DE81 028818

HIGH LEVEL NUCLEAR WASTE DISPOSAL: INFORMATION EXCHANGE AND CONFLICT RESOLUTION

S.G. Hadden, et al

U.S. Department of Energy
Washington, D.C.

July 1981

DE81 028818

High Level Nuclear Waste Disposal: Information Exchange and Conflict Resolution

by
Susan G. Hadden
James R. Chiles
Paul Anaejionu
Karl J. Cerny

PROJECT DIRECTOR
Robert D. Smith
PROJECT COORDINATOR
Gary W. Hamilton

Prepared for Texas Energy and Natural Resources Advisory Council
Funded, in part, by a grant from the U.S. Department of Energy

ALL PROGRAMS AND INFORMATION OF THE U.S. DEPARTMENT OF ENERGY
AND THE TEXAS ENERGY AND NATURAL RESOURCES ADVISORY COUNCIL
ARE AVAILABLE WITHOUT REGARD TO
RACE, ETHNIC ORIGIN, RELIGION, SEX, AND AGE.

READER'S GUIDE

This study provides background information for local, state, and federal decision-makers who are responsible for establishing the frameworks within which the high-level radioactive waste (HLW) disposal issue will be resolved. The authors have attempted to develop balanced presentations exploring the pros and cons of the various facets of this issue. Any opinions, findings, conclusions, and recommendations expressed are those of the authors and do not necessarily reflect the views of the U.S. Department of Energy or the Texas Energy and Natural Resources Advisory Council.

The research presented here was conceived as an exploration of the interactions among parties involved in the resolution of the HLW disposal issue. Because of the major differences in the nature of the interactions between levels of government, on the one hand, and between government and the public, on the other hand, this study is divided into two primary areas -- public participation and intergovernmental relations. These areas are further divided into theoretical and practical considerations. The theoretical discussions generally present basic history and background, explicate fundamental principles and problems, and suggest useful institutional mechanisms. The practical presentations include discussions of experiences and case histories of issues similar to the HLW disposal issue and suggestions for avoiding some of the pitfalls identified by those past experiences.

The format of the paper reflects the divisions explained above as well as the interaction of the various authors. Public participation is addressed from a theoretical perspective in Part 2. In Part 3 an essentially pragmatic approach is taken drawing on experiences from similar exercises. These two aspects of the study are presented in separate parts because the authors worked largely independently.

Intergovernmental relations is treated in Part 4. The treatment is organized as

two Sections of Part 4 to reflect the authors' close interaction which yielded a more integrated treatment of the theoretical and practical aspects of intergovernmental relations.

Detailed recommendations and conclusions appear in the final subsections of Parts 2, 3, and 4. Part 5, Summary and Conclusions, does not reiterate the detailed conclusions and recommendations presented in previous parts but rather expresses some general perceptions with respect to the high-level waste disposal issue.

A brief review of the Table of Contents will assist in visualizing the detailed format of this study and in identifying the portions of greatest relevance to specific questions. A detailed Subject Index and an Acronym Index have been included for the reader's convenience.

The scope of the HLW disposal issue is much broader than can be treated by any single study. Although many aspects of the issue have been treated here, many others were neglected. Cost issues were largely ignored. The timing of participation programs and information were mentioned but not treated in detail. Potential delays resulting from more extensive interactions also merit careful study. Further analysis of some of the topics addressed in this paper and studies of other areas not treated will be required to fully characterize the institutional problems and possible solutions. Nevertheless, the subjects within the scope of this study have been addressed in depth, and the final document does represent a significant contribution to the body of knowledge required for resolution of the high-level nuclear waste disposal issue.

ACKNOWLEDGEMENTS

Throughout the preparation of this study, the individuals involved have fulfilled the responsibilities expected of them and then have generously contributed that extra effort required to transform a good product into an excellent document. Assembling a more capable, conscientious, and cooperative group would, at best, be extremely difficult.

Sincere appreciation is expressed to the researchers who authored the text. Professor Susan G. Hadden is a member of the faculty of the Lyndon Baines Johnson School of Public Affairs, University of Texas at Austin. James R. Chiles is now Special Research Assistant to the Alaska Statehood Commission in Fairbanks. He was engaged in freelance writing in Austin, Texas after graduating cum laude from Harvard College and with honors from the University of Texas Law School. Professor Paul Anaejionu is a member of the faculty of the Department of Government, University of Texas at Austin. Karl J. Cerny is a doctoral candidate specializing in intergovernmental relations in the Department of Government at the University of Texas at Austin. The excellent text prepared by these authors is the core of this study and any praise garnered by this document is theirs.

The coordination of the preparation of the separate manuscripts was handled by Gary W. Hamilton. He was also responsible for preliminary editing to minimize redundancy and to integrate more effectively the various parts.

The following individuals reviewed and offered comments on various drafts of this study: Curt Carlson, DOE Regional Representative, Region VI; Ted Taylor, Policy Analysis Division Director, Texas Energy and Natural Resources Advisory Council (TENRAC); and Milton Holloway, Executive Director, TENRAC.

Eddie Selig coordinated the special services and printing for this volume. Layne

Jackson designed and executed the cover and title page. Amanda R. Masterson edited the final text and prepared the indexes.

Special thanks is extended to Christine Dominguez who for months has patiently prepared countless revisions of every part of this document and who painstakingly prepared the intricate figures and tables.

Most of the funding for this study was provided by the Department of Energy, National Waste Terminal Storage Program Office, Columbus, Ohio under Grant No. DE-FG-97-79ET46608.

Robert D. Smith
Project Director

CONTENTS

CONTENTS (continued) Page

CONTENTS (continued)

CONTENTS (continued)

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

OVERVIEW

Introduction

Private citizens have always had available to them certain mechanisms for communicating their desires to government officials. While the use of the court system, political parties, and pressure groups has been the traditional method of addressing the government with concerns, in recent years the process has become more expansive. At the state and national levels, many laws and regulations have been enacted to open the system to more people and to provide access to more dimensions of the decision-making process.

Open record laws, sunset legislation, the requirements of notice and hearing and other provisions under the National Environmental Policy Act, the Freedom of Information Act, open meetings laws, and the many requirements of environmental impact statements and environmental assessments all indicate an expansion of the governmental process to greater numbers of citizens (and their interest groups) at most stages of the decision-making process. Some requirements provide for extensive hearings, many provide for mediation, arbitration, or litigation, and almost all provide for information dissemination and exchange.

In addition, most governments have created advisory commissions on intergovernmental relations and citizen participation, whose deliberations and recommendations provide the basis for revision of legislation and regulations. Under this process, the appropriate roles and relationships for citizens, businesses, interest groups, and government agencies have been evolving.

The optimum method of interaction between different levels of government and between government and citizen has not been determined. However, attempts have been made to define the optimum methods or processes, and considerable progress

has been made. Still, agreement on the purpose of such interactions has not been achieved. Until this issue is resolved, implementation of the processes cannot be considered.

This report considers the many dimensions of these issues, and offers background information, analysis, and insight into the process known as consultation and concurrence. This process is an integral component in the program to site a high-level radioactive waste disposal facility.

History and Overview (Part 1)

In March 1978, President Carter formed the Interagency Review Group (IRG) on Nuclear Waste Management and charged it with responsibility for recommending policies and programs for dealing with radioactive wastes. This advisory group's 1979 Report to the President suggested several candidate waste disposal technologies, but concluded that the success of these programs would depend on the resolution of socio-political and institutional issues surrounding the role of state and local participation in the decision-making process. This document is intended to address the sociopolitical issues in high-level nuclear waste (HLW) management by providing detailed background information for federal, state, and local decision-makers who are responsible for establishing the formal and informal frameworks under which a cooperative process may be implemented to resolve the HLW disposal issue.

The respective roles of federal and state governments have not yet been defined clearly; thus, institutional problems continue to plague the implementation of waste disposal programs. The fundamental recommendation of the IRG proposed establishment of a process — originally referred to as consultation and concurrence — compromising between the extreme positions of total federal pre-emption and absolute state veto. This rather nebulous concept presents a substantial range of options which must, in practice, be narrowed. The term "consultation" obviously

specifies that information must be exchanged among the parties involved. "Concurrence" (or other related terms which may soon be in vogue) suggests the process by which the possibly conflicting goals and concerns of the parties involved are synthesized to develop a viable decision. These two basic concepts define the context of this study. The major parts of the study address theoretical and practical aspects of public participation and intergovernmental relations.

In order to more clearly define the consultation and concurrence process, this report addresses many key factors. Some relate to the purposes or goals of interaction, and others relate to the implementation of an interactive system. A partial listing of these factors includes:

(1) determination of appropriate points of interaction among the parties involved in the controversy;

(2) selection of interests, groups, or individuals to be admitted to participation in the process;

(3) funding of activities by interested and/or affected parties;

(4) tradeoffs between efficiency of decision-making and participation by individual citizens;

(5) degree of formality in the process, characterized by, at one extreme, notice, hearing, and possible litigation and, at the other extreme, mediation, conciliation, and arbitration;

(6) role of information exchange;

(7) relative power status of the federal government, state government, local government, and private citizens;

(8) role of affected parties in determining rules of procedure; and

(9) process of selection of delegates to represent interests of individuals, states, regions, and the nation.

PUBLIC PARTICIPATION

Theoretical Perspective (Part 2)

Citizen participation is an integral component of democracy. Direct participation is relatively easy in small, local groups, but representatives are needed when population size and diversity increase. Groups often serve as intermediaries between individuals and government, and group representatives often participate in policy-making on behalf of their members. Over-reliance on groups may undermine democracy by leaving out unorganized citizens and by delegating authority to only some of those affected by decisions. Citizen participation can serve both government and citizen by allowing decisions to be made that will be acceptable to citizens and supported by them, but conflicting purposes for participation make design and evaluation of specific programs difficult.

The diverse purposes for public participation can be encompassed in two general purposes:

(1) allowing citizens to affect government decisions, and

(2) encouraging citizens to accept government decisions.

Specific purposes identified by several sources appear in Table 1.

Costs associated with public participation programs such as money and time are obvious. These and other less apparent costs and several benefits are presented in Table 2. Whether costs outweigh benefits ultimately rests on the emphasis placed on each of these factors.

Effective public participation is dependent on exchange of information. The history of citizen participation in the United States in the latter part of the Twentieth Century can be viewed as an attempt to expand the scope of information that is considered rightfully to belong to citizens. One reason that substantive information is such an important resource for citizens' groups is that it fosters cooperation with policy-makers with whom they must work by giving them a shared

TABLE 1. Purposes of Citizen Participation

ACIR (Advisory Commission on Intergovernmental Relations)

- Give information to citizens
- Get information from and about citizens
- Improve public decisions
- Enhance acceptance of public decisions
- Supplement public agency work (through volunteers)
- Alter political power patterns
- Protect individual and minority group rights and interests
- Delay or avoid difficult public decisions

DOE National Radioactive Waste Plan

- Provide information
- Improve decisions
- Achieve understanding of the decision process
- Gain public acceptance

Rosener

- Generate ideas
- Identify attitudes
- Disseminate information
- Resolve conflict
- Measure opinion
- Review a proposal
- Serve as safety-valve for pent-up emotions

TABLE 2. Costs and Benefits of Public Participation

Benefits	Costs
Fulfills rights of citizens	Requires time
Provides a check on government	Requires money
Allows priorities to be set	Reduces decision-making efficiency
Encourages leadership development	Reduces rationality of the decision-making process
Puts emphasis on issues rather than party loyalty	Requires organization or representation of the unorganized
Brings citizens in closer contact with government -- reduces alienation	Increases conflict by bringing in new viewpoints
Encourages citizens to accept government decisions	

language and knowledge base. A related reason is that substantive information provides a medium of exchange common to decision-makers and citizens. Problems related to provision of substantive technical information include its use to justify policy decisions made on other bases, to divert attention from more value-laden aspects of a policy decision, and to distort through selective presentation of facts.

Implementation of many citizen participation programs over the last several years has provided a variety of models from which to choose (see Table 3, Participation Mechanisms). The experiences in these programs suggest that each participation mechanism is most useful for a particular purpose, and that no mechanism is useful for all purposes. Table 4 provides a list of techniques and their associated purposes.

Designing a public participation program requires choosing among different purposes and appropriate participation mechanisms, choosing the points in the process at which participation will occur, and choosing which groups will be encouraged to participate. Provision of information -- technical and procedural — is a critical component of a nuclear facility siting decision, as is collection of information, consensus-building, and citizen input improvement. If these procedures do not occur throughout the entire decision-making process, citizens will not perceive the process as fair. A mix of procedures will ensure that a variety of groups participate and that the kind of participation is appropriate to the point in the decision-making process.

Three questions concerning participants should be addressed: who should participate (individuals or groups), what is the role of states, and who is affected. Provision can be made for decision-making without concurrence if necessary. The siting jury procedure described in Table 5 is one alternative. Finally, compensation may be one way of defusing conflict.

Citizen participation will increase the time required for decision-making. However, it is possible to set deadlines that are reasonable and take account of

TABLE 3. Participation Mechanisms

Information Provision

citizens receive information; government active

- mass media
- displays and exhibits
- publications
- direct mailings
- advertisements

citizens seek information; government passive

- open meetings
- open records
- hot-lines

citizens and government interact

- drop-in centers
- speakers bureaus
- conferences

Information Collection

- public hearings
- surveys
- citizen advisory committees
- citizen members of decision-making bodies
- referenda
- interactive cable balloting

Conflict Resolution

- focused group discussions
- plural planning; design-in; fishbowl planning
- role-playing, simulation, Delphi, nominal grouping; charrette
- arbitration and mediation
- ombudsmen
- value analyses
- workshops; task forces

Citizen Input Improvement

- citizen employment
- citizen honoraria
- citizen training
- community technical assistance

TABLE 4. Technique/Function Matrix and Descriptions

Technique	Identify Attitudes and Opinions	Identify Impacted Groups	Solicit Impacted Groups	Facilitate Participation	Clarify Planning Process	Answer Citizen Questions	Disseminate Information	Generate New Ideas and Alternatives	Facilitate Advocacy	Promote Interaction Between Interest Grps.	Resolve Conflict	Plan Program and Policy Review	Change Attitudes Toward Government	Develop Support/ Mininize Opposition
Arbitration and Mediation								X		X	X			
Planning	X			X	X	X		X		X	X	X	X	X
Charrette	X			X	X	X	X	X			X	X	X	X
Citizen's Advisory Committee	X		X	X	X	X	X	X					X	X
Citizen Employment	X		X	X	X	X	X	X				X	X	X
Citizen Honoraria											X	X	X	
Citizen Referendum	X			X									X	X
Citizen Representatives on Policy-Making Bodies	X			X	X			X				X		X
Citizen Review Board			X										X	
Citizen Surveys	X			X	X				X				X	
Citizen Training				X	X			X	X					
Community Technical Assistance	X													
Computer-Based Techniques	depends on specific technique chosen													
Coordinator or Coordinator-Catalyst				X	X	X				X	X		X	X
Design-In	X	X		X	X	X		X				X		X
Drop-In Centers		X		X	X	X						X	X	X
Fishbowl Planning				X	X	X	X	X			X	X	X	X
Focused Group Interview	X		X	X		X				X				
Game Simulations					X					X		X		X
Group Dynamics										X	X		X	
Hotline		X		X		X								

(continued on next page)

TABLE 4. Technique/Function Matrix and Descriptions (continued from previous page)

Technique	Identify Attitudes and Opinions	Identify Impacted Groups	Solicit Impacted Groups	Facilitate Participation	Clarify Planning Process	Answer Citizen Questions	Disseminate Information	Generate New Ideas and Alternatives	Facilitate Advocacy	Promote Interaction Between Interest Grps.	Resolve Conflict	Plan Program and Policy Review	Change Attitudes Toward Government	Develop Support/ Miminize Opposition
Interactive Cable TV	X	X	X	X			X	X				X		
Meida-Based Issue Balloting	X			X		X	X					X		
Meetings - Community-Sponsored	X		X	X	X	X	X	X				X		X
Meetings - Neighborhood	X		X	X	X	X	X	X				X		X
Meetings - Open Informational			X		X	X	X					X		
Neighborhood Planning Council	X			X				X	X			X		
Ombudsman		X			X	X	X					X	X	
Open Door Policy		X		X	X	X	X					X	X	
Planning Balance Sheet	X											X		
Policy Capturing	X													X
Policy Delphi	X							X						
Priority-Setting Committee	X			X								X	X	
Public Hearing		X	X	X		X	X					X		
Public Information Programs					X		X					X	X	
Random Selected Participation Groups	X		X	X				X	X			X		
Short Conference	X			X	X	X	X	X		X	X	X		X
Task Forces			X					X				X	X	X
Value Analysis	X			X								X		X
Workshops	X		X	X	X			X		X	X	X	X	X

TABLE 5. The Siting Jury

Program Phase	Jury Membership	Function
National formation study.	One "foreman" chosen in each state with potential for a site.	Liaison to State Planning Council on generic technological issues and national policy questions.
State dropped by DOE.	Terminated.	
Regional site characterization studies.	Add one juror from a a panel named by National Governors' Association, and one juror from panel chosen by National Conference of State Legislatures.	Advice to state on procedural and generic issues. Liaison to NRC staff.
State dropped.	Terminated.	
Site proposal.	Add one juror representing local governments, and one representing House of Representatives.	Conduct hearings on suitability of site, and recommend on suitability to NRC and the President.
Site disapproved.	Terminated.	
Site licensed.	Same.	Monitor construction and operation for state and local governments. (At option of state.)

citizens' needs without severely compromising the timeliness of the decision. There are no easy solutions, but since decisions must be made, it is well to provide for as fair and sound a decision-making procedure as possible.

Practical Perspective (Part 3)

The issue of HLW disposal has many facets and perspectives, and deserves consideration from the standpoints of both theory and practice. In this Part, examples are drawn from nuclear controversies and other high-technology disputes in which the public has demanded a part in the final decision.

The purpose of public participation generally varies with the perspective of the individual or group. These purposes range from providing a "safety valve" for the disaffected (Victor Gilinsky, Nuclear Regulatory Commission) to stopping construction of a nuclear facility entirely (nuclear opponent organization). Also, the strategy employed by some opponents will vary according to whether they see the outcome as a foregone conclusion.

Clearly, there are many purposes for public participation. Recognition of the purposes of various groups and determination of those purposes to be pursued may influence the design of the appropriate participation mechanism. Whatever participation purpose and mechanism is selected, clear and consistent definition of the purposes of planned activities should help avoid anger and disgruntlement.

The large number of groups and individuals that may be involved in HLW disposal issues complicates participation processes and may be mitigated somewhat by resorting to selecting spokesmen for groups with similar interests. These spokesmen are generally responsive to their constituency because their survival depends on the continued confidence of those supporters. In some cases, coalitions are formed among established and ad hoc groups to present a stronger more unified front. Finally, recognition of a group's origin (local/outside) is important in

identifying their purposes and predicting their methods.

Two central questions with respect to eligibility to participate are:

(1) should the party be allowed to participate at all, and

(2) if so, to what degree should they be allowed to participate?

The resolution of these questions depends not only on the nature of the participants but also the nature of the process in which they are seeking participation. In informal public meeting forums, anyone might be allowed to participate while in trial-type hearings, public participation is limited to the very formal devices such as depositions, presentation of witnesses, cross-examination, and rebuttals.

The mode of participation may be of a cooperative nature as in the exchange of information or may be of an adversary nature as in court actions and civil disobedience. In information exchange, the public may assume an active or passive role. Passive public mechanisms involve receipt of information by the public and include reading rooms, regional document repositories, news releases, press conferences, mailouts, speakers bureaus, publications lists, "open" meetings, hearings, and freedom of information actions. Active public mechanisms involve citizen feedback to the decision-making process and include hearings, interviews, rallies, letters to editors, advertising, petitions, polls, and referenda.

The adversary mode of participation mentioned above may take the form of court actions, usually in federal courts because of the doctrine of pre-emption which confines the resolution of most nuclear controversies to the federal level. Bases for these court actions include nuisance law and National Environmental Policy Act requirements. Civil disobedience is another prominent adversary mode of participation. Actions may include blocking entry to facilities, peaceful occupation of sites, damage to facilities, and (rarely) sabatoge.

Two major issues within the area of public participation are procedural problems and intervenor funding. Procedural problems will depend on the purposes

the participation is to serve. For example, if the purpose is to build public consensus, a dysfunction which operates to prevent the transfer of information to decision-makers may be unimportant. Such a dysfunction may, on the other hand, be very serious if decision-makers wish the public to cross-check their recommendations. Other issues which may pose problems include intentional delay of progress by intervenors, legal confrontation in which opposing parties seek to prevent presentation of correct but unfavorable information, irresponsible disruption of participation, appearance that participation opportunities are provided for appeasement only, appearance of bias by hearing moderators, loss of control of participation forums, selection of affected communities, and dissemination of process information. Whether these topics actually represent problems depend on the purpose of participation and, likewise, possible solutions are dependent on the goals sought.

Generally, the argument for financial assistance to citizen groups is that a point of view represented only by them will not receive full consideration, for they typically cannot afford expert advice. Current proposals to fund public participation are in the embryonic stages. Bills to fund it generally at the federal level have all failed, though some agencies are authorized to do so and have set up programs. In the particular case of nuclear reactor licensing, arguments in favor of funding are that:

(1) intervenors can make and have made significant contributions to NRC hearings;

(2) they serve as a gadfly to staff and the boards;

(3) funding will increase the public's confidence in the efficacy and safety of nuclear technology;

(4) a sincere effort is needed to review safety, economic, and environmental factors; and

(5) intervenors bring in the outside view.

Arguments against the funding are that:

(1) the money will only increase delaying tactics;

(2) decisions on health, safety, and environmental issues are better left to agencies, which have been directed to pursue the public interest;

(3) trial-type licensing hearings are not suited to fact-finding, but only to grandstanding; and

(4) less drastic alternatives than direct funding exist.

The most compelling arguments for funding are those that address the need for technical advice.

If information exchange fails to result in concurrence, mechanisms for conflict resolution must be undertaken. In the case of siting a repository for high-level defense wastes, the Energy Research and Development Administration (ERDA) failed to inform a Michigan Congressman of their activities in his district and found themselves involved in Congressional hearings at the proposed site. The weight of the opposition discouraged ERDA from continuing the investigations. This project then focused on the Waste Isolation Pilot Plant site in New Mexico. More conscientious efforts were made to consult with all relevant parties but a misunderstanding generated substantial animosity. This confict seems to have been resolved in favor of DOE (ERDA successor) but with concessions to New Mexico. Case studies of two other controversies illustrate other conflict resolution mechanisms such as intervention of powerful officials, intervention of Congress, and establishment of citizen review committees to recommend solutions.

A final test of public participation efforts is whether the public learns to balance risks in a cost-benefit comparison. These compromises and difficult choices are expected from leaders; perhaps citizens can also be asked to wrestle with these "tragic choices." The participation mechanisms selected may enhance or discourage this result. The resolution of the dangers of radioactivity with the need for a HLW

repository will be an interesting test for public participation, an opportunity to see if anything has been learned from nearly 20 years of environmental controversies.

INTERGOVERNMENTAL RELATIONS

Theoretical Perspective (Part 4, Section I)

High-level waste disposal presents a significant challenge in the field of intergovernmental relations. The term consultation and concurrence is a metaphor for DOE's desire to find a tenable middle ground balancing conflicting federal, state, and local objectives. Perceiving intergovernmental relations as a management problem rather than as a necessary framework for cooperation may lead to incomplete assessment of state and local government motivation in this process.

Intergovernmental relations is not a new aspect of the American federal system. The classic cases in which the Supreme Court handed down landmark decisions were heard in the mid-1800s. The consultation and concurrence approach to intergovernmental relations is yet another form of cooperative federalism embracing the concept that federal and state political and legal responsibilities, as well as financial resources, overlap. The concept of cooperative federalism can have a deleterious effect on management planning. The overlap of federal-state responsibilities may lead to the assumption that should either level be unable to discharge its obligations, the other should inherit the responsibility and the ultimate assumption that federal and state governments have the same basic responsibilities. The end result of this reasoning may misdirect federal administrators to assume more authority than they have, and may fail to provide them guidance when negotiating with state and local officials.

The area of intergovernmental relations is complicated by several factors. First, the federal government does not speak with one voice. Second, states have different constitutional arrangements of power at both state and local levels. Third,

since intergovernmental relations exist for functional purposes, not only are cities and counties within a state aggregated differently for different programs, but different constellations of states can form interstate regional commissions or compacts.

The key actor at the state level is generally agreed to be the governor. State legislatures are also important because of their authority to appropriate money to support the governors' research endeavors. It is also reasonably clear that for a state to participate effectively at the licensing stage, it will need a stable, well-funded, competent agency working with DOE during the 10 to 12 years before the licensing hearings begin. The city and county governments are closest to the potential repository sites but do not have any formal representation in federal legislative bodies.

In the relevant studies, intergovernmental relations are approached in two ways: (1) as initiations of consultation at or before the survey stage and (2) as mechanisms for the resolution of irreconcilable conflict during the licensing stage. DOE has addressed the first stage with its gubernatorial notification procedures and willingness to formalize, in writing, agreements reached at this stage. At the second stage, efforts have been made, especially by Congress, to identify those decision-making points where a deadlock would stall the implementation of a HLW repository.

A second and no less critical assumption that appears in the studies mentioned above is that the "institutional issues" are management problems. Given this assumption, the phrase consultation and concurrence suggests that DOE will make a good faith effort to keep state and local governments informed. On the basis of the assumption above and comparison with other intergovernmental relations efforts, the following points have been identified: (1) initiative is the responsibility of the federal government, (2) conflict is probable, (3) concurrence is the desired level of agreement, (4) authority for negotiating is not decentralized, and (5) responsibility is

assigned to the lead agency, even though it may not be delegated full authority for all decisions in the project.

Government units at both the federal and state levels must act in order to establish complete intergovernmental relations frameworks. A state's response will depend on its constitutional basis, its political infrastructure, and its economic configuration. There are two typical federal actions requiring state response. First, the federal agency requests the governor to designate a personal representative or a state agency to be the official contact. Second, the federal agency states in writing that the duly authorized state/local agency will be the official partner but requires that agency to demonstrate that it has the legal authority to deal with the subject at hand. In a system with a strong governor, the power to designate the responsible state agency confers little additional discretionary authority. In states with weak governors, however, federal regulations can serve as an extra-constitutional mechanism for an incumbent to centralize power and authority.

The economic configuration of a state and community may positively or negatively affect interest in a HLW repository. The employment of up to 5,000 people can have a significant impact even on large, economically strong communities. Economic benefits may be even more direct than increased employment. In Barnwell, South Carolina, direct payments are made to the local community by the operator of a low-level radioactive waste disposal site.

Practical Perspective (Part 4, Section II)

Information enhances effective involvement of state and local levels of government in HLW programs in several ways. First, exchange of ideas and information among the three levels of government is the basis for implementing consultation and concurrence. Consultation involves the process of information diffusion and concurrence relates to agreement on details. Second, reliable informa-

tion is the foundation of viable policy decisions. A wide range of groups (utilities, government officials, regulatory agencies) will require different types of information. Third, discussions with officials at different levels of government reveal that there is a tremendous need for all parties involved to pay close attention to the role information acquisition and dissemination play, not only in policy formulation but also in policy implementation. Knowledge and the control of information are significant sources of power. Fourth, researchers in the field of socio-economic impacts of nuclear waste management have said that even though the accumulation and use of adequate information can improve policy development, policy-makers and policy analysts have given little attention to the aggregation of information pertinent to nuclear waste management. Fifth, additional information is needed to design institutional structures for effective HLW management. Gaps within existing institutions are likely to cause inequitable distribution of costs and benefits associated with implementation of nuclear waste disposal.

A number of factors are considered in the analysis of intergovernmental relations aspects of HLW disposal: (1) HLW characteristics, (2) technology, (3) political environment, and (4) economics. Pertinent information related to HLW characteristics include waste form (relevant in assessment of potential releases), waste quantity (needed for disposal facility design, transportation analyses, temporary storage requirements), and radioactivity and decay heat (needed for repository and transportation equipment design).

The most actively investigated disposal technology at present is mined geologic repositories. The acceptance of the technology itself can be further enhanced by a more aggressive information dissemination program. Significant observations related to information exchange are:

(1) site visits promote peer-to-peer network building, information dissemination, program advocacy, and confidence in programs;

(2) printed materials used to disseminate innovative information and to promote innovative implementation may not be as effective as the use of personal interaction;

(3) technical experts working under DOE contracts at the state-local levels may not have any commitment to consultation and concurrence;

(4) hearings may easily appear to serve no purpose other than to ratify decisions reached prior to the meetings;

(5) supporters and opponents may attempt to manipulate public hearings to advance their particular viewpoint;

(6) information dissemination through mass media may be ineffective in allaying deep-seated apprehensions; and

(7) characteristics of communications and information transfer tools tend to distort the information transferred.

The Geothermal Research Information and Planning Service (GRIPS) illustrates an effective framework for intergovernmental relations for a relatively sophisticated technology. The organization was established by four California counties to evaluate the positive and negative environmental, economic, and social impacts of geothermal resources development in that area. Significant intergovernmental relations achievements of GRIPS are as follows:

(1) developed a multi-county jurisdictional and organizational structure within which area-wide projects could be handled;

(2) provided the counties with a joint power agency;

(3) completed a number of research projects beneficial to its members and DOE; and

(4) developed significant input into designs of DOE funded studies.

The GRIPS model might be successfully applied to the HLW disposal issue for several reasons. First, the California experience has shown that the model works.

One of its greatest strengths is that it provides the mechanism for direct state/local input into the planning and execution of data acquisition, data interpretation and analysis, and information dissemination in a highly technical policy area. Second, the organizational framework provides a means to integrate the information needs of the federal, state, and local government jurisdiction. Finally, the GRIPS model satisfies one of the fundamental needs of governments in the area of HLW management -- it provides an institutional arrangement that minimizes both substantive and perceived federal/state/local conflicts, and that also facilitates conflict resolution.

PART 1 - HISTORY AND OVERVIEW

1. Introduction

The mounting controversy over nuclear waste disposal has led many states to reassess their role in nuclear waste management. This document is intended to provide detailed background information for federal, state, and local decision-makers who are responsible for establishing the formal and informal frameworks under which a cooperative process may be implemented to resolve the high-level waste (HLW) disposal issue.

The remainder of Part 1 will develop an historical perspective and overview of the federal-state interface in nuclear waste management. Subsequent parts will focus on institutional problems involved in the implementation of waste disposal programs. Parts 2 and 3 will focus on public participation in the decision-making process. Part 4 will examine the interaction of the various levels of government involved in the decision to site a HLW disposal facility. Finally, Part 5 will provide a summary and will draw conclusions from the overall study.

2. Consultation and Concurrence

2.1 Background

In March 1978, President Carter formed the Interagency Review Group (IRG) on Nuclear Waste Management and charged it with responsibility for recommending policies and programs for dealing with radioactive wastes. This advisory group's 1979 Report to the President suggested several candidate waste disposal technologies, but concluded that the success of these programs would depend on the resolution of socio-political and institutional issues surrounding the role of state and local participation in the decision-making process (Report to the President, 1979).

The terms "Consultation and Concurrence" and "Cooperative Federalism" have

been used interchangeably to describe the essence of an envisioned federal-state interface. The respective roles of federal and state governments, however, are not defined clearly at this time; thus, institutional problems continue to plague the implementation of waste disposal programs.

In its Report to the President, the IRG characterized the problem of establishing a workable model of federal-state interaction on nuclear waste issues as one of "choosing between the polar positions of exclusive federal supremacy (pre-emption) versus the state veto" (Consultation and Concurrence, 1979). Rejecting either extreme, the IRG recommended the concept of "consultation and concurrence" as a realistic middle ground approach. In order to clarify the distinction between "consultation and concurrence" and "state veto," the IRG stated that:

> State veto meant the possibility that a state could at one specific moment -- by one of several possible mechanisms -- approve or disapprove of federal site investigation activities or a proposal to site a repository or other facility. The veto concept as used did not include an ongoing dialogue and cooperative relationship between the federal and state authorities.
>
> Consultation and concurrence, by contrast, implies an ongoing dialogue and the development of a cooperative relationship between states and all relevant federal agencies .... Under this approach, the state effectively has a continuing ability to participate in activities and, if it deems appropriate, to prevent the continuance of federal activities. The IRG believes that such an approach will lead to a better protection of the states' interests than would a system of state veto, by which is usually meant that a state approves or disapproves of federal activities at one specific moment, as well as ensure effective state participation in the federal government's waste management program. (Report to the President, 1979)

Despite this description of the concept of consultation and concurrence there is a continuing disagreement over the exact meaning of "consultation" and "concurrence." The following discussion will explore some suggested definitions.

2.2 Consultation

The process of "consultation" involves coordination between the Department of Energy (DOE) and the states in the early stages of site characterization. Consultation with a state would require DOE to provide the state with all information ordinarily available to the public, such as environmental impact statements, as well as any specific information relevant to the site, including DOE criteria for evaluating the suitability of the site. After furnishing a state with all relevant information, DOE would be required to allow adequate time for the state to react to the proposal (Consultation and Concurrence, 1979).

Despite the fact that the consultation process appears to be a relatively straightforward concept, several states have enacted legislation to define their role in the early stages of site selection. One example of such legislation is the "Radioactive Waste Consultation Act," which was enacted in 1979 by the New Mexico State Legislature. This Act, which has the purpose of providing a "vehicle for legitimate state concerns," established a "Radioactive Waste Consultation Task Force" to negotiate on behalf of the state on all matters relating to the establishment of a nuclear waste repository within the boundaries of the state (Radioactive Waste Consultation Act, 1979).

2.3 Concurrence

There is widespread disagreement over the meaning of "concurrence" in the context of state participation in the process of siting a nuclear waste disposal site. At a minimum, it would seem that concurrence should involve an agreement between federal and state governments on the overall designs and site-specific plans for the proposed facility. But the procedure for concurrence must also entail broader provisions for dealing with the possibility that a state will not concur.

At the present time, there is no established procedure for resolving a

nonconcurrence stalemate. The federal government has expressed serious concern over the implications of granting veto power to the states (Cunningham, 1980), while the states appear to be equally concerned over the possibility that disputes will be resolved by federal fiat. Recent testimony by Dr. Worth Bateman, former Deputy Under-secretary for the Department of Energy, suggests that the current DOE policy is to allow states the right to veto the siting of a facility within their boundaries:

> We have proposed a consultation and concurrence process in an effort to obtain state cooperation during Phase I (next 5-16 years) and throughout the process (site selection and repository operation). If a policy of consultation and concurrence succeeds in getting to the point where a number of suitable options are available for selection as repositories, and a state refuses to concur in a DOE selection, one might ask whether the department would proceed anyway. Under current policy, the department would not proceed. (Bateman, 1979)

One potential difficulty with this policy is the possibility that all of the primary candidate states may eventually veto the proposed sites. DOE would then be faced with the prospect of locating the facility at a site in an unwilling host state or selecting no site at all.

Procedures for resolving federal-state conflicts are crucial, for they go to the very heart of the credibility and fairness of the consultation and concurrence process. Clearly, there is a need to establish formal channels for appeal or arbitration in order to avoid the pitfalls of the polar positions of federal supremacy and the state veto and to preserve the spirit of cooperation between the federal government and the states in resolving the nuclear waste disposal problem.

2.4 State Planning Council on Radioactive Waste Management

On February 12, 1980, President Carter announced the nation's first comprehensive radioactive waste management program and established a State Planning Council on Radioactive Waste Management to coordinate with the federal government on nuclear waste issues. The Council is responsible for providing general advice

and recommendations to the president and the Secretary of Energy on nuclear waste management issues (Executive Order, 1980). In addition to the State Planning Council, several other national groups are involved in the nuclear waste facilities. These groups include the National Conference of State Legislatures, the National Governors' Association Nuclear Power Subcommittee, and the State Working Group on High-Level Nuclear Waste Management.

3. Summary and Conclusions

Despite the highly controversial nature of the nuclear waste disposal issue, one overriding fact remains: even if all activities which generate radioactive wastes were halted immediately, the existing inventories of high-level radioactive wastes would continue to present a major disposal problem. The collective response of the states in solving this problem will be a major test of the concept of "cooperative federalism."

The "consultation and concurrence" concept has the potential for developing a cooperative relationship between the states and the relevant federal agencies for dealing with waste disposal issues. But the possible pitfalls of this process cannot be exposed fully until it is put into practice. Clearly, there is a need to establish procedures for ensuring public input into the decision-making process and for resolving intergovernmental difficulties resulting from a nonconcurrence stalemate. The following sections will focus on these and other issues and will offer some possible solutions.

REFERENCES

Bateman, Worth. Testimony. Committee on Interior and Insular Affairs, U.S. House of Representatives, June 28, 1979.

Consultation and Concurrence, Proceedings of the Orcas Island Workshop on Consultation and Concurrence, U.S. Dept. of Energy Office of Nuclear Waste Isolation (ONWI-87), September, 1979.

Cunningham, George W., Assistant Secretary for Nuclear Energy, U.S. Dept. of Energy. Testimony. Subcommittee on Nuclear Regulation of the Committee on Environmental and Public Works, U.S. Senate, January 23, 1980.

Executive Order 12192, Weekly Compilation of Presidential Documents, Vol. 16, No. 7, February 12, 1980.

"Radioactive Waste Consultation Act," 34th New Mexico State Legislature, 1st Sess., enacted April 6, 1979.

Report to the President by the Interagency Review Group on Nuclear Waste Management, U.S. Dept. of Energy (TID-29442/UC-70), March, 1979.

PART 2 - DESIGNING A CITIZEN PARTICIPATION PROGRAM FOR SELECTING A NUCLEAR WASTE DISPOSAL SITE

Susan G. Hadden

1. Introduction

Selection of a site for nuclear waste disposal poses many questions for a democracy. Many questions are so technical that it is difficult for citizens to understand them. The program itself is inequitable, imposing more costs on neighbors than on those more distant from the site. How can a decision be made democratically?

One important component of a democratic decision is public participation in the decision-making process. This paper describes a number of topics that are germane to designing a good participation program. For further insight, the works in the bibliography are recommended.

The paper is organized as follows: A brief history of citizen participation and its basis in groups (Section 2) shows that participation serves many, sometimes contradictory, purposes. Participation is based on information; Section 3 describes some problems in providing citizens with appropriate technical information. Section 4 presents several choices that are available to those designing a participation program -- choices of mechanisms, timing, and purpose. The conclusions (Section 5) suggest general characteristics of a good participation program.

2. History and Purposes of Citizen Participation

2.1 Democratic Theory

Democracy is rule by the people; by definition it requires some kind of citizen participation. Early theorists of democracy, the ancient Greeks, assumed that those who were citizens would participate in government by speaking at

councils, voting, and holding office. This model persists down to the present day, altered but slightly in the New England town meeting. The Founding Fathers also assumed that democracy required direct participation by citizens, especially at the local levels; activities of the nation as a whole would have to be conducted by representatives who could meet at one central place. Citizens were expected to participate in the selection of these representatives as well as to make their views known to them. A relatively homogeneous population with similar goals and lifestyles could be well served by a representative (Mayo, 1960).

2.2 Development of Groups

As the population grew in numbers and diversity, the old assumptions about direct participation became untenable. Americans had always tended to join groups -- de Tocqueville commented on this phenomenon in 1835 -- and groups took on added importance as intermediaries between citizens and government. Groups formed around specific political issues such as the gold standard, but also brought together people who shared common ethnic background, profession, sex, age, geography, school, or hobby, and many of these worked with and through political parties to attain those ends which were otherwise decided by government.

The diversity and strength of groups in American life led in the twentieth century to the development of a new theory of democracy -- the pluralist or interest group theory, which in its most extreme form holds that government policies were entirely the result of the push and pull of interested groups (Truman, 1951; Lowi, 1969). This theory has profound implications for democracy; for one, it suggests that unorganized citizens are disenfranchised.

Critics note a tendency in a system controlled by groups to delegate authority to the groups most directly affected by the relevant policy. For example, professional licensing is left to members of each profession, and many

matters of economic regulation to the regulated industries, because these groups are believed to have the best understanding of the technical aspects of the problems, even though the whole citizenry is affected by their decisions.

Other critics elaborated on Michels' "iron law of oligarchy" to show that group leaders often sought governmental actions that would benefit the organization of the group rather than furthering the group's stated goals. Thus, labor leaders might agree to a contract rather than have the union weakened from a very long strike, even though the contract provided poorly for individual members. These two criticisms of interest group pluralism suggest that groups are important means of representing the varied concerns of a heterogeneous population but that over-reliance on groups for policy-making can create serious inequities.

2.3 Citizen Participation Trends

The rise in demands for citizen participation in the twentieth century evolved in part from the realization that many people directly affected by government decisions were not represented in the making of those decisions, either because they were not organized into groups or because their groups were not included in the deliberations. There have been three kinds of participation movements in the latter half of this century: (1) attempts to include previously unrepresented citizens in the policy process, (2) demands for government openness, and (3) demands for participation in decisions with a significant technical content.

2.3.1 Involvement of Previously Unrepresented Groups

If the pluralist theory is correct, and groups constitute the most important basis for participation, unorganized interests can by definition not participate. Unorganized citizens typically consist of the poor and the poorly educated; in addition, very broad and diverse groups such as "consumers" also tend to remain

unorganized (Olson, 1965). The lack of organized groups among the poor became especially noticeable during the early 1960s, when the Great Society sought to involve beneficiaries in the design of some programs. The political remedy for this problem consisted of helping to organize groups and create leadership within them, often through the creation of community advisory panels (Marshall, 1971).

2.3.2 Open Government

Another reason that citizens could not participate in government was that frequently they were unaware that decisions were to be made, or that meetings were to be held. The Administrative Procedures Act of 1946 was an attempt to open the regulatory process to people not in the regulated industry by requiring agencies to give public notice and offer opportunities for comment on regulatory procedures. In the 1970s, sunshine and freedom of information acts at both federal and state levels expanded on the idea of government openness by ruling that decisions reached outside public meetings are not binding and by requiring that all government bodies give notice of meetings, keep records of them, and make information available to citizens.

2.3.3 Effects of New Technologies

Finally, in the 1970s, public interest expanded to include concern for the effects of new technologies and for policies with a scientific or technical component. The passage of some twenty laws covering subjects as diverse as highway safety and pesticides demonstrates that public concern. Many of these acts include provisions for public participation in decision-making, whether at the local, state, or federal level. For example, the Federal Water Pollution Control Act of 1972 requires that the public actively participate in "the process of setting water quality requirements and in their subsequent implementation and enforce-

ment." Since 1970, over 125 programs have been mandated by Congress to provide for public participation (ACIR, 1979).

In order to participate effectively in these kinds of programs, citizens found that they needed technical information. They could not assess environmental impact statements, for example, without technical information, nor determine whether pollution standards were adequate for protection of health or consistent with continued economic growth. The provision of policy-relevant technical information to citizens remains an unsolved requirement of current policy-making; this problem is discussed below in detail.

2.4 Purposes of Participation

This brief history of participation in the United States suggests that public participation in decision-making serves a variety of purposes in a democracy. Table 1 provides lists of purposes that different commentators have discerned; they range from informing citizens to altering existing patterns of power. These diverse purposes can be encompassed in two general purposes of citizen participation:

1. to allow citizens to affect government decisions; and
2. to encourage citizens to accept government decisions.

The two purposes also reflect the differing goals for participation held by citizens and officials, respectively. For the latter, participation only pays off if it results in support. There is a strong temptation for officials to define support in terms of the existing or bureaucratically-preferred program, whereas the kind of support implicit in participation theory results from a public perception that citizens helped to frame policy.

Not only do citizens and officials have different motives for supporting participation programs, citizens may differ among themselves on the purposes. Many seek a permanent redistribution of power through participation, which brings

TABLE 1. Purposes of Citizen Participation

ACIR (Advisory Commission on Intergovernmental Relations)

- Give information to citizens
- Get information from and about citizens
- Improve public decisions
- Enhance acceptance of public decisions
- Supplement public agency work (through volunteers)
- Alter political power patterns
- Protect individual and minority group rights and interests
- Delay or avoid difficult public decisions

DOE National Radioactive Waste Plan

- Provide information
- Improve decisions
- Achieve understanding of the decision process
- Gain public acceptance

Rosener

- Generate ideas
- Identify attitudes
- Disseminate information
- Resolve conflict
- Measure opinion
- Review a proposal
- Serve as safety-valve for pent-up emotions

Sources: ACIR (1979)
National Plan (1981)
Rosener (1978)

into the policy process the erstwhile powerless -- the poor, the consumer, or the environmentalist (Arnstein, 1975; Marshall, 1971). Others seek only to ensure that a particular policy outcome is acceptable. In either case, it may happen that once a group has been included in the decision-making process, it will find that it would like to exclude others just as it was previously excluded.

Designing a participation program that will fulfill these conflicting purposes will be difficult if not impossible. The discussion in Section 3 will suggest that public support of any policy related to nuclear power is weak because of public perceptions of the risks entailed. In place of agreement on the substance of the decision, therefore, perhaps the best that can be achieved is acceptance of the process by which the decision is made. Public participation should increase citizens' beliefs that the process is fair and help to legitimize decisions. This suggests that the overriding purpose of participation in the case of selecting sites for high-level nuclear waste disposal is to allow citizens to affect decisions -- the citizen-oriented goal. Officials will only want to accept a participation program, then, if they are convinced that it will ultimately lead to public acceptance.

2.5 Costs and Benefits of Citizen Participation

Both parties -- officials and citizens -- will accept a public participation program only if its benefits exceed its costs. Table 2 summarizes some costs and benefits of public participation programs. Different people and groups will weigh these factors differently.

For those who place great value on rational decision-making, the disruption in the routines of bureaucracy that citizen participation causes may be most disturbing (Kweit and Kweit, 1980). For those who value participation, the unrealistic expectations raised that future decisions will always be in the interests of the participating groups are a most serious cost of such programs.

TABLE 2. Costs and Benefits of Public Participation

Benefits	Costs
Fulfills rights of citizens	Requires time
Provides a check on government	Requires money
Allows priorities to be set	Reduces decision-making efficiency
Encourages leadership development	Reduces rationality of the decision-making process
Puts emphasis on issues rather than party loyalty	Requires organization or representation of the unorganized
Brings citizens in closer contact with government -- reduces alienation	Increases conflict by bringing in new viewpoints
Encourages citizens to accept government decisions	

One aspect of participation programs that almost everyone has found disappointing is the tendency for participation programs to be most effective for middle class, educated citizens. Bureaucrats find it easier to work with people like themselves who are generally able to understand their technical language and who can work within the organizations' routines. Thus, some observers feel that the expansion of citizen participation in the 1970s has resulted in increased representation of certain limited constituencies but has neither fundamentally altered the distribution of power nor created a system that is truly accessible to all citizens (Kweit and Kweit, 1980; Rosenbaum, 1976).

2.6 Summary

Citizen participation is an integral component of democracy. Direct participation is relatively easy in small, local groups, but representatives are needed when the number of people and geographic scope expand. Groups often serve as intermediaries between individuals and government, and group representatives often participate in policy-making on behalf of their members. Over-reliance on groups may undermine democracy by leaving out unorganized citizens and by delegating authority to only some of those affected by decisions. Citizen participation serves both government and citizen by allowing decisions to be made that will be acceptable to citizens and supported by them, but conflicting purposes for participation make design and evaluation of specific programs difficult.

3. Information for Public Participation

Citizens cannot participate in public decision-making without various types of information. This section distinguishes three kinds of information and examines in more detail one which is especially crucial to nuclear waste decision-making. The discussion then turns to limits on the reliability and pertinence of available

information and to some examples of similar instances in which information was provided to citizens.

3.1 Types of Information

Goal-opinion information is an expression of concern usually directed from citizens to government. This was the type of information that concerned the disenfranchised groups who felt they should have some input to programs for which they were the intended beneficiaries, as in the Community Action Program. Goal-opinion information embodies the goal of making policies acceptable to citizens by making them feel that their voices have been heard.

Process information elucidates the way in which policy is to be made. It describes places, dates, and times of meetings or ways in which decisions will be reached. In some sense, it is the opposite of goal/opinion information, since it is virtually always directed from government to citizens and is very specific.

Substantive information is factual information that forms the basis of policy. It often includes statistics that describe a problem and information about causes and effects that suggest how to solve problems. Substantive information is a special concern to citizens now, since so many policy decisions exhibit a significant technical content. Nuclear waste disposal siting is a clear example; substantive information necessary to make an informed policy is drawn from many areas, including geology, physics, engineering, economics, sociology, and political science.

All three types of information are important to participation, and none stands alone. For example, citizens may be well-provided with substantive information but they will be ineffective unless they know how to deliver that information to the right decision-makers in a timely fashion. Indeed, the history of citizen participation in the United States in the latter part of the twentieth century can be viewed as an attempt to expand the scope of information that is considered rightfully to

belong to citizens -- first goal/opinion, then process, and now substantive. Because the demand for substantive information has only recently become widespread as a result of the environmental and consumer legislation of the 1970s, our society has not yet solved the problem of how to provide relevant information to citizens, nor are all participants agreed on the amount or type of information that must be provided. Since substantive information is so important to present decisions and since its use presents some unresolved problems, it is considered in greater detail in the following subsections.

3.2 Role of Substantive Information In Participation

The literature on citizen participation is nearly unanimous in the opinion that information increases the effectiveness of participation (Goodman, ND; Berry, 1977, Gormley, 1980; Caldwell, 1976; Ebbin and Kasper, 1974). Although the authors do not make the distinction themselves, it is clear from their examples that they refer primarily to substantive information. Why is substantive information so special for citizens?

One reason that information is such an important resource for citizens' groups is that it increases their similarity to the policy-makers with whom they must work by giving them a shared language and knowledge base. The literature on technology transfer emphasizes the increased receptivity to new methods that occurs if they are purveyed by similar people (Rogers, 1971). The same is true for decision-makers. A recent article on the relationships between bureaucrats and citizens states explicitly that "the more citizens appear to conform to the premises of bureaucratic decision-making, the greater the likelihood that they will have an impact." In particular, "the higher the perceived citizen expertise, the higher the (bureaucratic) tolerance for citizen participation" (Kweit and Kweit, 1980). Expertise comes only from possession of substantive information.

A related reason is that only substantive information provides a medium of exchange common to both bureaucrats and citizens. As Table 3 suggests, the other types of information belong primarily to one side or the other. Substantive information is equally valuable to both sides, however, and thus possession of it makes citizens equal participants in the policy process.

Substantive, technical information is often used to justify policy decisions that have in fact been made on other bases (Hadden, 1977; Primack and von Hippel, 1974). Sometimes technical disputes may be used to divert attention from more value-laden and less easily resolved aspects of a policy decision (Nelkin, 1971). Selective presentation of facts may also make a decision appear to be better than it is (Nelkin and Pollack, 1979). Citizens, who are increasingly skeptical of government, know this and seek ways of obtaining full and impartial information so that they can assess governmental claims that are made on the basis of technical data. Governments have an incentive to provide this information so that citizens will accept policies based on it. Methods for providing citizens with this information are discussed in Section 4.1 and 4.5.3.

3.3 Information About Risk and Probabilities

Substantive information has become especially important to citizens because so many policies have a significant technical or scientific component. This is true of a wide range of policies, including those concerning the economy, the environment, energy, and taxation. Many of these policies are related to new technologies that are thought to present possible risks to users or society in general.

Information regarding risk and policies regulating hazardous activities, however, presents special difficulties to lay people. The sources of these difficulties are: lack of knowledge, use of probabilistic data, and disparities between lay and expert perceptions of risk. These are treated in turn.

TABLE 3. Characteristics of Information

Information Type	Direction	Example	Value
Goal/opinion	Citizens → Officials	We don't like having our children sick from the chemicals buried in the ground.	Low (Symbolic?)
Process	Citizens ← Officials	The City Council will consider the application for a toxic waste disposal site at its February 6th meeting. You may write a letter or sign up by Feb. 5 to speak at the meeting.	High to Citizens Low to Officials
Substantive	Citizens ⇄ Officials	Exposure to this chemical in doses as small as one part per billion causes loss of muscle control. Exposures at this level are common among children who play in Fields' Meadow, which appears to be a former disposal site for the chemical.	High

Source: Hadden (1981).

3.3.1 Lack of Knowledge

In devising policies to treat new technologies, we are often hampered by the fact that we simply do not know many important facts. For example, no one realized how persistent DDT would be until it had been in widespread use for many years (Dunlap, 1981). We still do not know whether increased use of hydrocarbons might result in increased ambient temperature through a "greenhouse effect."

In the face of scientific uncertainty, experts often disagree. It is very difficult for laypeople to assess the reasons for the disagreements and to choose among the experts' interpretations, which are often based on a "feel" for a situation stemming from long experience. For this reason, experts often think that it is inappropriate or misleading to provide information to citizens. On the other hand, some commentators argue that in these situations experts have no better standing to make decisions than do lay people, although they do have an obligation to publicize both the agreed-upon facts and the sources of their disagreements. One example is the Swedish program for developing a HLW management policy, in which scientists representing different positions were recruited to write a joint paper with the aid of a mediator in which were detailed: (1) areas of agreement; (2) areas of disagreement; (3) reasons for disagreement on each point; (4) additional information required to resolve the disagreement (League of Women Voters, 1980).

3.3.2 Use of Probabilistic Data

Determinations of risk are usually made on the basis of either epidemiological or laboratory data. In both cases, statistical inference is used. This means that causal relationships (or the lack of them) can be inferred but can never be proven; this situation can be exploited for political reasons. For example, industry scientists hoping to forestall Congressional action kept stressing that the relationship between smoking and cancer was not proven, even though the statistical

relationships were overwhelming (Reiser, 1966). In the case of carcinogenic substances, laboratory tests on animals are used to infer whether a substance will be carcinogenic in humans. Probabilities or other kinds of risks, for example the likelihood of an accident at a nuclear power plant, are determined through the use of "scenarios" and by multiplying together through a fault tree the likelihoods of smaller events that would lead up to the catastrophe. In each case there are sources of error in estimating individual probabilities or in considering synergistic (complementary interactive) effects; some critics have postulated discrepancies between risks estimated in this way and real risk at a thousandfold or more (Kendall and Moglouer, 1975).

Experts looking at probabilistic data may disagree about a number of factors, including the acceptability of the methods by which the data were obtained and the interpretation of the results. These technical disputes are difficult for laypeople to understand or resolve. In addition, laypeople are poor at estimating probabilities of events. Gamblers, for example, are known to behave as if a long run of red increases the likelihood that black will turn up next, even though in reality each spin of the wheel is an event completely independent of any other spin (Twersky and Kahneman, 1974). Lay perceptions of risk are thus distorted by poor estimates of the likelihood of events as well as by complexities of probabilistic data.

3.3.3 Assessment of Risk

Experimental psychologists have discovered and documented a series of systematic perceptual biases that cause laypeople to estimate risk incorrectly. We have already mentioned the "gambler's fallacy;" a similar problem is termed the "availability bias." When some event makes a hazard highly memorable or imaginable -- examples include the vivid film "Jaws" or the events at Three Mile Island -- people believe that the likelihood of injury is higher than it really is

(Twersky and Kahneman, 1974).

Another set of perceptual biases is related to characteristics of the risk. Other things being equal, individuals will perceive a risk that is involuntary, uncontrollable, unfamiliar, or unpredictable or that has delayed consequences as "more risky" than a similar risk that is voluntary, controllable, familiar, or predictable or that has immediate effects. Certainty of death is another important determinant of individual perception; the more certain is death from exposure to an event, the more risky it is perceived to be, even when the probability of the event is extremely low (Fischhoff, 1977).

The size and specificity of the affected population is another characteristic that appears to affect public perception. People seem to be more willing to tolerate "statistical risks" to unknown individuals (one in 1,000 automobile drivers, for example) than similar risks to clearly defined populations such as residents of a particular location or workers in a specific industry. A risk bias that seems to have increased in recent years is fear of cancer and carcinogenic agents. Activities suspected of causing cancer are viewed with trepidation even if the probability of occurrence is quite low (Hadden, 1980).

All these perceptual biases work in the same direction in the case of nuclear power. It is often perceived as more risky by laypeople than by experts because it is unfamiliar, unpredictable, largely involuntary, and uncontrollable. Furthermore, risks are assumed to fall on people near the site, an identifiable population. Finally, the risks involved in nuclear accidents involve not only cancer, but potential damage to the reproductive cells which cause damage to future generations. Thus, selection of sites for any nuclear facilities will be perceived as unacceptably risky by many people (Slovik, 1978).

When individuals inaccurately estimate risks, they press government to allocate resources inefficiently. That is, they ask governments to spend a large

sums of money alleviating low-probability, low-cost events (such as individuals being eaten by sharks) at the expense of others (such as automobile safety) that would bring much greater benefits for the same investments. Some experts believe that this is an argument for minimizing public decision-making. On the other hand, some analysts believe that governments should respond to citizen perceptions of risk even if these are inaccurate; the psychic relief to citizens provides an important political benefit, which is especially important since even expert estimates of risk are fraught with uncertainty (NRC, 1979).

3.4 Resolution of the Information Problem

The difficulties citizens have in assessing and acting upon substantive information, especially substantive information about risk, suggest that merely providing substantive information will not serve either of the purposes of public participation -- allowing citizens to affect policy and encouraging them to accept policy. It has been suggested that when decisions must be made about subjects on which there is lack of knowledge, disagreement among experts, and technical complexity, citizens will accept policy decisions if they believe that the process by which those decisions are made is a good one (Zeckhauser, 1975). This solution does not relieve governments of their obligation to provide technical information to citizens; on the contrary, the following discussion suggests that it increases this obligation by requiring that governments provide citizens with both information and technical assistance to help them understand that information. However, the procedural solution also underlines the importance of the other types of information, since both process information and goal/opinion information are critical components of a legitimate decision-making process. While there are many components of such a process, citizen participation is one important aspect; we turn now to the choices involved in designing an acceptabe participation process.

4. Design of a Participation Program

Implementation of many citizen participation programs over the last several years has provided a variety of models from which to choose. The experiences in these programs suggest that each participation mechanism is most useful for a particular purpose, and that no mechanism is useful for all purposes. This section presents a series of choices that must be made in designing a public participation program, along with some information that has been gathered about the advantages and drawbacks of each choice. The choices to be made fall into three categories: purposes and related mechanisms, participants, and timing. In addition, three programs to increase the effectiveness of public participation are described.

4.1 Purposes and Mechanisms

Two major purposes of public participation were distinguished in Section 2.4: encouraging citizens to affect public policy and to accept public policy. Table 1 presented a variety of additional purposes which fall into either or both of these general categories. The purposes of a participation program are important because they determine many of the choices in its design; certain participation mechanisms are most suitable for fulfilling certain purposes. Several possible purposes are listed without comment, and appropriate mechanisms are discussed.

4.1.1 Information Provision

One "universal purpose of participation programs is the provision of information" (ACIR, 1979). All three sources for Table 1 mention this purpose, since information is the basis of both citizen input and citizen acceptance of policy. In this discussion, most references are to substantive information; the other types are specifically designated.

Although much of the information about nuclear waste disposal sites is subject to the difficulties outlined above -- technical uncertainty, unpredictability, risk assessment -- there is a great deal which is known. Peoples' perceptions of risk tend to be quite stable over time, and may well not be altered by provision of technical information (Slovik, 1978). However, if this information is not provided, there will be those who will interpret this as a "cover-up" and an admission that the information is unfavorable. In providing information, it will be important to admit that there are gaps in knowledge and to explain how these may be interpreted (see Section 3.3.1).

Table 4 presents several information-provision mechanisms. These have been divided into three categories, which emphasize the fact that information is often provided in ways that either direct the flow of information to citizens who are already interested (open meetings) or that are one-way communications and therefore may seem to be propaganda. A few forms of information provision are designed to encourage or permit interaction between citizens and government, although all of these require the citizens to take the initiative in seeking information.

One important aspect of information concerns the provider. Information may be provided by scientists or laypeople, either of whom may be associated with or independent of the government. Information is probably more authoritative coming directly from the appropriate expert. Often, however, experts have difficulty communicating with laypeople in understandable language (Primack and von Hippel, 1974). In addition, complex issues such as nuclear waste disposal draw on many diverse fields of expertise; it is difficult for citizens to make use of information presented in bits and pieces. What seems to be required is a generalist with some expertise in a wide range of applicable subjects who is also trained to talk to laypeople. Few of these talented individuals exist, but it is possible to train them;

TABLE 4. Participation Mechanisms

Information Provision

citizens receive information; government active

- mass media
- displays and exhibits
- publications
- direct mailings
- advertisements

citizens seek information; government passive

- open meetings
- open records
- hot-lines

citizens and government interact

- drop-in centers
- speakers bureaus
- conferences

Information Collection

- public hearings
- surveys
- citizen advisory committees
- citizen members of decision-making bodies
- referenda
- interactive cable balloting

Conflict Resolution

- focused group discussions
- plural planning; design-in; fishbowl planning
- role-playing, simulation, Delphi, nominal grouping; charrette
- arbitration and mediation
- ombudsmen
- value analyses
- workshops; task forces

Citizen Input Improvement

- citizen employment
- citizen honoraria
- citizen training
- community technical assistance

Sources: ACIR (1979)
Rosener (1978)
EPA (ND)

one important attribute is that they know when to say they do not know and where to obtain that missing information (Primack and von Hippel, 1974).

It is well known that policy-makers are likely to accept advice from technical experts only if they trust the individual advisers. Expertise alone is not sufficient (Cahn, 1971). There is reason to expect that citizens and citizen groups have the same attitude. This situation means that agencies cannot assume that if they provide information, citizens will feel satisfied; rather, citizens may feel that they are receiving only part of the information. A program in the National Science Foundation, the Science for Citizens program, is one attempt to provide citizen groups with "their own" scientists. Paid directly or indirectly through the program, the scientist is free to work within the group itself and to gain the trust that is necessary to ensure that his information is understood and acted upon (Section 4.5.3).

4.1.2 Information Collection

Many participation activities involve collecting information from citizens, such as determining which citizens consider themselves to be affected by a program, assessing attitudes toward the proposed policies, exposing new alternatives, and discovering new substantive information. Information collection also serves both major purposes of citizen participation.

Table 4 presents several mechanisms especially suited to information collection. The interactive activities for information provision can also be used to obtain information. Of the mechanisms, public hearings are perhaps the most widely used; indeed they are specified by several of the laws that require public participation. Public hearings are often regarded as token participation by citizens, however, because they often occur late in the policy process, are only advisory in nature, are

poorly publicized, and may be dominated by vocal minorities (Checkoway, 1981). Surveys are another important form of information collection; they have the unique attribute of obtaining views from the unorganized or even uninterested citizen who is nevertheless affected by the policy (Milbrath, 1981). Surveys, however, are expensive, time-consuming, and subject to an unusual number of methodological and procedural traps.

Citizens advisory committees are another popular way of obtaining information from citizens; they serve a subsidiary purpose of providing information to some citizens, who ideally will in turn disseminate it further. Advisory committees can be very effective in clarifying goals, in increasing access to decision-makers by at least some citizens, and in facilitating feedback. They are, however, very time-consuming, and, being only advisory, may not be highly regarded by citizens. Equally important, the composition of the committee may reflect an overreliance on organized groups who fight to ensure a place, with consequent over-representation of views that already have organized access to the policy process.

4.1.3 Conflict Resolution

Most citizen participation occurs when there is disagreement about a policy. Resolving conflict can enhance public acceptance. Table 4 shows some methods of resolving conflict that have been used in public participation activities. In addition to these, citizen advisory groups and public hearings may on exceptional occasions help to resolve conflict. Arbitration and mediation are techniques that have been adapted from the labor movement. But selection of the mediator can be very difficult, and arbitration may leave a great deal of residual resentment among those who feel they are the "losers." Most of the other techniques are different types of small-group activities in which representatives of citizens, government,

and other interests attempt to work out acceptable compromises. Typically, each party is encouraged to articulate its goals, weigh them, discuss them with the other parties, seek answers to factual questions that arise, and finally reach some agreement through an iterative process. Small group activities are very time-consuming and expensive. They also suffer from difficulties in selecting participants who are representative of all relevant groups and points of view. However, these exercises seem to be the most successful of all participation methods for reassuring all parties that their views were considered in arriving at a decision (Arnstein, 1975). The ombudsman serves as an intermediary between citizen and government and attempts to resolve problems before they become the object of full-scale participation activities.

4.1.4 Citizen Input Improvement

Many of the methods we have discussed so far require the use of considerable resources by citizens. They may have to take time off from work to attend a hearing, purchase a document, get a babysitter to come to a weekend conference, and so on. A variety of techniques have been developed to enhance citizens' abilities to participate. Although some enhance the organizational strengths of groups, many of these involve direct payments to citizens. The Environmental Protection Agency's guidelines for citizen participation show that payment of travel allowances and per diem to attend public hearings and conferences are widely accepted, while similar payments to participate in adjudicatory procedures are banned by Congress (Federal Register, Vol. 46, p. 5739; Jan. 19, 1981). Conflict-resolution techniques may also be employed within groups to give them the power in the policy process that comes from unanimity. Holding meetings in the evening or in locations near affected publics also promotes access.

4.1.5 Other Purposes

Although there are many other purposes of citizen participation, most may be related to the ones already discussed. Table 5 provides one analyst's list of techniques and their associated purposes (the Appendix includes brief descriptions of the techniques).

4.2 Designation of Participants

An important choice facing designers of a participation program is to determine who will be encouraged to participate and who will be provided information. Most programs attempt to involve the "affected public" but it may be difficult to determine who they are. Three questions concerning participants will be considered here: who should participate (individuals or groups), what is the role of states, and who is affected.

4.2.1 Individuals and Groups

There are a variety of participation activities that are individual, including voting and attending meetings and hearings. Many activities, however, are based on representation of groups, including most of the techniques for resolving conflict, since they are based on small-group interactions and could not work for large numbers of individuals.

The history of participation at the beginning of this paper suggests that a group basis for participation is inevitable in a citizenry that is large, heterogeneous, and geographically diffuse. The critiques of interest group liberalism point out the dangers in relying too exclusively on groups, however. In designing participation programs, it is important to ensure that groups which are not powerful and citizens who are not organized have at least some opportunity to participate. Since some participation mechanisms are most appropriate for

TABLE 5 Technique/Function Matrix and Descriptions

Technique	Identify Attitudes and Opinions	Identify Impacted Groups	Solicit Impacted Groups	Facilitate Participation	Clarify Planning Process	Answer Citizen Questions	Disseminate Information	Generate New Ideas and Alternatives	Facilitate Advocacy	Promote Interaction Between Interest Grps.	Resolve Conflict	Plan Program and Policy Review	Change Attitudes Toward Government	Develop Support/ Minimize Opposition
Arbitration and Mediation								X		X	X			
Planning	X			X	X	X		X		X	X	X	X	X
Charrette	X			X	X	X	X	X			X	X	X	X
Citizen's Advisory Committee	X		X	X	X	X	X	X				X	X	X
Citizen Employment	X		X	X	X						X	X	X	
Citizen Honoraria				X										
Citizen Referendum	X													
Citizen Representatives on Policy-Making Bodies	X			X	X			X				X	X	X
Citizen Review Board				X								X		X
Citizen Surveys	X		X											
Citizen Training				X	X				X				X	
Community Technical Assistance	X			X	X			X	X					
Computer-Based Techniques	depends on specific technique chosen													
Coordinator or				X	X	X				X	X		X	X
Coordinator-Catalyst												X		X
Design-In	X	X		X	X	X		X						
Drop-In Centers		X		X	X	X						X	X	X
Fishbowl Planning				X	X	X	X	X			X	X	X	X
Focused Group Interview	X		X	X		X				X				
Game Simulations					X					X		X		X
Group Dynamics										X	X		X	
Hotline		X		X		X								

(continued on next page)

TABLE 5. Technique/Function Matrix and Descriptions (continued from previous page)

Technique	Identify Attitudes and Opinions	Identify Impacted Groups	Solicit Impacted Groups	Facilitate Participation	Clarify Planning Process	Answer Citizen Questions	Disseminate Information	Generate New Ideas and Alternatives	Facilitate Advocacy	Promote Interaction Between Interest Grps.	Resolve Conflict	Plan Program and Policy Review	Change Attitudes Toward Government	Develop Support/ Miminize Opposition
Interactive Cable TV	X	X	X	X			X	X				X		
Meida-Based Issue Balloting	X			X		X	X					X		
Meetings - Community-Sponsored	X		X	X	X	X	X	X				X		X
Meetings - Neighborhood	X		X	X	X	X	X	X				X		X
Meetings - Open Informational			X		X	X	X					X		
Neighborhood Planning Council	X			X				X	X			X		
Ombudsman		X			X	X	X					X	X	
Open Door Policy		X		X	X	X	X					X	X	
Planning Balance Sheet	X											X		
Policy Capturing	X													X
Policy Delphi	X							X						
Priority-Setting Committee	X			X								X	X	
Public Hearing		X	X	X		X	X					X		
Public Information Programs					X		X					X	X	
Random Selected Participation Groups	X		X	X				X	X			X		
Short Conference	X			X	X	X	X	X		X	X	X		X
Task Forces			X					X				X	X	X
Value Analysis	X			X								X		X
Workshops	X		X	X	X			X		X	X	X	X	X

Source: Rosener (1978).

individuals and others for groups, one solution is to adopt a mix of techniques.

4.2.2 The Role of States

Many discussions of the process for selecting nuclear waste disposal sites, including statements by the National Governors' Association and the State Planning Council, suggest that the states tend to be more responsive to citizens' interests than does the federal government. This is because states are smaller and have established systems for citizen access to officials. The states have therefore sought to be included directly in the site selection process.

There is no doubt that the states should be included in the site selection process. This inclusion, however, cannot be substituted for other participation mechanisms that are based on individual or group participation or on local governments. State political systems may deny access to affected groups, are too diverse to be able to claim to represent all citizens, and often are unusually responsive to special interests because of the part-time status of their legislators (Weber, 1975). Officials of small localities, on the other hand, tend to follow the wants of their constituents, because they are more directly accountable. States have no more resources for conflict resolution than other levels of government, and like citizens and localities, often lack the highly specialized technical staffs needed for strong participation in nuclear waste disposal siting. Thus, states are important participants in decision-making but cannot be relied upon as the exclusive channel for local, group, or individual participation.

4.2.3 Affected Parties

Perhaps the most difficult question facing designers of any participation program is the determination of which citizens are most strongly affected by government action in order to ensure that they are included in decision-making.

One possible purpose of participation programs is to find out which citizens consider themselves to be affected. As noted above, often special consideration must be given to finding unorganized interests (such as consumers or people who live near a selected site) or groups with limited resources to ensure that they participate. It is possible to design a phased participation program in which efforts are first directed toward finding and mobilizing affected citizens and then including all of these in a process leading to a policy decision. Some analysts believe, however, that citizens will organize if they are closely enough affected by a policy, so that officials do not need to attempt to mobilize citizens. This development seems likely for site selection -- so long as decisions are well-publicized, concerned citizens will probably take some initiative.

For purposes of most programs, including all citizens who feel that they are affected by a decision may pose more complex problems. By its very nature, selection of a site imposes particularly strong effects on those near to the site, while those living at a distance are less strongly affected. When the site is to be chosen for a beneficial facility, the economic market works well, since potential beneficiaries will provide incentives to decision-makers in proportion to the benefits they expect to receive. When, however, the facility (such as one for storing hazardous materials) may impose costs on local residents greater than the benefits to be received, the market breaks down (a scheme for overcoming this market breakdown is discussed in Section 4.5.1). Since everyone living at a distance has a strong incentive to select one particular site, there is a danger that the majority might, to use Madison's phrase, tyrannize the minority. However, institution of a veto over a site by local groups most closely affected could result in all sites being vetoed.

The difficulty of structuring a participation process that gives weight to those most closely affected without giving them veto power is exacerbated in the

case of nuclear facilities since there is a vocal national constituency that opposes all nuclear power development and that can be expected to consider its interests to be directly affected by all nuclear siting decisions. What kind of standing should this group have in public participation programs, especially in programs whose major purpose is to include residents of the area nearest to the site in site selection procedures?

One solution to this difficulty defines a series of decisions that have narrower and narrower geographical impacts. As the scope of the decision becomes narrower, the weight given to local interests increases. A statute recently adopted by the State of Michigan that establishes a process for selecting solid waste disposal sites illustrates this concept. The statute creates a state-wide body, including representatives of various governmental, industrial, and environmental interests, to determine state-wide policy, including site-selection criteria and survey of potential sites. As the process narrows to a few sites, representatives of affected localities are added temporarily to the policy-making body (Act 64 of 1979, Hazardous Waste Management Act). Kai Lee (1980) has suggested a similar concept for nuclear waste disposal (described in Section 4.5.2).

The purpose of these plans is to ensure standing for all groups in those issues that most concern them. Thus, all groups would be involved in site-selection criteria and design of the public participation program. When one or more states are designated as potential sites, extra representatives from the state(s) would be included. As localities within the states were designated, people from those places would be placed on the decision-making body or on advisory panels. National interests would not be dropped from the latter stages, but narrower local interests would be added, thereby giving them greater weight.

This procedure does not address two important concerns: selection of local groups and domination of proceedings by a vocal minority. Although all national

interests would be included in early deliberations, there is some concern that even local proceedings would be dominated by outsiders with particular opinions to express, especially anti-nuclear groups. There is very little evidence that would allow assessment of the likelihood of this happening. A study of the demonstration at Seabrook, New Hampshire by the anti-nuclear group Clamshell Alliance, shows that an overwhelming majority of the participants came from the New England states and New York, within a couple of hundred miles of the demonstration site (Katz). A study of the anti-nuclear demonstration in Washington, D.C., in 1979, a demonstration that was intended to be national in scope, shows that about one-third of the participants came from within 100 miles of Washington, while another third came from distances of 300 to 600 miles. People from farthest away tended to belong to organized groups that travelled together in buses (Van Liere, 1981). Although this evidence is equivocal, it seems unlikely that masses of outsiders would appear at local hearings. Furthermore, without disenfranchising these interests, it is possible to design participation mechanisms that would not include people from outside a specific geographic area -- small-group workshops, for example -- and to include these along with mechanisms such as public hearings from which the national constituency would not be excluded.

4.3 Timing of Participation

The decision-making process occurs in stages. Figure 1 shows the major stages in the process for selecting a site for high-level nuclear waste disposal. At which stage should public participation occur?

In order for participation to be effective, it must occur early enough in the policy process that it can have some effect on the decision. If citizens are not included from the very outset, many alternatives which citizens might prefer may be discarded for organizational or technical reasons. There are many studies of

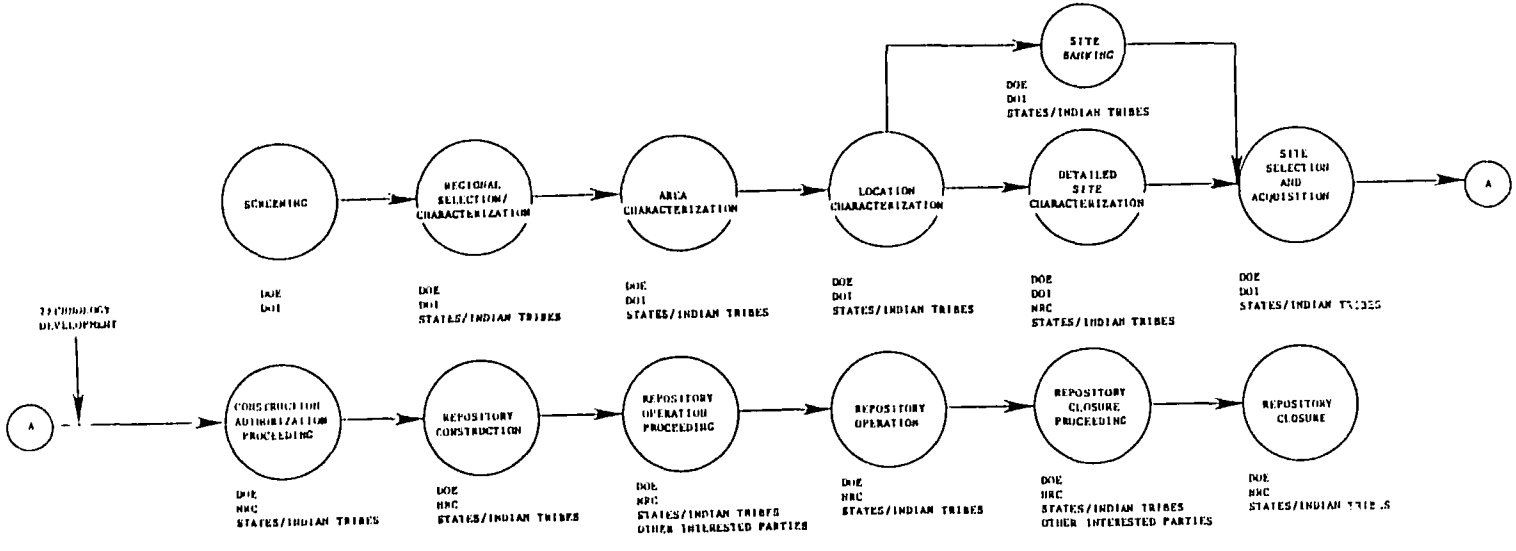
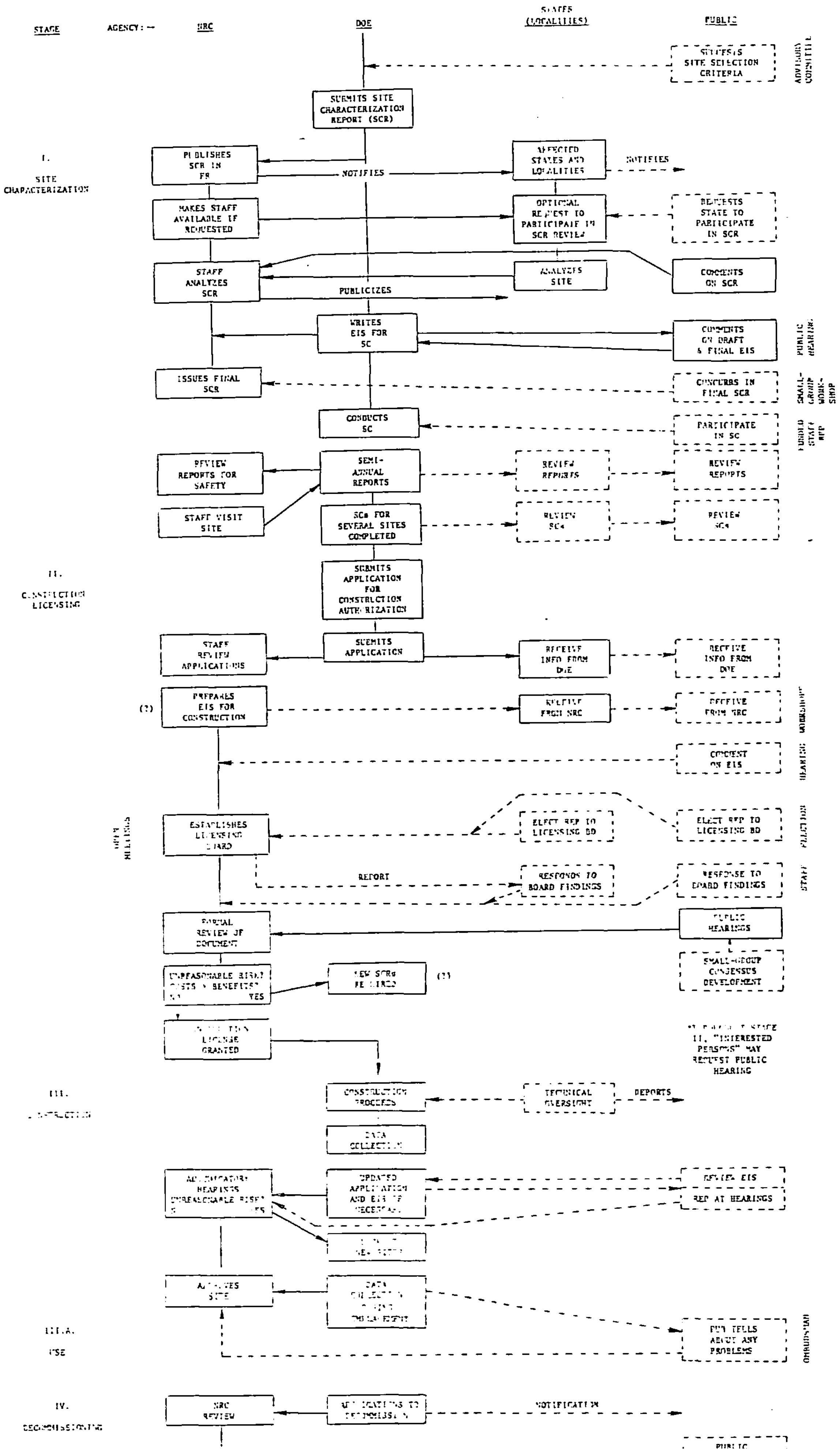


FIGURE 1. High-Level Waste Repository Site Selection Process

cases in which citizens were forced to react to decisions already made rather than participating in them from the outset, with results that often destabilized the political system (Caldwell, 1976). Given the complexities of the issues and the public perception of the unacceptability of the risks entailed in nuclear waste disposal, it seems unlikely that pro forma or reactive planning will be sufficient to gain public acceptance.

The first stage in the site selection process requires that EPA establish general criteria for disposal of nuclear wastes and specific standards for disposal of nuclear waste. In this criterion-development phase, there is opportunity for public participation. EPA can hold regional public meetings, make use of advisory committees, and conduct a public information program. EPA especially needs to ensure that anti-nuclear groups, including technically sophisticated ones such as the Federation of American Scientists, are included in development of criteria. At the same time, the DOE is developing a National Plan for Nuclear Waste Management. It has provided for a variety of kinds of public input including public comments, information surveys, regional public meetings, sponsored critiques from diverse groups, and advisory committees (National Plan Draft IV).

Figure 2 shows the points in the site licensing procedure outlined by the Nuclear Regulatory Commission in December 1979, and in February 1981, at which public participation could be instituted. Solid arrows and boxes show currently-mandated public involvement, while dotted arrows show potential additional points for involvement. Appropriate mechanisms for achieving participation are also indicated. The NRC has indicated that it plans to open to the public all meetings concerning waste disposal, so this mechanism is not mentioned in the figure. The NRC regulations do not make specific mention of the public participation pertaining to the National Environmental Protection Act (NEPA); however, draft EIS's must be made available to the public along with opportunity to comment, and


STAGE
AGENCY:
NRC
DOE
STATES (LOCALITIES)
PUBLIC
SITE SELECTION CRITERIA
SUBMITS SITE CHARACTERIZATION REPORT (SCR)
I.
SITE CHARACTERIZATION
PUBLISHES SCR IN FR
NOTIFIES
AFFECTED STATES AND LOCALITIES
NOTIFIES
MAKES STAFF AVAILABLE IF REQUESTED
OPTIONAL REQUEST TO PARTICIPATE IN SCR REVIEW
REQUESTS STATE TO PARTICIPATE IN SCR
STAFF ANALYZES SCR
ANALYZES SITE
COMMENTS ON SCR
PUBLICIZES
WRITES EIS FOR SC
COMMENTS ON DRAFT & FINAL EIS
PUBLIC HEARING
ISSUES FINAL SCR
CONCURS IN FINAL SCR
CONDUCTS SC
PARTICIPATE IN SC
SEMI-ANNUAL REPORTS
REVIEW REPORTS FOR SAFETY
REVIEW REPORTS
STAFF VISIT SITE
SCs FOR SEVERAL SITES COMPLETED
REVIEW SCs
II.
SUBMITS APPLICATION FOR CONSTRUCTION AUTHORIZATION
SUBMITS APPLICATION
STAFF REVIEW APPLICATIONS
RECEIVE INFO FROM DOE
PREPARES EIS FOR CONSTRUCTION
(?)
RECEIVE FROM NRC
COMMENT ON EIS
HEARING
ESTABLISHES LICENSING BOARD
ELECT REP TO LICENSING BD
REPORT
RESPONDS TO BOARD FINDINGS
RESPONSE TO BOARD FINDINGS
STAFF
PUBLIC HEARINGS
SMALL-GROUP CONSENSUS DEVELOPMENT
LICENSE GRANTED
III.
TECHNICAL OVERSIGHT
REPORTS
UPDATED APPLICATION AND EIS IF NECESSARY
REVIEW EIS
REP AT HEARINGS
III.A.
USE
IV.
NRC REVIEW
NOTIFICATION
PUBLIC

39 c

39 b

39 a

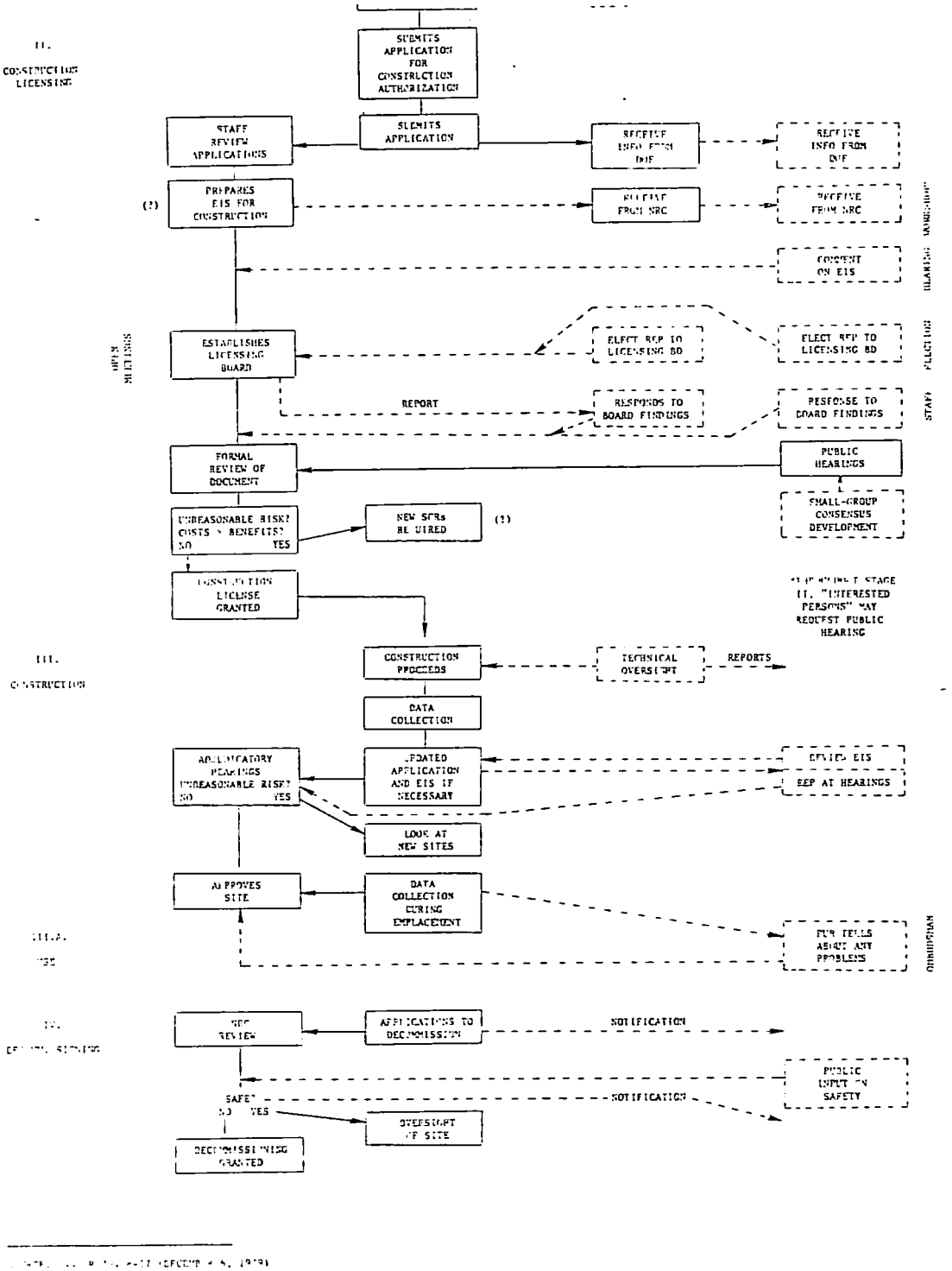


FIGURE 2. Procedure for Selecting High-Level Waste Disposal Sites - Solid arrows and boxes show currently-mandated public involvement, while dotted arrows show potential additional points for involvement

agencies must respond to public comments in drafting the final EIS (Delogu, 1974).

As Figure 2 suggests, the NRC regulations do not specify very many points for public participation. The State Planning Council would like to see more specific provisions included in NRC's formal procedures. The regulations contain a special section on working with the states, and it appears that many of the activities under this section are construed by the NRC to constitute public participation (see Section 4.2.2 on states and citizen participation). The additions shown in the figure suggest that public participation can be built in to many additional stages of the process so that participation, especially by small advisory groups, is an on-going rather than an intermittent process.

4.4 Monetary Costs

It should be clear that citizen participation programs entail significant costs in terms of money and staff time. Table 6 presents one estimate of these costs for a program that generally affects localities or sub-state regions. The costs for certain aspects of national programs is larger, since hearing officers must travel around the country, advertisements must be placed in more expensive publications with national readership, and so on. Table 6 represents one of the very few attempts to quantify costs.

4.5 Additional Proposals

A variety of proposals have been developed that address particular aspects of site selection for noxious facilities. Many of these are intended to supplement more usual citizen participation programs. Three are discussed here.

TABLE 6. Rough Cost Guide to Most Frequently Used Public-Involvement Techniques

Technique	Cost ($)
Interviews (per 20-minute interview)	15-30
Newspaper advertising	250-750
Radio advertising	250-750
Press release	100-500
Public hearing	2,500-6,500
Large public meeting	2,500-6,500[a]
Small meeting or workshop	2,000-4,000[a]
Publicity on radio or TV	250-500
50-page report	5,000-10,000
200-page report	10,000-50,000
Information bulletins (4-8 pages)	500-1,500
Conducting a survey:	
Per mailed questionnaire	3-5
Per telephone interview	10-15
Per personal interview	15-30

[a] May be reduced if a series of identical workshops or meetings is held.

Source: Delli Priscoli, 1978.

4.5.1 Compensating Local Residents

In Section 4.2.3, we noted that beneficial facilities are given incentives by cities and counties to locate there, but that facilities that impose net costs on their neighbors present a case of market failure. One proposal to overcome market failure mirrors the incentive proposal: it requires the manager of the facility to offer incentives to residents to accept the facility.

One of the most avid proponents of compensation is Michael O'Hare, who believes that citizen participation will not be able to resolve siting disputes because for neighboring groups "the only rational position is uncompromising opposition." Compensation can overcome this opposition. O'Hare notes two general principles for a compensation scheme: (1) compensation should be limited to those individuals living in a community when the project is first announced and (2) several sites should be considered simultaneously and encouraged to bid against each other for the minimum acceptable compensation in order to reduce the likelihood of overpayment (O'Hare, 1980). The idea of competing bids is embodied in a recent Massachusetts statute concerning chemical waste disposal sites.

O'Hare argues that one of the most substantial impacts on residents may be to reduce the values of their homes, which for many individuals represent the major portion of their life savings. O'Hare proposes an insurance program that would ensure current residents of a return on the first sale of the property after the facility is constructed comparable to the return they would have received in the absence of the facility. Other proposals include an insurance program for cancer and other potentially radiation-related diseases that does not require proof of a causal connection between the site and the disease, and federal government support of services that will be demanded by facility construction workers and employees.

4.5.2 A Federalist Strategy: Designing for Non-Concurrence

The current emphasis on "consultation and concurrence" embodies the hope that sufficient information provision (consultation) will eventually produce agreement (concurrence). As has been suggested, the nature of nuclear facilities makes it unlikely that provision of information alone will produce concurrence. Kai N. Lee (1980) has suggested that planning be instituted for "non-concurrence," the situation in which a state or states do not agree that they should be loci for nuclear waste disposal facilities.

Lee notes that conflicts are often two-sided. In this case, the pro-nuclear federal government and industry on one side and environmentalists, local government officials, and anti-nuclear activists on the other. Lee argues that introduction of a third party into conflicts frequently alters them enough to permit compromises to be reached. He suggests that the states act as the impartial third party, through a siting jury. The jury would be formed in three stages, changing with the change in emphasis in the policy process. Lee's jury process is summarized in Table 7. It makes use of the principle noted above in which those most closely affected in each stage would be given extra weight on the decision-making body. However, in Lee's proposal, each state with an interest in the procedure would select a state representative to a federal group that would identify geologic formations. This person would become the "foreman" of the site selection jury of each state that remains under consideration in the second stage. At this point two members from within the state are appointed to the jury. When localities for sites are identified, these send people to the state jury, which then has five people, who together serve to determine whether the federally-chosen site is acceptable. Lee's detailed proposal also envisions that many questions will arise as the procedure is implemented the first time; he suggests that procedural questions be decided by the State Planning Council while the NRC would retain

TABLE 7. The Siting Jury

Program Phase	Jury Membership	Function
National formation study.	One "foreman" chosen in each state with potential for a site.	Liaison to State Planning Council on generic technological issues and national policy questions.
State dropped by DOE.	Terminated.	
Regional site characterization studies.	Add one juror from a a panel named by National Governors' Association, and one juror from panel chosen by National Conference of State Legislatures.	Advice to state on procedural and generic issues. Liaison to NRC staff.
State dropped.	Terminated.	
Site proposal.	Add one juror representing local governments, and one representing House of Representatives.	Conduct hearings on suitability of site, and recommend on suitability to NRC and the President.
Site disapproved.	Terminated.	
Site licensed.	Same.	Monitor construction and operation for state and local governments. (At option of state.)

Source: Kai N. Lee (1980)

control over technical siting questions and final licensing procedures.

4.5.3 Funding of Technical Staff

Because of the complexity of the technical issues involved in siting decisions, agencies have not discharged their obligations to provide citizens and local government officials with information merely by transmitting "four-pound studies" to them. Rather, these members of the public must also receive support staff who can help them understand the technical issues involved as well as the implications for policy. The NRC has recognized this problem, and, as Figure 2 showing the licensing process indicates, will provide states with technical support staff upon request. This support staff may also be available to citizens groups who request it.

The experience of the Science for Citizens program of the National Science Foundation, a program designed to provide policy-relevant technical information to citizens who would normally not have such information, suggests that citizens might be skeptical of staff assistance provided directly from NRC. Citizens (and probably state officials) would prefer to have experts whose loyalty they feel is to them rather than to a federal agency. This is consonant with the finding that policy-makers are most responsive to technical information from those with personal ties to them (Cahn, 1971; Cooper and Werthamer, 1975).

An alternative to providing its own staff members as technical experts to the public would be for NRC to provide funds to states, localities, and interest groups to hire experts of their own choosing. Groups may not know exactly which experts are appropriate or, more often, appropriate experts may be difficult to locate or unavailable. This problem is especially likely during a siting decision, when all affected parties may be bidding for the services of a very few experts. One solution may be a program which provides a year's leave for scholars from universities to work with citizens. Alternatively, the State Planning Council or

still another more neutral body could be granted funds to build up a technical staff which could in turn be delegated to affected parties. In any case, technical assistance must be provided to enable citizens to benefit from information.

4.6 Summary

Designing a public participation program requires choosing among different purposes and appropriate participatory mechanisms, choosing the points in the process at which participation will occur, and choosing which groups will be encouraged to participate. Provision of information -- technical and procedural -- is a critical component of a nuclear facility siting decision, as is collection of information and consensus-building. If these procedures do not occur throughout the entire decision-making process, citizens will not perceive the process as fair. A mix of procedures will ensure that a variety of groups participate and that the kind of participation is appropriate to the point in the policy process. Provision must be made for making decisions without concurrence if necessary. Finally, compensation may be one way of defusing conflict.

5. Conclusions

This part provides an overview of a variety of topics relating to the design of a citizen participation program for selecting a site for high-level nuclear waste disposal. Section 2 showed that participation is an integral part of our democracy, but that different groups wish to use participation programs for different, even conflicting, purposes. Section 3 pointed out the problems inherent in providing technical information to citizens about a subject as complex as nuclear waste disposal, especially in light of perceptual biases that cause them to overestimate the risks from nuclear facilities of all kinds. It was argued that citizens might accept decisions with which they may not agree if the decisions are made through

an acceptable process; such a process must include a large measure of citizen participation so that citizens will feel that they both affected the course of events and knew what was occurring at all times. Section 4 presented a variety of means by which citizen participation can be instituted in the policy process. The following discussion highlights several problems and suggests some general rules for designing a participation program.

5.1 Reasons for Citizen Participation

The contention that process provides a solution to the problem presented by citizens' presumed unwillingness to accept nuclear facilities nearby is central to most arguments for citizen participation. Our discussion has shown that different actors hold different goals for participation programs, however, which means that it will be very difficult to design a process that is perceived to be fair by all actors. Officials support participation as a means of obtaining support for programs. They naturally prefer that this support be given to the decisions they have reached on the basis of their technical expertise, and may not be committed to involving citizens in real program design.

Citizens, on the other hand, support participation primarily in order to affect government decisions, and secondarily to redistribute power from those who are perceived to hold it to themselves. In fact, the only real evidence available to citizens that they have affected the policy process is provided by decisions or outcomes favorable to their positions. Time after time, citizens who have enthusiastically supported participation programs have circumvented program procedures and referred disputes to legislatures or the courts when the outcomes did not suit them. Our political system is designed to provide an almost endless series of appeals, and one result of the participation movement of the 1960s and 1970s is that citizens know how to exploit them.

Thus, the argument that a fair process, and especially citizen participation, will result in public acceptance of decisions they would otherwise oppose, is weak. Why then, should we include citizen participation in a technically complex program such as nuclear waste disposal siting?

We should include public participation -- genuine participation, not just formal public hearings that allow citizens to let off steam -- for the several reasons mentined below. Citizens have a right to be informed of decisions that will affect them and to have a voice in their design. They surely have the right to feel that decisions were made openly and with full understanding of who would benefit. We should also provide for public participation because there are experts outside government who can provide a check on experts inside government and who may even have some additional information that affects the decision. It is well known that scientists in government do not have the same motivations as scientists in universities or industry and, hence, may emphasize different aspects of research. Finally, we should provide for participation because, even though it may not ensure acceptance of policies, lack of it will probably ensure dissatisfaction with policies.

Although the argument that a fair process can overcome substantive disagreement is appealing, it may be somewhat naive in light of previous experience. Nevertheless, we should provide for citizen participation in controversial and highly technical decisions.

5.2 The Unalterable Opposition Assumption

The argument that process can substitute for substantive disagreement, which we rejected on the basis of political experience in Section 5.1, can also be questioned on the basis of the validity of its underlying assumption -- that citizens will remain unalterably opposed to becoming neighbors of a nuclear waste disposal site.

Our discussion of lay perceptions of risk shows that perceptual biases all reinforce the tendency to feel that nuclear facilities are highly risky. We know that such perceptions are persistent and not amenable to quick change even in the face of "overwhelming" evidence. On the other hand, we also know that people living near nuclear power plants perceive them to be much less risky than do similar people living at a distance from the plants (Maderthaner, 1976). Thus, familiarity can overcome previous perceptions of risk.

It is important to remember, however, that acceptability of risk is related to the benefits obtained in incurring the risk. Most commentators believe that the benefits from having a waste disposal site nearby are too small to allow any rational citizen to find it acceptable, and so they believe that the siting decision will only be made, if at all, through procedural equity. A variety of compensation schemes have been proposed that are designed to increase the perceived benefits of siting. In addition, the siting process itself will bring new citizens and a lot of money to nearby communities, and many would count this economic growth as a benefit. Thus, it may not be as difficult to obtain agreement from those most closely affected as is often assumed.

Some groups for whom the risk will never be acceptable are those who believe that development of waste disposal sites constitutes endorsement of the entire nuclear power program. While it will be difficult to placate these groups, one important part of the site selection process should be to plan to license disposal only of existing wastes, while establishing a somewhat different procedure for emplacement of new wastes. At the same time, it is necessary to stress the relative safety of the longer-term storage mechanisms in comparison to existing above-ground storage. Another important part of an overall strategy to gain these groups' acquiescence must be to foster research and development of non-nuclear power sources. In short, the assumption that all prospective neighbors will remain

unalterably opposed to a waste disposal site may well be incorrect.

5.3 Evaluation of the Present Plan

Whatever the rationale for public participation in siting decisions, the present plan is weak. The NRC portion provides for public hearings upon request and for public comment on the Site Characterization Report, relying at other points upon the states to transmit and collect information from and to the public. The NEPA procedure requires citizen participation, but each agency is free to structure its own program, and DOE does not yet seem to have done so. DOE does have some plans for public participation in preparation of the National Plan for 1982. There is only one Environmental Impact Statement provided for in the NRC regulations --at the site characterization stage. Most agencies rely too heavily on the states, at the expense of both localities and the general citizenry.

5.4 Requisites for a Participation Program

Our discussion has suggested several general characteristics of a good participation program.

(1) Citizens should be included in the design of the participation program itself.

(2) Citizens must be provided with technical information and with process information with regard to when and how decisions are to be made. In order to help citizens understand and use the technical information, government must provide technical assistance, either through direct provision of staff or by funding staff. Citizens must perceive the source of technical information as neutral or favorable to them.

(3) The presence of three agencies with authority allows for maximum access and participation at different stages of the process, but also has

the potential for confusing citizens. Process information is an especially important remedy.

(4) The presence of several affected levels of government also permits access to different kinds of groups, so long as each level provides for participation activities.

(5) A procedure that increases the weight of local interests on the decision-making process as it is narrowed will meet considerations of equity without provision for a local veto.

(6) Provision for compensation, especially property value insurance, health insurance, and impacted areas aid, will increase the value of participation programs.

5.5 Problems With Proposed Process

The proposed process is time-consuming. Citizen participation will increase the time required for decision-making. However, it is possible to set deadlines that are reasonable and take account of citizens' needs without severely compromising the process. The process should not include so many formal appeal procedures that they can be used to delay decision-making indefinitely.

A process that is projected to take a decade or more will tax citizens' resources. It is to be expected that different citizens will be active at different times, and officials must prepare to interact with changing groups and personnel. Insofar as possible, however, the introduction of a new group late in the process should not be considered grounds for questioning decisions made earlier, so long as those decisions were made with the concurrence of then-active publics.

5.6 Conclusion

Citizen participation is an integral component of our democracy. Decisions

that are inherently inequitable -- siting decisions, for example -- pose difficult problems for democracy because the people most directly affected feel that they should have a disproportionate say in the policy. A well-designed participation program that includes a mix of procedures and provides for access to several agencies and levels of government can partly overcome this difficulty. Compensation can help to even out the inequities of the decision. There are no easy solutions, but since decisions must be made, it is well to provide for as fair and sound a decision-making procedure as possible.

APPENDIX

DESCRIPTION OF PARTICIPATION MECHANISMS

Fishbowl Planning: A planning process in which all parties can express their support or opposition to an alternative before it is adopted, thereby bringing about a restructuring of the plan to the point where it is acceptable to all. Involves use of several participatory techniques -- public meetings, public brochures, workshops, and a citizens' committee.

Focused Group Interviews: Guided interview of six to 10 citizens in which individuals are exposed to others' ideas and can react to them; based on the premise that more information is available from a group than from members individually.

Game Simulations: Primary focus is on experimentation in a risk-free environment with various alternatives (policies, programs, plans) to determine their impacts in a simulated environment where there is no actual capital investment and no real consequence at stake.

Group Dynamics: A generic term referring to either interpersonal techniques and exercises to facilitate group interaction or problem-solving techniques designed to highlight substantive issues.

Hotline: Used to denote any publicized phone answering system connected with the planning process. Hotlines serve two general purposes: 1) as an avenue for citizens to phone in questions on a particular project or policy and receive either a direct answer or an answer by return call; or 2) as a system whereby the citizen can phone and receive a recorded message.

Interactive Cable TV-Based Participation: An experimental technique utilizing two-way coaxial cable TV to solicit immediate citizen reaction; this technique is only now in the initial stages of experimentation on a community level.

Media-Based Issue Balloting: Technique whereby citizens are informed of the

existence and scope of a public problem, alternatives are described, and then citizens are asked to indicate their views and opinions.

Meetings -- Community-Sponsored: Organized by a citizen group or organization; these meetings focus upon a particular plan or project with the objective to provide a forum for discussion of various interest group perspectives.

Meetings -- Neighborhood: Held for the residents of a specific neighborhood that has been, or will be, affected by a specific plan or project, and usually are held either very early in the planning process or when the plans have been developed.

Meetings -- Open Informational (also "Public Forum"): Meetings which are held voluntarily by an agency to present detailed information on a particular plan or project at any time during the process.

Neighborhood Planning Council: A technique for obtaining participation on issues which affect a specific geographic area; council serves as an advisory body to the public agency in identifying neighborhood problems, formulating goals and priorities, and evaluating and reacting to the agency's proposed plans.

Ombudsman: An independent, impartial administrative officer who serves as a mediator between citizen and government to seek redress for complaints, to further understanding of each other's position, or to expedite requests.

Open Door Policy: Technique involves encouragement of citizens to visit a local project office at any time on a "walk in" basis; facilitates direct communication.

Planning Balance Sheet: Application of an evaluation methodology that provides for the assessment and rating of project alternatives according to the weighted objectives of local interest groups, as determined by the groups themselves.

Policy Capturing: A highly sophisticated, experimental technique involving mathematical models of policy positions of parties-at-interest. Attempts to make explicit the weighting and trading-off patterns of an individual or group.

Policy Delphi: A technique for developing and expressing the views of a panel of individuals on a particular subject. Initiated with the solicitation of written views on a subject, successive rounds of presented arguments and counter-arguments work toward consensus of opinion, or clearly established positions and supporting arguments.

Priority-Setting Committees: Narrow-scope citizen group appointed to advise a public agency of community priorities in community development projects.

Public Hearings: Usually required when some major governmental program is about to be implemented or prior to passage of legislation; characterized by procedural formalities, an official transcript or record of the meeting, and its being open to participation by an individual or representative of a group.

Public Information Program: A general term covering any of several techniques utilized to provide information to the public on a specific program or proposal, usually over a long period of time.

Random Selected Participation Groups: Random selection within a statistical cross-section of groups such as typical families or transit-dependent individuals which meet on a regular basis and provide local input to a study or project.

Short Conference: Technique typically involves intensive meetings organized around a detailed agenda of problems, issues, and alternatives with the objective of obtaining a complete analysis from a balanced group of community representatives.

Task Force: An ad hoc citizen committee sponsored by an agency in which the parties are involved in a clearly-defined task in the planning process. Typical characteristics are small size (8-20), vigorous interaction between task force and agency, weak accountability to the general public, and specific time for accomplishment of its tasks.

Value Analysis: Technique which involves various interest groups in the process of subjectively ranking consequences of proposals and alternatives.

Workshops: Working sessions which provide a structure for parties to analyze thoroughly a technical issue or idea and try to reach an understanding concerning its role, nature, and/or importance in the planning process.

DESCRIPTION OF FUNCTIONS

Identify Attitudes and Opinions: Determine community and/or interest group feelings and priorities.

Identify Impacted Groups: Determine which groups will be directly or indirectly affected by policy and planning decisions.

Solicit Impacted Groups: Invite the individuals and groups thought to be impacted by the program to participate in the planning process.

Facilitate Participation: Make it easy for individuals and groups to participate.

Clarify Planning Process: Explain or otherwise inform the public on planning, policies, projects, or processes.

Answer Citizen Questions: Provide the opportunity for citizen or group representatives to ask questions.

Disseminate Information: Transmit information to the public: includes techniques which provide access to information.

Generate New Ideas and Alternatives: Provide the opportunity for citizens or group representatives to suggest alternatives or new ideas.

Facilitate Advocacy: Provide assistance in developing and presenting a particular point of view or alternative.

Promote Interaction Between Interest Groups: Bring interest group representatives together for exchange of views.

Resolve Conflict: Mediate and resolve interest group differences.

Plan, Program, and Policy Review: Provide an opportunity for policies to be reviewed.

Change Attitudes Toward Government: Makes individuals or groups view government differently.

Develop Support/Minimize Opposition: Explain the costs, benefits, and trade-offs to the public, thereby defusing possible oppposition and building support.

PARTICIPATION TECHNIQUES

Arbitration and Mediation Planning: Utilization of labor-management mediation and arbitration techniques to settle disputes between interest groups in the planning process.

Charrette: Process which convenes interest groups (governmental and non-governmental) in intensive interactive meetings lasting from several days to several weeks.

Citizen Advisory Committees: A generic term used to denote any of several techniques in which citizens are called together to represent the ideas and attitudes of various groups and/or communities.

Citizen Employment: Concept involves the direct employment of client representatives; results in continuous input of clients' values and interests to the policy and planning process.

Citizen Honoraria: Originally devised as an incentive for participation of low-income citizens. Honoraria differs from reimbursement for expenses in that it dignifies the status of the citizen and places a value on his/her participation.

Citizen Referendum: A statutory technique whereby proposed public measures or policies may be placed before the citizens by a ballot procedure for approval/disapproval or selection of one of several alternatives.

Citizen Representation on Public Policy-Making Bodies: Refers to the composition of public policy-making boards either partially or wholly of appointed or elected citizen representatives.

Citizen Review Board: Technique in which decision-making authority is delegated to citizen representatives who are either elected or appointed to sit on a review board with the authority to review alternative plans and decide which plan should be implemented.

Citizen Surveys of Attitudes and Opinions: Only technique other than talking with every citizen that is statistically representative of all citizens; allows for no interaction between citizens and planners.

Citizen Training: Technique facilitates participation through providing citizens with information and planning and/or leadership training, e.g., game simulation, lecture, workshops, etc.

Community Technical Assistance: A generic term covering several techniques under which interest groups are given professional assistance in developing and articulating alternative plans or objections to agency proposed plans and policies. Some specific techniques are:

Advocacy Planning: Process whereby affected groups employ professional assistance directly with private funds and consequently have a client-professional relationship.

Community Planning Center: Groups independently plan for their community using technical assistance employed by and responsible to a community-based citizens group.

Direct Funding to Community Groups: Similar process to Advocacy Planning; however, funding comes from a government entity.

Plural Planning: Technique whereby each interest group has its own planner (or group of planners) with which to develop a proposed plan based on the group's goals and objectives.

Computer-Based Techniques: A generic term describing a variety of experimental techniques which utilize computer technology to enhance citizen participation.

Coordinator or Coordinator-Catalyst: Technique vests responsibility for providing a focal point for citizen participation in a project with a single individual. Coordinator remains in contact with all parties and channels feedback into the planning process.

Design-In: Refers to a variety of planning techniques in which citizens work with maps, scale representations, and photographs to provide a better idea of the effect on their community of proposed plans and projects.

Drop-In Centers: Manned information distribution points where a citizen can stop in to ask questions, review literature, or look at displays concerning a project affecting the area in which the center is located.

REFERENCES

ACIR. Advisory Commission on Intergovernmental Relations. Citizen Participation in the American Federal System. Washington, D.C.: U.S. Government Printing Office, March 1979.

Aleshire, Robert. "Planning and Citizen Participation: Costs, Benefits, and Approaches." Urban Affairs Quarterly 5 (1970): 4, p. 369H.

Arnstein, Sherry. "A Working Model for Public Participation," Public Administration Review, Jan.-Feb. 1975, pp. 70-73.

Berry, Jeffrey. Lobbying for the People. Princeton: Princeton University Press, 1977.

Cahn, Anne H. Eggheads and Warheads: Scientists and the ABM (Cambridge, Mass.: Center for International Studies of MIT, 1971).

Caldwell, Lynton K., Hayes, Lynton, and MacWhirter, Isabel. Citizens and the Environment: Case Studies in Popular Action. Bloomington: Indiana University Press, 1976.

Checkoway, Barry. "The Politics of Public Hearings." Journal of Applied Behavioral Science, forthcoming 1981.

Cooper, Benjamin, and Werthamer, N. Richard. "Two Physicists on Capitol Hill," Physics Today (January 1975), pp. 63-66.

Delli Priscoli, Jerry. "Implementing Public Involvement Programs in Federal Agencies," in Stuart Langton, ed., Citizen Participation in America (Lexington, Mass.: Lexington Press, 1978), pp. 97-108.

Delogu, Orlando. United States Experience with the Preparation and Analysis of Environmental Impact Statements (Morges, Switzerland, International Union for Conservation of Nature and Natural Resources), 1974.

Dunlap, Thomas. DDT: Scientists, Citizens, and Public Policy (Princeton, Princeton University Press, 1981).

Ebbin, Stevan and Kasper, Raphael. Citizen Groups and the Nuclear Power Controversy: Uses of Scientific and Technological Information. Cambridge, Mass.: The MIT Press, 1974.

EPA. Public Participation -- Working for Clean Water. Washington: U.S. Government Printing Office, N.D.

Fischoff, Baruch. "Cost-Benefit Analysis and the Art of Motorcycle Maintenance" Policy Sciences 8 (1977): pp. 177-202.

Goodman, John A. An Evaluation of Policy-Related Research on Citizen Participation in Municipal Service Systems: Environmental Planning. Washington, D.C.: TARP Institute.

Gormley, William, Jr. Participation in Public Utility Regulation. Citizen Participation, 1980, 1, 3ff.

Gormley, William, Jr. Alternative Forms of Public Advocacy. Journal of Applied Behavioral Science, forthcoming, November 1981.

Hadden, Susan G. "Technical Advice in Policy Making: A Proposed Inventory." In Haberer, Joseph, ed., Science and Technology Policy. Lexington, Mass.: Lexington Press, 1977.

Hadden, Susan G. "Public Policy Response to Risks to Health, Safety and the Environment," Public Affairs Comment XXVII #1, November 1980.

Hadden, Susan G. "Technical Advice for Citizens." Journal of Applied Behavioral Science, 1981.

Katz, Neil and List, David C. "Seabrook 1978," forthcoming.

Kendall, Henry and Moglewer, Sidney. "Preliminary Review of the Reactor Safety Study," in Benefit-Cost and Policy Analysis 1974.

Kweit, Robert W., and Kweit, Mary Grisez. Bureaucratic Decision-Making: Impediments to Citizen Participation. Policy, 1980, 12, pp. 647-666.

League of Women Voters, A Nuclear Waste Primer (Washington: League of Women Voters Education Fund, 1980).

Lee, Kai N. "A Federalist Strategy for Nuclear Waste Management," Science, Vol. 208, May 16, 1980, pp. 679-684.

Lowi, Theodore. The End of Liberalism. New York: W.W. Norton, 1969.

Maderthaner, R., et al. "Perception of Technological Risks" IIASA Research Memorandum 76-53, 1976.

Marshall, Dale R. The Politics of Participation in Poverty. Berkeley, University of California Press, 1971.

Mayo, Henry B. An Introduction to Democratic Theory. New York: Oxford Press, 1960.

Milbrath, Lester. "Citizen Surveys," in Citizen Participation, Vol. 2:4 March/April 1981, pp. 3-5.

National Plan. (U.S. Department of Energy). National Plan for Radioactive Waste Management, Working Draft #4, January 1981.

National Research Council, Committee on Nuclear and Alternative Energy Standards (CONAES). Energy in Transportation, 1975, 2010. Washington, D.C.: National Academy of Sciences, 1979.

Nelkin, Dorothy. Nuclear Power and Its Critics. (Ithaca, N.Y.: Cornell University Press, 1971).

Nelkin, Dorothy and Pollack, Michael. Public Participation in Technological Decisions: Reality or Grand Illusion? Technology Review, 1979, pp. 55-64.

O'Hare, Michael. Testimony before the Committee on Interior and Insular Affairs. U.S. House of Representatives, June 28, 1980.

Olson, Mancur. The Logic of Collective Action. (New York: Schocken, 1965).

Ornstein, Norman and Elder, Shirley. Interest Groups, Lobbying, and Policy-Making. Washington, D.C.: Congressional Quarterly Press, 1978.

Primack, Joel and von Hippel, Frank. Advice and Dissent: Scientists in the Political Arena. New York: Basic Books, 1974.

Reiser, Stanley Joel. "Smoking and Health" in Sanford Lakoff, ed., Knowledge and Power (New York: Free Press, 1966).

Rogers, Everett M. Communication of Innovations: A Cross-Cultural Approach (second ed.). New York: The Free Press, 1971.

Rosenbaum, Walter A. "The Paradoxes of Public Participation." Administration and Society 8:3 (November 1976) pp. 355-383.

Rosener, Judith. "Matching Method to Purpose: The Challenges of Planning Citizen Participation Activities," in Stuart Langton, ed., Citizen Participation in America (Lexington: Lexington Press, 1978), pp. 109-122.

Rosener, Judy B. "A Cafeteria of Techniques and Critiques," Public Management, Vol. 57, no. 12 (December 1975).

Slovik, Paul. "Judgment, Choice and Societal Risk Taking," in Kenneth R. Hammond, ed., Judgment and Decision-Making in Public Policy Formation (Washington: American Association for the Advancement of Science (AAAS), 1978).

State Planning Council on Radioactive Waste Management Interim Report, Feb. 24, 1981.

Truman, David. The Governmental Process (New York: Knopf, 1951).

Twersky, Amos and Kahneman, Daniel. "Judgment Under Uncertainty," in Benefit--Cost and Policy Analysis 1973 (Chicago: Aldine, 1974) pp. 66-80.

Van Liere, Kent, et al. "Anti-Nuclear Demonstrators: A Study of Participants in the May 6 Anti-Nuclear Demonstration," paper presented at the annual meeting of the Mid-South Sociological Association, Oct. 30, 1981.

Weber, Ronald E. "The Political Responsiveness of the American States and Their Local Governments" in Leroy Reiselbach, ed., People vs. Government (Bloomington, Ind.: Indiana University Press, 1975), pp. 189-225.

Zeckhauser, Richard. "Procedures for Valuing Lives" Public Policy 23 #4 (Fall, 1975), pp. 419-464.

PART 3 - PUBLIC PARTICIPATION IN THE SITING OF A NUCLEAR WASTE STORAGE FACILITY

James R. Chiles

1. Introduction

1.1 General Statement

Citizen participation in nuclear issues can be traced to 1956, when the United Auto Workers Union decided to take a stand against the construction of the Enrico Fermi liquid metal fast breeder reactor, located near Detroit, Michigan (Ebbin and Kasper, 1974). The demonstrations were quite modest compared to a spectacle that occurred during public participation at the Three Mile Island Unit 2 krypton release hearings, when a Nuclear Regulatory Commission examiner was shouted down by "500 furious, screaming, and often tearful people"; a medical consultant was shouted down with cries of "murderer" (New York Times, 1980). Is this the culmination of a 24-year trend, or a momentary aberration -- or has the consensus of compromise broken down when the issue is a nuclear one? Further, will the public react differently to a high-level waste disposal site than it does to a power reactor? These are initial questions of public participation in the consultation and concurrence process proposed for the siting of a waste repository. As can be seen, the question has many facets and points of view, and deserves consideration from both the standpoints of theory and of practice: what works, what transmits information, and what operates to destroy the consensus. Examples will be drawn from nuclear controversies, and from other high-technology disputes in which the public has demanded a part in the final decision.

Even in the calmest moments, "the citizen-government partnership is a delicate one -- one that depends to a very great extent on attitudes and perceptions if it is to grow and succeed" (League of Women Voters, 1980). This partnership will be under a

number of demands in the siting process, most of which cannot be met if the Atomic Energy statutory mandates are to be followed. Some citizens are sure to insist on a local veto, and are equally sure to be deeply offended by the argument that such vetoes are incompatible with the law. This disagreement is partly due to the friction between a democratic society and a society which also has a pressing need for a high-level waste repository in spite of possible discontent at the final site. Necessary though the limits on public participation might be, appearing as "a challenge to the very foundations of American democracy" (Wengert, 1976):

> ... the response to participatory demands must vary according to the values one wishes to maximize. A major concern is that greater public involvement may further encumber efficient implementation of public policies.... The importance of an enlightened public and the greater articulation of diverse values that may emerge in a participatory process must be weighed against the urgency of implementing specific policies. (Nelkin, 1977)

One of the questions, then, that must be answered in structuring public participation is the time allowed for a decision. Participation that is adequate for the Draft Environmental Impact Statement for the MX-missile project may not be adequate for high-level nuclear waste storage, as delay in waste storage is not (theoretically) as damaging as delay in providing for national defense. Delay in storage may, in fact, be productive in allowing time for further research, e.g., on waste solidification techniques. Delay has many dimensions, as will be discussed later, but one which should be mentioned is that delay may work in favor of the completion of a major project. Citizen opposition to a particular siting proposal is often broken by delay in this fashion: the proposal is framed by government, a citizen group, or other group forms and wins some concessions, funding is abandoned, several years pass, and finally the proposal is resurrected with success. The will to fight seems to be severely tested by such an ebb and flow. Citizens are very conscious of such tactical advantages on the government side. Further, participants will be on the alert for participation processes seemingly a sham, or occurring too late to influence decisions.

1.2 The Purposes of Public Participation

Initially, it should be noted that the purposes of public participation are not necessarily those of the consultation and concurrence process. A site is not to be chosen with an eye to winning a referendum -- "it is usually impossible to find majority support for most governmental decisions" (Wengert, 1976) -- but rather with the intent of serving the public interest, that elusive compromise that will best satisfy the need for permanent waste storage while seeing to it that the site is the best that current technology can recommend. The purpose of public participation, on the other hand, may be to win that majority support. Whether the majority support is needed is a political decision.

Certainly the purposes of public participation are many. Citizens see one outcome, government another, and contractors still another. In the reactor licensing field, one critic is Professor Harold Green. He favors the abolition of most participation mechanisms, first by re-examining the meaning of "participation":

> The fact is that public participation is nothing more than a code word for intervention by self-styled public interest groups who believe that the Nuclear Regulatory Commission itself is not protecting the public interest and believe, in view of the perceived default, that they have an obligation to do so. (University of Pennsylvania, 1979)

Some definitions are appropriate at this point. The true "public" -- the mass made up of every citizen of the United States, voting or not, apathetic or expert -- is a mystery. Its wishes and its fears will probably never be known; what votes and polls are taken are a model only, and usually among a minority. When we refer to the public interest, one commentator says, we are really referring to the expressed wishes of definable "publics" (Trumbull, 1977), mere raisins in the loaf of the nation, but still very important, for they often wield influence out of proportion to their size. This perception will be further elaborated upon.

The goals behind involving the publics in consultation and concurrence, and

nuclear decision-making generally, vary. For the federal government, Commissioner Victor Gilinsky (1976) of the Nuclear Regulatory Commission (NRC) laid out four purposes:

(1) promoting public education;

(2) enhancing public acceptance of Commission work;

(3) providing an opportunity to check the wisdom of staff decisions; and

(4) affording a safety valve for the disaffected.

Related but distinct are the purposes of

(5) providing regulators with a greater range of information; and

(6) freeing the agency from excessive interdependence with a regulated industry.

With respect to its opponents, the agency wishes to assure moderates of opposition that all reasonable precautions have been taken, while it also wishes to prevent successful legal attack from the implacably-opposed (Whitney, 1974). Related to this purpose is that of dissuading the angry from seeking recourse to their Congressional delegation. As will be noted in the final section -- that of conflict resolution -- an offended Congressman is the greatest single foe by which any siting proposal can be opposed.

Purpose (4), the "safety valve," is a particularly sensitive one, for while all participants in the process recognize that hearings provide a vent for tensions, none of the citizens like being patronized. This condescension was the cause of much of the anger at the 1979 hearings on Department of Energy (DOE) plans for the fuel reprocessing plant at West Valley, New York, where, under the original hearing format, the public was not to be allowed to challenge a recent DOE report on its plans for the plant. A last-minute change in the format did little to assuage the anger -- it's "nothing more than patting us on the head," one state legislator said (New York Times, 1979).

David Williams, a citizen participating in the Waste Isolation Pilot Plant (WIPP) hearings of 1979, summarized the purposes of public participation from a neutral point of view:

(1) acquainting the federal government with legitimate local concerns not otherwise addressed; and

(2) subjecting the complicated Environmental Impact Statement to peer review.

A host state may also have the same purposes in mind. If it favors the project, it may want to add "building a consensus"; if it seeks a way to effectively veto the project, it can be expected to use channels of participation in a way similar to that of an anti-nuclear organization, with the possible exception that the state may prefer to shift the site to another state rather than block it altogether.

Public participation is now beginning to appear as a tool, a strategy towards a desired end, at least as much as it serves to fill a democratic ideal. This function can be seen in studying the efforts of public interest groups allied against the use of nuclear energy. First, there is little question that many citizens live in fear -- reasonable or not -- of radiation exposure; and, in fact, feel anxiety at the mere mention of the word "nuclear" or "atomic." This fear is more connected with the possibility of catastrophe, however, than with the health effects of constant low-level exposure (Whitney, 1974). The fact that opponent organizations have this support to draw upon affects their purposes when they participate in siting decisions. Their purposes are intended to:

(1) stop construction of the nuclear facility entirely;

(2) delay construction, raise expenses and hope for success by default;

(3) press for specific design changes;

(4) play a watchdog role, and keep the agencies sharp; and

(5) educate the public in their point of view (Davis, 1976).

For some groups the supreme goal may be stopping construction, for some it may be delay; the moderates may settle for design changes. So it can be seen that the mix of purposes is probably unique to each citizen group. Two points should be made here.

First, a radioactive waste disposal site is fundamentally different from a reactor in the kind and quality of opposition it attracts. It is less a forum for attacks on the use of commercial power reactors and more a forum for technical objections to a particular site, although it is certain that some of the speakers in any hearings on nuclear waste disposal will dwell on the use of power reactors. The more astute nuclear-energy opponents will cloak their objections in site-specific challenges -- for example, opponents to the East Texas sites have said they will draw upon seismic studies -- for though they wish to delay waste storage, knowing it hampers the approval of power reactor construction licenses, they cannot expressly say so, for they risk appearing inconsistent with their stands at reactor licensing proceedings, when they challenged issuance on the grounds that waste disposal was unresolved. Alongside technical challenges will be those grounded in morality: "that involuntary risks of radiation exposure imposed on present and unconsulted future generations violate ethical principles and social justice in equity" (Maxey, 1979).

The second point relative to waste disposal hearings is that some opponents' strategy will vary according to whether or not they see the outcome as a foregone conclusion. The "no-win" hearing is one in which approval of the siting proposal is seen as inevitable (Davis, 1976). This was the frank strategy of intervenor attorney Irving Like, as described before a legal seminar on environmental advocacy:

> ... winning the ultimate environmental objective requires maximum use of the media and arts of communication in dramatizing the confrontation between the citizen and his corporate and agency adversaries... all of the skills of counsel and his dedicated lay and scientific allies must be exerted to the task of educating the public to understanding the nature of the particular technology and its environmental effects, and moving the public to adopt the ecological ideal. (Like, 1971)

He elaborated that, as the chance of success in the participation procedure drops, the use of the forum as a soapbox to reach the public at large increases, in what amounts to a sidestepping of the official decision-making process. It is at this point that opponents of a siting proposal make their most effective uses of any internal inconsistencies and contradictions found in stands taken by proponents of the site. This strategy is well-known in legal circles, among debaters, and among those without extensive resources: use the enemy's weaknesses against him. In the Cambridge, Massachusetts, recombinant DNA laboratory controversy, the city mayor (an opponent) pointed out with some effect that he questioned the ability of Harvard University to contain rogue bacteria when it had been incapable of controlling Egyptian ants infesting the building in question. The ants had escaped years before, from a professor's briefcase (New York Times, 1977).

It is most important that such internal contradictions be avoided in the nuclear waste controversy. This policy should extend also to the stated purposes of the various hearings. If a hearing is intended as a 'scoping' meeting -- a chance to state one's fears — the meeting should be announced as having such a purpose, and not as intended to provide an opportunity to discuss technical objections with agency decision-makers. Such false advertising will breed months of anger, and provide a focal point for more generalized disgruntlement.

1.3 Parties

Parties can be broken, initially, into five levels: federal, state, sub-state planning regions, localities (county and city), and the public. Federal, state, and local levels fall into:

(1) executive and agency actors;

(2) legislative actors; and

(3) judicial actors.

In the four parties other than the public, the spokesmen and the lines of responsibility are clear enough. The nature of the public and who its spokesmen may be is the subject of the next section.

It should be noted, however, that all five parties listed above are public spokesmen; a state legislature is not only the representative voice of a state, but also is so well-gounded locally and stands for re-election so often that members must be somewhat responsive to public desires. The distinction usually drawn between such government entities and the public is probably grounded in a distrust of officialdom. Government entities are "non-public," while individual citizens and their leagues and ad hoc organizations are "public," even though in practice, some citizen organizations may be far less responsive to citizens than a given state legislature. Certainly the distinction is an uneasy one, though it will be retained in deference to common understanding.

2. The "Public": A Question of Spokesmen

Traditionally, the ideal in public participation is the town meeting (Murphy and Hoffman, 1976), where each adult citizen can make his or her voice heard directly, undiluted by spokesmen, the wording of petitions, or back-room compromises. The time in which this was practical is long gone, however, and the public interest must be pursued through a bewildering crowd of spokesmen, appointed and unappointed. Unassociated, "free" citizens do appear at nearly every public hearing, of course, but the human tendency is to disregard or devalue their opinions as lacking the weight of a membership.

The public interest group has been called the "great democratic innovation of the 1970s." The phrase "public interest" "simply asserts that they have no more financial interest in the outcome of their issues than that of the citizens at large" (Stone, 1977). For all the accusations of citizen groups as elitist, by and large:

> these organizations function in a delicate ecological balance with the public. They can only survive in such proportion as the public's assessment of the importance of their issues and the correctness of their stands .... (They must) renew their constituency each year, and maintain the confidence of their supporters continually. This keeps them democratically responsive. (Stone, 1977)

The public has great difficulty initiating action directly at the federal level (Caplan, 1977), and, in line with this, most citizen groups wield their influence in a negative manner: fighting proposed projects, for example. Opposition to a high-level radioactive waste repository falls exactly within the area of strength for citizen groups against nuclear power generally. Their weakness is in proposing a reasonable alternative to the handling of wastes which already exist:

> Protest groups are uniquely capable of raising the saliency of issues, but are unequipped -- by virtue of their lack of organizational resources -- to participate in the formulation or adoption of solutions to the problems they dramatize. (Lipsky, 1970)

Protest leaders, facing the need to rely on third parties for resources and information, confront constant difficulties in sustaining the interest of their constituencies; while declining to compromise on policy stands, they make a great many organizational compromises that may lead to more extreme positions.

A 1975 survey of the environmental movement found 20,000 citizen groups covering a wide range of stands: pro- and anti-nuclear, pro- and anti-development. At the heart of the anti-nuclear and anti-development groups, a Rockefeller Brothers Fund report found, were 300 organizations, mostly neighborhood in size. They fell into membership (e.g., Sierra Club) and professional (e.g., Union of Concerned Scientists) organizations (Boasberg Study, 1975).

Established organizations are only one of three types of environmental groups. Ad hoc groups are a second type -- usually created for the resolution of a single issue -- and the third type is the coalition. Coalitions are what make generalizations about public interest spokesmen so hazardous; these are sometimes fleeting, sometimes

durable, groups made up of other groups. The Clamshell Alliance is such a coalition, as is the Atomic Industrial Forum (600 member organizations).

A given coalition may in turn support a lobbying group, like the Environmental Policy Center of Washington, D.C. Some research foundations are technically independent of other groups, but are supported by the same environmental activists and usually benefit from other groups' mailing lists. The Southwest Information and Research Center of Albuquerque, N.M. is apparently such a foundation (one pro-WIPP citizen called it a "propaganda hotel" (Ahlen, 1981)). This tangle is due partly to the informal quality of environmental activism, and due partly to Internal Revenue Service regulations, which place limits on the lobbying and political activities of tax-exempt organizations (Goetz and Brady, 1975). When a strong lobbying effort is needed, several tax-exempt groups often create a separate "action group"; this must be publicly supported apart from the parent groups, but it usually benefits from the structure and staff of the parents.

Alongside the three types of environmental organizations listed above, another type of group that will be seen operating is the neighborhood-scale group. Any public participation scheme must allow it a place. Some of these groups are completely independent and unique, and some are affiliated with national organizations, like the League of Women Voters or the Rotary International. These will not be limited in number to the immediate communities around the proposed site; communities along the proposed waste transportation corridor also will seek a role.

Some questions have been raised as to whether public participants in waste-site and reactor hearings were mostly local, or arrived en masse, summoned by the Sierra Club from hillside houses near San Francisco. Researchers Ebbin and Kasper (1974) studied several licensing hearings and their participants at length, and concluded that "opposition interventions are for the most part localized undertakings"; generic

hearings, on the other hand, breed less local interest and are more likely to attract nationwide attendance. There does seem to be a loose network of environmental activists across the nation who would appear at anything as important as a high-level waste repository hearing, even apart from the urging of large organizations (Green, 1974).

Besides the local/outsider axis, unaffiliated individuals can be subdivided into expert or lay, depending on the specific topic. An expert on high-energy physics, for example, should be accorded no particular deference for his opinions on heat mechanics in salt domes. Hearings have shown a marked tendency, however, for examiners to defer to anyone with a Ph.D. in a nuclear field (Ebbin and Kasper, 1974).

2.1 Eligibility to Participate

Eligibility encompasses two questions:

(1) should the party be allowed to participate at all; and

(2) if so, to what degree should they be allowed to participate?

These questions are subsumed under the topic of standing.

The Administrative Conference of the United States has set out five factors in considering whether to allow supplemental public participation (Murphy and Hoffman, 1976):

(1) the type of hearing;

(2) the intervenor's precise interest in the subject matter and outcome;

(3) the adequacy of other representatives in presenting this point of view;

(4) the ability to present relevant argument; and

(5) the effect of the participation on the agency's statutory mandate.

Considering that hundreds of federal and state programs utilize some form of public participation, a tremendous variety of hearing types is available. On the simplest end of the spectrum, and lending itself to the broadest participation (since standing

requirements are minimal) is the "public meeting," perfected by the U.S. Army Corps of Engineers over the course of controversy on scores of water projects. In early 1977, President Carter proposed an early end to 19 dams and flood control projects; the Corp's public meetings which followed are good exemplars. Attendance ranged from several hundred to several thousand; meetings lasted for up to 12 hours per day and were widely publicized in local media and by letters to environmental and neighborhood groups; further, anyone who wanted to speak was generally allowed access to the microphone, though usually for a limited time. Also, attendees could express their opinions on registration cards distributed early in the meetings, in a kind of straw poll (Public Works, 1977).

Somewhat more restrictive is the "legislative"-type hearing, which is usually advertised as public. The WIPP site hearings of 1978 and 1979, held in Idaho, New Mexico, and Texas, were legislative hearings. One of the distinctions between this and the public meeting is that officials are usually present at the former, and a dialogue often develops. Parliamentary rules are the procedure, though in the heat of acrimony they often go by the wayside; the first sign of a deteriorating atmosphere are shouted questions and comments from the audience.

One of the few restrictions on eligibility may be a requirement that speakers prepare a summary of their testimony for the agency conducting the hearing, and have it filed some days or weeks prior. Originally, the 1979 WIPP hearings were to require this, but in practice the statements were not insisted upon and "everybody had a chance to speak" (Ahlen, 1981). Though public meetings and legislative hearings have the advantages of cheapness -- both to the agency and to the participants -- and openness, "participation in effect being limited to making statements on questions of concern to them, provisions for only legislative-type hearings seem to be nothing more than a political cosmetic, a sop thrown to opponents of nuclear power" (Green, 1974). Any questions troubling the audience are

usually required to be written, and passed up to the examiner or moderator, who can ask or dismiss them at his discretion. Policy issues are well-addressed in a legislative hearing, for all its flaws.

The most elaborate, and the most restrictive, form of hearing is the trial-type hearing. Examples are the construction licensing hearings before the Atomic Safety and Licensing Boards of the Nuclear Regulatory Commission. Trial features are access to discovery devices typical of federal courts, like interrogatories, depositions, and searches for documents; presentation of witnesses and cross-examination of the opponents' witnesses; rebuttals; and final statements. A trial-type hearing may not have all these features, however. Participation depends heavily on the use of attorneys and of expert witnesses. Further, the issues must be well-drawn: there must be opponents. In reactor licensing, industry applicants and environmentalist intervenors form natural opponents; this may not occur in the context of high-level nuclear waste repositories.

Occasionally, features of both legislative and trial-type hearings are combined in the hybrid hearing: an example is the proceedings on the Generic Environmental Statement of Mixed Oxide Fuel (GESMO). Generally, a hybrid hearing begins in a legislative manner, in which an attempt is made to resolve all issues informally. If issues are left, an adjudicatory format is selected (Speth, 1978). In the GESMO hearings, 75 individuals, companies, agencies, and public interest groups were qualified to act as full participants. In the legislative stage, participants were able to gather documents freely and submit witnesses, but had to process all their adverse questions through the hearing board. As a further complication, the proceedings were broken into two parts: health, environmental, and safety issues first; then safeguards and cost-benefit analysis (Strauss, 1976). Further, any members of the public could submit a written statement.

In selecting participants, one member of the Administrative Conference

(1971) warned against selecting one representative of a given interest as the only spokesman; for example, he says, "the poor are many and different and must be able to speak with many voices." A hearing examiner may be more willing to qualify multiple representatives if they are willing to consolidate their arguments on areas in which they have already reached substantial agreement. Besides the fact that most statements made in any hearing are not salient to the issues at hand, the next most common problem is the constant repetition of testimony.

So, it can be seen that for any given potential participation, the options of participation are multiple:

(1) total exclusion;

(2) attendance only;

(3) written statements only;

(4) full testimony; or

(5) full participation -- cross examination, etc.

The doctrine of standing is helpful in deciding how much participation to allow. While some principles may be borrowed from judicial standing, that forms a higher standard than standing to participate before an agency proceeding. Further, standing requirements to participate in a legislative hearing are more easily satisfied than requirements before a trial-type hearing. In case a participant wishes to challenge agency procedures in court, he or she ought to be able to satisfy judicial standing requirements as well. The essence of judicial standing is alleging such a personal stake in the outcome of the dispute so as to "assure that concrete adverseness" which sharpens the presentation of issues on which the court legally depends (United States Reports, 1962).

Standing to appear in an administrative proceeding is a threshold question, a privilege to be granted or denied by an agency; it has no constitutional dimension (Government Affairs Committee, 1978). The courts began reviewing agency opinions

on standing with Office of Communication of the United Church of Christ v. Federal Communication Commission, when then-Circuit Judge Burger said public participation may be compelled by the need for additional viewpoints:

> unless the listeners -- the broadcast consumers -- can be heard, there may be no one to bring programming deficiencies or offensive over-commercialization to the attention of the Commission in an effective manner. (Federal Reporter, 1966)

Held, the listening public and individual members of it had standing to participate in this license renewal proceeding. Given the need for multiple views, and for broadening the agency's consensus:

> there is special and important justification for allowing intervention in an agency proceeding, even though that party might not have standing to later seek review of that outcome in Federal court. (Governmental Affairs Committee, 1978)

In practice, agencies usually set standing requirements with their regulations: the NRC, Civil Aeronautics Board, National Labor Relations Board, Federal Communications Commission, Federal Trade Commission, Federal Power Commission, and Interstate Commerce Commission have published such rules. Generalizations are difficult, but:

> A few that can be made include: some degree of interest in the proceeding must be demonstrated; intervention in rule-making-type proceedings is more permissive and frequent than intervention in adjudicatory matters; and the hearing officer or administrative law judge is given wide discretion as to who is admitted and what privileges they can exercise. (Governmental Affairs Committee, 1978)

Some of those rules permit an appearance by representatives of state and local agencies with overlapping jurisdiction.

3. Modes of Participation

This chapter parallels in some respects the following chapter, "The Conduct of

Public Participation: Problems and Solutions." The difference is that the instant chapter is an overview of the whole process by which members of the public and their citizen groups interact with government as siting decisions are made; the following chapter, on the other hand, focuses on dysfunctions, mostly in the hearing process. The "Conflict Resolution" chapter continues this post-mortem analysis in scrutinizing the dynamics of decision-making in high-technology siting controversies.

The first mode of participation is information exchange between government (all levels) and members of the public and their organizations. It should be emphasized that the exchange is a true one, indeed a two-way process, and should be divided into active and passive public. The "Passive Public" is a receptor of information, while the "Active Public" returns information to government about alternatives and about its opinions, while keeping within the official bounds of the consultation and concurrence process. When the public is aroused and takes steps outside consultation and concurrence procedures, information exchange is overshadowed by the realities of power and intimidation: we now see an "Aggressive Public." While information exchange is the first mode, the second mode of participation is power balancing between government and that aggressive public.

3.1 Information Exchange

Information is the "currency of power" (Gordon and Engel, 1979); alternately both the means and the end of the political process. The information that will be exchanged relevant to high-level commercial reactor wastes can be subdivided into:

(1) technical;

(2) historical;

(3) political and strategic; and

(4) legal.

Technical information is that which is quantifiable and theoretically subject to

evaluation by impartial experts: this category includes geology, meteorology, seismicity, engineering, systems analysis, and economics. Historical information includes past experience with radioactive waste storage, the resolution of other siting controversies, and extrapolation from the behavior of social institutions. Political and strategic information spans the environment a proposed site finds itself in: What do the citizens of the area think, and what actions do they contemplate in regard to the project? Is the state's legislature enthusiastic, and what leaders shape its positions? What newspapers best reflect local thinking? Would people be more receptive if they were offered compensation to offset the drawbacks of a waste repository in their county? Finally, legal information includes both statutes and case histories of prior court challenges, everything from regulations defining notice requirements to the successful arguments in National Environmental Policy Act (NEPA) suits.

3.1.1 Sources of the Public's Information (Passive Public)

In current siting controversies, the government is a prime source of information. In order of increasing coverage -- though not in quantity of information content -- first come the federal and state registers, containing proposed rules, executive orders, and meeting notices. Any agency depending solely on registers for dissemination will breed a good deal of ill will. Information of a technical kind may be distributed through the indexes and print-outs of the National Technical Information Service, the National Academy of Sciences (which has a WIPP-site panel), or by funding independent bodies of scientists to cross-check the work of federally-employed scientists. The Environmental Evaluation Group (EEG), under the Health and Environment Department of the State of New Mexico, is such a federally-funded watchdog body. "We're paid by DOE to look over their shoulders," said Robert Neal, EEG director (Neal, 1981). As part of EEG's dissemination task, short workshops are

being held in selected towns, periodic reports are made to the legislature, and 200 groups receive regular mailings. On the whole, EEG's findings are too complex for the ordinary citizen. For one year, the Consultation Task Force under the New Mexico governor's office handled the job of spreading more generalized information to the public. John Gervers, who was coordinator during the Task Force's active period (summer 1979 to summer 1980) said that he was surprised at how little use was made of the Task Force's reading room by activist groups (Gervers, 1981). In Colorado, a state-endorsed citizens' group called the Monitoring Committee reviews documents and holds hearings on the Rocky Flats plutonium reprocessing facility. Some of the citizens hold security clearances, so they can participate in decisions on the release of papers to the public.

The operation of a reading room is often important in information dissemination. The WIPP-site controversy has bred several in New Mexico. At Carlsbad, the reading room is set up in the public library. Typically, reading rooms house Environmental Assessments, Draft and Final Environmental Impact Statements, hearing testimony, working papers, maps, and occasionally material freed from government by the use of state or federal freedom of information statutes. This material would include agency contracts, internal studies, and letters. Reading rooms are generally popular; the only complaint is usually that the selection is not wide enough.

Aside from reading rooms, government document regional depositories are a treasure trove for activists both pro and con. Although specific impact statements often are not placed in such libraries, contained in the mass of Congressional hearings and agency documents is a complete summary and presentation of the issues and arguments in waste disposal. Equally valuable are the secondary references to privately-printed matter and the names of experts who have taken sides on the issues.

Having somewhat wider coverage than depositories are news releases issued and

news conferences held by government officials, usually during the round of public hearings. These mainly serve to answer charges by anti-nuclear activists, and to provide notice of later public participation opportunities. Falling in the same category as releases are handout publications distributed at hearing rooms. The advantage of these is that citizens can select documents without having to wait several weeks for a return mailing. These publications should be under 100 pages in length; longer ones can be requested and sent by mail.

The dissemination method having the widest coverage, though of necessity restricted to material fairly brief in content, is the "occupants mailing," addressed to every resident in a county or Congressional district. Again, these serve to provide notice, a summary of the basic issues, and tell where to write for or locate more information. They may also be used to poll residents informally.

In 1977, Dorothy Nelkin of Cornell University documented the results of a set of experiments in environmental information dissemination by the governments of Sweden, the Netherlands, and Austria. In Sweden, the government set up a series of "study circles" managed by political parties and popular organizations both to discuss government-provided information and to use government funds to develop their own data. Eighty thousand people met in groups of 10 to 15, for at least 10 hours; surprisingly, the effort only increased the number of citizens declaring themselves ambivalent about the subject of the project, which was nuclear power.

As a part of a larger decision-making process in the energy and transportation sectors, the Dutch government devised a system whereby any major plan was to be preceded by "policy intentions" papers. For a year, these papers are circulated for comment, and discussed in "information evenings," exhibits, lectures, and television programs. Written comments go to a council of workers, company executives, and representatives of popular organizations. The council report is redistributed for comment, and finally the appropriate minister reads all the comments, writes a

summary, and reports to parliament. The minister is held, to some extent, personally responsible for his recommendation, though citizens can lobby in parliament.

Running from 1976 to 1978, the Austrian government experimented with nuclear issue debates. Scientists opposing nuclear development assembled a list of questions they wanted answered; this list was divided into 10 areas, and groups of experts (half opponents, half proponents of nuclear power) prepared information on the questions, and this information provided the format for televised public debates. Brochures defining technical terms were freely distributed. Again, results suggested that -- at least in the early stages -- increased information led to more uncertainty.

The second source of the public's information is the private publishing list. Publications vary widely in quality, from the most blatant propaganda to the most exacting technical performance data. Books on nuclear issues tend to be partisan, and concentrate more on power reactors than on waste disposal. Ideally, readers will realize that the truth lies somewhere in between the partisan stands of opponents and proponents. Periodicals are better sources in the field of popular material than books are; they serve to summarize and update waste disposal issues and the status of their siting controversies. Still better are technical and political science periodicals available in university libraries.

The news media also serve to pass along the contents of government reports which otherwise most of the public might never see; summaries of the Kemeny Commission report on the Three Mile Island incident were printed widely, and The New York Times reprinted sections of a DOE report on West Valley, New York, wastes alongside selective criticisms from environmentalists.

The media has also been known to pass along rumor as fact. In accidents involving the possibility of catastrophe, rumor can be one of the public's most potent sources of information or misinformation. In the Three Mile Island panic, word of mouth and media painted a "confused and terrifying picture to people in the area ..." (Hendrie, 1979).

Some newspapers allow public access into their clipping and photo files; this access is a valuable source of information to citizens of an area with a long-lasting siting dispute. Computerized data banks -- such as the New York Times Information Service -- will become more important in the future, but for the time being the hourly user-charges are discouraging to all but the most well-financed of citizens and citizen groups. Most must content themselves with periodical and book indexes in alphabetical form, and the National Technical Information Service, which also can be manually accessed.

Citizen groups provide information to non-members via lectures, debates, brochures, booths, and door-to-door solicitation. In 1973 and 1974, Upper Peninsula Citizens Concerned About Sanguine (Sanguine is a submarine communication antenna system, dealt with in greater detail in the section entitled "Conflict Resolution") decided they did not like hearings held by the Navy Department, so they held their own, and the former chairman said they drew a large audience (Lori, 1981).

In Colorado, the American Friends Service Committee and the Rocky Flats Nuclear Weapons Facilities Project has used a diversified plan to get their message across to residents near the weapons plant. Pam Solo, coordinator of the group, calls it a "combined-community informal educational effort," consisting of a speakers bureau, a publications list, audiovisual presentations, citizens' hearings, and participation in debates sponsored by other groups. Current efforts are directed at publicizing alleged effects of routine low releases of radioactive materials.

In Washington, the Nuclear Information Resource Service operates a toll-free hotline to answer questions from an environmentalist viewpoint. Senator Mike Gravel from Alaska opposed nuclear development as well, and sent out packages of offprints to enquirers until he was defeated in 1980.

Citizen groups often express curiosity about the inner workings of government contractors, but have major difficulties in gathering this information. One source is

the Corporate Data Exchange; another is interviews with disgruntled employees. The courts may provide some help; in unassociated lawsuits (antitrust, for example) corporate files may be made public, or shareholders may exert legal pressure on company directors to release files. A shareholder in General Public Utilities, parent corporation of Metropolitan Edison of Three Mile Island fame, has filed a federal class action suit against GPU and 10 directors, seeking damages resulting from withholding of information on reactor flaws (New York Times, 1979).

The public certainly gains some information by its attendance at hearings, but several analysts question whether the information is worth all the trouble. Uncontested hearings, they say, are poorly attended and thus ineffective vehicles to distribute hard information, while contested hearings are packed with proponents and opponents receptive only to narrow wavelengths of information tending to support their earlier conclusions (Ebbin and Kasper, 1974). However, the more local the hearing, the higher the attendance will be generally, and it will more likely be composed of those whose minds are not yet settled. Conversely, generic hearings -- usually held regionally or in Washington, D.C., are poor forums for disseminating information; they are primarily aids to decision-makers. Here again, the different functions of public participation are surfacing, and it can be seen how all functions cannot be served in a single proceeding.

The public may also receive information by attendance at the executive meetings of those agencies involved in consultation and concurrence, when those meetings are "open." At the city and county levels, most meetings are open (Adams, 1974). This level is important whether or not involved officially in consultation and concurrence, due to the resolutions for or against the site which will probably be voted upon. In Michigan, county boards of commissioners registered votes against both the Sanguine submarine antenna system and the Alpena nuclear waste disposal site proposed in 1976.

Each state has adopted its own open meetings statutes and regulations, and it is difficult to generalize given the scope of this study to consider all states. Generally, though,

> all states with Open Meetings laws open state-level non-legislative bodies. There are exceptions throughout, especially in terms of judicial and quasi-judicial bodies, parole boards and the like. But generally speaking, the laws appear to provide ammunition for reporters and others seeking access to state administrative bodies and county and local meetings. (Adams, 1974)

For those seeking access to such meetings, Adams says the ideal law will provide for or include:

(1) open legislative committees;

(2) an open legislature;

(3) open meetings of state agencies or bodies;

(4) open meetings of agencies and bodies of political subdivisions of the state;

(5) open County Boards;

(6) open City Councils;

(7) legal recourse to halt secrecy;

(8) penalties for violators;

(9) a statement of policy, favoring openness;

(10) a prohibition of closed executive sessions;

(11) a declaration that actions taken in meetings which violate the laws to be null and void.

A canny attender of executive meetings will carry a wallet card summarizing the essentials of his or her state's open meetings laws; the threat of court action is often sufficient.

On the federal level, the relevant statute is the Government in the Sunshine Act, (United States Code, Chapt. 5, Sec. 552(b)), passed in early 1977, at a time when 71% of the American public was said to support the opening of all federal boards,

commissions, agencies, and Congressional committees to public attendance (Cohen, 1978). The Sunshine Act is a good deal more limited than that, however. It applies only to the federal executive, and then only to the meetings of multi-headed "collegial bodies," which now number about 50. Such important players in the environmental field as the Environmental Protection Agency and the Department of Energy, then, are excluded. The rationale was that the public would have much less to see in the decision processes of single-headed agencies -- that the interference would not be worth the trouble. Like the open meetings laws of most states, the Sunshine Act was designed only to allow attendance at meetings, not active participation in them.

Freedom of information laws are common on the state level -- in 1977 there were 48 states with statutes, and two states with common-law access; some are quite old. The Wisconsin statutes date back to 1849. Again, a detailed examination of a particular state's laws must await a narrowing down of the candidate sites for waste disposal, but the important provisions in any statute are:

(1) the definition of "public record" and "agency;"

(2) the breadth of access to a document, assuming it is a public record;

(3) the determination of whether a particular seeker is within the classes of citizens granted access; and

(4) the nature of the judicial remedy available following violations by agencies. (Fordham Law Review, 1977)

The federal Freedom of Information Act (United States Code, Chapt. 5, Sec. 552) is contained in the Administrative Procedure Act. Amendments that became effective in February 1975 were important to users of the act: they specified the time allotted to an agency for its response, and added Civil Service sanctions for non-compliance with a reasonable request. As it stands now, the FOIA contains a presumption of disclosure -- disclosure is the "overriding goal" (Federal Reporter, 1971).

The FOIA as amended falls into three parts that:

(1) require agencies to give notice of what their files contain;

(2) set out the rights of access of citizens to government files; and

(3) exempt certain categories of documents from disclosure.

The test of disclosability is two-fold: both the governmental organization petitioned and the document sought must qualify under the disclosure mandates of the FOIA (Washington Law Review, 1976). The act covers only "agencies;" these are generally all executive agencies, including government-owned and government-controlled corporations. The Executive Office of the President is covered, but his staff is not (Business Lawyer, 1979). Further, an agency is only obligated to release documents within its present control (United States Reports, 1980).

3.1.2 Information Return from Public (Active Public)

The most obvious means of obtaining feedback from the public is the hearing, both those held for consultation and concurrence purposes, and those before boards or agencies not directly involved in the process (county commissioners' meetings, for example). Particular features and problems of these hearings, and possible solutions, will be dealt with in the next chapter. It should be noted that the public's means for getting a message across go beyond testimony; during the hearing, signs can be waved, notes passed, comments shouted, and groans heaved, and examiners can be approached before and after the formal proceedings.

The public also returns information via the news media by: man-in-the-street interviews of the sort popular in Pennsylvania during the Three Mile Island incident; press conferences; managed public rallies; talk shows; participation in documentaries; letters to editors; paid advertising; debates; and rebuttals under the fairness doctrine of the Federal Communications Commission.

Another means of information return is the public petition. Related are the

attempts to gauge the public mood correctly with polls initiated by government and private organizations; the non-binding referendum is one form of poll.

3.2 Power Balancing Between Government and an Aggressive Public

This section covers the steps opponents may take outside the consultation and concurrence process. Petitions and polls and some demonstrations are inside the process, because they represent an appeal to the final decision-makers. Methods outside the process attempt to bypass the process entirely, and, generally, look either to the courts or to the mass of people.

3.2.1 Use of the Courts

Due to the doctrine of pre-emption, which confines the resolution of most nuclear controversies to the federal level, the courts discussed will be the federal courts. In the past, major court attacks on nuclear installation have centered on the extent of pre-emption, licensing procedures, and the requirements of the National Environmental Policy Act. In the areas where state prerogatives remain, nuisance law has been used, but with modest success. Nuisance is a traditional doctrine intended either to close or, more often, compensate the victims of a "messy" industry nearby. Suffice it to say that nuisance law will probably be of little avail to waste-site opponents, given the doctrine's favoring of publicly necessary projects, the cost-benefit analysis of Reserve Mining Co. v. EPA, (Federal Reporter, 1975), and the cleanliness of a waste site for at least several hundred years. The more likely legal attacks by intervenor groups will concern licensing procedure and the requirements of the National Environmental Policy Act (NEPA).

NEPA demands full consideration of environmental issues at every stage of the decision-making process, said the Eighth Circuit in Calvert Cliffs v. AEC (Federal Reporter, 1971). That decision put the area of reactor licensing firmly under NEPA

requirements though a private utility was financing and constructing the facility. "The adequacy of the environmental impact statement subsequently became a major issue in licensing proceedings" (Sekuler and McCullough, 1980). This trend was partly reversed by the decision in Vermont Yankee Nuclear Power Corporation v. Natural Resources Defense Council (United States Reports, 1978), which was a reminder by the Supreme Court that NEPA is largely procedural and not to be used for disguised attacks on agency prerogatives in carrying out legislative encouragement of nuclear power.

The original purpose of NEPA was to provide "all agencies and all federal officials with a legislative mandate and a responsibility to consider the consequences of their action on the environment" (United States Senate, 1969). The essence of those parts of NEPA relevant to a permanent high-level waste disposal site (which is a "major Federal action significantly affecting the quality of the human environment") is that officials must prepare a statement on the environmental impact, unavoidable adverse environmental effects, alternatives, and irreversible, irretrievable commitments of resources (United States Code, Chapt. 42, Sec. 4332(c)). Timing is important; the evaluation is to prevent mistakes before they happen. NEPA is to mesh with the entire siting process:

> A basic and critical characteristic of a timely siting methodology is that there must be a comprehensive alternative assessment in anticipation of any potential proposals and not after a formal proposal or right of way application is initiated. (Kapaloski, 1979)

If a citizen group feels that NEPA requirements have been ignored, they must first seek relief within the relevant federal agency -- this action is the "exhaustion of remedies" requirement (Sekuler and McCullough, 1980). It is to be presumed that, due to the uniqueness and longevity of a waste site, agencies will take considerable care in meeting NEPA, but opponents may well proceed to federal court in hopes of winning delay. Agency decisions on their compliance with NEPA are often reviewed in

federal court, as complainants have judicially enforceable substantive rights to see that it is satisfied, presuming they satisfy standing requirements. Any relief from the courts would probably be in the form of enjoining construction of the facility. The injunction process begins with a temporary restraining order, followed by a preliminary injunction, and finally a permanent injunction.

Even if a violation of NEPA were found, however, an injunction would not necessarily be granted (Leshy, 1977). Four factors would need to be shown:

(1) that the plaintiff citizen group is likely to prevail on the merits;

(2) that the group will suffer irreparable harm if the relief is withheld;

(3) that harm to the government if relief is granted does not justify withholding the relief; and

(4) that the public interest lies with granting the relief.

It is difficult to predict if opponent groups will turn to litigation of waste disposal issues, given the paucity of suits on permanent high-level waste disposal, but certainly litigation efforts have been rather successful in delaying and hampering the use of power reactors.

3.2.2 Civil Disobedience

Outside consultation and concurrence, more direct challenges to nuclear installations than litigation may be used. At Rocky Flats, Colorado, a group of activists split off from the Rocky Flats Action Group and formed the Truth Force, which pursued a strategy of civil disobedience in the form of vigils and sit-ins on the railroad tracks leading into the facility. These actions began in April of 1978 (Solo, 1981). The Action Group had originally planned to include disobedience in its repertoire, but, after engaging in one action, its leaders became alarmed at the unpredictability. Although the Truth Force could not stop the trains, the sight of tents erected on the tracks leading into the facility became a favorite of press photographers.

Civil disobedience may range from peaceful occupation of a plant site to riots with some deaths, of the sort becoming alarmingly frequent in West Germany. Traditionally, though, it is peaceful:

> Civil disobedience is defined as a deliberate act of lawbreaking which is both a public and conscious act of protest ... civil disobedience accepts the general legitimacy of authority but attacks some particular aspect of such authority in order to effect a change. (Vermont Law Review, 1980)

The history of public protest at the Seabrook, New Hampshire, reactor site is a good opportunity to view the various forces at work. Seabrook was selected as a site for two reactors from 19 possible locations in mid-1973 (Christensen, 1979). Hearings were held by the Atomic Safety and Licensing board in 1975. In the summer of 1976, a coalition called the Clamshell Alliance formed from 100 regularly-meeting local groups of the Northeast, each autonomous and having control of its own finances (Matthei, 1978). In August of that year, 18 New Hampshire residents were arrested after an attempt to occupy the construction site; three weeks later, 180 protesters were arrested. The Clamshell organized a massive protest for April 30 and May 1, 1977, in which 2,000 trespassed on the grounds. Fourteen hundred fourteen people were arrested, 85% of them apparently from out of state. Thereafter, police noted that many demonstrators declined to give their names or addresses, apparently not so much to hide where the majority were coming from, but in an attempt to avoid getting a police record. As the Seabrook site is just seven miles from Massachusetts, the high proportion of out-of-staters is not surprising. By most measures, the Spring 1977 demonstration can be counted a success for the plant's opponents. The 1,414 occupiers of the site had been trained in "nonviolent resistance," and police had to spend hours dragging them to makeshift jails in National Guard armories (Christensen, 1979). The State of New Hampshire was obligated to spend about $50,000 per day in caring for them (Newsweek, 1977). A Clamshell leader, explaining the coalition's motivation, said, "We feel Seabrook in particular, and nuclear power plants

in general, are life and death issues, and we are acting in self-defense" (Time, 1977).

On June 24, 1978, the Clamshell hosted an "energy fair" at Seabrook which attracted 20,000 people (Christensen, 1979). Then, on May 24, 1980, the disobedience resumed when 1,000 demonstrators attempted to close the main highway at the site by barricading it with cars and debris; meanwhile, smaller groups staged attacks on the chain-link fence. At first, the gate was the target, but each time cordons of police shoved the attackers back, who numbered about 400. Later, the attackers dispersed into a grove of trees, and spent the rest of the day making sporadic forays from this shelter, tearing down 20 yards of fence in one attempt (New York Times, 1980). The reactors have yet to be completed; the latest estimate is 1986 for the second reactor unit's completion date (Wall Street Journal, 1981).

At the Vermont Yankee plant of Vernon, Vermont, a civil disobedience action was staged to protest the refueling of the facility on October 8, 1977. The plant entrance was blocked, the protesters taken into custody and charged with criminal trespass; six raised a necessity defense (Vermont Law Review, 1980). The rationale of the defense and the stated purpose of the action was to:

> prevent workers from gaining access to the plant and thus reasonably attempt to stop the flow of radioactive substances into the environment, by preventing its further operation. (Atlantic Reporter, 1979)

Unfortunately for the protesters, Vermont had no statutory necessity defense to criminal charges. However, the Model Penal Code does recognize the defense (American Law Institute, 1958). A number of states recognize it as well, though they vary on whether conduct based on reasonable belief is necessary, and whether the objective harm to be avoided must clearly outweigh the harm caused by the disobedience. The existence of a necessity defense in a candidate state for waste disposal will have some bearing on the likelihood of trespass attempts, though not a conclusive effect.

Most protests, in the United States and worldwide, have occurred at power

reactor sites. Will anyone actively protest a waste repository? In late September of 1979, rallies were held at the Zion, Illinois; West Valley, New York; and Savannah River nuclear waste dumps (New York Times, 1979). In early May of 1980, in West Germany, 3,000 demonstrators occupied part of a waste disposal site (New York Times, 1980).

Some large-scale reactor protests have been part of a loosely coordinated worldwide challenge to nuclear power. On June 4, 1979, six power plant demonstrations in the U.S. were held in conjunction with protests in Spain, West Germany, France, and Canada (in the last, five activists used the novel trespass of parachuting into the compound) (New York Times, 1979). In the Spanish demonstration, one person was killed. This date was International Antinuclear Day. In one of the American demonstrations (in Shoreham, N.Y.), fences were taken down and a gate disassembled by a militant splinter group of about 20. In all, 600 were arrested at Shoreham (New York Times, 1979).

However, all this civil disobedience pales alongside the saga of the Narita International Airport outside Tokyo, Japan. Acting under motivations still unclear, thousands of demonstrators have spent years fighting the completion of a jetport located in a rice- and peanut-growing area. The runways were blocked with steel towers and flag-topped wooden scaffolding guarded by activists living in a shack nearby. Pitched battles at the towers, occupation of a control tower following a sudden, brilliant raid -- all this in fighting a facility planned to reduce the noise and danger of air traffic around Tokyo. One spokesman said they were angry at the preemptory way in which government had sited the project without consulting the local people (New York Times, 1977).

Another form of civil disobedience, though a rare one, is sabotage from inside. It is usually a symbolic gesture. In 1979, two technicians used sodium hydroxide to damage new fuel elements at a Virginia Electric and Power Company reactor.

Damage was estimated at $1 million. The claimed motive was "exposing a lack of security" (New York Times, 1979).

The likelihood of all these means of protest, those outside consultation and concurrence, is very uncertain. Factors to be considered include the national and international mood on the use of nuclear power, the attitude of the media, the exact location, the stands of politicians, and efforts to involve the public within consultation and concurrence.

4. The Conduct of Public Participation: Problems and Solutions

This section is an examination of complaints about the participation process, with some opinion on the seriousness of the grievance, and of possible solutions. It is subdivided into first, procedural problems, and second, the issue of assistance to public participants.

4.1 Procedural Problems

First, it is to be noted that the problems, if any, will depend on the purposes the participation is to serve, discussed in Section One. If the primary function is to build public consensus for permanent waste storage, a dysfunction which operates to prevent the transfer of technical, substantive information to decision-makers may be unimportant. In this scenario, it is the image which is to be served, and decision-makers do not plan to act on the public's technical objections. However, if decision-makers are not positive that the site is a good one, and wish the public to cross-check their recommendations, such a dysfunction may be very serious.

No participation process has been so scrutinized, is more intricate, or offers more opportunities for intervention than reactor licensing. One critic cited earlier, Professor Harold Green, has said that the very thoroughness of the process has sown the seeds of its own destruction. He proposes dismantling most of the system:

> The licensing process now is grotesquely and absurdly overcomplicted in terms of the number of procedural steps required by the statute; the manner in which each of the steps is burdened by so-called public participation; and by the measures that have been adopted by the NRC to encourage such public participation while, at the same time, preventing the public participation from being meaningful or effective. (University of Pennsylvania, 1979)

The tangle obscures the honest effort the NRC makes, he says, and reduces public confidence despite the government's attempts to court it. He continues:

> I think the hearings are useful for only one purpose. That is, they provide a means whereby intervenors have a shot at either stopping a plant dead in its tracks, ... or more realistically, as a means whereby intervenors can conduct guerilla warfare and harass a plant to the extent that either the proponents of that plant or the proponents of other possible plants in the future will decide the game is not worth the candle. (University of Pensylvania, 1979)

In short, it appears that the very public participation process may be damaging the democratic process by lending excessive interference power to small groups. Theoretically, at least, the majority may favor the projects small groups are able to block totally under the cloak of public participation. Green favors discarding the bulk of hearings and, instead, focussing responsibility on individual officials.

Part of the blame should fall on the adjudicatory process. When a controversy revolves around technical issues -- e.g., whether ground water will rise sufficiently over a span of 20,000 years to flood a waste repository -- it is doubtful that the adversary process contributes much to a good resolution. Ebbin and Kasper, in their study of the licensing system, concluded that non-substantive, procedural issues occupied much of the time, often in attempts to discredit witnesses:

> The lawyer becomes the focal point of the intervention and it is his command of the scientific and technical support which becomes a critical factor ... for the most part, the citizen is reduced to an observer, a non-participant who must depend on others for a clear articulation of his interests. (Ebbin and Kasper, 1974)

At the heart of the problem is the attorney's training to use only the scientific

information which supports his position, and to keep out all conflicting information; arguably, this is contrary to free scientific inquiry and discussion. Another commentator says cross-examination is of limited utility in cases of "immense volumes of complex data embracing various specialized technical disciplines" (Whitney, 1974). As Ebbin and Kasper report:

> There is ... a tendency to ask essentially random, groping questions in an attempt to expose an area in which scientific knowledge of the witness is vague or incomplete, or to be satisfied with having evoked an equivocal response from a technical witness. (Ebbin and Kasper, 1974)

One solution could be the funding of technical witnesses for opponents of the site, who ideally could proceed to build their own case rather than grope for contradictions and holes in the proponents' case. This issue will be addressed later. Other remedies could involve the use of technical interrogators, who would replace attorneys in most of the cross-examination of technical witnesses. The results in licensing proceedings to date have been mixed, and problems have revolved around definitions of who is sufficiently expert in a particular area, and around a tactful method to restrict the scope of questioning to the interrogator's expertise.

Another type of experiment took place in 1976, in Cambridge, Massachusetts, during the dispute on a recombinant DNA laboratory. There, a citizens' panel was appointed to conduct their own inquiry and place recommendations with the city council. Occasionally, the panel took on the role of a jury and invited scientists in for a "mock trial" on a particularly thorny technical issue. Afterwards, one member of the panel expressed satisfaction with the process, though he recommended more use of surrogate, technically competent questioners. He said the intermittent use of the adversary method had been very successful (Krimsky, 1977). The problem, it seems, is to retain the objectivity of scientific inquiry while utilizing the sharpness of the adversarial stance (Michael, 1977).

Again, the use of attorneys in waste repository siting hearings would depend on

what the function of the hearings is to be. Public meetings rarely call for attorneys, but they are considered de rigueur in adjudicatory proceedings. If technical issues are to be preferred over procedural issues, a modified, hybrid, adjudicatory proceeding might be best and attorneys could be discarded. The difficulty is to provide fairness to both sides while leaving room for "the democratic processes of compromise and negotiation" (Sherry, 1976). The alleged role of the attorney is to see that fairness is done, but, as Ebbin and Kasper say, the lawyer may succeed in winning the battle of procedural due process for his client, while losing the war of substantive due process.

Returning to the recombinant DNA dispute, the director of the American Institute of Biological Sciences, Richard Trumbull, has said he fears the results of excess public participation in technical decision-making -- that a given citizen with no background in the issues will become a sort of kibitzer, a mere spectator with no commitment to the integrity or rationality of the process; such spectators, he says, have little reluctance to acting like football fans who rush onto the field to tear down the goalposts before the game is over (Trumbull, 1977). The deeper each participant's commitment to a reasoned decision, the harder everyone will work for a mutually agreeable outcome: each has a personal stake in preventing a circus atmosphere. Necessary to this kind of consensus is the feeling that one is being heard and not just indulged, and that if one builds a good enough case, the result might be different than if one had not participated. On the surface, this seems a difficult goal to mesh with consultation and concurrence, given that localities and their citizens cannot be given a veto under current law.

It is possible, though, to give public participation a real role without coming into conflict with the law: i.e., if several sites are under active consideration when public participation begins. In this case, participation need not revolve around the frustrating question of pre-emption but can move on to the more pertinent question of which site is the best under existing knowledge. If only one site is "alive" when

participation begins, the public has the impression that the outcome is fore-ordained, given the government's statements that waste disposal is overdue. The only apparent role for participation in that case is appeasement.

However, if several sites are under consideration, and the participation begins at an early stage, participants have to take on some of the responsibility for the selection of the final site. If community A is selected as the final site, its citizens have to acknowledge some of the blame for not making a good enough case against location A to make community B the final site. Then, too, the multiple sites strategy allows for the possibility that one community might heartily welcome the waste repository.

When a single site has been named, all citizen groups against permanent storage present a single, united front, whether they oppose storage in that geology generally or only the particular site. If several sites have been named, some of this opposition breaks down into self-interest, saying that storage might be acceptable in some other community, ostensibly for technical reasons. As a strategic matter, then, proponents of permanent storage should favor the naming of several candidate sites, and their being kept "alive" during public participation. If the multiple sites are narrowed to one before the public enters the process, most of the consensus obtainable through consultation and concurrence will be lost. This discussion highlights the problem of timing. As a House subcommittee concluded after studying the attempt to locate a WIPP-site near Alpena, Michigan, they feared that state participation would be limited to professional and scientific staff:

> and that mutually acceptable procedures developed thereto will not reflect the wishes of the local governments, elected officials, and individual citizens residing near a candidate site. Public participation is likely to be restricted to a series of well-intentioned but ineffective public hearings.... The Alpena incident demonstrates that concerned citizens and government leaders are not responsive to a sales pitch after significant decisions have been made. (Proposed Nuclear Waste Storage in Michigan, 1977)

In the reactor licensing area, citizen groups would be less negative if they participated at the earliest stages -- when the utility was considering the very need for a plant, before "large amounts of money and resources have been expended ..." (Ebbin and Kasper, 1974). As Harold Green points out, the groups feel that all economic forces have been set in motion to complete this particular project -- that they face the tip of an enormous wedge -- and they often adopt desperate, "no-win" tactics of delay and site occupations (Green, 1974). In the area of general revenue sharing, a League of Women Voters study on public participation in budgeting said:

> Nothing is more damaging to citizens' willingness to invest time and effort in participation mechanisms than a perception that their role is pro forma, that they are as "window dressing," that the decisions have already been made. (League of Women Voters, 1980)

This problem raises the problem of appearances, "image," which goes beyond questions of timing. A participation process of utmost real fairness is of questionable value if a large proportion of the interested public feels that they have been cheated. This lack of value is especially pronounced if the whole point of the participation was to muster a consensus. The outcome is not the sole determinant of the public's feeling about the integrity of the process:

> What may be more important in generating public confidence, however, is not whether individual intervenors win or lose their particular contentions; but rather whether the public realizes NRC proceedings are an open process, available to all interested persons .... (Boasberg Study, 1975)

Details are important. A participant in the "scoping hearings" preceding the issuance of a Draft Environmental Impact Statement on the proposed MX-missile siting in New Mexico and Texas complained that it was a hot-air meeting only, since no votes were taken, nor any tapes or transcripts made (Greathouse, 1981). In the WIPP-site controversy, one opponent said, "There are plenty of hearings -- the number of hearings is not the problem. They'll hold hearings at the drop of a hat, but neither side seems to address the issues raised by the others" (Stone, 1981). Professor Robert

Kates, of Clark University, sat in on the 1979 West Valley, New York, hearings on reopening the Nuclear Fuel Services reprocessing plant. He talked of the panelists, officials of the Department of Energy, as "extraordinarily inhuman" in their demeanor; that is, "they never engaged, just sat patiently while catcalls and shouts came from the audience. People wanted to discuss broader issues. Altogether, both sides came off very poorly" (Kates, 1981). The hearings, he said, served neither to find facts nor to let off steam.

Professor Green has said that part of the reason for the bad image of licensing hearings is that the public is not involved in the more fundamental questions of the need for a particular facility, nor the disadvantages:

> Since there has never been an authoritative articulation in the arena of public discussion of the actual risks of nuclear power plants, public debate presently proceeds from two extreme positions ... Each side attacks the other, usually ad hominem .... (Green, 1974)

To pursue the issue of who runs the hearings: the purpose of the meeting should determine who conducts it. A public meeting intended to survey local opinion does not need a moderator with the same techical or legal background as the examiner in an adjudicatory proceeding. Also, questions are often raised about the objectivity of the examiners and moderators. While some participants in the WIPP hearings complained that former General Ernest Hardin was too closely associated with DOE, they did want to see DOE decision-makers at the hearing, available to answer questions. One suggested that the hearing moderator be a local person of some standing, reasoning that the audience would be more polite to someone they would see in the future. It is also important that the moderator avoid the appearance of bias on either side; this appearance of bias has been a problem with members of the Atomic Safety and Licensing Boards (University of Pennsylvania, 1979). It may be an unattainable goal; at the same hearings on the WIPP-site, some participants complained of hostility toward opponents of the project while others said proponents were

systematically mistreated in deference to the opponents.

However, while it is important to appear fair, it is also important to keep a firm hand on conduct of the proceedings. If this is neglected, questions and insults will be hurled from the audience, breeding more arguments; some will rise and attempt to lead the group in prayer; some witnesses will perform as improvisational comedians — for any emotionally-charged hearing without the power of contempt citations is always on the verge of becoming a circus. Certainly much of the testimony will stray from the issues at hand (Gervers, 1981). It is part of the tension between the need to keep comments relevant and short, and the pressure to address larger policy questions. At least half the participants in the West Valley hearings, said Robert Kates, thought the scope far too narrow. He suggested small workshops and a long-range study panel as better than the hearings which were held (Kates, 1981). It should be noted that Kates spoke in opposition to the reopening of the reprocessing plant.

The subjects addressed at any hearings to be held on waste repository siting will depend partly on whether there are several "live" sites. If so, rather than have each local hearing address much of the same material relating to storage generally, issues might be divided into site-specific and non-specific areas (e.g., transportation safety).

The question of definition of a local hearing and of what localities are relevant will arise:

> Recommending participation on the lowest level or on a face-to-face basis does not automatically identify the geographic unit which provides the focus for attention. In fact, one of the most difficult and complex decisions is determining appropriate boundaries. Simple geography, i.e., where people live or work, is not enough. Problem boundaries must be related to reflect interest boundaries -- and, depending on the problem, these could be the entire nation .... Who has an interest in the public domain, in atomic energy research and production, in the development of a river? .... The locale is important, but it is not the sole dimension. (Wengert, 1976)

The writer, Norman Wengert, raises several interesting points. One is the problem of selecting the affected communities; in a waste repository proposal, the relevant communities might be those immediately around it (to what radius?), those on the transportation corridor, or even the entire nation. It is the dilemma of a democracy: some necessary activities are noxious and yet cannot be hidden away from all population. A minority of communities must take on the unquestionable burden of a steel mill nearby, or a chemical waste dump, or a power plant, or a radioactive waste repository. The good of the whole nation requires that these facilities be located somewhere even though not a single community wishes to host them.

Several things can be done to reduce the disgruntlement if it exists. One approach is to offer positive inducements, popular in Japan, in compensation for the risk incurred. For the siting of a power reactor, there is the inducement of much local hiring, and the likelihood that the power company will be paying much of the county's property tax bill (Ebbin and Kasper, 1974). Also, it should be pointed out to the impacted community that other parts of the nation are taking on onerous burdens of pollution or the possibility of disaster.

Local hearings serve to bring out wide policy issues. Drawing on experience with local citizen participation in the use of general revenue sharing funds, Carol M. Rose of the Southern Regional Council suggested that local hearings should be in series, rather than "one-shot affairs," with at least one round at the neighborhood level. One-time, city-wide hearings, "particularly where they are not combined with other well-developed methods of eliciting citizen input, appear to be quite ineffective ..." (Rose, 1975). In the waste repository subject area, local meetings might serve to elect representatives to a legislative-type or adjudicatory-type hearing on a larger scale. Such a filtering process might reduce some of the acrimony of these hearings, "debate which disrupts the delicate fabric" (McGowan, 1977).

In concluding this consideration of procedural problems in the participation

process, a number of minor matters arise. One is notice. Several participants in the WIPP hearings complained that the only notice to a meeting or hearing was contained in the Federal Register, which is approaching a hundred thousand pages per year (Kartchner, 1981). Means of notice should depend on the target public -- "what are its usual information media and means of communication" (Rose, 1975). For agencies, the Administrative Conference of the United States (1971) has suggested:

> factual press releases written in lay language, public service announcements on radio and television, direct mailings and advertisements where the affected public is located, and express invitations to groups which are likely to be interested in and able to represent otherwise unrepresented interests and views. The initial notice should be as far in advance of hearing as possible in order to allow affected groups an opportunity to prepare. Each agency should consider publication of a monthly bulletin, listing:
>
> (a) the name and docket number or other identification of any scheduled proceeding in which public intervention may be appropriate;
>
> (b) the date, time, and place of the hearing;
>
> (c) a brief summary of the purpose of the proceeding; and
>
> (d) the name of the agency, and the name and address of the person to contact if participation or further information is sought.

The recommendations for a monthly bulletin echo those of Carol Rose of the Southern Regional Council, who said that "one of the most serious impediments to citizen participation in revenue sharing is the lack of public information about the program" (Rose, 1975). The Office of Revenue Sharing had issued a booklet, Getting Involved, but it contained little hard information on the procedures: where the hearings were to be held, or how one sought access to the microphone, or if statements needed to be set out in writing. The FCC is more organized in this regard: it publishes a weekly bulletin called Actions Alert on pending hearings, has issued a procedural manual on the filing of compiaints and participation in application and rule-making hearings, and leaves copies of the manual with licensees, who are directed to make them available to inquirers (Regulatory Reform, 1976). Its Guide to

Open Meetings gives room arrangement and key personnel's names and functions, and lists procedure and terminology. Attendance is also facilitated when agencies hold at least some of their hearings in the evenings or on the weekends. Community television may be willing to broadcast the proceedings. Dissemination is also aided by news coverage, but at some cost in intimidation to citizens not accustomed to the prospect of appearing in the news.

Both citizens and decision-makers would profit by a higher level of background knowledge on the part of public participants. Ebbin and Kasper recommend that all speakers be required to prepare summaries of their testimony, and that the summaries be reproduced and distributed prior to appearance so laypeople can follow the substance (Ebbin and Kasper, 1974). Harold Green, after eliminating all reactor licensing hearings, would substitute a wide-scale public education program with a full cost-benefit analysis "in a form readily comprehensible to the public" (Green, 1974).

4.2 Assistance to Intervenors

Generally, the argument for financial assistance to citizen groups is that a point of view represented only by them will not receive full consideration, for they typically cannot afford expert advice:

> ... (n)oneconomic interests or those economic interests that are diffuse in character tend to be inadequately represented. (Georgetown Law Journal, 1972)

Current proposals to fund public participation are in the embryonic stages. Bills to fund it generally at the federal level have all failed, though some agencies are authorized to do so and in fact have set up programs.

The question of funding public participation must depend on the nature of the hearing or procedure proposed:

> one should examine (1) the purpose of the hearing, (2) the nature of the

contested issues, (3) the role of the NRC staff, (4) the proposed contributions intervenors can make, and (5) the anticipated costs of such interventions. (Boasberg Study, 1975)

If trial-type, adjudicatory hearings are planned, the arguments for funding are stronger, as the intricate procedures often cost a great deal in fees for attorneys and expert witnesses. The fact that participation may be expensive does not end the inquiry, however; all citizen groups are not alike. One group may not have any money at all, while another may have decided to spend its funds on some "worthier" project. The first has a somewhat better claim to funding (Nagel, 1976).

A report prepared by a Washington law firm for the NRC in 1975, called the Boasberg Study, sums up the issues of financing intervention in reactor licensing proceedings; some of the material is relevant to participation in waste repository siting. Arguments in favor of funding are that:

(1) intervenors can make and have made significant contributions to NRC hearings;

(2) they serve as a gadfly to staff and the boards;

(3) funding will increase the public's confidence in the efficacy and safety of nuclear technology;

(4) a sincere effort is needed to review safety, economic, and environmental factors; and

(5) intervenors bring in the outside view. (Boasberg, 1975)

Arguments against the funding are that:

(1) the money will only increase delaying tactics;

(2) decisions on health, safety, and environmental issues are better left to agencies, which have been directed to pursue the public interest;

(3) trial-type licensing hearings are not suited to fact-finding, but only to grandstanding; and

(4) less drastic alternatives than direct funding exist. (Ebbin and Kasper, 1974)

On the delay argument, Ebbin and Kasper have said that lack of funds is the real reason for delaying tactics by environmentalist groups, the product of an organization drawn too thin.

Also, the fear has been expressed that funding will cause citizen groups to become the captives of the agency approving funding. Lesser alternatives than direct funding do exist; agencies may reduce costs by waiving various fees, making copies free of charge, conducting research (Administrative Conference, 1971), providing independent assistance centers with the aid of universities or bar associations (Boasberg, 1975), or easing the procedural requirements of hearings (Merrill, 1978).

Methods of funding vary from small but easily obtained payments, to the other extreme of payment only after participation is over, and then only to those groups which have distinguished themselves. A compromise between these two extremes is to distribute half the money which is available to all groups which apply and participate, and to reserve the other half for those which make the most meaningful contribution. Applications for funding should be supported with affidavits, financial statements, and a detailed plan for the participation that includes a statement of why the group can make a unique contribution. Funding decisions should be made by an impartial arbiter or agency.

The more compelling arguments for funding are those which refer to the need for technical advice, rather than for more legal advice. "Expertise is a crucial political resource" in high-technology decision-making, Dorothy Nelkin (1977) has said. However, "independent scientific analysis and evaluation is almost never available" for citizen groups, say Ebbin and Kasper (1974). Although the raw information is available to the diligent, a Sierra Club staffer told a Congressional subcommittee, the talent to sift and digest it, to draw conclusions, and to know where and when to look for more information, is highly specialized and usually not available (Resnikoff, 1976). Further, another activist says:

> scientists must work with, and within, these groups to be useful to them. It is not as if the group needed to know some isolated fact, or the result of some esoteric single calculation. Science must infuse their program, and their perception of possibilities and risks. (Stone, 1977)

Usually, if technical advice is available at all, it is from graduate students or "all-purpose" experts, who are allied with an entire movement. In the anti-nuclear field, Linus Pauling and John Gofman are examples. Though experts in one field, by necessity rather narrow in scope, they are called on to testify about everything from thermal pollution to the effects of alpha radiation (Cameron, 1972).

Central problems at the core of this include the lack of access to the names of all experts available to testify on abstruse subjects; not knowing enough to ask the right questions of them when their services are obtained; and lacking enough money to pay them. The first two problems are more easily remedied: attempts have been made by the National Science Foundation's Science for Citizens Program, the Center for Science in the Public's Interest Science Matching Service, and the Federation of American Scientists. Ebbin and Kasper (1974) describe independent environmental assessment centers, organized by subject area, and staffed with university personnel drawn on temporary loan; these centers work to spell out areas of agreement and disagreement, while disseminating information without passing judgment. New Mexico's Environmental Evaluation Group, with five staff scientists, is such an assessment center. This approach is a less drastic alternative than direct funding of citizen groups so they can hire experts. It has the advantages of avoiding the capture problem; it leaves more of a role for small and outsider groups not eligible for direct funding; it maintains more objectivity; and it enables citizens to seek technical information directly without the need to belong to a funded group.

For a discussion of the pros and cons of attorney funding, the Boasberg Study should be consulted. Since it is unlikely that a full adjudicatory format will be used in the waste repository siting hearings, attorneys are less useful than in reactor

licensing. Because of the difference in procedures, the few experiments in funding are only moderately relevant. NRC qualified five groups for $200,000 during the GESMO hearings; the National Highway Transportation Safety Administration conducted a one-year pilot program; and FTC has funded intervenors in rule-making proceedings since 1976 under the Magnuson-Moss Warranty and FTC Improvements Act (United States Code, Chapt. 15, Sec. 45). Under that act, attorney and expert witness fees may be paid to:

> any person (A) who has, or represents, an interest (i) which would not otherwise be adequately represented in such proceeding, and (ii) representation of which is necessary for a fair determination of the rule-making proceeding taken as a whole, and (B) who is unable effectively to participate in such proceeding because such person cannot afford to pay costs of making oral presentations, conducting cross-examination, and making rebuttal submissions in such proceeding. (United States Code, Chapt. 15, Sec. 57a(h)(1))

Five hundred thousand dollars was appropriated the first year; one of the first grants was to a consumer action group for participation in a trade regulation rule-making on vocational schools (Nuclear Regulatory Commission, 1976). FTC standards are less strict than those of NRC in authorizing funding.

Controversy on the results revolves around alleged capture of small groups by FTC and possible duplication of effort. One supporter of the program says that it is important that the agency's general counsel, not its staff generally, makes the funding decisions; he adds that the diverse list of grass-roots organizations funded and the actions they have taken shows "independent-mindedness," and that the participation clearly went beyond what would have been possible without the grants (Halpern, 1979).

5. Conflict Resolution: Case Histories

Hundreds of isolated controversies, nuclear and non-nuclear, have some bearing on the issues of a high-level waste repository; in the interest of economy and

relevance, however, three controversies of particular importance have been selected: the common factor among them is the proposal to site a largely untried, high technology installation among an ambivalent population. Each technology holds promise for the nation and yet some possibility of disaster. The controversies are:

(1) proposed sites for defense-related radioactive wastes;

(2) proposed sites for extremely low frequency submarine communication antennae; and

(3) the construction of a containment laboratory for recombinant DNA research.

5.1 Defense Wastes

The history of this controversy illustrates well the danger of alienating a Congressional delegation. Ever since the military started producing transuranic wastes (TRU), it has known it would need a repository for them. Active planning began with salt beds near Lyons, Kansas. In April 1970, the Atomic Energy Commission informed Congressman Joe Skubitz of a plan called Project Salt Vault, followed by a public announcement of a waste repository to be located in an abandoned salt mine one-half mile outside the city and 1,000 feet below the surface. Citizens of Lyons protested that summer, and Skubitz challenged the site's appropriations on the House floor, charging the AEC with a violation of NEPA. The following summer, the news media reported that a nearby hydraulic salt mine had lost 175,000 gallons of water due to uncapped exploratory oil and gas drill holes. As this water loss indicated a threat to the watertight integrity of Project Salt Vault as well, the site was abandoned, in 1972.

The next candidate site was the Salina Basin, a salt formation underlying the northeast corner of the upper Michigan peninsula, contained in the counties of Alpena, Presque Isle, and Montmorency. Negotiations began in 1975 between ERDA

and the Michigan Department of Natural Resources. Through early 1976, ERDA and Union Carbide sought permission to sink test holes, but it was not until May 25 of that year that ERDA notified Michigan Congressman Philip Ruppe of the plans. Ruppe was upset at the late notice, and responded critically. He brought the House Interior and Insular Affairs Committee's Subcommittee on Energy and the Environment into Alpena, Michigan, for a set of field hearings on ERDA's plans. That same day, the Alpena Board of Commissioners passed a resolution, "that the Alpena County Board of Commissioners officially opposes and rejects the planning and development of a radioactive waste dump within Northern Michigan and specifically within any geographic area of the county of Alpena" (Nuclear Waste Disposal in Michigan, 1976). At the hearing, a spokesman for the Public Interest Research Group in Michigan argued for a clear statutory decision-making process, and the provision of state and local veto power. He alluded to a dispute between ERDA and NRC over jurisdiction of the proposed site, saying "public anticipation will be correspondingly frustrated: people will troupe from hearing to hearing, only to be told that they are in the wrong place ..." (Conlin, 1976). Another speaker criticized "the secrecy that shrouded the project, ... the lack of adequate notice, and even time for citizens to participate" in ERDA's first hearings (Coggins, 1976). Congressman Bob Carr of Michigan expressed concern about public-state-federal communications, while explaining the purpose of his subcommittee's field hearings:

> We want to make sure that both the citizens of Michigan and their elected representatives will be able to participate in a significant fashion in any discussion to locate a radioactive waste storage site in this State .... Considerable concern resulted from ERDA's having made plans to conduct the test drilling without informing the people of the State of Michigan or their concerned representatives at both the State and Federal levels. (Carr, 1976)

State Representative Lynn Jondahl arrived to propose an outline of what was later to be called consultation and concurrence. By November of 1976, the citizens were

taking sides on the issues; local voters resoundingly voted to oppose waste disposal in their counties.

Meanwhile, ERDA and its successor DOE were examining sites in New Mexico soon to replace those in Michigan as the active candidates. A site was test-drilled on Bureau of Land Management property in September 1975, where hydrogen sulfide was encountered. In late 1975, an alternate site now known as the Waste Isolation Pilot Plant became active (Armstrong, 1981) east of Carlsbad, New Mexico. A number of test holes have been sunk, and the next step this year is completion of two test shafts; the contractor is Sandia Laboratories.

DOE held a short series of public meetings on the WIPP issue in summer 1978, and these meetings together with promises allegedly made to Senator Peter Domenici created the impression among some that the state would have an absolute veto over the project, despite clear statutory responsibility on the federal level (Lucas, 1979). In December 1979, DOE rejected any state veto. Misunderstandings and bitterness engendered by this seemingly broken promise still plague the project (Gervers, 1981). DOE did take the novel step of funding a separate technical review group on the state level, the Environmental Evaluation Group referred to earlier. In June and October of 1979, the Department hosted six sets of public hearings on the WIPP matter, held in four New Mexico cities, one Texas city, and one Idaho city. The first hearing examiner (for the June hearings) was former General Ernest Hardin, who had some difficulties controlling the audience in Albuquerque. The second examiner was Robert Hamilton, professor of law at The University of Texas at Austin, Law School. The conduct of the hearings has been discussed previously.

John Gervers, former coordinator of the Radioactive Waste Consultation Task Force, identified the principal citizen groups involved in the controversy surrounding the WIPP site. They are the Southwest Research and Information Center, Albuquerque; Citizens Opposed to Nuclear Dumping, Las Cruces; Citizens Against

Radioactive Dumping; Friends of the Earth; New Mexicans for Jobs and Energy; Americans for Rational Energy Alternatives; and Carlsbad Nuclear Waste Forum.

The last is the classic ad hoc, small scale group, formed around a neighborhood core. It is the brainchild of Roxanne Kartchner of Carlsbad, who is still in control; membership is about 20 (Kartchner, 1981). They participated in most of the hearings and have gotten some technical advice from a professor at New Mexico State University (Stone, 1981). Southwest Research and Information Center, founded in 1971, is an independent research and advocacy organization of environmentalist bent. They oppose WIPP, the director said, on transportation hazard, resource, and technical grounds, and prefer that several sites be considered simultaneously (Hancock, 1981). Southwest has been an active user of the Freedom of Information Act (Munroe, 1981), provides Congressional testimony, has a speakers bureau, and stays in close contact with state officials. Americans for Rational Energy Alternatives is a group of about 250, generally of pro-development and pro-WIPP views (Williams, 1981). It is not an ad hoc group, as it deals with a number of energy issues. Citizens Against Radioactive Dumping could not be reached, and is apparently inactive.

On a related topic, the proposed siting of the MX-missile in New Mexico and Texas, ad hoc groups are forming to oppose that project. These are the MX Action Groups, modeled on the pattern established by the Rocky Flats Action Group. An action group is forming in Portales, New Mexico: Betty Greathouse, of a ranching family, is one of the organizers. She said that much of the membership is drawn from ranchers already active in opposing a proposed extension of the Melrose Bombing Range (Greathouse, 1981). The MX and Bombing Range issues are similar: the taking of private land, wind erosion, the use of scarce water, and the boom-bust effect on local economies. State Representative Judy Pratt of Bernalillo has been a leader in the early fights against the MX system in New Mexico.

Some of the planning for the MX Action Groups -- Lubbock and Amarillo have

one each as well -- comes out of the offices of Austin's American Friends Service Committee (AFSC), in conjunction with the Texas Mobilization for Survival, formed in 1977, of the same office. AFSC is a highly capable organizer. Each action group is autonomous, though linked in planning. Action groups use the "telephone tree" and newsletters for notification. Austin publishes the "MX Action News," written by Mobilization staffers, and a Guide for action groups. The Guide outlines strategy:

(1) letters to:
   a) MX offices, local and national;
   b) elected officials;
   c) newspapers;
   d) Secretary of Defense and the President;
(2) public hearings participation:
   a) presenting testimony;
   b) wearing lapel buttons and carrying signs;
   c) hosting the group's own hearings;
(3) petitions; and
(4) links with other groups.

The Amarillo MX Action Group is currently under the direction of Carroll Wilson, a newsman. It is actively supported by the Panhandle Environmental Awareness Committee, also of Amarillo, which concerns itself with the proposed high-level waste repository, the Pantex nuclear weapons assembly plant near Amarillo, and the arms race generally. Its members are highly sensitive to the possibility of retributions by pro-nuclear activists holding positions of power in the community (Wheeler, 1981; Crawford, 1981).

5.2 The Shelf/Sanguine/Seafarer/ELF Antennae

This controversy also stands as a warning against the dangers of alienating a

Congressional delegation. For 24 years the Navy Department has sought, without success, a location for a large-scale Extremely-Low-Frequency (ELF) submarine communication antenna. The name of the project has undergone several evolutions, as can be seen from the section heading. Briefly stated, the antenna would cover a land area of 2,000 to 20,000 square miles of a particular kind of land: that which is underlain by non-conducting igneous rock, close to the surface. Millions of watts of electrical energy would pour through an array of buried cables in a grid pattern, sending a radio signal deep into the earth. These waves loop back to the antenna and send a signal with a 2,500-mile wavelength into the atmosphere. These waves follow the curvature of the earth and dip down far enough into seawater (several hundred feet) to communicate with American submarines trailing a long cable. Although submarines could not reply via ELF, the advantage is communications without the necessity of submarines coming close to the surface at regular intervals. "Bit" rate -- the rate of information transmission -- would be quite low, due to the low frequency. The Navy has said, to date, that only three locations meet the requirements of this project: near Clam Lake, Wisconsin; Michigan's upper peninsula; and a portion of the Texas Hill Country, near Llano. The controversy centered around land use and the alleged effects of ELF radiation on animal and human biology:

> Early studies of the project's environmental effects suggested that the low frequency waves could, over a period of time, raise the blood pressure of some animals, retard the growth of seedlings, cause mutations in insects, and shorten the lives of some plants. (New York Times, 1974)

The first experiments were conducted on mountaintops in Virginia and North Carolina, in 1962 (New York Times, 1969).

The first opposition appeared in 1969, over the Navy's test facility near Clam Lake -- a 14-mile long antenna, crossing in an "X," with 2.4 megawatts power consumption. While opponents forecast the building of this "electric chair" would

electrify everything in sight, the Navy Department lost credibility when it stamped several newspaper articles already published on the facility as "secret." Once the facts were out, the Navy found itself obligated to make more and more disclosures though it was unable to rebuild its credibility with the public. Altogether, the controversy was creating "the belief in the opposition that the Navy could not be trusted." At this point, Senator Gaylord Nelson said, in effect, that he didn't trust the Navy either and would insist on a seprate review panel to "evaluate whatever findings the Navy makes" (New York Times, 1969). The Navy scheduled a hearing, which was attended by Ashland County officials, the New Democratic Coalition, and members of the Stop Sanguine Committee, chaired by a history instructor of Northland College of Ashland (New York Times, 1969).

In 1973, Melvin Laird stepped in. Laird, retiring as Secretary of Defense in January, cancelled the Wisconsin plans as one of his last official acts, and ordered the Navy to turn its attention to Texas. Laird is from Wisconsin. By this time, the first designation, Shelf, had changed to Sanguine, perhaps indicating the high hopes the Navy still placed in the project. The National Academy of Sciences convened an ad hoc panel on the project, but it dealt only with feasibility in a military sense, and did not address the environmental objections (Texas Monthly, 1973).

One thousand residents of the Llano area attended a Navy meeting, and some were dissatisfied enough to join the Texas Environmental Coalition or the Texas State Committee to Stop Sanguine, a non-profit corporation. Texas was to prove a short-lived option. In November 1973, the House Appropriations Committee terminated Sanguine's entire $16.7 million budget request. The reason was not disapproval of the system as an abstraction, for funding was restored when the site proposal shifted to Michigan, but rather revenge:

> Congressional sources say the move to Texas, where opposition welled up strongly, may have been the death blow for the project. Representative George

> H. Mahon, Democrat of Texas, is the influential chairman of the House Appropriations Committee .... (New York Times, 1973)

Apparently, the Navy had strayed onto Mahon's "turf." It faced more Congressional opposition. By this time, Senator Gaylord Nelson had been dogging the project for five years, calling the expenditure of $57 million to date "a tragic waste of the taxpayers' money" (New York Times, 1973).

Several months before the appropriation was cut due to the Texas siting, two state legislators from Michigan issued an open invitation to the Sanguine project to come to the upper peninsula. The Navy responded with a proposal for a grid 900 to 10,000 square miles in size. The original conception had been two linked antennae, ideally one in Texas and one in Wisconsin or Michigan. Now the Navy was content to settle for Michigan with a possibility of a link to Clam Lake, Wisconsin. However, the citizens of Michigan proved less hospitable than their legislators. The Navy's hearings in Marquette, Michigan, were well-attended. David Lori, a young attorney from Iron Mountain, had started a highly effective ad hoc group called Upper Peninsula Citizens Concerned About Sanguine. This group achieved active status in the fall of 1973, before the Texas site was abandoned, and remained active for another two years (Lori, 1981). Lori said that the nucleus was about 20 to 30 in number; the group drew most of its financial support from the surrounding area, though it did receive contributions from businessmen in Chicago. Other support came from the Audubon Society and the Sierra Club. He attributed the success of his group in stalling the project to contacts with the news media -- "it was the key to success," he said; a series of hearings the group conducted in reply to the Navy's hearings; and contacts with local politicians. In referenda conducted in six different Michigan counties, a majority of voters in each case opposed the system.

In April 1974, the Navy suspended development of Sanguine. In 1977, it was back with renewed vigor, suggesting deployment of Seafarer (4,000 square miles of

antenna). President Carter, who had made a campaign promise not to impose the antenna system upon an unwilling area, now publicly favored the system. The Navy held four more hearings and restocked its public information office with publications. By this time, critics were charging the Navy with suppression of health studies, and the senators of Michigan, its governor, and many of its congressmen were opposed (New York Times, 1977). In the face of this opposition, the Navy offered a smaller proposal: 120 miles of cable (New York Times, 1978). Currently, this is where the controversy stands. Recent advances in submarine communications are making Seafarer (now called, simply, ELF) obsolete.

5.3 Recombinant DNA Laboratories

The core of this controversy is the safety of research on "gene-splicing." This technology has been practiced since 1975; gene strands are removed from one type of cell, and spliced into a common, quickly reproducing bacteria such as E. Coli, creating what is essentially a new organism. There is some possibility that the new creature might prove virulent, escape, and create an epidemic without a cure if it were able to survive outside the lab. Several methods can be used to reduce the possibility of escape, such as the use of weak strains of E. Coli, or laboratories which process all wastes to destroy the escapees.

In Cambridge, Massachusetts, the City Council, and Massachusetts Institute of Technology with Harvard University found themselves on opposite sides of the controversy. MIT-Harvard had plans for a containment laboratory to be remodeled from an existing building, and the City Council became alarmed, though it had no direct power to prohibit the construction. On July 8, 1976, the City Council voted to ask Harvard for a three-month moratorium and study period. This resolution followed several weeks of unstructured public debate; leading the opposition was George F. Wald, Nobel laureate in biology and Harvard faculty member. More significant than

the moratorium, the Council voted to establish a citizens' review committee. The moratorium was later extended to February 1977, to allow enough time for the review committee to prepare its report and recommendations. The Committee first met in August of 1976. Eight members spent 8 to 10 hours per week for four and one-half months. Testimony was taken from residents and experts in the field, from Cambridge and elsewhere. The mock trial, in which scientists presented the opposing sides of the controversy, was used. The panel itself was selected by the city manager; they had no special biological expertise. One member was an oil dealer, one a professor at Tufts University. The conclusion was unanimous: allow construction of a P-3 laboratory, if Harvard-MIT would agree to observe additional safeguards to be contained in city ordinances. A P-3 lab is a "moderate containment" facility, one step below the maximum security facility used by the military in developing biological warfare agents.

Meanwhile, Harvard had begun construction. In February 1978, the city council endorsed the review committee's recommendation with a unanimous vote. Even Mayor Alfred Vellucci, who had vowed never to allow the research, joined (New York Times, 1977). Harvard and MIT agreed to follow the guidelines, which supplemented the National Institute of Health rules, under which the research was conducted, because the work was partly NIH-funded.

Citizen organizations involved in the dispute were the Environmental Defense Fund, which succeeded in using the FOIA to root out violations of NIH guidelines by a Harvard researcher (New York Times, 1977); the Coalition for Responsible Genetic Research, formed by George Wald, which argued that the lab was needed but should be built in a sparsely-populated area; the Boston Area Recombinant DNA Group; and the Genetics Group of Science for the People, which appeared at city council hearings and the review group's meetings. The Natural Resources Defense Fund, together with the Environmental Defense Fund, favored universal federal guidelines

through NIH, regardless of sources of funding (New York Times, 1976).

At Princeton University, the borough council set up a Princeton Citizens' Committee on Research with Biohazardous Materials, which also held hearings and also concluded with a recommendation to allow P-3 laboratory work. Ending an 18-month moratorium, the borough council voted six to one to allow the P-3 research (New York Times, 1978). Several conditions were imposed. Experimenters must first register with a municipal biohazards officer, and their university must allow two members of the faculty oversight committee to be appointed by the borough council.

6. Summary and Recommendations

This study began with a discussion of the purposes of public participation. Decision-makers in consultation and concurrence will have to decide what purposes they seek to maximize, and select the mechanisms accordingly. However, some general suggestions are in order, most of which apply to the full range of participation mechanisms available.

(1) Practice consistency in the role of participation. It is most important that agencies remain consistent and clear in their pronouncements on the role of public participation and on the state and federal role in consultation and concurrence. The Congressional subcommittee investigating the acrimony of Alpena, Michigan, concluded that "ambiguity and inconsistency" were responsible for much of the opposition -- "that is, they stressed the essentiality of state cooperation and approval while reserving the right to override the state's opinion" (Proposed Nuclear Waste Storage in Michigan, 1977). As one of the county commissioners said, "I think it has been a long time since I have heard such evasive use of the English language when all we needed was a yes or no ...." (Clark, 1976).

(2) Don't alienate the area's Congressional delegation. Congressional opposition is often the death knell of a siting proposal. This opposition springs both from

neglecting to notify a representative, and thus trespassing on his "turf," and from the lobbying efforts of disaffected citizen groups.

(3) Keep several sites "alive." This gives public participation in siting decisions a constructive role, in answering the questions of which site is preferable. Otherwise, participants feel that their role is strictly symbolic, a sham, and consider the use of "no-win" tactics like delay and civil disobedience.

(4) Reconsider the usefulness of the hearing. In a waste repository controversy, adjudicatory hearings are of limited utility. The adversary process as currently used, with its heavy emphasis on procedure and neglect of technical questions, would be of little use without clearly defined opponent parties. If opponents and proponents fall into neat groups, with an agency in between, a form of arbitration might be considered, as in labor disputes. In this way, some initial disputes might be resolved before groups take on polarized positions. Public meetings and legislative-type hearings will be of some use, though a greater emphasis should be placed on workshops and direct public education.

(5) Have an independent technical review group, like the Environmental Evaluation Group of New Mexico. Ensure that its findings are disseminated to laypeople.

(6) Consider funding citizen groups' experts, if hearings are to be held. At the minimum, a clearinghouse should be set up to provide citizens with free access to technical materials and government documents (beyond what most reading rooms are providing now) and with names and resumes of expert witnesses on both sides of the controversy.

(7) Use local citizens as moderators of public meetings and as members of a possible citizens' review committee, charged with recommending action on a particular matter. Have representatives of all major interests either on the panel or testifying before it; the purpose would be to produce a compromise. If several sites

are "alive," the committee could be composed of citizens from all the communities, and charged with making a recommendation for a single site. At the minimum, the committee could hope to settle on some common ground, perhaps by devices similar to the requests for admissions or stipulations used in courts. Any agreements could be announced to the media. "This is a maturing process which tests the objectivity of both sides and exposes primary motives" (Trumbull, 1977).

(8) Provide Freedom of Information Act ombudsmen in relevant agencies, to advocate the release of documents. A great deal of the delay in the intervention process is due to searches for documents.

As biologist Richard Trumbull said, the final test of public participation efforts is whether the public learns to balance risks, in a cost-benefit comparison. We expect these compromises and hard choices from our leaders; perhaps the time has come to expect citizens to wrestle with these "tragic choices." The participation mechanisms can be set up to encourage this result, as can be seen from the recombinant DNA controversy, or to defeat it, placing everyone at odds and breeding no-win tactics.

The resolution of the dangers of radioactivity with the need for a high-level waste repository will be a good test for public participation, a good chance to see if anything has been learned from nearly 20 years of environmental controversies. The consensus for an amicable solution appears to be present.

REFERENCES

Adams, John B. State Open Meetings Laws: An Overview (Columbia, Mo.: Freedom of Information Foundation, 1974).

Administrative Conference of the United States. "Recommendation No. 28: Public Participation in Administrative Hearings" (Dec. 7, 1971).

Ahlen, Jack. Interview, 1981.

American Law Institute. Model Penal Code, Tentative Draft No. 8, Sec. 3.02 (1958).

Armstrong, William. Telephone interview, 1981.

Atlantic Reporter, 2nd Ser. State v. Warshow, Vol. 410 (1979).

Boasberg, Hewes, Klores, and Kass. "Report to the Nuclear Regulatory Commission: Policy Issues Raised by Intervenors' Requests for Financial Assistance in Nuclear Regulatory Commission Proceedings" (Contract No. AT(49-24)-0138) (July 18, 1975).

Business Lawyer, Vol. 34, p. 983-984 (1979).

Cameron, Roderick. "Exchange of Ideas Between Scientists and Lawyers: A Cost-Benefit Analysis" (mimeographed paper) (December 29, 1972).

Caplan, Marc. Public Participation in Federal Agency Proceedings Act of 1977: Hearings on S. 270 Before the Subcommittee on the Judiciary, U.S. Senate, 95th Cong., 1st Sess. (1977).

Carr, Bob. Testimony. Nuclear Waste Disposal in Michigan: Oversight Hearings Before the Subcommittee on Energy and the Environment, of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Christensen, Steven. "Analysis of Public Intervention in the Siting Process in France and the United States," Journal of International Law and Policy, Vol. 8 (1979).

Clark, C. Merritt. Nuclear Waste Disposal in Michigan: Oversight Hearings Before the Subcommittee on Energy and the Environment, of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Coggins, Mary Ann. Statement. Nuclear Waste Disposal in Michigan: Oversight Hearings Before the Subcommittee on Energy and the Environment, of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Cohen, David. Statement. Oversight of the Government in the Sunshine Act: Hearings Before the Subcommittee on Federal Spending Practices and Open Government of the Senate Committee on Governmental Affairs, 95th Cong., 1st and 2d Sess. (1977-1978).

Conlin, Richard. Statement. Nuclear Waste Disposal in Michigan: Oversight Hearings Before the Subcommittee on Energy and the Environment, of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Davis, Thomas P. "Citizen's Guide to Intervention in Nuclear Power Plant Siting," Environmental Law Review, Vol. 6 (1976).

Ebbin, Steven, and Kasper, Raphael. Citizen Groups and the Nuclear Power Controversy (Cambridge, Ma.: MIT Pres., 1974).

Federal Reporter, 2nd Ser., District of Columbia Circuit, Calvert Cliffs v. AEC, Vol. 449 (1971).

Federal Reporter, 2nd Ser., District of Columbia Circuit. Office of Communication of the United Church of Christ v. F. C. C., Vol. 359 (1966).

Federal Reporter, 2nd Ser., 8th Circuit. Reserve Mining Co. v. EPA. Vol. 514 (1975).

Federal Reporter, 2nd Ser., Soucie v. David, Vol. 448 (1971).

Fordham Law Review. Comment, "Public Inspection of State and Municipal Executive Documents." Vol. 45 (1977).

Georgetown Law Journal. Vol. 60, pp. 525, 529 (1972).

Gervers, John. Telephone interview, 1981.

Gilinsky, Victor. Recycling of Plutonium. Oversight Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Goetz, Charles J., and Brady, Gordon. "Environmental Policy Formation and the Tax Treatment of Citizen Interest Groups," Law and Contemporary Problems, Vol. 39 (1975).

Gordon, Andrew C. and Engle, Larry G. Public Access to Information (John B. Heinz, ed.) 1979.

Governmental Affairs Committee, The. The Citizens' Right to Standing in Federal Courts Act of 1978: Joint Hearings Before the Subcommittee on Citizens and Shareholders Rights and Remedies of the Senate Committee on the Judiciary and the Committee on Governmental Affairs, 95th Cong., 2d Sess. (1978).

Greathouse, Betty. Telephone interview, 1981.

Green, Harold P. "Public Participation in Nuclear Power Plant Licensing: The Great Delusion," William and Mary Law Review, Vol. 15 (1974).

Halpern, Charles. Statement. Departments of State, Justice, and Commerce, The Judiciary, and Related Agencies Appropriations for Fiscal Year 1980: Hearings Before a Subcommittee of the Senate Committee on Appropriations, 96th Cong., 1st Sess. (1979).

Hancock, Don. Telephone interview, 1981.

Hendrie, Joseph. Testimony. Radiation Protection: Hearings Before the Subcommittee on Energy, Nuclear Proliferation, and Federal Services of the Senate Committee on Governmental Affairs, 96th Cong., 1st Sess. (1979).

Kapaloski, Lee. "Power Plant Siting on Public Lands," Denver Law Journal, Vol. 56 (1979).

Kartchner, Roxanne. Telephone interview, 1981.

Kates, Robert. Telephone interview, 1981.

Krimsky, Sheldon. Statement. Science Policy Implications of DNA Recombinant Molecule Research: Hearings Before the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology, 95th Cong., 1st Sess. (1977).

League of Women Voters. Proposed General Revenue Sharing Extenstion: Hearings Before the Subcommittee on Revenue Sharing, Intergovernmental Revenue Impact, and Economic Problems, of the Committee on Finances, U.S. Senate, 96th Cong., 2d Sess. (1980) (paper of the League of Women Voters).

Leshy, John D. "Interlocutory Injunction Relief in Environmental Cases," Ecology Law Quarterly, Vol. 6 (1977).

Like, Irving. "Multi-Media Confrontation and the Environmentalists' Strategy for a 'No-Win' Agency Proceeding," presented at ALI-ABA Course of Study on Environmental Law, January 1971.

Lipsky, Michael. Protest in City Politics (Chicago: Rand McNally and Co., 1970).

Lori, David. Telephone interview, 1981.

Lucas, Patricia. "Nuclear Waste Management: A Challenge to Federalism," Ecology Law Quarterly, Vol. 7 (1979).

Matthei, Chuck. Testimony. Nuclear Siting and Licensing Process, Part 4: Oversight Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 95th Cong., 2d Sess. (1978).

Maxey, Margaret. Nuclear Waste Management: Hearings Before the Subcommittee on Energy Research and Production of the House Committee on Science and Technology, 96th Cong., 1st Sess. (1979).

McGowan, Alan. Statement. Science Policy Implications of DNA Recombinant Molecule Research: Hearings Before the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology, 95th Cong., 1st Sess. (1977).

Merrill, David. Testimony. Nuclear Siting and Licensing Process, Part 4: Oversight Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 95th Cong., 2d Sess. (1978).

Michael, Donald N. Statement. Science Policy Implications of DNA Recombinant Molecule Research: Hearings Before the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology, 95th Cong., 1st Sess. (1977).

Munroe, Alison. Telephone interview, 1981.

Murphy, T. R., and Hoffman, Joel. "Current Models for Improving Public Representation in the Administrative Process," Administrative Law Review, Vol. 28 (1976).

Nagel, Edward M., Letter, 1976.

Neal, Robert. Telephone interview, 1981.

Nelkin, Dorothy. Science Policy Implications of DNA Recombinant Molecule Research: Hearings Before the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology, 95th Cong., 1st Sess. (1977).

Newsweek. May 23, 1977.

New York Times, The. October 14, 1969.

New York Times, The. November 7, 1969.

New York Times, The. March 25, 1973.

New York Times, The. November 28, 1973.

New York Times, The. February 17, 1974.

New York Times, The. November 11, 1976.

New York Times, The. January 17, 1977.

New York Times, The. February 8, 1977.

New York Times, The. May 9, 1977.

New York Times, The. May 15, 1977.

New York Times, The. December 16, 1977.

New York Times, The. January 12, 1978.

New York Times, The. May 16, 1979.

New York Times, The. June 4, 1979.

New York Times, The. June 16, 1979.

New York Times, The. September 30, 1979.

New York Times, The. March 21, 1980.

New York Times, The. May 4, 1980.

New York Times, The. May 26, 1980.

Nuclear Regulatory Commission. Letter. Recycling of Plutonium. Oversight Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Nuclear Waste Disposal in Michigan: Oversight Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Proposed Nuclear Waste Storage in Michigan: A Report Prepared by the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 95th Cong., 1st Sess. (1977).

Public Works for Water and Power Development and Energy Resources Appropriations Bill, 1978: Hearings Before a Subcommittee of the House Committee on Appropriations, 95th Cong., 1st Sess. (1977).

Regulatory Reform: Hearings Before the Subcommittee on Oversight and Investigations of the House Committee on Interstate and Foreign Commerce, Vol. 5, 94th Cong., 2d Sess. (1976).

Resnikoff, Marvin. Statement. Recycling of Plutonium. Oversight Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Rose, Carol M. Citizen Participation in Revenue Sharing: A Report from the South (Atlanta: Southern Regional Council, 1975).

Sekular, Susan, and McCullough, John. "Litigating Nuclear Waste Disposal Issues," Tulsa Law Journal, Vol. 15 (1980).

Sherry, Edward V. Statement. Electric Utility Rate Reform and Regulatory Improvement, Part 1: Hearings Before the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, 94th Cong., 2d Sess. (1976).

Solo, Pam. Telephone interview, 1981.

Speth, Gus. Testimony. Nuclear Siting and Licensing Act of 1978, 1978.

Stone, Ford. Telephone interview, 1981.

Stone, Jeremy. Statement. Science Policy Implications of DNA Recombinant Molecule Research: Hearings Before the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology, 95th Cong., 1st Sess. (1977).

Strauss, Peter. Statement. Recycling of Plutonium. Oversight Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 94th Cong., 2d Sess. (1976).

Texas Monthly. September, 1973.

Time. May 16, 1977.

Trumbull, Richard. Statement. Science Policy Implications of DNA Recombinant Molecule Research: Hearings Before the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology, 95th Cong., 1st Sess. (1977).

United States Code. "Compensation for Attorney Fees, Expert Witness Fees, etc., Incurred by Persons in Rulemaking Proceedings; Limitation on Amount; Establishment of Small Business Outreach Programs." Chapt. 15, Sec. 57a(h)(1) (1974).

United States Code. "Cooperation of Agencies; Reports; Availability of Information; Recommendations; International and National Coordination of Efforts." Chapt. 42, Sec. 4332(c) (1970).

United States Code. "Open Meetings." Chapt. 5, Sec. 552b (1976).

United States Code. "Public Information; Agency Rules, Opinions, Orders, Records, and Proceedings." Chapt. 5, Sec. 552, as amended.

United States Code. "Unfair Methods of Competition Unlawful; Prevention by Commission -- Declaration of Unlawfulness; Power to Prohibit further Unfair Practices." Chapt. 15, Sec. 45 (1975).

United States Reports. Baker v. Carr. Vol. 369 (1962).

United States Reports. Kissinger v. Reporters' Committee for Freedom of the Press. Vol. 445 (1980)

United States Reports. Vermont Yankee Nuclear Power Corporation v. Natural Resources Defense Council. Vol. 435 (1978).

United States Senate. Report No. 91-875, 91st Cong., 1st Sess. (1969).

University of Pennsylvania Law School. Legal Consequences of Nuclear Accidents and Shutdowns (Philadelphia: Pennsylvania Law Journal, 1979).

Vermont Law Review. Note, "Anti-Nuclear Demonstrations and the Necessity Defense." Vol. 5 (1980).

Wall Street Journal. April 15, 1981.

Washington Law Review. Note, "Agency Secrecy." Vol. 52 (1976).

Wengert, Norman. "Citizen Participation: Practice in Search of a Theory," Natural Resources Journal, Vol. 16 (1976).

Wheeler, Betty, and Crawford, Bill. Telephone interview, 1981.

Whitney, Scott. "Enhancing Public Acceptance of Nuclear Decision-making," William and Mary Law Review, Vol. 15 (1974).

Williams, David C. Telephone interview, 1981.

PART 4 - INTERGOVERNMENTAL RELATIONS

Paul Anaejionu and Karl J. Cerny

1. Introduction

High-level waste disposal is becoming an abrasive in the fabric of intergovernmental relations. The Department of Energy's response to the necessity of dealing with state and local governments has swung from one of neglect to one of devolution of authority to the governors. Consultation and concurrence is a metaphor for the Department's desire to find a tenable middle ground, balancing conflicting federal, state, and local objectives. Beneath the metaphor we find that the departmental view of intergovernmental relations as a management problem -- something to be solved so as to get on with the business of operating a high-level waste (HLW) disposal site -- has led to an incomplete assessment of state and local government motivation in this process.

To help explain the organization of this study, analogies are here drawn from Wall Street. There are two schools of investment thought, the technical and the fundamental. Technicians suggest the investor buy low and sell high, whereas the fundamentalists suggest long-term investment in expanding sectors of the economy. Obviously, these recommendations need not conflict. For purposes of intergovernmental relations, technical analysis can be likened to study of the momentary set of regulations and of the personalities and abilities of key political figures, while fundamental analysis can be likened to patterning of intergovernmental relations as mandated by the constitutional division of political and economic responsibility. Clearly, one of the responsibilities of state and local governments is to secure the continued health of the local economy. Therefore, an agreement reached through a consultation and concurrence process that runs counter to the long-term interests of the state or local community will be ephemeral. Newly elected leaders will work to

have it set aside or amended.

This part is divided into two sections and a conclusion. Section I (Subsections 1-3) introduces an approach to intergovernmental relations, identifying where possible likely actors in HLW management and also identifying and evaluating the types of concerns and problems that have arisen in the intergovernmental relations aspects of other programs. Section II (Subsections 4-7), based on a model of information dissemination and utilization, is an attempt to identify the specific characteristics of HLW management that are likely to be focal points for information exchange among the levels of government. The conclusion (Subsection 8) ties these two sections together by developing a set of concept-oriented recommendations based on the conceptual orientation of the observer.

SECTION I.
FUNDAMENTALS OF INTERGOVERNMENTAL RELATIONS

2. Definitions, Issues, and Actors in Intergovernmental Relations

2.1 Background

Before beginning consideration of consultation and concurrence, the issue of intergovernmental relations should be addressed. To put the issue in perspective, it should be noted that this topic is not unique to the American federal system — Canada experiences many similar difficulties (Conference Board of Canada); nor is it a topic unique to federal systems generally — the British government despite theoretical Parliamentary supremacy has its share of difficulties persuading local governments to cooperate (McAuslan, 1980; Roberts, 1976). Moreover, intergovernmental relations is not a new aspect of the American federal system. The classic cases in which the Supreme Court developed the distinctions between exclusive

versus concurrent powers and the initial definition of the reserved powers of the states were decided in 1824 in Gibbons v. Ogden (U.S. Reports, 1824) and in 1852 in Cooley v. Board of Workers (U.S. Reports, 1852). Ultimately, it is wrong and misleading to consider intergovernmental relations as a "problem" to be solved. Instead, it describes a necessary interaction among governmental units.

At varying times, different adjectives have been placed before the noun "federalism" to describe the general tendency of the interaction. Before the New Deal, the operative adjective "dual" was used to describe the effort to circumscribe very separate spheres for the federal and state governments. Since the New Deal, the operative adjective has been "cooperative," although critics have labeled it "coercive," emphasizing joint responsibilities. In recent years, Presidents have charted variations within the general spirit of cooperative federalism: Lyndon Johnson's "creative" federalism and Nixon's "new" federalism being the two most important. Common to all notions of cooperative federalism is the idea that federal and state political and legal responsibilities, as well as financial resources, overlap. Thus, programs require varying types of partnerships. During the original New Deal, the partnership was primarily one of federal grants-in-aid to states (and, later, to local communities) for purposes of maintaining the national economy and minimal levels of social egalitarianism. As the social component became more prominant during the 1950s and 1960s, cooperative federalism contained a definite coercive element as federal law required substantial changes in state and local politics.

At no point, however, did any of the adjectives applied to federalism actually capture the complexity of intergovernmental relations. Grants-in-aids were an established fact prior to the New Deal and states had important functions administering programs and assisting or modifying federal policy in such areas as transportation and interstate commerce, criminal justice, and information gathering generally. After the New Deal, not all programs necessarily had an intergovernmental compo-

nent. Indeed the concept of national security has had a much broader meaning recently than it did a half-century ago -- strengthening federal preemptive powers in relevant issue-areas. Concurrently, changes in state and local politics reflecting demographic shifts to urban areas and the growth of urban management capability, as well as a marked upgrading in staff capability and a generally more aggressive attitude at the state government level, have combined to change the milieu within which federal policy-makers and managers operate (Wright, 1978; Glendening and Reeves, 1977; Sharkansky, 1978; Leach, 1970; Bahl, 1978 (for fiscal federalism); and Wright, 1973 for an extensive bibliography on intergovernmental relations.)

In one sense the concept of cooperative federalism has had a deleterious effect on management thought. As stated earlier, cooperative federalism contemplates overlapping federal-state responsibilities. It is easy to move from this position to the assumption that should either level be unable to discharge its obligations, the other should inherit the responsibility. This assumption suggests that, ultimately, federal and state governments have the same basic responsibilities. At its worst, the federal government becomes the "big" brother. The metaphor has its diminutive counterpart: state and local elected and appointed officials are then seen as inferior versions of their federal level contemporaries. One characteristic of this school of thought is the assertion that policy initiatives and administrative power should be centralized in the President, either in the Executive Office or Office of Management and Budget (OMB). Fascination with (and glorification of) a strong, single executive has been an important theme in a broad range of academic literature, not just intergovernmental relations (for an example in intergovernmental relations, see Stone and Geiger, 1978). This approach seems to misdirect federal administrators into assuming more authority than they have, and fails to provide them guidance when they negotiate with state and local officials who have very different concerns and reponsibilities.

2.2 Parties to Intergovernmental Relations

Basically, intergovernmental relations describes the interaction of the federal government with the state and local governments. This picture is simplistic for three reasons. First, the federal government does not speak with one voice; thus, intergovernmental relations includes intragovernmental relations at the federal level. Second, although each state stands on an equal footing with every other state vis-à-vis its federal privileges and responsibilities, each has a very different constitutional arrangement of powers at both state and local levels. At the state level governors are powerful or weak, legislatures meet on different schedules with differentially active committees, and cities and counties have various endowments of power. Third, since intergovernmental relations exist for functional purposes, not only are cities and counties within a state aggregated differently for different programs, but different constellations of states can form interstate regional commissions or can join together into interstate compacts. This entire range of complexity is present in the intergovernmental relations component of HLW. In addition, the Indian Tribal Councils are asking to participate like states in the consultation and concurrence process. This last development is a new and rapidly evolving component of intergovernmental relations.

At the federal level there are primary and secondary actors. It is assumed that the Department of Energy's Waste Management Program will continue intact through the forthcoming reorganizations and that it will continue to be the lead federal agency for purposes of developing and maintaining federal policy in HLW. Within the Department, this program will be coordinated with all other departmental programs through the Office of Intergovernmental Relations. Other federal agencies with primary input on the shape of HLW policy are the Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), Environmental Protection Agency (EPA), and Department of Interior - U.S. Geological Survey (DOI-USGS). Key in

shaping the milieu, but relatively uninvolved in the day-to-day administration of this policy, are OMB (representing the Executive Office of the President), and Congress through its committees on governmental affairs, environment and public works, and science and technology, and through floor action in the House and Senate and its Office of Technology Assessment. Provided there is a Congressional decision to unite military and commercial high-level waste, Department of Defense components would join the first circle.

At a second level there are those agencies with an interest in a small section of HLW policy and the "if" agencies. Among the former are the Federal Emergency Management Agency (FEMA), which will train first responders to transportation accidents and which may be responsible for overseeing a general emergency management plan for the site (NRC does not intend to address this at present, 10 CFR 60.130(5) proposed). The Department of State is interested in the international ramifications of the siting decisions and National Security Council (NSC) in the security aspects. There are also those agencies which will be interested in a small aspect of the HLW policy but will only become involved because they have been requested by state and local clients to provide technical and financial assistance at the time of site selection. The most important are Housing and Urban Development (HUD) and the Department of Commerce's extensive housing, regional planning, and business assistance programs. At this level it is difficult to think of a federal agency that could not become involved in tangential aspects of the HLW siting process if requested by state and local governments. The scope of this last point is presently being studied in DOE's Community Development Handbook (to be released summer 1981, Creitz George, interview).

The second level "if" agencies are those that will become involved only if the site selected bears certain characteristics. If the site will affect water resources in any way (which should not be the case), the Corps of Engineers will need to grant a

permit. If the state is located in the coastal zone, the National Oceanic and Atmospheric Administration-Department of Commerce (NOAA-DOC) will be involved in the federal consistency determination (assuming the state government decides to launch a cumulative impact argument). If the site is on federal land, the Bureau of Land Management (BLM) becomes involved. If the site is adjacent to a national park or forest, then the Forest Service (U.S. Department of Agriculture) or the Park Service (DOI) can be expected to show interest. Since HLW siting decisions will not be made for several years, this type of scenario analysis is of limited use other than to point out the important role of the federal government collectively in land use policy.

At the state level there is presently agreement at all levels that the governor of each state should be the key actor. This is all the more interesting because Secretary Edwards, in his former position as Governor of South Carolina, was the chairman of the National Governors' Association (NGA) task force which sought to force DOE to consult (and concur) with the governor of each state prior to undertaking any HLW survey work in that state (see DOE, Cross-Statement, 1980, Appendix B for the letters establishing this mechanism). There are indications that the Secretary fully intends to stand by his earlier recommendations, and that he intends to honor the memoranda of understanding (MOU) signed by his predecessor (Bill Tucker, interview).

State legislatures are important because of their authority to appropriate money to support the governors' research endeavors. Although it is not specifically stated, it is reasonably clear that for a state to participate effectively at the licensing stage (10 CFR 60), it will need a stable, well-funded, competent agency working with DOE during the 10 to 12 years before the licensing hearings begin. Otherwise, in the two- to three-year licensing cycle, the Governor will not be able to initiate research programs and still meet the deadline schedule -- that is, to

participate in rather than just be informed of the information flow.

At the state-wide level, the designated A-95 clearinghouse will in all likelihood function as the coordinating center. To the extent that the Councils of Government will be the designated center, this procedure will provide a formal consultation mechanism for local elected officials adjacent to the affected jurisdiction.

Finally, there are the governmental units closest to the depository site — city and county (parish) governments and the Indian Tribal Councils. The former are characterized by their wide divergences in style and authority, while the latter may be best described as undergoing an evolutionary process. The Tribal Councils are like the states in the sense that they have their primary relationship with the federal government; but they also share some of the problems of local governments, since they have no formal representation in the federal legislative bodies. In recent years, they have been striving for treatment more like that of states than local governments. At least in the HLW policy on consultation and concurrence, the governors seem to support the councils (see State Planning Council, 1981; primarily Resolution 4-8, secondarily Resolutions 3-5, 3-6, 4-9, 4-10, 5-1).

Finally, some attention has been directed to formal mechanisms by which the states can interact. This is a somewhat troublesome area in which there is little consensus to be found. Theoretically, each state is represented by its two senators and there is an assumption that in some sense a state's House delegation should work together. Thus, there should be little need for formal interstate coordinating groups beyond interstate compacts.

In practice, however, the National Governors' Association (NGA) and the National Conference of State Legislatures (NCSL) are regarded as lobby groups which try to protect state prerogatives from federal encroachment. In addition, Congress created the Advisory Commission on Intergovernmental Relations (ACIR) in 1959. This body is primarily responsible for conducting studies on the impact of federal

legislation on the states. It has recently completed a three-year, multi-volume study on the federal role in the dynamics of regional growth and is just beginning a multiyear project on devolution of authority. Moreover, President Carter, acting on the recommendation of the Interagency Review Group (Report to the President by the IRG), created the State Planning Council on Radioactive Waste Management to develop ideas for effective means for states to participate in the HLW decision-making process.

As might be expected, given the overlapping memberships, the NGA, the NCSL, and the State Planning Council agree among themselves on most issues, and especially on the matter of the two-house override of a state objection to DOE's siting plans (Holmes Brown, interview). There is some discussion reported in NRC's Report of the Working Group (Introduction, pp. 17-20 and Part 2, pp. 21-32) that the Congress might extend the State Planning Council's term indefinitely (it is presently scheduled to terminate in August 1981). But the NRC report indicates that states do not want to delegate bargaining authority to the Council. Indeed the Report indicates some tension because not all of the states represented on the Council are potential hosts, nor are all the potential hosts represented on the Council.

2.3 Federal Approaches Toward Intergovernmental Relations

In fall 1980, the Advisory Commission on Intergovernmental Relations concluded that the issue of developing formal procedures for intergovernmental relations in nuclear energy had been so thoroughly covered that new studies were unlikely to add much to the existing body of knowledge. Given this assessment and limited staff resources, the ACIR decided not to address this issue this year (Anne Hastings, interview). To date, intergovernmental relations in HLW have been addressed in the following official documents: Interim Report by the State Planning Council (1981); Report to the President by the Interagency Review Group (1979); "Review of a draft

DOE Report" by the NGA (1978); Consultation and Concurrence, conference proceedings reported by Battelle Memorial Institute (1980); Statement of the Position of the United States Department of Energy (April 15, 1980); and the Cross-Statement of the United States Department of Energy (September 5, 1980); 10 CFR Part 60 by NRC; and "Report of the Working Group on the Proposed Rule-Making on the Storage and Disposal of Nuclear Wastes" (January 28, 1981) NRC (this last is primarily summaries of the statements of the parties to the Confidence Hearings). In addition, Congressional action on H.R. 8378 and S.B. 2189 during fall 1980 represents a form of official discourse since these bills addressed possible mechanisms for intergovernmental relations in siting disputes.

In these documents, intergovernmental relations are approached in two ways: (1) as initiations of consultation at or before the survey stage and (2) as mechanisms for the resolution of an irreconcilable conflict during the licensing stage. DOE believes that it has solved the first stage with its gubernatorial notification procedures and its willingness to formalize agreements reached at this stage in writing. (MOU's were the vehicle for the previous administration. It is not clear what position the new administration intends to take on these legally unenforceable but politically attractive pieces of paper.) At the second stage, efforts, especially those of Congress, have been made to identify those decision-making points where a deadlock would stall the implementation of a HLW repository. The operative assumption at the second stage is that no state will want a repository located within its geographical boundaries. The proposed mechanism, requiring DOE to obtain a two-House override of a state objection to its plans before it can proceed to NRC's licensing hearings, appears intended to distinguish between legitimate objections to DOE's technological proposals and objections based solely on the desire to keep the HLW site out of the locality.

A second and no less critical assumption that runs through these reports is that

the "institutional issues" as they are termed, while separate from the "technical issues," are nonetheless management problems; and that it is DOE's duty to solve them since it is the HLW manager (one example can be found in Report of the Working Group, Introduction at 17). Consultation and concurrence, given this assumption, has a more restricted scope than the phrase would appear to indicate. It suggests that DOE will make a good faith effort to keep state and local governments informed. From a management viewpoint, nonconcurrence in the technology of disposal is meaningless if scientists are able to validate the engineering designs. Thus, nonconcurrence can only refer to value judgment-based decisions in the socioeconomic and political realms, and there DOE will make the best practicable efforts to modify the physical workings of the plant to make them as compatible as possible with state and local planning.

The reason for the foregoing discussion on the orientation of official publications on intergovernmental relations in HLW is that it emphasizes several points that can be compared to other federal intergovernmental relations efforts. The purpose for such comparisons is to assess DOE's cooperative mechanisms and to make some predictions about nonconcurrence resolution mechanisms. The following points have been identified and will be addressed in greater detail later: (1) initiative is the responsibility of the federal agency; (2) conflict is probable; (3) concurrence is the desired level of agreement; (4) authority for negotiating is not decentralized; and (5) responsibility is assigned to the lead agency, even though it may not be delegated full authority for all decisions in the project.

To provide a basis for comparative analysis, the 81 entries under "Intergovernmental Relations" listed in the Index to the Code of Federal Regulations were examined. After combining multiple entries for a single program, 67 usable examples of intergovernmental efforts remained. Two of these, dealing with petroleum allocation (10 CFR 211) and petroleum set-asides (10 CFR 205), are probably defunct.

This list does not include grant-in-aid programs, (although some entries do provide for monetary assistance), nor does it include revenue sharing. Given the assumption that a fee will be charged to users of the HLW disposal site, these latter financial assistance programs do not appear to be an appropriate comparison.

2.3.1 Initiative

The HLW management program is not unusual in that it requires the federal administrator to take the initiative for establishing intergovernmental relations. Twenty programs require the designated federal official to contact designated state or local officials. Eight programs allow either the federal or the state/local administrator to trigger the intergovernmental mechanism. Thirty-six programs require state or local government or, in the case of monetary assistance, the applicant, public or private, to take the initiative.

By categorizing within initiative, a picture of the various reasons for establishing intergovernmental relations emerges. Of the 36 entries requiring state/local initiative, 22 are requests for assistance (from personnel to equipment to technical assistance) and 14 are requests for a state or local law or program to be "recognized" by a federal agency, to be exempted from federal preemption, or to enter into a cooperative agreement with a federal agency. These last 14 are all regulatory-related and contemplate substitution of state and local enforcement in the place of federal enforcement.

Of the eight allowing initiative to come from any level of government, three are regulatory-related, two are information exchange programs, one deals with diplomatic protection, one is a request for mediation, and the last has to do with the Susquehanna River Basin Commission -- a program established by an interstate compact to which the federal government is a party.

Among the 20 requiring federal initiative are five directing the federal

administrator to request the states to participate. In these five programs, the director is empowered to offer "bribes" of varying sizes to elicit interest. The other 15 have a compulsory element and work in various ways. Five require a federal agency to keep state and local governments informed about the agency's activities or needs. Eight of the remaining 10 are a mixed bag requiring states to monitor air quality (EPA), prepare a State Implementation Plan to clean the air (EPA), report on Equal Employment Opportunity Commission (EEOC) progress, accept payments in lieu of taxes, modify or abandon rent control on government subsidized or owned housing, participate in placing new National Guard units, and participate in planning oil allocations and set-asides. The last two deal with the organization of federal agencies for intergovernmental relations -- National Aeronautics and Space Administration (NASA) and U.S. Department of Agriculture (USDA) (for rural development).

2.3.2 Conflict

HLW management is not a unique example of a program with a high potential for creating conflict between the various levels of government. The potential for conflict in other programs is recognized implicitly and explicitly. In the 36 programs requiring state or local initiative, and the five programs where the federal agency can request state or local participation, the decision to grant or deny the request is final. However, in the 14 preemption cases and a couple of others, the decision not to participate means that the federal government will do the job.

If the state or local government decides to make a request, conflict can occur in two ways: the designated federal official can deny the request, or the official may require that, in order to submit a request, the state or local government must have met prior requirements -- themselves conflict prone. Grounds for denial are typically straightforward. In most requests for exemption from preemption, the state/local law must meet or exceed federal standards and must not unduly burden interstate

commerce; in most requests for assistance there is the primary question of agency resources (i.e., Congressional appropriations) and, secondarily, an examination of the reasonableness of the request. For example, requests for military aid to quell civilian disturbances are to be evaluated according to a carefully prescribed set of standards (32 CFR 215).

The issue of prior requirements is complex. While the types of conflicts that can arise are not easily classified, the one common theme is that the federal agency acquires more discretionary authority than is immediately apparent. Conflicts range from the simple difficulty of understanding labyrinthine instructions to the need for multijurisdictional cooperation or state-enabling legislation before the community can apply. HUD's public housing assistance program (24 CFR 891) serves as a good example. Before a local government can request assistance, there must first be state-enabling legislation to create public housing authorities that have been evaluated by HUD for competence. In addition, the community should have a HUD-approved housing assistance plan.

The Intergovernmental Cooperation Act of 1968 and OMB's A-95 circular implementing that act have added a wealth of formal opportunities for conflict. These include all categories of initiative. Briefly, the A-95 process requires that before federal money can be disbursed for many specific programs, the project proposal must have been reviewed by the designated A-95 clearinghouse (a matter of state law, which usually provides different clearinghouses for different functional categories). The clearinghouse review is intended as a mechanism to make sure that the project will not duplicate or conflict with existing federal programs in the area, that the project is consistent with all state and local comprehensive plans, and that the project does not contravene state or local law. Nevertheless, not one instance could be found where an A-95 clearinghouse disapproval of an application is final. Every single program mentioning the need for A-95 clearance -- 17 in this data base --

provides for a federal override. The grounds for override range from the federal administrator's judgment that the clearinghouse was mistaken in its findings of conflict with existing comprehensive plans to the judgment that an overriding federal interest should preempt well-taken objections.

Apart from the five requests for cooperation and the two housekeeping entries, the programs requiring federal initiative are either oriented toward programs single states could not undertake, e.g., defense, or are implicit rebukes to the states for having failed to fulfill essential responsibilities, e.g., pollution control, civil rights. In either case, the type of conflict varies. State and local governments have difficulty legitimating an attack on the substance of the project (oppose national defense?, defend dirty air?), but must, instead, object to the way in which the project is being implemented. And, indeed, the relevant passages of the Code of Federal Regulations (CFR) address procedural complaints. For example, EPA requires that state governments preparing the state implementation plan (SIP) for improving air quality are to hold public meetings and consult with local elected officials (the governor is instructed to designate boards of local elected officials). Local elected officials who feel that they were excluded from the consultation process can appeal to the regional EPA administrator for a hearing (40 CFR 51.247). That is, the state will have a SIP; conflict is channeled into the state/local political interface.

2.3.3 Concurrence

HLW management emphasis on consultation is not unusual since one of the purposes of formalizing intergovernmental relations is to ensure that consultation will take place. The use of the term concurrence, however, is unusual. Only three other programs use this term.

The first of these three appears at 13 CFR 510.2. This section establishes the mechanism for changing boundaries of the Regional Action Planning Commissions.

One of the three requirements that the Secretary of Commerce must fulfill to change the boundaries is that he receive "the written concurrence of the governor of the state or states whose territory would be affected." There is no provision empowering the Secretary of Commerce to take action in the absence of the governor's concurrence.

The second use of the term concurrence appears at 33 CFR 265.14(c). Part 265 provides the mechanism by which the Corps of Engineers can provide individual state governments with comprehensive water resource planning assistance. "(W)ith the concurrence of the state, the Corps is authorized to prepare a report of survey-type scope on those aspects of the study for which there is a federal interest." A couple of paragraphs later in Section 265.15(a), "mutually understood goals" are added as a limiting clause, simultaneously defining and delimiting the scope of concurrence. As in the first case, in the event of nonconcurrence, nothing happens.

In the third case, the term concurrence appears repeatedly. This part of CFR establishes the Coastal Zone Management Program. At 15 CFR 930.54(e), 930.63, 930.79, and 930.80 concurrence is transformed into an object, "a concurrence," which a state agency grants or is conclusively presumed to have granted after a specified period to indicate its agreement with an applicant's federal consistency certificate. Part 930 is very convoluted and establishes a mediation procedure -- used to resolve disputes about whether a project needs to undergo federal consistency review -- and an appeals process in the event the state declines to grant concurrence. These will be discussed later in detail. Key points about concurrence, as used in Part 930, are: (1) that a state's concurrence that a proposed project is consistent does not bind the federal agency to approve the application, 930.63(c), and (2) that a state's nonconcurrence can be overturned in the appeals process by the Secretary of Commerce on finding that the application is "consistent with the objectives or purposes of the Act," (930.121), or that it is "necessary in the interest of national security" (930.122).

2.3.4 Decentralization

There are at least two ways in which the extent of decentralization of intergovernmental relations responsibilities can be assessed: (1) simply, and perhaps deceptively, by the extent to which the agency personnel are physically emplaced in regional offices and the extent to which those offices have formal contact responsibility, or, (2) perhaps more accurately, by the extent to which regional offices have effective decision-making power. Here, we are assessing only the intergovernmental relations component, not devolution of programmatic authority making the states responsible for evaluating the geologic suitability of individual sites.

An indication of the agencies and departments with significant regional staffs is provided by the present composition of the Federal Regional Councils (FRC). There is one in each of the 10 standard federal regions. They exist by Executive Order and are intended to serve as a coordinating and information-sharing device. The FRCs are presently composed of representatives from the regional offices of Health and Human Services (HHS), Department of Labor (DOL), Community Services Administration (CSA), Office of Personnel Management (OPM), Regional Action Planning Commissions (RAPC), Small Business Administration (SBA), General Services Administration (GSA), Corps of Engineers, USDA, DOC, DOE, HUD, DOI, DOT, ACTION, EPA, and FEMA. In the data base being used, each of these agencies normally designates its regional directors or local agency heads to be the lead officer for contacting designated state and local officials. That state and local official designation can be very specific ("Chief Executive Officer" 41 CFR 29-50) or fairly flexible ("Any political community which has the authority to adopt and enforce flood plain management regulations" 44 CFR 66 or "government as the term is used by the Bureau of the Census" 43 CFR 1880). The regulatory authorities, NRC, Federal Trade Commission (FTC), Consumer Product Safety Commission (CPSC), Food and Drug Administration (FDA), Food Safety and Quality Service, for the most part do

not decentralize contacting authority and insist that state and local governments contact the commissioners or administrators in Washington.

The second test of decentralization, the effective decision-making responsibility of the regional offices, is a difficult one. Certainly, on paper, the Department of Defense (DOD) makes the most strenuous efforts to decentralize intergovernmental relations responsibility. "(C)ommanders at all levels" are responsible to the Secretary of Defense for community relations (32 CFR 237). Community relations for DOD components comprises both intergovernmental relations and public participation. In Part 237 DOD components are instructed that there are four reasons for maintaining good community relations: (1) to inform the public on the preparedness of the department; (2) to develop public understanding of and cooperation with DOD programs; (3) to promote national security and a patriotic spirit; and (4) to assist recruiting and personnel procurement efforts. Translated into a functional program, DOD components are instructed, for example, on the intergovernmental coordination of land use (32 CFR 243) to negotiate with the A-95 clearinghouses and, when necessary, to accommodate, modify, or otherwise change plans and projects to meet local objections. Only in the event of "nonresolution" is the matter to be forwarded to the Assistant Secretary for Installations and Logistics.

For the civilian agencies, two issues make evaluative judgments difficult: (1) the fact that they do not rely on CFR as an internal communication device in the same way DOD does, and (2) the joint problem of variable Congressional appropriations and periodic reorganizations. One of the most interesting intergovernmental relations programs in the CFR is FEMA's establishing "Consultation Coordination Officers" to act as intergovernmental liaisons for local communities in the flood insurance program (44 CFR 66). As interesting as the program looks, its has never been implemented because Congress has never appropriated the money for FEMA to hire these officers (John de la Garza, Dell Greer, interview). Instead, the regional

offices, using the manpower they have, try to meet the objectives of the program. On the basis of the interviews, generally, underfunding and limited resources at the regional level are persistent problem for most agencies.

Probably the most notorious examples of the second problem, continuous reorganization in Washington making it impossible for regional offices to exercise effective decision-making authority, have been HUD's Model Cities program (Judd and Mendelson, 1973; Friedan and Kaplan, 1977; Pressman and Wildavsky, 1973). Because of continual reorganization and redefinition of the purpose of and the requirements for participation in the program, local governments and states have little incentive to negotiate with the regional offices.

The Department of Energy is physically decentralized, but it faces reorganization. At present, 12,000 of its 20,000 employees work outside Washington. (There are, in addition, over 80,000 people working for DOE under contract.) Under a recent realignment of the field offices, each of the 10 regional offices and some of the program offices (including Nuclear Waste Terminal Storage) now report to operations offices rather than directly to headquarters in Washington. Thus far, DOE's Waste Management Program has been able to maintain a stable staff (Creitz George, interview). It is possible that program coherence can survive reorganization.

2.3.5 Intrafederal Relations

Finally, DOE is not in an unusual position in having been designated as the lead agency but not having the authority to make all the important decisions. Twenty of the programs examined specifically mention at least one other federal agency which must be dealt with as part of the program. Interviews with officials further confirmed the impression that formal mechanisms for intrafederal relations are an important component of intergovernmental relations.

In some cases, like the Office of Personnel Management, requests from other

agencies are the central reason for a program's existence. But in most of the cases, an uncooperative relationship can sabotage the program. Different agencies have different styles for handling this problem. The Farm Home Administration and HUD typically provide for conferences at an early stage in an application's journey through the bureaucracy so that differences can be aired and settled. Justice and DOD rely on the FRCs as an intrafederal coordinating device. DOD, furthermore, instructs its components to obtain MOUs to document the outcome of negotiations with other federal agencies. USDA, in its role as the lead agency for purposes of implementing the Rural Development Act of 1972, has major coordination problems. Its regulations (7 CFR 22, 23) call for three separate organizational tools: (1) the Under Secretaries' Group, (2) the Assistant Secretaries' Working Group, and (3) the FRCs.

3. Problems of State Response to Intergovernmental Relations

If the initial problem is to define the proper federal response to intergovernmental relations, the obvious followup is to define an appropriate state response. The fundamental elements of the second problem are fairly easy to define even if appropriate measures are elusive. Because each state has its own constitutional basis, its own political life, and its own peculiar economic configuration, no two states can respond in precisely the same way to a federal initiative. To rephrase the concept, theoretically each state has an equal relationship with the federal government but, practically, "states" do not act. Individuals representing agencies and elected officials representing jurisdictions meet with federal officials. Both constitutionally and practically, their status differs on a state-by-state basis.

There are two typical federal responses. First, the federal agency requests the governor to designate a personal representative or a state agency to be the official contact. Second, the federal agency states in writing that the duly authorized state/local agency will be the official partner but requires that agency to demon-

strate that it has the legal authority to deal with the subject at hand. Characteristically, the second approach is used in cases where initiative rests with the state, e.g., application for exemption from preemption, and the first is used in cases where the initiative rests with the federal agency.

To be sure, every state has a governor. However, they stand in remarkably different positions. In the 24 states that have been or are being considered as host states for an HLW depository, in two cases -- Maine and New Jersey -- the governor is the only administrative officer elected on a statewide basis. At the opposite end, the governor's office in Louisiana is one of 11 and in Mississippi is of the 12 offices and agencies whose heads are elected. In a system with a strong governor, the power to designate the responsible state agency confers little additional discretionary authority. In states with weak governors, however, federal regulations can serve as an extra-constitutional mechanism for an incumbent to centralize power and authority. In this fashion, federal programs can help to change the existing balance of power within a state.

As the point of contact moves away and down (hierarchically) from the governor's office, the political element becomes more prominent. The consequences are in fact recognized. In the simplest case, the governor designates an official as requested; for example, the state's radiation control director. Titles carry little credibility. Thus, the federal agency, NRC in this example, bears the burden of demonstrating to other state and local officials that the state position created at federal request carries clout. To do so, NRC makes sure that the radiation control directors are the first to receive information, and using multiple sources of funding brings all 50 to an annual conference. In addition, the directors from the 26 Agreement States are sent to training courses on a continuing basis to learn the latest techniques, are brought to an all-Agreement State meeting annually (both at NRC expense), and when necessary (and as infrequently as possible) NRC officials

will intercede in state politics to help assure the directors of the necessary financial resources. NRC has been pleased with the way the program has gained stature over time. In addition, turnover of state directors, but not their staffs, has been low (Donald Nussbaumer, interview).

The more politically unpalatable the program, the more complex the interaction of the federal agency with the state or local agency, and the more important the role of elected officials. The position of local elected officials is, however, ambiguous. In interview after interview, the assertion was made that in small communities elected officials follow public opinion and that in large communities they lead it. This may, however, be a misleading generalization.

Two interesting examples that highlight the previously mentioned complex interaction typical in unpopular programs come from HUD and the Corps of Engineers. Key points in both examples are the attempt to mobilize local initiative at the beginning, the variable responses of elected officials to opposition, and the use of the Congressional delegations.

The federal government has been in the business of providing public housing assistance since the late 1930s. The program has always required state enabling legislation (about four-fifths of the states now have such) and approved Public Housing Authorities (there are about 4,000) before an application can be filed. Current regulations encourage the local jurisdiction to have an approved Housing Assistance Plan as well. The request for assistance must come from the community. By statute, 20% of available funds are earmarked for housing for the elderly; the remaining 80% to be spent on multifamily housing for low-income residents. Local officials know they can demonstrate leadership by aggressively seeking money to house the elderly -- this initiative is well-regarded by the community. Such projects sail through the bureaucracy. Not so for the other four-fifths of the money. HUD has found that even when local officials support the project, determined local

opposition can bring it to a standstill. In Petersburg, Virginia, a project is in court on the grounds that it will undermine historical preservation of a battlefield. The judge is entertaining the suit even though HUD and the local housing authority obtained a supportive MOU from the regional FRC and DOI's historic preservation group. (Ray Hamilton, telephone interview.) HUD's Washington office is kept busy because the opposition to the project sends to its Congressional delegation a continuing series of form letters, which are forwarded by administrative assistants with requests for response or action. Given HUD's policy that the stamped slips are to be treated as official Congressional correspondence and answered within seven days, other projects are neglected.

The Corps of Engineers, as well, never initiates a project. It acts upon Congressional requests -- which are frequently in response to local requests -- and upon local requests. The Corps' resources allow a different response. As the preliminary survey planning begins at one of the 37 district offices, efforts are begun to identify all parties likely to be interested in the project -- pro, con, and the simply interested. As preliminary planning progresses and data are acquired, public meetings are held, and all interested parties who wish to be on the mailing list (which automatically includes all elected officials in the affected area) receive material. In addition, the district office makes its technical staff available and provides office space as necessary to those parties who remain interested in the planning process. The district office simultaneously keeps the relevent Congressional offices informed of the progress of the project. The Corps' experience has shown that opponents of the project will focus their efforts on the governor or the Congressional delegation. District staff members are thus prepared to and expect to be summoned to make presentations to these officials about the project at a moment's notice. The Corps has requested and in most states the governor has appointed the director of the natural resources department to be the state's A-95 clearinghouse for water resource

issues. In the event of large and probably controversial projects, the district office will inform the governor's office directly. When planning is complete, the Corps will not recommend a project to Congress which the governor opposes. The ability to determine the "implementability" of a project before it is submitted for appropriations is aided in no small measure by the fact that the average district office has a planning staff of 50-70 people; all are career staffers (the Corps is about 95% civilian) and most are on lengthy assignments (Bill Holliday, Bernie Goode, interviews).

If it is true that federal agencies can change the existing political power structure in communities as they make efforts to get their programs implemented, it is also true that local communities and state governments can manipulate the federal agencies. There are any number of reasons why it would be in the best interests of state/local governmental bodies to do so. Some examples will help describe the context. By having a dual regulatory apparatus, state and local regulatory agencies are in a position to grant (and in fact have sometimes granted) permits to projects, especially water permits, that they know are environmentally unacceptable. They then quickly inform the federal agency that, despite their approval, the project is unacceptable and that it should be stopped. Because the Carter Administration had decided to use its discretionary authority to stop questionable projects in favor of the environment, this tactic effectively shifted the political heat away from local agencies (Bernie Goode, Michael Shapiro, interviews).

The Coastal Zone Management (CZM) program provides a more complex example. The CZM program offered states that were willing to review and, if necessary, override local land use plans in their coastal zones for purposes of environmental protection, the opportunity to review and object to a broad spectrum of federal programs and activities in their coastal zones if they have a NOAA-approved plan. This carrot is the federal consistency reviews mentioned earlier ("a

concurrence"). In addition, provision is made for states to obtain authority to review projects not on the list if they can prove a substantial spillover or cumulative impact on their coastal zones. Twenty-five of the 34 states and territories with coastal zones have approved CZM plans. Georgia is unable to participate because the state government is constitutionally prohibited from overriding local land use decisions. The approved list includes states with important environmental groups in local politics such as California, Oregon, Washington, and Wisconsin and states, such as Alabama, which are not usually associated with the environmental vanguard.

There have been some imaginative and successful uses of the mediation procedure. For example, Oregon can now review EPA pesticide labelling; Alabama won the right to review Offshore Continental Shelf (OCS) activities 15 miles offshore; Puerto Rico used the program to block the Carter Administration's attempt to put a Cuban refugee center on the island. Obviously, the mediation procedure has not worked the way in which it was intended.

The procedures themselves can be requested by the governor or head of the state CZM agency, or by the secretary or head of the federal agency that has a "serious disagreement" with the state. The Secretary of Commerce designates a hearing officer who takes testimony from both sides and from any other interested parties. The Secretary can then review the record, consult with both parties, and ask for a representative from the Executive Office of the President to be present. He then tries to find an acceptable compromise. Only one case has gone all the way to the Secretary's office — California and DOI over OCS leasing activities. The mediation failed in this attempt.

Three reasons were offered to explain the failure of mediation attempts. First, there has to be a rough balance of power between the parties for bargaining to be effective. The only real weapon the states have is to threaten court action. Thus, this weapon will be effective only if the federal agency is in a hurry. Second, the

procedure is voluntary. Either party can refuse to mediate and, at any time, either party can break off the procedure and go to court. Third, federal agencies perceive NOAA-DOC automatically to be on the state's side in the dispute since it will always be based on a NOAA-approved CZM plan. In the California versus DOI dispute, neither party ever altered its position at any time in the proceedings. It was used as a public relations gimmick, with the two parties posturing for position for the expected court battle. California eventually won in court. In a second instance, California versus GSA over the disposition of an old Air Force base in the San Francisco Bay region, GSA refused mediation, arguing that NOAA-DOC had mischaracterized its program as requiring consistency review. In the ensuing court battle, California got both the development delay and the deed restrictions it wanted. Interestingly, in the California-DOI controversy, none of the three parties wanted to involve the Executive Office of the President. They feared that if OMB were tapped, the decision would follow purely budgetary considerations. Moreover, it was feared that the Council on Environmental Quality was too much of an unknown quantity. In one sense, though, the formal mediation procedures have had the desirable effect of forcing the parties to decide early on how serious the dispute is. When positions are alterable and negotiation is possible, the offices of the General Counsel for the Office of Coastal Zone Management can informally relay information between the parties (Michael Shapiro, John Pedrick, interviews).

The final example of the complex interaction between a federal and state agency is that of the Federal Energy Regulatory Commission (FERC) and the state commissions regulating gas wells. Among other things, the Natural Gas Policy Act extended price controls to intra-state gas and charged FERC to oversee the implementation of this policy. The act also made the states responsible for making the wellhead determinations that are the basis for pricing the gas. Given the thousands of wells and the fact that FERC was not given extra staff to review state

decisions, one can persuasively argue that Congress effectively decentralized decision-making authority in the natural gas pricing area (Mat Holden, interview).

In all the examples offered in this section, it is clear that they could just as easily be interpreted as efforts by state and local leaders to protect their economies. Even using statewide aggregations, it is amazing how varied the economic bases of the states are. For instance, five percent of the labor force in Nevada and seven percent in New Mexico is employed in manufacturing, whereas the corresponding figures for Rhode Island, South Carolina, and North Carolina are 34%, 34%, and 35%, respectively. Likewise, there is tremendous variability in other employment sectors. Forty-two percent of the Nevada labor force is employed in the service sector, compared to 13% of the South Carolina labor force and 14% of that in Mississippi and North Carolina (see accompanying tables for a complete analysis).

This variability in economic base may strengthen or weaken community interest in a HLW repository. DOE estimates that an operational HLW facility will employ as many as 5,000 people and it wants, to the greatest extent possible, to tailor the operation to make use of the indigenous labor force. Moreover, one of the implicit assumptions seems to be that, if at all possible, the HLW facility should be placed near a community with an unemployment problem and that can use supplemental income. Examples are work provided for unemployed potash miners at the Carlsbad, New Mexico, Waste Isolation Pilot Plant; community payments made by the Barnwell, South Carolina, low-level radioactive waste disposal facility; and, possibly, the community impact payments Congress makes to the two Manhattan project communities, Oak Ridge, Tennessee, and Los Alamos, New Mexico. While it is true that South Carolina and New Mexico are relatively poor as measured in terms of per capita income on a nation-wide basis, it is also true that some of the states with HLW-related projects are wealthier: e.g., Nevada, Washington, New York. The State Planning Council is clearly uneasy with the notion of a community being offered sums

TABLE 1. Employment Distribution by State

State	1978 Total Number Nonag. Employed 1,000s	% Nonagriculturally Employed in *							% Unemployed 1978
		Manufacturing	Wholesale & Retail	Government	Services	Transportation	Finance, Insurance, Real Estate	Construction	
Connecticut	1,350	31	21	14	19	4	7	4	5.2
Georgia	1,992	26	23	20	15	6	5	5	5.7
Louisiana	1,416	15	24	19	17	8	5	8	7.0
Maine	405	27	22	20	17	4	4	5	6.1
Maryland	1,586	15	24	24	20	5	5	6	5.6
Massachusetts	2,499	26	22	16	23	5	6	3	6.1
Michigan	3,535	32	20	18	17	4	4	4	6.9
Mississippi	813	29	20	22	14	5	4	6	7.1
Nevada	350	5	20	15	42	6	4	7	4.4
New Hampshire	362	30	22	15	18	4	5	5	3.8
New Jersey	3,185	not available							7.2
New Mexico	445	7	23	26	20	6	4	8	5.8
New York	7,025	21	21	19	22	6	8	3	7.7
North Carolina	2,265	35	19	17	14	5	4	5	4.3
Ohio	4,381	31	22	15	18	5	4	4	5.4
Pennsylvania	4,670	29	21	15	19	6	5	4	6.9
Rhode Island	398	34	20	15	19	3	5	4	6.6
South Carolina	1,134	34	19	20	13	4	4	6	5.7
Texas	5,238	18	24	18	17	6	6	7	4.8
Utah	525	15	24	23	17	6	5	7	3.8
Vermont	189	25	21	19	22	5	4	5	5.7
Virginia	2,036	20	21	24	18	5	5	6	5.4
Washington	1,497	19	24	20	18	6	6	6	6.8
Wisconsin	1,879	30	23	16	18	5	5	4	5.1

*Mining not shown separately, fills in missing values.

Source: Calculated from U.S. Department of Commerce, 1980; Table 680.

TABLE 2. Farm and Mineral Statistics by State

State	1974[1] # Farms 1,000s	1974[1] $ Value Farm Produce in Millions	National Rank for Value Minerals Produced 1977[2]
Connecticut	3	187	44
Georgia	55	1,860	28
Louisiana	33	1,194	2
Maine	6	360	45
Maryland	15	620	36
Massachusetts	4	180	43
Michigan	64	1,491	11
Mississippi	54	1,229	27
Nevada	2	133	31
New Hampshire	2	72	48
New Jersey	7	297	40
New Mexico	11	522	8
New York	44	1,462	29
North Carolina	91	2,121	34
Ohio	92	2,263	14
Pennsylvania	53	1,503	7
Rhode Island	1	22	49
South Carolina	29	676	38
Texas	174	5,638	1
Utah	12	339	20
Vermont	6	208	46
Virginia	53	960	17
Washington	29	1,658	35
Wisconsin	89	2,353	37

Sources: (1) U.S. Department of Commerce, 1980; Table 1186.
(2) U.S. Department of Commerce, 1980; Table 680.

TABLE 3. Public Employment, Income, and Legislative Statistics by State

State	Full-Time Equivalent Public Employment Per 10,000 Pop. Total	State	Local	Legislature Meets in Years (Sessions)	State Rank 1978 Per Capita Income	1978 Median Family Income
Connecticut	413	129	284	Annual (2)	4	5
Georgia	530	149	381	Annual (2)	37	36
Louisiana	521	176	345	Annual	49	35
Maine	439	155	284	Annual (2)	46	43
Maryland	509	166	343	Annual	12	3
Massachusetts	473	118	355	Annual	14	8
Michigan	461	120	341	Annual (2)	10	9
Mississippi	466	142	324	Annual	50	50
Nevada	532	154	378	Odd	3	15
New Hampshire	442	162	281	Odd	32	24
New Jersey	462	97	364	Annual (2)	6	4
New Mexico	567	223	344	Annual (2)	43	45
New York	508	103	405	Annual (2)	13	10
North Carolina	466	154	312	Odd	41	44
Ohio	411	93	318	Annual	20	16
Pennsylvania	395	110	285	Annual (2)	21	26
Rhode Island	469	201	268	Annual (2)	26	20
South Carolina	482	179	302	Annual (2)	48	39
Texas	485	128	358	Odd	22	34
Utah	512	223	289	Annual (2)	39	23
Vermont	490	218	272	Odd (2)	42	37
Virginia	498	170	328	Annual (2)	24	19
Washington	502	176	327	Odd	9	14
Wisconsin	466	116	350	Annual	25	12

Sources: Council of State Governments, 1979, p. 189;
U.S. Bureau of the Census, 1980, pp. 38-39.

of money for anything other than direct expenses. "The Council did not specify what types of impacts merit compensation, but concluded that only quantifiable impacts should qualify, and not impacts caused by the perceived risks of a high-level waste repository" (State Planning Council, p. 25).

SECTION II.
APPLICATION OF INTERGOVERNMENTAL RELATIONS

4. Introduction

This section is organized into four subsections. The introductory subsection outlines the overall objectives and theoretical focus of the section. In the second subsection an analytical model is introduced. Its purpose is to illustrate how one can use the framework to identify issue areas where one needs data and information. The third subsection evaluates the theoretical and practical basis for consultation and concurrence implementation. The concluding subsection presents a model that federal, state, and local governments can use to implement HLW technology.

In this section the focus is on information requirements for state-local government interaction with the federal government. The purpose is to evaluate the extent to which data and information requirements for HLW program implementation can provide the basis for strong involvement by state and local levels of government. The objectives of this exercise include: (1) demonstrating that the theoretical basis for expecting consultation and concurrence to work is weak; and (2) identifying ways by which states or local governments can use data and information requirements to determine both the extent and patterns of their interaction with the federal government.

This emphasis is needed for a variety of reasons. First, exchange of ideas and information among the three levels of government is the basis for implementing consultation and concurrence. While consultation refers to the "process of mutual

information and technical interaction" (Reiser, et al., eds., 1980:19), concurrence may refer to a veto or a "pro forma acquiescence to veto" by a state government (Reiser, et al., eds., 1980:V). Alternatively stated, consultation involves the process of "information diffusion," and concurrence relates to "agreement on details" concerning the federal nuclear waste management program (Lee, 1979:90).

Second, reliable data and information are the foundation of viable policy decisions. Both policy planners and policy implementors (G. C. Edwards, 1980) need adequate information to set attainable objectives and as realistic guidelines. With respect to HLW management, affected states wishing to participate in the NRC review of Site Characterization Reports must submit proposals that contain, among other things, such information as a "preliminary estimate of the types and extent of impacts" from a mined geologic repository (10 CFR Part 60.62). One problem with implementing an HLW program is that a wide range of groups will require different types of information. Writing about this problem as it relates to hazardous chemicals, Gusman, et al., (1980:107) state that there are considerable variations in the types of information that people need and the "forms" in which the information must be communicated. For example, regulatory agencies such as NRC and EPA need information on environmental and health effects of potential radiation leaks. Utilities need estimates of how much waste disposal will cost them and how this cost will affect utility rates. State and local governments need to know what levels of socio-economic and environmental impacts to expect.

Third, discussions with officials at different levels of government revealed that there is a tremendous need for all parties involved, including investigators, to pay close attention to the role that data acquisition and information dissemination play, not only in policy formulation but also in policy implementation. This is important because "knowledge" and the control of information are vital sources of power. An implication for HLW policy decisions is, for example, that interest group organiza-

tions, state and local agencies, and the U.S. Congress will look to DOE, NRC, and the nuclear industry for useful information.

Fourth, researchers in the field of socio-economic impacts of nuclear waste management have said that even though the accumulation and use of adequate information can improve policy development, policy-makers and policy analysts have given little attention to the aggregation of data and information pertinent to nuclear waste management. Writing on this subject, LaPorte (1979:369) suggested that:

> ... Information of a type not now available or perhaps not yet assembled for public use should be provided both to improve the quality of policy development in selecting an acceptable radioactive waste management system and to inform the public debate concerning such systems. The type of information and analyses described herein should be sought from industry, the U.S. Department of Energy, and the U.S. Nuclear Regulatory Commission by citizens and policy-makers alike.

A fifth consideration involves the need for information to design institutional structures for effective HLW management. Leaders in industry, government, and public interest organizations recognize that gaps within existing institutions are likely to cause inequitable distribution of costs and benefits associated with implementation of nuclear waste disposal. Institutions are defined as:

> ... interrelated collection of laws, agencies, organizations, and procedures that define responsibilities, set requirements, provide accountability and liability, and determine and limit interactions in a given area (Peelle, 1980:121).

In testimony before the Subcommittee on Rural Development of the Senate Committee on Agriculture, Nutrition, and Forestry, Dr. Elizabeth Peelle of Oak Ridge National Laboratory said that "the biggest problem impeding equitable solutions is the institutional gap or absence of appropriate institutions" (U.S. Senate, 1980:121).

Two illustrations of efforts to deal with this problem are the establishment by President Carter of the State Planning Council and the adoption of the consultation and concurrence principle. In other areas, institutional arrangements are lacking,

whereby people who benefit from nuclear power but do not share commensurate risks or impacts will be required to compensate those who bear a disproportionate share of associated risks. Two related factors complicate this problem: time and inadequate information. In the first, accumulating the necessary data as a basis for institution building will take time. With respect to toxic chemicals, Gusman, et al. (1980:116) explain why information systems dealing with toxic substances will take decades to develop:

> They (information systems) must serve the diverse needs of manufacturers, regulators, users of chemicals, researchers, labor groups, public interest groups, workers, health professionals, educators, journalists, and many others. The obstacles are formidable: the large-scale of the enterprise, the complex and rapidly changing nature of the information base, the lack of standardized formats and terms, the need to provide broad access while protecting confidential data ...

The second factor, lack of information, stems from the fact that we, as a nation, have not had the experience of comprehensive management of nuclear waste. What information we have is fragmented. Writing about the paucity of relevant information, LaPorte (1979:368) observed that:

> ... there is little information on which to base discussions of advantages and disadvantages of the different organizational strategies for waste management.

5. An Analytical Model

As the foregoing discussion indicates, the nature of the HLW management information problem facing federal, state, and local governments is complex. To aid in analysis of this problem as it involves intergovernmental relations, four groups of factors will be considered: (1) HLW characteristics; (2) technology; (3) political environment; and (4) economics. These sets of factors determine the politics of HLW management.

The analytical framework implicit in this discussion was first suggested by

Davis (1978). He explained that the politics of an energy resource arena are influenced by three factors: (1) the characteristics of the resource, including the nature of the resource and its geographic distribution; (2) market forces affecting demand and supply of the resource and industry operation; and (3) the political environment in which the resource came into prominent use. This third factor involves issues that contribute to shaping the policy process. For HLW management, significant issues include environmental protection, nuclear safety, and nuclear weapons proliferation. The model suggested here differs from Davis' (1978) in one fundamental way. It recognizes technology as a key variable.

In this subsection, one set of factors is selected and pertinent intergovernmental relations implications of these factors are discussed. For present purposes, the characteristics of HLW are chosen. However, intergovernmental politics involving HLW disposal rest on the acquisition and use of data and information about each of the variable sets.

5.1 Characteristics of HLW

Several characteristics of HLW have implications for its management -- implications for involvement by interest groups including the nuclear power industry, environmentalists, and the federal, state, and local levels of government. The characteristics to be considered here include (1) the physical forms of wastes; (2) quantities of wastes; (3) radioactivity; and (4) heat generation. Each of these is discussed in terms of issues raised for intergovernmental relations.

5.1.1 Forms of Wastes

With respect to the forms of high-level wastes, scientists agree it is easier to handle nuclear wastes in solid rather than in liquid forms. This is primarily because there are greater risks of chemical toxicity and waste leakage associated with liquid

wastes than with solid wastes. Presently, it is national policy that high-level liquid wastes be converted to solid forms within five years of the date of production, even though this policy has not been implemented in the case of the only liquid waste produced in the U.S., at the defunct spent fuel reprocessing facility at West Valley, New York.

From the 1950s to the late 1960s, leakage of highly radioactive waste at Hanford, Washington from tanks containing hundreds of thousands of gallons of liquid wastes was well publicized. The manner in which the Atomic Energy Commission (AEC) handled the problem, despite warnings from the U.S. Geological Survey and the General Accounting Office, did not inspire confidence among the public concerning the agency's ability to manage nuclear high-level wastes.

To prevent such mishaps, the federal government initiated a program to solidify existing liquid wastes at Hanford. Although a discussion of the different ways to solidify liquid nuclear wastes, such as calcination or vitrification, is beyond the scope of this paper, it is important to recognize that the physical form of HLW affects management, technical design, and repository medium selection decisions. In Radioactive Waste: Politics, Technology, and Risk, Lipschutz (1980:56) comments that:

> The physical form of high-level wastes is an important aspect of the waste management program ... waste form is of critical importance for the emplacement (and retrieval, if necessary) phase of a repository. Over the longer term, waste form may or may not be important, depending upon the degree of sophistication of the waste packaging and chemical conditions within the repository rock matrix.

5.1.2 Quantities of Wastes

With respect to the amounts of HLW, decision-makers need to know the quantities available for disposal as well as estimates of quantities expected in the near to intermediate future (up to the year 2000). Considerations of quantities of

high-level waste to be disposed of are important for three principal reasons: (1) planning repository size and construction; (2) planning logistics to move wastes from temporary sites to a permanent site or logistics to retrieve wastes should the need arise; and (3) estimating costs to reprocess or store increasing quantities of wastes.

Decisions regarding how much area to close off from other uses, how much geological and environmental survey work is needed, and how much compensation will be due a community where a site is located are examples of policy implementation questions affecting repository size -- questions for which local, state, and federal officials will seek answers. As of 1979, there were approximately 75 million gallons of radioactive liquid wastes, and 5,900 metric tons of spent nuclear fuel (League of Women Voters Educational Fund, 1980:7). According to the Interagency Review Group (IRG), these spent fuels are estimated to accumulate at an annual rate of about 1,300 metric tons (2.68 million pounds). Table 4 presents the quantities and locations of storage of high-level waste in existence in the United States as of December 1978.

For some utilities operating nuclear power plants, this rate of accumulation and the locations of interim away-from-reactor repositories may pose significant problems. First, there is apprehension that some plants may soon exceed their capacity to store spent fuel rods, or that adverse environmental and health effects might result should NRC grant power plants licenses to expand their plant storage facilities. The case State of Minnesota v. NRC (1979) and the resulting Waste Confidence Rulemaking by NRC (see DOE Statement of Position and its Cross-Statement) indicate, among other things, that the problem of off-site or on-site interim storage of spent fuel is not being taken lightly. For the utilities, DOE's position that spent fuel can be stored safely on-site or off-site until its ultimate disposal assured them of continued operation even if they filled their on-site storage facilities. Although industry has increased the capacity of on-site storage facilities, some nuclear power plants may

TABLE 4. High-Level Waste and Spent Fuel Storage in the United States

Existing high-level reprocessing waste (as of 10/1/77):

Site	Volume (thousands of cu. ft.[a])
DOE-operated	
Savannah River, South Carolina	2900
Idaho Falls, Idaho (Idaho National Engineering Laboratory)	404
Hanford, Washington	6102.5
Subtotal	9406.5
West Valley, New York (Nuclear Fuel Services)	
Neutralized (Purex waste)	80.2 (600,000 gallons)
Acidic (Thorex waste)	1.6 (12,000 gallons)
Subtotal	81.8
Total	9488.3

Spent fuel storage (as of 12/31/78):

1. At the end of 1978, there were approximately 4,400 metric tons of commercial spent reactor fuel in storage at reactor sites and the three nonfunctioning reprocessing plants (GE-Morris, Illinois; West Valley, New York; AGNS-Barnwell, South Carolina).[b]

2. The Tennessee Valley Authority has announced tentative plans to construct a large away-from-reactor spent fuel storage facility by 1984. The facility may be located at Oak Ridge, Tennessee.

3. The federal government intends to construct an away-from-reactor spent fuel storage facility by 1984-1985. Interim storage of spent fuel may take place at the three nonfunctioning reprocessing plants.

4. Spent fuel storage experiments are planned or underway for Hanford, Washington, and the Nevada Test Site. The Waste Isolation Pilot Plant may include "demonstration" storage of small quantities of defense HLW in a retrievable mode, but the project will not commence before 1985.

5. Spent reactor fuel is presently accumulating at the rate of about 1,300 metric tons per year.

---

a 1 cubic foot = approximately 7.5 gallons of liquid; much of the defense waste is solidified.

b 1 metric ton = 2,200 pounds. Volume is about 13.1 cubic feet per metric ton of spent fuel.

Source: Interagency Review Group (1979).

have to shut down by the late 1980s. In reference to industry and government studies, Lipschutz (1980:46) stated that:

> ... as many as 28 nuclear power plants could be forced to shut down by 1986 owing to the absence of storage capacity for additional spent fuel.

With respect to transportation logistics, DOE maintains that the necessary transportation needs will be met, that waste shipments will not have significant adverse impacts on local communities, and that adequate receiving facilities will be built to handle expected shipments (DOE Cross-Statement, 1980:111-15). However, analysts including Cochran and Tamplin (1980) share the concerns of some participants at the rule-making hearings that logistics problems have not been adequately addressed by DOE and DOT. In particular, they point to insufficient numbers of shipping casks, over-reliance on the railroads, and inappropriate assumptions made about the quantities of wastes to be transferred as well as the rate at which they can be shipped to a repository.

Cochran and Tamplin (1980:1) have concluded that:

> ... when one examines the logistics problem in the waste area, there are institutional, political, and economic as well as technological considerations that lead to a far more pessimistic view of the future than (DOE's) conceptual design considerations would suggest.

Pertinent institutional questions to raise are: (1) to what extent have federal officials incorporated intergovernmental considerations into their logistics planning; and (2) to what extent have they sought input from state and local government officials?

In addition to their concern about economic risks associated with unanticipated but possible plant shut-downs, industry representatives have another concern. It is the uncertainty over how much it will cost them to reprocess and/or dispose of wastes from their plants. Some calculations show that it may cost about $225 to store a kilogram of spent fuel (Congressional Quarterly, 1979:116). This rate means that for

a reactor that produces 30 metric tons of spent fuel, storage fees will cost approximately $6.8 million a year. Since this cost will be passed on to electricity consumers, both industry and public representatives are concerned over the impacts of storage and disposal costs on customer utility rates.

5.1.3 Radioactivity and Associated Heat

One of the distinctive characteristics of HLW is its emission of radiation. A consequence of this radioactivity or decay is the release of large amounts of heat energy. The radiation hazard of HLW materials is especially serious if the materials are inhaled or ingested and incorporated into the tissues. When considering this feature of high-level waste, opponents of the nuclear industry argue that the disposal of HLW presents a serious threat to health and the environment. Industry supporters, however, insist that the public is misinformed about the dangers of radioactivity and that before policy-makers can make a "rational decision" about waste disposal, actors must address the problem of the "lack of unbiased information on the subject" (Copulos, 1977:2).

Federal and state officials must address legitimate questions to the satisfaction of community leaders. Scientists have said that it will take from 3,200 to 10,000 years after high-level wastes are stored in a repository for the site to return to its original thermal condition. DOE sums up the basis for this opinion by saying that:

> ... most evaluations indicate that, during the first 10,000 years, the radiological hazard due to spent fuel placed in a repository will decrease to approximately the levels of radiological hazard associated with naturally occurring ore bodies (NRC, 1981:209).

6. Information Requirements and HLW Management Technology

The issue of HLW technology continues to be debated among scientists, policy-makers at all levels of government, nuclear industry leaders, and interest group

representatives. It can be argued that the debate on (and hence the politics of) HLW management has centered on technology. Presently the technology being considered is mined geologic repositories. The U.S. Department of Energy maintains that the following geologic media have attractive properties as potential host rock for HLW disposal: bedded salt, domed salt, basalts, granites, volcanic tuff, and shale. Presently, the media receiving greatest attention from DOE are salt domes in Texas, Louisiana, and Mississippi, bedded salt in West Texas, Utah, and New Mexico, and basalt in Washington. The extent to which these and other states with potential geologic media cooperate with the federal government to implement this technology will determine how successful the federal government can be in executing its responsibility to manage HLW. It was toward this goal that DOE instituted the process of Consultation and Concurrence.

For the rest of this paper, the following argument will be advanced. If emphasis within the consultation and concurrence framework is not on information transfer (including the exchange of ideas), successful implementation will be difficult to realize. Attributes of successful implementation of technology include technical soundness, political viability, and social acceptance. But if emphasis within the consultation and concurrence process is on the acquisition and transfer of data and information, successful implementation will be achieved with minimal resistance. Further, we will show that the present practice emphasizes the former. To correct that approach, we then will propose an approach that can permit local and state involvement in both data generation and information dissemination.

The present approaches to information sharing among federal, state, and local government representatives are an inadequate means of securing strong inputs into HLW management planning and implementation. These interaction activities include site visits, conferences, seminars, films, briefings, and information dissemination using reports and "information sheets." Details about some of these activities are

presented in two documents:

(1) DOE (1981) Report on Consultation and Concurrence; and

(2) USBLM (1981) Responses to Issues Raised in Comment Letters Received by the BLM Regarding DOE Exploration Activities in the Paradox Basin.

DOE reports that consultation and concurrence activities are going on in some 20 states. It is true that these interactions have provided avenues for information exchange between federal, state, and local levels of government. While DOE representatives insist that the Department has an aggressive consultation and concurrence program (Barainca, interview, 1981), there are strong theoretical reasons for pessimism about how well the consultation and concurrence process is working.

First, as noted by Tornatzky, et al. (1980), site visits can promote "peer-to-peer network-building," information dissemination, program advocacy, and reduction of uncertainty about a program. But, while the use of site visits (Tornatzky, et al., 1980) or "travelling seminars" (Richland, 1965) to promote innovation adoption makes sense and has reasonable theoretical appeal, several investigators (Glaser and Ross, 1971, and Tornatzky, et al., 1980) have shown that site visit interventions must consider several factors such as the context (organizational, time, etc.) in which site visits take place, and the "order of interventions," including "consultation assistance" following the visit (Tornatzky, et al., 1980:184).

With respect to state-local involvement in HLW management decisions, the argument that participative decision-making leads to more innovation decision has some relevance. In particular they argue that adoption of participation enhancement mechanisms that focus on process will lead to greater perceived involvement decisions. While process techniques can alter the frequency and intensity of interaction between levels of government, structure techniques can change the number and roles of organizational participants.

The implication for HLW policy decisions is that process interactions such as

visits, seminars, and memo exchanges may lead to greater perceived involvement but not to actual decisions. However, adoption of other types of mechanisms, including state-local government representation on intergovernmental policy review committees, state-local government control of a special arbitration committee, or the use of memoranda of understanding can lead to innovative policy changes. That is to say that certain types of interactions are politically more symbolic than they are substantive.

Second, the use of printed materials to disseminate innovative information and to promote innovation implementation may not be as effective as the use of personal interaction. With respect to the implementation of the HLW program, the federal government's use of reports, memos, etc., may have minimal impact on state involvement:

> At many levels of government, there are still attempts to disseminate information about, and to promote implementation of, "exemplary" social innovations through the use of printed materials. Government agencies, to a significant degree, are fueled by paper — guidelines, regulations, memos, manuals, and the like. These data would indicate that unless such activities are coupled with more interpersonally intense interaction and sufficiently powerful incentives, the likelihood of effecting change is small. The role of printed media in this context seems to be to promote a very low level of awareness and passive interest in innovation (Tornatzky, et al., 1980:147).

Third, technical experts working under DOE contracts at the state-local levels may not have any commitments to consultation and concurrence. Two conditions may lead to that situation. One is the case where consultants are more interested in completing their investigation than in taking the time to implement consultation and concurrence. Another situation is the case where consultants perceive priorities that are in conflict with the primary need to implement HLW technology. Some technical experts, while they believe that HLW management is an important issue area, insist that the disposal of toxic chemical waste poses greater and more immediate threat to

public health, safety, and welfare than nuclear waste. Accordingly, they believe that the issue of nuclear waste management is overemphasized.

In terms of consultation and concurrence, most technical experts agree that the relationship between DOE and a state geological survey is a one-way street. That is to say, DOE can veto recommendations by a state geological survey. In fact, most state geological surveys will not recommend a site DOE considers unsuitable for whatever reason.

As they realize that they cannot overrule DOE's recommendation, scientific and technical experts at the state and local levels convey a sense of frustration when they say that what complicates the consultation and concurrence process for them is that they are concerned about generating technical data and information that will meet the approval and the needs of three groups of people. These are the public, the technical community, and the politicians. First, they see the need to convince the technical community on the technical merit of their evaluations. Second, they see the need to satisfy politicians who would want to use their recommendations in policy-making decisions. Third, they see the need to communicate their findings to the general public. Even though they see these different needs, scientific and technical experts realize that their primary responsibility is to the technical community. There are two reasons for this orientation: (1) the need to maintain scientific rigor so as to promote reliability of the data generated, and (2) the conviction that politicians, interest group organizations, and other interested members of the public will turn to experts for advice (Krietler, interview, 1981).

Fourth, there is the problem of people's perception that hearings are a forum whereby they are called upon to ratify decisions they feel the federal government reached prior to the hearings. According to Unseld, et al. (1979:265), industry and government representatives may withhold information or manipulate other types of data to "substantiate decisions already taken."

A fifth and related problem is the manner in which both the supporters and opponents of nuclear power use public hearings to advance their respective viewpoints. Unseld, et al. (1979:267), report that interest groups use data and information to support their various positions:

> As with the committed proponent, the antinuclear activist uses data and events to support a preconceived position with the result that new pieces of information have little impact on existing attitudes.

Sixth, information dissemination through the mass media and public relations campaigns may be an ineffective means to allay people's fear about nuclear power or their distrust of the industry and government. If, as some authors have suggested, public opposition to nuclear power is rooted in people's emotions, no amount of information about DOE's management principles or about NRC's confidence rule-making procedures will assure them of any solutions. As Lifton (1976) and others have observed:

> These fears are not susceptible to resolution of rational-probabilistic assessments of risk, such as the Rasmussen Report, because it may be the mode rather than the number of deaths which is critical ... The "most important human feelings are precisely those least susceptible to mathematical equations" (Unseld, et al. 1979:280).

There is a fundamental problem with the application of the conventional wisdom which says that the way to get people to change their perceptions, attitudes, and behavior is by giving them relevant information. The problem lies with doubtful assumptions underlying the proposed solution. According to Unseld, et al. (1979:280), two assumptions are involved. The first is that public attitudes are mainly cognitive in basis; and the second is that increased knowledge will create a more favorable attitude toward nuclear energy. With respect to the first assumption, investigators such as Pahner (1976) and Lifton (1976) have shown that opposition to nuclear power may be rooted in conscious or unconscious fears of dangers associated with nuclear war or nuclear radiation, or they may be rooted in deep emotions about the integrity

of human body that might be threatened by radiation. With respect to the second assumption, there is some weak evidence that information and knowledge may contribute to attitude formation (Unseld, 1979:280). However, analysis of survey data on the subject indicates that support for nuclear power is "not associated with higher levels of knowledge. If anything, support may be inversely related to knowledge" (Unseld, 1979:281). The authors showed that for both men and women in their survey "increased knowledge was positively associated with greater opposition" to nuclear technology. The researchers concluded that:

> Perhaps the most judicious assessment at this point is that empirical support is lacking for the argument that opposition stems from ignorance for the argument that greater information will change attitude (Unseld, et al, 1979: 282).

Reports by Bem (1970) and Mazur (1977) suggest that support for, or opposition to, nuclear technology will grow through a "network of personal relationships" (Unseld, et al, 1979:285).

Other writers including Olsen (1978) and Bem (1970) have suggested that the formation of, and changes in, attitudes take place primarily through "interpersonal interaction, not mass communications" (Olsen, 1978:98). Bem (1970:76) and others argue that dissemination of information to the public is a two-stage process. In particular, these authors suggest that information flows from the media through family members, friends, and other community contacts to the rest of the community. In Olsen's (1978) view, neighborhood groups and community organizations play a major role in forming and altering attitudes toward energy technology adoption. An implication for public acceptance of HLW technology is that information dissemination as a tool must be reinforced with other measures.

Finally, from an institutional perspective, reliance on communications and information transfer as tools to implement consultation and concurrence may rest on questionable theoretical grounds. The following propositions by Krippendorff

(1980:46-47) form the basis for this critique:

1. Communications tend to be governed by institutional rules prescribing conditions under which they are disseminated and used within an organization.
   (a) Within social organizations, the right to use a particular channel of communication is regulated and whatever data one obtains in such contexts reveal what an institution deems permissible.
   (b) Most communications can be assessed in terms of institutional costs and benefits.
   (c) Communications in institutional contexts, particularly public communications, thus reflect the dominant power configurations of senders and potential receivers.
2. Communications, created and disseminated under the operating rules of an institution, tend to reinforce the rules under which they are created and disseminated.
   (a) Within institutional contexts, the activity of saying something is often more important than what is being said. Ceremonial speeches may come to mind. Their primary purpose is to move a ritual performance from one stage to the next and demonstrate an institution's success in completing the sequence.
3. Communications transmitted through institutional channels tend to assume the syntax and form such channels can transmit efficiently.

These propositions have implications for consultation and concurrence implementation. First, production and dissemination of volumes of reports on HLW management may be important for their symbolic political significance but not for what they contain that state and local officials can use. For one thing, under its operating rules, DOE must produce and circulate these reports. Some critics charge that these reports are prepared as a justification of the agency's position (Unseld, 1979:265).

Second, producing and distributing these reports may be a mechanism to redistribute responsibilities or to shift controversial policy decisions from one agency to another or from one level of government to another. DOE's request that the

governors of Mississippi, Louisiana, and Texas announce in their respective states that domed salt sites had been designated for further investigation illustrates the point that the release of information can be used as a tool to shift responsibilities.

Third, HLW information may be disseminated not in forms usable by state and local decision-makers, but in formats that agencies can produce easily. This may be done in order to save money or merely to satisfy consultation and concurrence requirements. There is need to disseminate information in the form and through the channels that permit most effective use by state and local officials. Digesting and transmitting technical information through acceptable channels to local and state governments is important. Krippendorff (1980:10) describes a requisite organizational structure as:

> ... one that can take note of channels and constraints on information flows, communication processes and their functions and effects in society, and systems involving advanced technology and modern social institutions.

Fourth, to be an effective tool for intergovernmental relations, information transfer will be pursued within innovative organizational channels. That means that federal, state, and local government representatives need new organizational structures designed to encourage strong state-local involvement in HLW management. What they need is a system that permits these three levels of government to collaborate in both data acquisition and information dissemination.

7. The GRIPS Model

Many policy analysts and corporate leaders claim that a trend is developing toward more local control over energy and non-energy development decisions that have significant impacts on local communities. For this reason, local jurisdictions and states with potential HLW sites should seriously consider adopting a model such as the Geothermal Research Information and Planning Service (GRIPS) model. An overview of the model and an explanation for recommending this organizational

framework is presented.

The original idea for GRIPS evolved from a project that Lake County, California, funded in 1976; the objective was to evaluate both positive and negative environmental, economic, and social impacts of geothermal resources development in that county. Developed and implemented by local and state governments, using DOE assistance, the purpose of the Geothermal Resources Impact and Planning Study was to provide the best information available to the county decision-makers concerning the consequences of their decisions (Hussey and Lagassa, 1980:117).

GRIPS might not have the recognition it has attained today had it not been for (1) the participation of three other counties: Mendocino, Napa, and Sonoma, and (2) the involvement and funding of the California Energy Commission (CEC) and the U.S. Department of Energy. In 1977, GRIPS, as a four-county organization, secured a contract from CEC and ERDA to prepare jointly a plan for data acquisition to assist in evaluating geothermal development impacts in the region. Specifically, the contract required the following:

(1) The preparation of a bibliography and a library of existing information;

(2) The categorization, evaluation, and assessment of the adequacy of the existing data base to determine whether it would meet the needs of the agencies involved;

(3) The identification of needs for additional data; and

(4) The preparation of a report and management plan for implementing studies and constructing a more comprehensive data base (Hussey and Lagassa, 1980:118).

As these tasks indicate, data collection, data analysis, and information dissemination are the principal organizational objectives with which GRIPS started. It is essentially an intergovernmental organization that collects and disseminates useful information among its members. In the words of Hussey and Lagassa (1980:118):

GRIPS is a focal point for the data collection needed prior to timely permit decisions and for the sharing of information on all levels of government.

Emphasizing its significance for intergovernmental relations, the authors state that:

> GRIPS offers a unique mechanism for assuring that federal and state research is valuable and useful to local decision-makers. Contracting with GRIPS for such research needs guarantees that the research results will be useful and used in the local decision-making process (Hussey and Lagassa, 1980:119).

Since its inception, GRIPS has achieved several objectives and has encountered several difficulties. The major problem has been the difficulty in raising funds to accomplish one of its principal objectives -- preparing a "master environmental assessment plan" together with its data base (Hussey and Lagassa, 1980:119).

However, four of its accomplishments that have relevance for HLW management must be noted. First, the formation of GRIPS by four counties with significant state and federal involvement must be recognized as an achievement. It offers the four county jurisdictions the organizational structure within which to plan and implement area-wide projects that deal with the impacts of geothermal resource development.

Second, GRIPS provided these counties the organizational framework to form a Joint Power Agency (JPA), similar to the Texas Municipal Power Agency (TMPA). TMPA is a consortium of Texas cities formed under a 1975 Texas law that allows two or more public utilities to form a municipal power agency; the Agency has power of eminent domain and plans to mine lignite to generate electricity for its member utilities. Incorporated under the name of GRIPS Commission, the JPA has a provision in its charter whereby CEC and DOE can have nonvoting members on the Commission.

Third, GRIPS has completed a number of research projects for its members and for DOE. Some of the research contracts include (1) a $90,000 DOE grant to investigate the establishment of geothermal development policies in the four-county

region; (2) a GRIPS-BLM project to prepare an inventory of cultural resources of the area; and (3) a grant to study the impact of geothermal development on the peregrine falcon in the Geysers region.

Fourth, GRIPS has developed significant input into designs of DOE-funded studies. Two examples are worth mentioning. In the first instance, GRIPS, through workshops in which local leaders participated, worked with Lawrence Livermore Laboratory (LLL) to draw up a plan for environmental studies at the Geysers and to identify major priorities for action. The final plan contained a status report of the types of environmental data that the different levels of government needed for their planning. It also included a list of projects to generate data to fill information gaps.

The second example concerns a research plan that LLL drew up on a DOE-funded project. GRIPS caused LLL to make changes in the original plan it had submitted. Commenting on this type of influence on research plans, Hussey and Lagassa (1980) noted that:

> ... when the Lawrence Livermore Laboratory (LLL) delivered a work plan for ..., GRIPS noted the implications of its unilateral preparation. A series of meetings with LLL followed, with the result that LLL came back with a work program more appropriate to the needs of the local governments involved.

These two examples illustrate that an intergovernmental information dissemination and research organization, established at the local government level, can make useful contributions to the design and execution of social/technical research projects.

Before concluding discussions on the GRIPS organizational model, further attention must be given to the objectives of the GRIPS Commission. This emphasis is in order because the outlined objectives of the Commission focus on the problem of using technical data and information as a mechanism to promote intergovernmental relations. According to Hussey and Lagassa (1980:118) there are four principal objectives:

(1) To document and integrate the interests of federal, state, and local agencies in planning development of a common information base for integrated assessment of geothermal resource impact projections;

(2) To develop a specific management structure and technical plan for creating, assembling, and utilizing a common information base;

(3) To implement the common information base and integrated assessment system for geothermal resource impact projections; and

(4) To create a system to make data available for coordinated policy determination and decision-making among governmental jurisdictions.

The purpose of presenting this overview of GRIPS is to suggest that local communities and states with potential HLW sites seriously consider adopting the model. This organizational framework is recommended for a number of reasons. First, the California experience in the region of Lake, Mendocino, Napa, and Sonoma counties has shown that the model works. It is effective mainly because it provides the mechanism for direct state/local input into the planning and execution of data acquisition, data interpretation and analysis, and information dissemination in a highly technical policy area. This implies that projects conceived and implemented within such a framework will find useful application at all levels of government.

The emphasis on local control over development decisions is deliberate. In the energy arena, Exxon has recognized the need to solicit local input to its corporate plans to develop its synfuels projects in the western United States. "This approach is a must," an Exxon executive comments, because it is good for business, for sustained community growth, and for the protection of our national interest since we are in "this business for the long haul" (W. W. Madden, interview, 1981). Worthington (1980) affirms that in several communities throughout the country, leaders are seeking ways to hold corporate decision-makers accountable for their decisions that will affect localities. The fact of the matter is that frequently "communities like Youngstown,

Ohio, and Forest Grove, Oregon" are affected adversely by decisions from "distant corporate headquarters" (Worthington, 1980:57). On this issue of local involvement in energy development decisions, the author concluded that:

> After the fact, local leaders are painfully aware that they lack input into decisions affecting the welfare of their communities, whether these decisions concern energy per se or economic development in general. Holding corporate activity accountable to the public interest will be at the center of public issues in the 1980s, precisely because corporate planning decisions have serious public impacts in highly centralized societies (Worthington, 1980:57).

With respect to HLW management, the foregoing observations have implications for intergovernmental relations. First, if executives in Exxon can say that they are in the energy business (in particular, synfuels) for the long haul, agency officials in federal and state governments must recognize that the central government is in the high-level nuclear waste disposal business for the longest haul. It follows, therefore, that federal and state officials should look into approaches such as those Exxon and other companies have developed to secure local inputs into their decisions. Second, there are lessons that government agencies can learn from Exxon's experiences in dealing with local communities, lessons that will aid in the planning and design of intergovernmental networks for HLW management.

Another reason the GRIPS model is recommended is that the organizational framework provides a means to integrate the information needs of the federal, state, and local government jurisdictions. This is important because not only will it promote program coordination among all levels of government agencies, but also it will facilitate communications among interest groups by experts. Such an approach to effect state-local involvement in data collection and information dissemination is shown schematically in Figure 1.

This diagram illustrates the idea that federal/state/local government interactions, such as workshops (held at the local community level as within the GRIPS

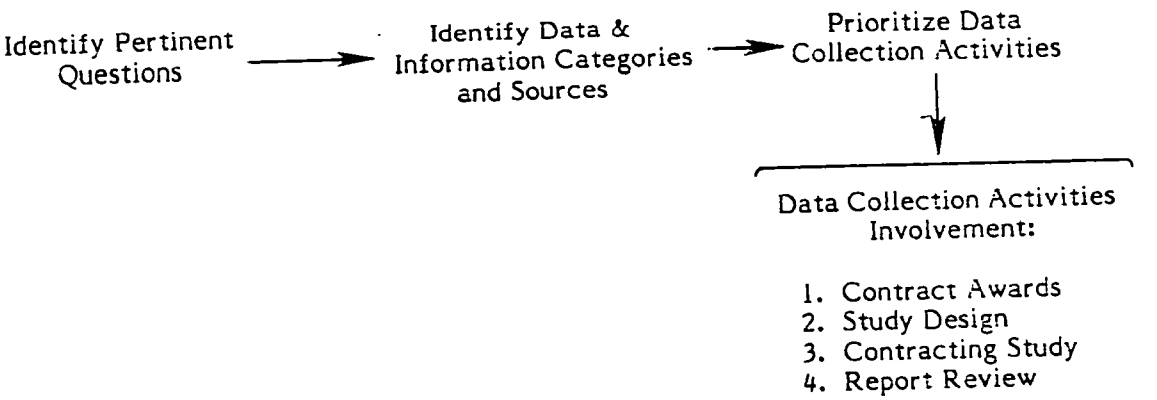


FIGURE 1. An Intergovernmental Information Generation Procedure

context) can be used to involve state and local officials in decisions affecting data collection and dissemination. At the first stage, questions will be identified to which answers are sought by representatives from the three levels of government and from other interest groups. From these questions participants can then identify types of data and information needed to provide necessary answers. The next stage will be to identify and prioritize data collection activities such as socio-economic and political impact surveys.

State and local governments can undertake varying degrees of responsibilities at the involvement stage. In theory, state and local governments can collaborate with federal agencies in one or more of the following ways: (1) granting contract awards, (2) planning study designs, (3) managing or executing studies, and (4) reviewing draft reports. Presently, states are involved in various aspects of these activities with respect to HLW siting projects. For example, the State of Texas, through the Texas Energy and Natural Resources Advisory Council (TENRAC) and the Bureau of Economic Geology (BEG), has participated in DOE's HLW investigations in Texas partially through funding provided by DOE. Additionally, states are required to review DOE's site characterization reports (10 CFR Part 60.64). This type of arrangement has two shortcomings. First, it fails to accommodate local communities in any formalized framework of interaction for either data acquisition or data dissemination. What efforts there are for the latter are limited to the use of such "passive" information-transfer mechanisms as public libraries. NRC's experience in this regard has shown that use of community libraries as information dissemination centers has been ineffective. Surveys of depository libraries by NRC officials have revealed that volumes of reports were missing and that most of those available had not been used (Donald Nussbaumer, interview, 1981).

The second shortcoming is that the existing network, while it focuses on federal-state interaction, fails to provide adequate mechanisms for initiative and

input from local and state officials. Local initiatives and inputs are essential because it is the people who live in affected communities, who know not only the socio-economic needs of their communities, but also the strengths and weaknesses of existing networks of power. Generally, community leaders perceive the lack of local initiatives in, or inputs to, the planning of federally mandated projects in local communities as a threat to local autonomy. To avoid this situation, and hence minimize state/local opposition to HLW repository siting, DOE must work with the other levels of government to set up institutional channels where state/local initiatives will be sought for nuclear waste data collection and analysis and information dissemination.

The third reason that the adoption of the GRIPS model is advocated is that it will satisfy one of the fundamental needs of governments in the area of HLW management -- an institutional arrangement that minimizes both substantive and perceived federal/state/local conflicts, and that facilitates conflict resolution. The GRIPS framework should accomplish these goals. One reason for this optimism is that through their direct involvement in site characterization or environmental impact studies, for example, local groups will hardly accuse federal agencies of exercising preemptive power. Another reason for the optimism is that if the model is adopted with full support from DOE, local and state leaders will be reassured that the federal government will make good its promises of technical and financial assistance.

Federal officials must accept the fact that local opposition to HLW siting will not simply fade away. To work out effective intergovernmental relations mechanisms, federal-state officials must interpret the opposition as a pressure on them to demonstrate their accountability toward the public. This understanding is important because it minimizes the chances for an elitist interpretation which says that local opposition is "radical" dominated, and that given information, time, and promises of assistance, it will dissipate.

Community leaders fear being left out in the cold, with pleasant sounding promises of compensation. If community representatives are brought into the decision-making process through open channels, then compensation promises and appropriate actions will allay their fears of federal preemption or state neglect.

8. Conclusions, Reflections, and Recommendations

The HLW management program is by no means unique in exhibiting an element of intergovernmental relations. But it is true that HLW management poses some unique issues for intergovernmental relations. Since concepts of intergovernmental relations have been stressed throughout this paper, it is appropriate that the conclusions and recommendations address the conceptual framework of intergovernmental relations.

The first conceptual issue is the determination of the function of state and local government. This determination is not to be confused with identifying a role for state and local government. It is relatively easy for any administrator to identify tasks that are conveniently delegated. The difficulty with this procedure is that it assumes those who are requested to fulfill the task will share the perception of the administrator and will take those actions anticipated by the administrator. To the extent the assumption fails, so will the delegation.

Commissioner Holden (interview), responding to a question on the need for formal intergovernmental relations mechanisms, suggested that the state governments are expected to serve as conduits for the anxieties and interests of their constituencies. State officials become the vehicle for articulating those concerns -- that is, translating concerns into questions -- and demanding reasonable responses from Washington. The effect is that the state governments force the federal government to document the fairness of its decisions. This attitude is far from the New Deal view of the federal government as a warm, friendly uncle.

Several recommendations are suggested by this conceptual approach. Elected officials, state and local, who tend to be more accurate than civil servants in assessing the depth of popular concern, should be DOE's primary contacts for addressing objections. This procedure will avoid the temptation of allowing meetings between DOE's technical staff and the designated state agencies' technical staffs to substitute for intergovernmental relations. A good principle might be that all objections will be heard and answered, if not all objectors. Furthermore, DOE should provide each potential host state with a grant for purposes of establishing its own internal HLW information exchange mechanism between state and local officials. By encouraging local residents to use their elected officials as the communicating link with DOE, the Department will avoid undercutting local power structures and, with a coordinated state mechanism, maintain a manageable number of contacts. Ideally, all objections and concerns will move from the localities to DOE and answers will be returned quickly enough that citizens will not feel a need to resort to extra-governmental organizations to get answers.

The second conceptual issue is that of the permanence of HLW siting decisions. In the Cross-Statement, responding to charges that federal HLW policy was likely to be fickle, DOE said:

> There is some potential for policy shifts from President to President, but the Department does not believe this to be a credible deterrent for a finding of confidence. Although refinements or minor modifications may be expected to occur, radical departures from an existing national policy cannot occur without deliberation on the part of both Congress and the President. If it is determined by both branches of the government, acting under their constitutional authority, that the national interest dictates that major departures from past practices are necessary, then policy positions will be developed consistent with the needs at that time. The guarantee sought by the State of Ohio and the California Department of Conservation, that policies have to be fixed forever, is not achievable, nor should it be (at II-5).

The same reasoning can, of course, be applied to state and local policy

commitments. In a bargaining situation, it is normally preferable to be the only party with an escape clause (i.e., ability to extract future concessions). The problem in HLW is that DOE does not want to lose years of work in a site at licensing time. Pressure for policy changes will likely come from two different sources. At the federal level, the decision regarding where the proper safety levels should be set in regulatory decisions is inherently discretionary and is properly the decision of each administration. There is no way EPA (and the Corps of Engineers for water matters) can be expected to announce in 1981 its unalterable 1995 standards. This, no doubt, plays havoc with engineering design. Conversely, state and local assessments of the social and economic impact of an HLW depository are based on the present market structure. Accurate judgments about mineral prices in 1995, influenced as they are by a variety of economic and political factors, are difficult and will probably require continuing revision.

The recommendations resulting from this viewpoint suggest that DOE should involve as many people as possible and maintain as many sites as possible as long as possible (more than NRC's minimum of three sites in two unrelated media). The principle is that as late as the licensing hearings, fundamental decisions should still be possible (even if they rarely are); DOE should not be forced to have only one candidate it can defend. The corollary is that state, local, and federal appointed officials should be allowed to work on the basis of short-term commitments, because no elected official has to fear that his/her constituency is making an irrevocable decision at an early stage in the HLW siting process.

The third major conceptual concern is for the tandem issues of bias and conflict of interest. On a basic level, DOE will always be perceived as a proponent of permanent HLW sites -- it is the lead agency. Any information DOE releases will be evaluated in that light. On a second level, other federal agencies and private groups will assume that DOE officials have a vested interest in protecting any agreements

reached with particular states and localities. This second level explains the willingness of parties to enter mediation procedures ostensibly to bargain, and to then engage in a stylized play wherein they posture rather than bargain, each trying to avoid becoming the defendant in the expected lawsuit.

The fundamental determinant of bias and conflict of interest is the way in which officials acquire and use knowledge. That officials in Washington tend to view problems differently than do regional and state officials is a commonplace observation. A frequently offered, but incorrect, explanation is that officials in Washington see the "whole" picture while regional and state officials know only their limited parts. A more satisfactory explanation is that all administrators react to pressure and learn what they need to operate on a day-to-day basis. More than at the regional office or state level, federal officials in Washington spend most of their time defending policy decisions. Bits of knowledge are the links in their armor protecting the administrator from external attack. Again posturing, in this case establishing position, is important in the way information is presented for such defenses. The differing orientation toward the use and purpose of knowledge makes communication difficult (Mat Holden, interview).

Recommendations suggested by this third conceptual concern relate to the way knowledge is developed. To the maximum extent possible, and certainly for issues of great importance to local communities like economic impact, DOE should provide the funding and let the affected communities select a consultant or hire their own staff to conduct the studies. In addition, with full recognition of the danger of incompetence and noncompliance, DOE should consider making it the direct responsibility of the contractors to place copies of their studies in designated depository libraries. This requirement would help eliminate any suggestion that DOE officials censored unfavorable findings in any of the technical or socio-economic studies. NRC has already addressed this issue at the licensing stage and recognizes that for

the contracted research to be meaningful, opportunity must be provided for the use of negative results in opposing the license application (Mike Bell, interview).

A second set of recommendations on this third point relates to personnel. The importance of face-to-face contact as a mechanism to reduce the tendency to label the other party as a biased opponent was often stressed in interviews. In interview after interview, respondents pointed to examples where personal relationships in the multi-cornered arena of elected and appointed officials at the federal and state levels were what made informal mediation efforts effective. Aside from the problem of tight travel budgets, this means that agencies must have continuity of personnel over time. As it is, DOE's Waste Management Program and NRC's HLW Licensing Branch have been stable. It is thus incumbent upon the potential host states to designate and adequately fund state counterparts for the long term. The HLW documentation is so voluminous that stereotyping is the only strategy available to officials who can only work on it a few hours a month.

The fourth conceptual concern is the extent of DOE's competence in the field of HLW management. The role of the lead federal agency is problematic given that it is expected to project an assurance of management capability even in areas where basic legislative decisions have not been made. Contingency planning can provide the lead agency with policy options no matter what direction the decision eventually takes. Unfortunately, state and local elected officials do not have the same freedom. They are pressured to make initial commitments permanent.

The recommendation, then, is that DOE should not cover for Congressional indecision. For example, state and local governments should not be expected to make commitments until Congress decides the strength of the link between the national responsibility for HLW and the national financial burden (both operating costs and liability for accidents or eventual retrieval; State Planning Council). Congress must also decide whether military and commercial waste will be combined. DOE should

devise a diplomatic way to provide a public list of necessary legislative decisions.

All four sets of these recommendations are at odds with a management orientation to intergovernmental relations. This is deliberately so. In each case, a voluntary relinquishment of day-to-day control will produce the desired long-run policy product. At the heart of consultation and concurrence in intergovernmental relations must be a recognition of the right of parties to approach the HLW issue with entirely different concerns.

REFERENCES

Aaron, Joan B., "Intergovernmental Politics of Energy," Policy Analysts, Volume 5, Fall 1979.

Bahl, Roy (ed.), The Fiscal Outlook for Cities: Implications of a National Urban Policy. Syracuse: Syracuse University Press, 1978.

Barainca, Mike. Interview, 1981.

Bartlett, John W., "The Role of Information in the Consultation and Concurrence Process" in Consultation and Concurrence (draft), The ORCAS Meeting, Eastsound, Washington, September 23-26, 1979.

Battelle Memorial Institute. Consultation and Concurrence (draft). The Orcas Meeting, Eastsound, Washington, September 23-26, 1979.

Bell, Michael. Interview, 1981.

Bem, Daryl J., Beliefs, Attitudes, and Human Affairs, Belmont, California: Books/Cole Publishing Company, 1970.

Berger, John J., Nuclear Power: The Unenviable Option, New York: Dell Publishing Co., Inc., 1977.

Brown, Holmes. Interview, 1981.

Cochran, Thomas B.; Rotow, Dimitri; and Tamplin, Arthur R., "Radioactive Waste Management," a Report prepared for the U.S. Department of Energy, April 13, 1979.

Cochran, Thomas B. and Tamplin, Arthur R., "Nuclear Waste, Too Much Too Soon," a Paper prepared for the Natural Resources Defense Council, Inc., 1980.

Committee on Radioactive Waste Management, Commission on Natural Resources, National Research Council, Implementation of Long-Term Environmental Radiation Standards: The Issue of Verification, Washington, D.C.: National Academy of Sciences, 1979.

Conference Board of Canada (William Dodge, ed.). Consultation and Consensus: A New Era in Policy Formulation? Study No. 54, Canada: The Conference Board of Canada, 1978.

Congressional Quarterly, Energy Policy, Washington, D.C.: Congressional Quarterly, Inc., 1979.

Copulos, Milton R., "Storing Nuclear Wastes," a Background Paper prepared for The Heritage Foundation, 1977.

Council of State Government, The. The Book of the States, 1978-1979, Lexington, Kentucky, 1979.

Cross-Statement of the U.S. Department of Energy in the Matter of the Proposed Rule-making on the Storage and Disposal of Nuclear Waste, PR-50, 51 (44FR61372) Washington, D.C. (1980).

Davis, David, Energy Politics, (2nd edition), New York: St. Martin's Press, 1978.

DOE, Statement of Position in the Matter of Proposed Rule-Making on the Storage and Disposal of Nuclear Waste. April 15, 1980.

Edwards, George C. III, Implementing Public Policy, Washington, D.C.: Congressional Quarterly, Inc., 1980.

Edwards, James B., "Parameters of Consultation and Concurrence and Its Historical Foundation," in Consultation and Concurrence (draft), The ORCAS Meeting, Eastsound, Washington, September 23-26, 1979.

Finley, James R. Interview, 1981.

Friedan, Bernard J. and Kaplan, Marshall. The Politics of Neglect: Urban Aid from Model Cities to Revenue Sharing. Cambridge: The MIT Press, 1977.

de la Garza, John. Interview, 1981.

Gates, Mahlon E., "Commercial Nuclear Waste Management Program, Interim Spent Fuel Management Program," Statement to Congress, FY 1982 Appropriations Hearings. February 20, 1981.

George, Creitz. Interview, 1981.

Glaser, E. M. and Backer, T. E., "Innovation Redefined: Durability and Local Adaptation," Evaluation, Volume 4, 1977.

Glaser, E. M. and Ross, H. L. Increasing the Utilization of Applied Research Results, Los Angeles: Human Interaction Research Institute, 1971.

Glendening, Parris N. and Reeves, Mavis Mann. Pragmatic Federalism: An Intergovernmental View of American Government. Pacific Palisades, California: Palisades Publishers, 1977.

Goode, Bernie. Interview, 1981.

Greer, Dell. Interview, 1981.

Gusman, Sam; von Moltke, Konrad; et al., Public Policy for Chemicals, Washington, D.C.: The Conservation Foundation, 1980.

Hart, Peter; Johnson, Robert L., et al., "Survey of Salt Dome Investigations," a Report prepared for the Nuclear Regulatory Commission, January 1981.

Hartung, Ludwig; Lehman, Linda; et al., "Basalt Waste Isolation Project," a Trip Report for the Nuclear Regulatory Commission, September 1980.

Hastings, Anne. Interview, 1981.

Heath, Colin A., "DOE's Program for High-Level Radioactive Waste Disposal," Paper presented at AIR Conference held in Los Angeles, March 17, 1981.

Holden, Mathew. Interview, 1981.

Hussey, Elaine T. and Lagassa, George K., "Geothermal Energy and Intergovernmental Cooperation in California: The GRIPS Approach," in Daneke, G. A. and Lagassa, G. K. (eds.), Energy Policy and Public Administration, Lexington, Mass.: Lexington Books, 1980.

Interagency Review Group on Nuclear Waste Management. Report to the President. Washington, D.C., March 1979.

Judd, Dennis R. and Mendelson, Robert E. The Politics of Urban Planning: The East St. Louis Experience. Urbana: The University of Illinois Press, 1973.

Kasperson, Roger E.; Berk, Gerald; et al., "Public Opposition to Nuclear Energy: Retrospect and Prospect" in Unseld, Charles T.; Morrison, Denton E.; et al. (eds.), Sociopolitical Effects of Energy Use and Policy, Washington, D.C.: National Academy of Sciences, 1979.

Kreitler, Charles W., et al., "Studies of the Suitability of Salt Domes in East Texas Basin for Geologic Isolation of Nuclear Wastes": Bureau of Economic Geology, The University of Texas at Austin, 1980.

Kreitler, Charles W. Interview, 1981.

Krippendorff, Klaus, Content Analysis: An Introduction to Its Methodology, Beverly Hills, California: Sage Publications, 1980.

LaPorte, Todd R., "Nuclear Waste: Increasing Scale and Sociopolitical Impacts" in Unseld, et al, Sociopolitical Effects of Energy Use and Policy, Washington, D.C.: National Academy of Sciences, 1979.

Lash, Terry. "Relationship of Technology Development and Technology Review to the Process of Consultation and Concurrence" in Consultation and Concurrence (draft), the Orcas Meeting, Eastsound, Washington, September 23-26, 1979.

Leach, Richard H. American Federalism. New York: W. W. Norton & Company, Inc., 1970.

League of Women Voters Education Fund, A Nuclear Waste Primer, Washington, D.C.: League of Women Voters of the United States, 1980.

Lee, Kai N., "Implementing the Consultation and Designing Concurrence" in Consultation and Concurrence (draft), the Orcas Meeting, Eastsound, Washington, September 23-26, 1979.

Leonardo Scholars (The). Resources and Decisions. North Scituate, Massachusetts: Duxbury Press, 1975.

Lifton, R., "Nuclear Energy and the Wisdom of the Body," Bulletin of the Atomic Scientists, Volume 32, Number 7, pp. 16-20, 1976.

Lipschutz, Ronnie D., Radioactive Waste: Politics, Technology, and Risk, Cambridge, Massachusetts: Ballinger Publishing Company, 1980.

Madden, W. W. Interview, 1981.

Mazur, A. and Conant, B. "Controversy Over a Local Nuclear Waste Repository," Social Science Program, Syracuse University, Syracuse, New York, 1977.

McAuslan, Patrick. The Ideologies of Planning Law. Oxford: Pergamon Press, 1980.

McKay, John. Interview, 1981.

Mountain, John. Interview, 1981.

National Conference of State Legislatures, The (1977-78), Goals for State-Federal Action, Washington, D.C.: The National Conference of State Legislatures.

National Governors' Association National Resources and Environmental Management Committee, Nuclear Power Subcommittee, "Review of 'Draft Report of Department of Energy Task Force for Review of Nuclear Waste Management,'" (draft). July 10, 1978. Reprinted in Oversight: Nuclear Waste Management Hearings, before Subcommittee on Fossil and Nuclear Energy Research, Development and Demonstration. 95th Congress, 2nd Session. 1978, pp. 892-915.

Neff, Jeff O. Interview, 1981.

"Nuclear By-Products: A Resource for the Future," a Background Paper prepared for The Heritage Foundation, 1978.

Nuclear Regulatory Commission. "Report of the Working Group on the Proposed Rule-Making on the Storage and Disposal of Nuclear Wastes." Washington, D.C., January 24, 1981, in three parts.

Nussbaumer, Donald. Interview, 1981.

Olsen, Marvin E., "Public Acceptance of Energy Conservation," in Seymour Warkov (ed.), Energy Policy in the United States, New York: Praeger Publishers, Inc., 1978.

Pahner, P. A Psychological Perspective of the Nuclear Energy Controversy. Laxenburg, Austria: International Institute for Applied Systems Analysis (Research Memorandum 76-67).

Pedrick, John. Interview, 1981.

Peelle, Elizabeth, "Social Impact Mitigation and Nuclear Waste Repository Siting," Statement before the Subcommittee on Rural Development of the Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, August 26, 1980.

Pressman, Jeffrey L. and Wildavsky, Aaron. Implementation. Berkeley: University of California Press, 1973.

Reiser, Rock; Shilling, Hank; et al. (eds.). Consultation and Concurrence (ONWI-87), Office of Nuclear Waste Isolation, U.S. Department of Energy, January 1980.

RESOLVE, Center for Environmental Conflict Resolution, Nuclear Waste Management Process Review Forum, Report to the U.S. DOE, the U.S. NRC, and the Electric Power Research Institute (EPRI), 1980.

Richland, M. Final Report: Travelling Seminar and Conference for the Implementation of Educational Innovations, (ERIC No. 003126) Systems Development Corporation, 1965.

Roberts, Neal Alison. The Reform of Planning Law: A Study of the Legal, Political, and Administrative Reform of the British Land-Use Planning System, London: Macmillan Press Ltd., 1976.

Schurr, Sam H.; Darmstadter, Joel; et al., Energy in America's Future, Baltimore, Maryland: The Johns Hopkins University Press, 1979.

Shapiro, Michael. Interview, 1981.

Sharkansky, Ira. The Maligned States: Policy Accomplishments, Problems and Opportunities, 2nd ed. New York: McGraw-Hill Book Company, 1978.

State Planning Council on Radioactive Waste Management. Interim Report. Washington, D.C. February 24, 1981.

Stokes, Dorris. Interview, 1981.

Stone, Donald Crawford and Geiger, Susan K. Curriculum Package: Intergovernmental Policy and Program Management. 2nd ed. Washington, D.C.: National Academy of Public Administration, June 1978. Published in six parts.

Temples, James R., "The Politics of Nuclear Power: A Subgovernment in Transition," Political Science Quarterly, Volume 95, Number 2, Summer 1980.

Tornatzky, Louis G. and Fergus, Esther O., et al., Innovation and Social Process: A National Experiment in Implementing Social Technology. New York: Pergamon Press, 1980.

Tucker, Bill. Interview, 1981.

Unseld, Charles T.; Morrison, Denton E.; et al. (eds.). Sociopolitical Effects of Energy Use and Policy, Washington, D.C.: National Academy of Sciences, 1979.

U.S. Atomic Energy Commission, Radioactive Wastes, Washington, D.C.: The U.S. Atomic Energy Commission, 1969.

U.S. Bureau of Land Management and the Nuclear Waste Terminal Storage Program, Responses to Issues Raised in Comment Letters Received by the Bureau of Land Management Regarding Department of Energy Exploration Activities in the Paradox Basin, BLM, U.S. Department of Interior, 1981.

U.S. Bureau of the Census. State and Metropolitan Area Data Book 1979, Washington, D.C., U.S. Government Printing Office, 1980.

U.S. Department of Commerce. Statistical Abstract of the United States, 1980, Washington, D.C., 1980.

U.S. Department of Energy, Management of Commercially Generated Radioactive Waste, Vol. 1, Final Environmental Impact Statement, Washington, D.C.: U.S. Department of Energy, 1980.

U.S. Nuclear Regulatory Commission, "Report of the Working Group on the Proposed Rule-Making On the Storage and Disposal of Nuclear Wastes, Part 1.B, Summary of Participants' Statements, Washington, D.C.: ; Nuclear Regulatory Commission, 1981.

U.S. Reports. Cooley v. Board of Wardens. Vol. 52 (1852).

U.S. Reports. Gibbons v. Ogden. Vol. 22 (1824).

U.S. Senate, Committee on Agriculture, Nutrition, and Forestry, The Socioeconomic Effects of a Nuclear Waste Storage Site on Rural Areas and Small Communities, Hearing before the Subcommittee on Rural Development of the Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, Washington, D.C.: U.S. Government Printing Office, 1980.

Worthington, Richard. "The Politics of Energy Self-Sufficiency in American States and Regions," in Energy Policy and Public Administration, Daneke, G. A. and Lagassa, G. K. (eds.), Lexington, Massachusetts: Lexington Books, 1980.

Wright, Deil S. Understanding Intergovernmental Relations: Public Policy and Participants' Perspectives in Local, State and National Governments. Massachusetts: Duxbury Press, 1978.

Wright, Deil S. and Peddicord, Thomas E. Intergovernmental Relations in the United States: Selected Books and Documents on Federalism and National-State-Local Relations. Center for the Study of Federalism, Temple University. December 1973.

PART 5 - SUMMARY AND CONCLUSIONS

Resolution of the nuclear waste problem will require the cooperative efforts of all parties involved. This study is based on the belief that the consultation and concurrence process can serve as a mechanism for promoting cooperation over confrontation by involving state and local governments and the public in the decision-making process for selecting a nuclear waste repository site.

The foregoing parts of this study have explored two of the most likely sources of conflict in the consultation and concurrence process: intergovernmental relations and public participation. The information contained in those chapters is not intended to provide decision-makers with a handbook that can be followed to implement consultation and concurrence. Rather, the authors have attempted to provide an overview of their respective topics, while identifying specific aspects of the nuclear waste problem that may be sources of particular concern.

Finally, this report is optimistic in two respects. First, it is based on the assumption that, despite the complexities inherent in the nuclear waste disposal problem, a solution will be found in the not too distant future. Second, it concludes that the consultation has the potential for serving as an effective mechanism for involving state and local governments and the public in the decision-making process for siting a high-level nuclear waste repository.

INDEX

Compiled by Amanda R. Masterson

Alphabetization is letter-by-letter. All acronyms are listed together in the acronym index.

Acronym Index

LLL -- see Lawrence Livermore Laboratory
MIT -- see Massachusetts Institute of Technology
MOU -- see memorandum of understanding
NASA -- see National Aeronautics and Space Administration
NCSL -- see National Conference of State Legislatures
NEPA -- see National Environmental Policy Act
NGA -- see National Governors' Association
NIH -- see National Institute of Health
NOAA -- see National Oceanic and Atmospheric Administration
NRC -- see Nuclear Regulatory Commission
NSC -- see National Security Council
OCS -- see Offshore Continental Shelf
OMB -- see Office of Management and Budget
RAPC -- see Regional Action Planning Commissions
SBA -- see Small Business Administration
SIP -- see state implementation plan
TENRAC -- see Texas Energy and Natural Resources Advisory Council
TMPA -- see Texas Municipal Power Agency
TRU -- see transuranic wastes
USDA -- see U.S. Department of Agriculture
USGS -- see U.S. Geological Survey
WIPP -- see Waste Isolation Pilot Plant

Subject Index

A

E

F

G

H

I

J

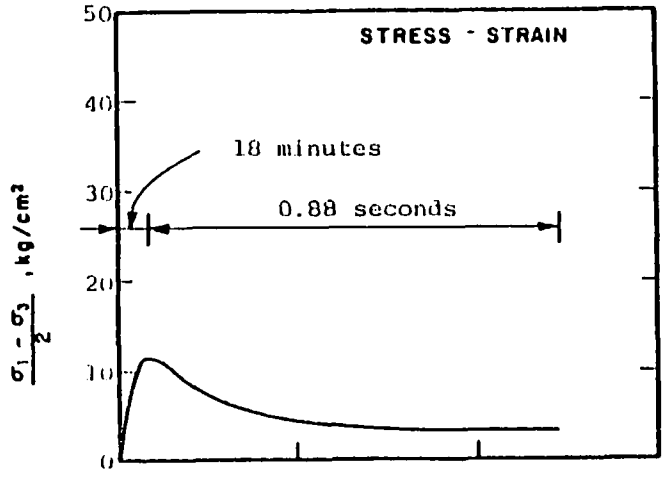
O

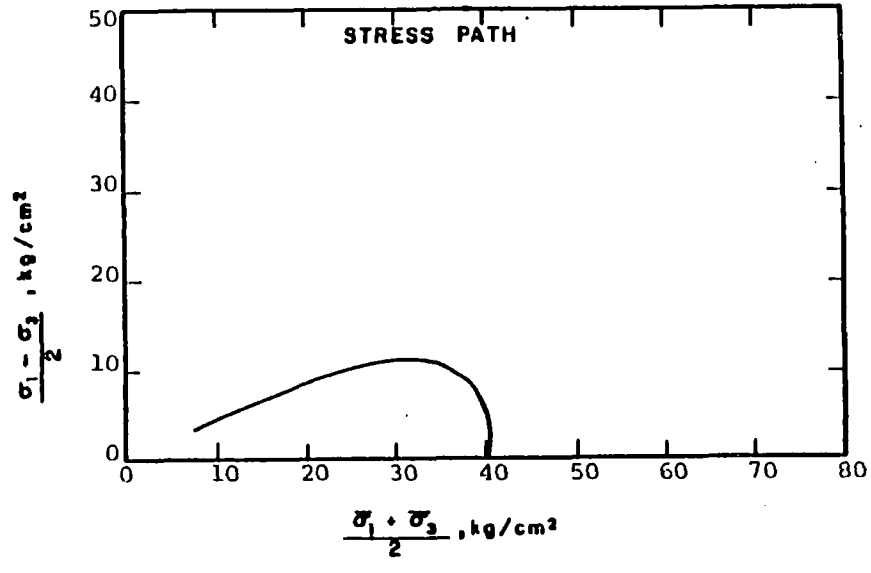
P

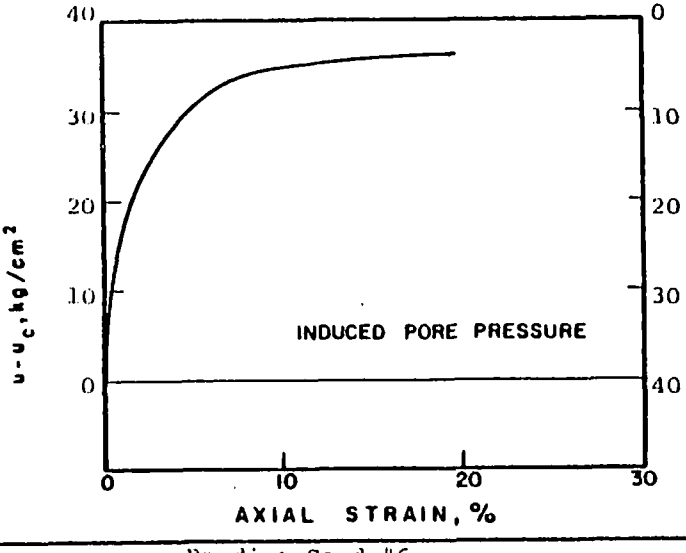
R

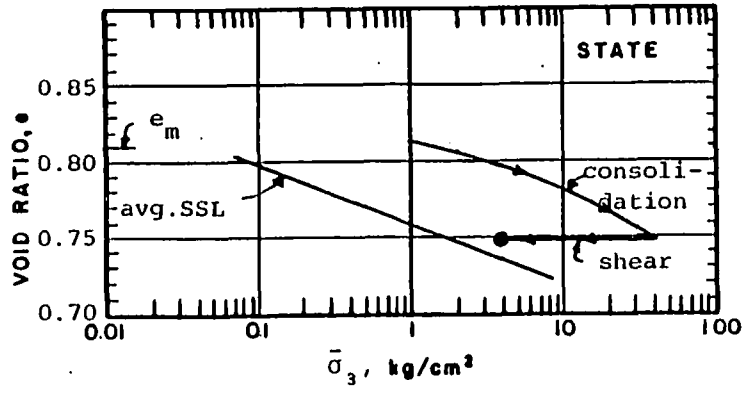
W

Z









SOIL	: Banding Sand #6	METHOD OF LOADING:	Undrained, Axial Compression Load Control
STRUCTURE	: Compacted Moist		
STATE AFTER CONSOLIDATION:	$\bar{\sigma}_{3c}$ = 40.00 kg/cm², $\bar{\sigma}_{1c}$ = 40.00 kg/cm² e_c = 0.748 , γ_{dc} = 95.0 pcf	TESTING DETAILS :	Specimen Diameter 3.60 cm Specimen Height 5.30 cm End Platens: Conventional

R-623