Low-Level Waste Management Program, U.S. Department of Energy, under Contract No. DE-AC05-840R21400.

DESCRIPTION OF THE SITING SIMULATION

Development

The objective in developing the siting simulation was to design an exercise in which participants could "walk through" key steps of the siting process. Development of the simulation was guided by two decisions regarding its scope. First, rather than focusing on the technical aspects of siting and licensing, the simulation would primarily address sociopolitical and economic aspects, specifically the conflicts generated by proposed LLW disposal facilities. Second, the simulation would focus on the early phases of site selection, which are critical to the success of the effort.

Design of the simulation began in July 1984 by the Harvard Program on Negotiation. The design activity began with research to identify 1) who are the stakeholders (those parties having significant interest in LLW facilities), and 2) what are the positions and underlying interests of stakeholders. This was followed by the creation of a scenario for the simulation and designation of the issues to be negotiated in the exercise. The scoring scheme was then developed based on the interests of the stakeholders.

The simulation consists of two sessions which are typically conducted in the morning and afternoon of an all-day workshop. The scenario for the first session is a meeting to negotiate the selection of criteria for siting a LLW disposal facility. Issues raised during criteria selection session are based on established regulations and the perspectives of the parties involved. These hypothetical parties are the Public Management Authority, the Federated Indian Tribal

Council, the Environmental Coalition, the "Green Wave" Anti-Nuclear Coalition, the Association of Municipal and County Governments, the Association of Radwaste Generators, and the Governor's Blue Ribbon Advisory Panel. The second session is concerned with selection of a preferred facility site from three candidate sites. The parties represented in this negotiation are the Governor, the Environmental Coalition, the Association of Radwaste Generators, Town A, Town B, and Town C. Issues which figure prominently in the second session include compensation to the host community and the sharing of control over the facility between the operator and community.

To conduct a simulation, participants are broken into groups of 6 to 10 individuals; each group sits at a separate table and includes at least one person representing each of the parties in the negotiation. Participants are given confidential role descriptions that indicate their goals and instructions as negotiators for their interest group. Each role description includes a score sheet indicating the numerical importance attached to each of the criteria being negotiated and the total number of points required for acceptance of the negotiated package. At intervals during the session, the negotiators are asked to vote on whether they can support a package of proposals. If five of more parties vote "yes" the negotiated package is adopted. At the conclusion of the session, the facilitator conducts a debriefing in which the results from all the groups are compared. Also included is a discussion of negotiation behavior and problems which occurred during the exercise.

Use of the Simulation

On December 14, 1984, the siting simulation was conducted in Boston with 33 persons from the northeastern states. This represented the first use with the intended audience, namely persons who are actively involved in siting for LLW disposal facilities. The participants included representatives from 1) regulatory agencies (state and federal), 2) waste generators, 3) potential facility developers, 4) state legislatures and administrative agencies, 5) environmental and consumer groups, and 6) academic institutions. Persons from all the New England states and New York attended, but no participants came representing New Jersey, Pennsylvania, Delaware, or Maryland.

The siting simulation was conducted at a second workshop in Richmond, Virginia, June 18, 1985. The Virginia Solid Waste Commission co-sponsored the 35-person workshop, and about two-thirds of the participants were members of the Low-Level Radioactive Waste Dialogue Group organized by the Commission. The remaining participants came from North Carolina, Ohio, Michigan, Texas, and California.

The primary purpose of this second workshop was to expose the newly formed dialogue group to issues to be considered in a siting process. This was particularly appropriate as this group would be actively involved in analyzing plans for LLW management and providing recommendations to be considered by the state. In order to increase the number of potential facilitators for future workshops, several people from the University of Virginia Institute for Environmental Negotiations were invited to participate and become familiar with the simulation. The participants from other states were invited to act as a source of information on the simulation to other perspective users in their region/state. Several future workshops have resulted because of their participation.

Evaluation

After the Boston and Richmond workshops, evaluations were conducted to determine participants' reactions to the workshop and to identify what the participants had learned. The evaluations indicated that most participants had little difficulty with their role assignments. Only 13% of the Boston participants indicated that their roles were unfamiliar, and only 9% indicated difficulty in playing their roles. Participants felt that the simulation was realistic in its depiction of interest groups, roles, and issues, but unrealistic because of the time under which negotiations took place and constraints imposed by the scoring system.

Most workshop participants felt they had learned about the negotiation process from the simulation. Participants mentioned that they had learned about the communication between diverse interest groups and about the process of compromise leading to consensus.[3] About 60% of the participants left the Boston workshop expecting to behave in a cooperative manner in future negotiations.[4] Participants also stated that they had become more familiar with the overall siting process and the various issues and perspectives involved in it. They also had learned about the several aspects of siting such as the influence of alliances, politics, or mechanisms for compensation.[3]

The ability of participants to actually utilize the information gained was a major concern. According to a survey of the Virginia Dialogue Group, a majority of the attendees felt that they had not only benefitted and gained insight from the experience, but that they would be able to put the knowledge to use in their role as Advisory Committee members.

DISCUSSION

Negotiation and Siting Conflict

The past two decades offer numerous cases in which the proposed siting of facilities has provoked notable conflict. The patterns by which conflicts arise are well documented,[5] and there is every reason to believe that LLW management facilities, if developed according to past patterns, would encounter similar problems.[1] The traditional approach to facility siting frequently results in situations characterized by rigidity, suspicion, hostility, and lack of communication by both proponents and opponents. The parties in a siting conflict often engage in behavior that is uncooperative, uncompromising, and adheres strictly to a particular set of narrowly-framed, preconceived notions about how to accomplish specific goals.[4] A key point is that both parties typically see their goals as mutually exclusive from their opponent's goals.

A preferable alternative would be a siting process which moved toward the definition and solution of joint problems. In joint problem-solving, parties work together to discover or create solutions that are acceptable to all. Negotiation sessions between all

major parties may provide a way to require that stakeholders look beyond their own interests and consider the concerns of other parties.[6] Only then can stakeholders identify overlapping interests and issues on which compromise is possible.

Joint problem-solving through negotiation could help solve four problems which seem likely to arise in LLW siting efforts:[4]

- Lack of information,
- Difficulties with the perception and/or allocation of risk,
- The need to provide opportunity shared decision making, and
- The need to provide compensation to host communities.

However, a major obstacle that blocks greater use of negotiation to resolve siting conflicts is that many people approach negotiations as an adversarial bargaining process rather than a joint problem solving process.

Usefulness of the Simulation

Based on the experience to date, the simulation has shown itself to be valuable in three ways:

- As a tool for training,
- As a vehicle that can foster communication, and
- As a step toward consensus-building and conflict resolution.

Training. As a training tool the simulation operates on three levels:

1. Familiarization with the Siting Process. The exercise helps participants become familiar with siting criteria, both those criteria required by regulations and those desired by various interest groups. In addition, participants learn how the various technical, economic, environmental, and social concerns affect the site selection process.

2. Demonstration of an "Enlightened" Conflict Management Process. The simulation exercise presents an overall model of siting as a process which balances many competing interests. Participants learn about the concerns of other interest groups with which they may not be familiar. The simulation suggests to participants that negotiation can serve their interests in the siting and licensing process.

3. Instruction in Negotiating Skills. The simulation introduces participants to basic skills of communication and conflict resolution. The simulation also can make people more aware of negotiation skills they already have, especially in the context of siting and licensing.

Part of the value of the siting simulation as a training tool comes from the fact that the participants learn by doing. The simulation probably has the greatest value to persons who are relatively less knowledgeable about siting a facility. Many participants, however, are well informed about their areas of concern (e.g., regulations) but can benefit by broadening their knowledge of the entire process.

Of the simulation's three training functions, the second, broadening participants' mental model of the siting process, may be the most valuable. Many people have a rather simplistic conception of the siting and licensing process that includes only two groups, "the developers" (e.g., the state, compact, or development contractor) and "the opponents" (e.g., the environmentalists, local landowners, etc.). Persons who identify with either group frequently tend to see the other group as being significantly more powerful. Opponents of a facility may believe that developers can brush aside environmental or local concerns because of the state-wide or regional need for a site. Developers, on the other hand, often believe that opponents can completely block development of a worthwhile facility through delaying tactics or frivolous legal maneuvers. In this simplistic model, the end result is a stalemate. For some participants, the siting simulation can replace the model of "two-sided deadlock" with a far preferable model of "multiparty joint problem solving."

Improved Communication. In the process of attending a siting simulation workshop, participants meet and interact with other people who are concerned with LLW management, thus promoting communication. While any meeting of people concerned with LLW issues would foster communication, the mechanics and content of the simulation enhance the quality of the interaction for many participants. In a role playing exercise, participants must listen to each other in order to play their roles well. In addition, because participants are playing a role, they can make statements or proposals more freely than they would in a real negotiation or in normal interaction. Thus, a simulation provides a lower-stakes, nonthreatening environment for participants to test new ideas or new techniques for solving problems. The patterns of improved communication between persons at a simulation may carry forward into their real-life interactions. The simulation also provides a forum for discussion of issues. This could be carried further by creating additional follow-up meetings which could provide state/regions with recommendations and/or guidelines for a siting process.

Consensus Building and Conflict Resolution. Based on the evaluations conducted, many participants of the siting simulation take home two key lessons:

1. Siting requires compromise to accommodate the needs of many diverse interest groups
2. Shared power and compensation are two of the issues that may need to be negotiated in order for a LLW disposal facility to be acceptable to a community.

In addition, the simulation highlights the conflicts in a siting situation and their sources.

By providing a positive, holistic model of the process of conflict management, the simulation can provide a step toward consensus building and conflict resolution. Contributing to this is the simulation's demonstration of joint gains, the mutual benefits that can accrue to all or most stake-holders from joint problem solving activity. In a real conflict situation, if most parties (or if an influential minority

of the parties) share a positive model of conflict management, the prospects for resolving the conflict are improved.

AVAILABILITY FOR FURTHER USE

The Low-Level Radioactive Waste Siting Simulation is now available for use by parties involved in siting LLW disposal facilities. Use of the simulation can be coordinated through the DOE LLW Management Program, and simulation materials can be obtained from the Case Clearinghouse at Harvard University's Program on Negotiation. Use of the simulation would be most beneficial in the following circumstances:

1. The LLW planning process has begun but has not passed beyond the site selection phase (and preferably has not completed selection of siting criteria)

2. There is a real possibility that the region, state or community will host a LLW disposal facility

3. Parties in conflict have some commitment to dialogue and problem solving

4. Resources and interest exist for organizing a moderate-sized workshop.

CONCLUSION

The siting of disposal facilities such as those for LLW is fraught with problems that cause conflict between proponents, opponents, and other affected parties. Successful handling of these problems is crucial to future efforts in LLW management. Indeed, the development of effective communication between parties in conflict and the utilization of techniques to manage and resolve the conflicts represent perhaps the most significant challenge for the people involved in LLW disposal in the next decade.

The siting simulation is a tool that may help solve the siting puzzle for LLW disposal facilities. If incorporated into public involvement or public education programs in a host state or potential host community, the siting simulation can help to establish new patterns of interaction between parties in conflict over siting proposals.

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