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STORAGE AND DISPOSAL OF RADIOACTIVE WASTES

Jay E. Silberg*

I. INTRODUCTION

The Atomic Energy Commission (AEC) and its successors, the Energy Research and Development Administration (ERDA), and the Department of Energy (DOE), have for the past twenty years been undertaking numerous efforts with regard to developing the storage and ultimate disposal capacity for radioactive wastes. There is a general consensus in the scientific community, backed up by numerous studies, that disposal in geologic media is the safest and most fully explored way of permanently disposing of high level radioactive wastes. However, problems have arisen in attempting to implement those solutions.

A facility might have been built at Lyons, Kansas, had it not been for local opposition and some geologic problems that were discovered in exploring the site. The government shifted to the retrievable surface storage concept, in which high level radioactive wastes would have been placed in large concrete mausolea. That program was then withdrawn, and the federal government returned to the geologic storage concept, this time proposing that they would have six geologic repositories in operation starting in 1985. That number was cut back to two, two or three years ago, and in 1978 the government is re-evaluating the program once again. The dates may slip. The whole concept may change. There has been a lot of public opposition to siting of geologic storage facilities in given areas, and the solution to the problem is going to require a great deal more in the way of scientific studies, in the way of state involvement, and in the way of involvement of citizens groups.

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We have done a lot of work on paper which has been evaluated by organizations in the federal government, but we still have very little to show for it.

From my vantage point as a lawyer who represents electric utility companies with nuclear power plants in various stages of construction, planning or operation, I view this situation with some amount of alarm. There have been many studies. The studies have uniformly concluded that ultimate disposal of high level radioactive wastes in geologic media, such as salt beds or salt domes, is technically feasible, that the technology exists today, and that it can be done at reasonable economic cost. The National Academy of Sciences has undertaken several studies, the earliest in 1957. The American Physical Society recently released a report agreeing with those conclusions. The Ford Foundation prepared a study saying that geologic storage was technically and economically feasible. And, of course, AEC, ERDA and DOE have done numerous studies, all of which have shown that the technology basically is here today and that all that is needed to be done is to implement that technology.¹

The major problem we face today is one of public confidence and acceptance of the program. However, more time must be spent in additional scientific and technical studies and in developing public confidence by involving the states and involving private citizens. That additional time, unfortunately, puts the utilities in a Catch-22 situation. At the same time that people are saying we need a lot more studies, that we need a lot more public involvement, all of which is going to take a lot more time, the same people are saying that we cannot proceed with the nuclear program until we have an implemented solution to high level radioactive waste problems.

We are thus at a standstill. There are many states, some of which have been mentioned earlier in the program, in which the lack of a solution to the radioactive waste problem is either seriously hindering, or threatening to entirely halt, nuclear development in that state. Cali-

1. See NUCLEAR REGULATORY COMMISSION, ENVIRONMENTAL SURVEY OF THE REPROCESSING AND WASTE MANAGEMENT PORTIONS OF THE LWR FUEL CYCLE: A TASK FORCE REPORT (NUREG-0116) 2.4.2, 4.4.2 (1976); *Radioactive Waste Management: Hearings Before the Subcommittee on Environment and Safety of the Joint Committee on Atomic Energy*, 94th Cong., 2d Sess. 141-167 (1976) (Statements of Dr. John Frye and Dr. Robert Frosch) (views of National Academy of Sciences); S.M. KEENY, NUCLEAR POWER ISSUE AND CHOICES 266 (1977) (conclusions of the Ford Foundation Study); REPORT TO THE AMERICAN PHYSICAL SOCIETY BY THE STUDY GROUP ON NUCLEAR FUEL CYCLES AND WASTE MANAGEMENT 3 (July, 1977); NATIONAL RESEARCH COUNCIL, RADIOACTIVE WASTE AT THE HANFORD RESERVATION: A TECHNICAL REVIEW (1978).

ifornia is perhaps the best example. The California Energy Commission recently determined that implementation of radioactive waste management is not here and is not likely to be here for some time, and as a result, has recommended that the Sundesert facility being proposed by San Diego Gas & Electric Company, not be built.² In Ohio, the staff of the Ohio Power Siting Commission has recommended against issuing a certificate for the Erie Nuclear Power Plant, being proposed by Ohio Edison Company, largely on the grounds that there is nowhere that spent fuel can be stored, and therefore the spent fuel storage pool at the plant will become a de facto permanent disposal area.³ In Wisconsin, the staff of the Public Service Commission has recommended against any further nuclear development, relying heavily on the perceived absence of a solution to the problem of disposing of spent fuel and high level waste.

II. IMPACT OF STATE REGULATION ON UTILITIES

The impact that this has on utilities is fairly obvious. First of all, utilities have grown increasingly hesitant to order new nuclear plants. Largely as a result of state licensing problems, the period of time necessary for a utility to bring a new nuclear plant on line has become completely uncertain. A utility never knows when filing an application whether it is facing a state review process of one year, five years, or ten years, or whether it will ever get a state review process under way. In California, Pacific Gas & Electric has recently taken the California Energy Commission to court on the grounds that the Commission has refused even to start reviewing an application for a nuclear power plant.⁴ The lack of an implemented solution to the radioactive waste problem also tends to undermine public confidence in nuclear power, and this despite the fact that polls and elections have shown overwhelming support by the American people for continued development of nuclear power. In 1976, there were six state-wide referenda calling for one form or another of nuclear moratorium. All of those were defeated by an average two to one majority.⁵ But at the same time, the polls show that the American people are very concerned that there is no demon-

2. See NUCLEAR FUEL CYCLE COMMITTEE, CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION, STATUS OF NUCLEAR FUEL REPROCESSING, SPENT FUEL STORAGE AND HIGH-LEVEL WASTE DISPOSAL (January 11, 1978).

3. *Secretary's Report of Investigation and Recommended Findings*, at 11-14, 20, 21, Application of the Ohio Edison Company, Case No. 01-00003 (September 9, 1977).

4. See 6 ENERGY DAILY No. 10 (January 16, 1978).

5. See 4 ENERGY DAILY No. 100 (November 4, 1976).

strated solution to radioactive waste.⁶

The lack of an in-place radioactive waste management program also results in a great deal of uncertainty as to the costs of nuclear power. Waste management is obviously a cost of the nuclear fuel cycle, and it should be considered in doing a cost-benefit analysis of nuclear power, the same as the cost of air pollution control equipment must be considered in pricing the true cost of electricity generated by coal. Right now we have no idea what the cost of radioactive waste management will actually be. Utilities have consultants who have done studies, but again they are only paper studies based on their present best judgment as to what a permanent geologic repository might look like and how much the government would charge.

III. NUCLEAR UTILITY PLANNING

The uncertainty also extends to utility planning. Utilities have to make some sort of arrangements for handling the spent fuel which is currently being generated in existing nuclear power plants. What do utilities do? Do they continue to expand the existing spent fuel pools? Do they go off site and attempt to build new spent fuel pools solely for the purpose of holding this fuel until the government implements its policy? The utility really has no way to determine what its construction program ought to be.

I think a little bit of history might be useful in understanding how we got into this problem. Until recently, the utilities were led to believe that nuclear fuel would be reprocessed and recycled. There existed from about 1966 to about 1972 a commercial reprocessing plant, the Nuclear Fuel Services (NFS) plant at West Valley, New York, which did in fact commercially reprocess spent fuel from nuclear power plants. About that time, General Electric was building its reprocessing plant in Morris, Illinois. Allied-General Nuclear Services was building its reprocessing plant in Barnwell, South Carolina. Exxon was talking about building a reprocessing plant in Oak Ridge, Tennessee. Since that time, of course, reprocessing has fallen on hard times. The NFS plant was shut down in 1972 for expansion. As a result of NRC licensing problems, the company has thrown in the towel and has announced

6. Remarks of Louis Harris before the National Environmental Development Association at the National Press Club, Washington, D.C., March 14, 1978. Recently, the League of Women Voters issued a policy statement stating that "although new LWR nuclear plants might have to be built, the overall LWR percentage share of U.S. electricity production should not be increased—mainly because of the waste problem." *NUCLEONICS WEEK*, March 30, 1978, at 12.

that they are abandoning the facility. The G.E. plant never went into operation because the G.E. design, which was using a new process not used in any of the other reprocessing plants, was not workable. The Allied Gulf Nuclear Services (AGNS) plant in Barnwell, South Carolina has largely been completed, but has been held up by NRC licensing and by changing regulatory requirements. It sits there today, a 250 million dollar investment, with no hope that it is going to be put into commercial operation at any time in the near future. Finally, as a result of recent developments, Exxon has scrapped its plans to build a reprocessing facility in Oak Ridge.

IV. REPROCESSING SPENT FUEL

Until recently, the utilities had assumed that spent fuel would be reprocessed. Thus, their only plans were to store spent fuel at the reactors for a few years until it was shipped off-site to be reprocessed. Reprocessed plutonium and uranium would be returned to reactors in the form of fuel, and the resource savings of reprocessing and recycling would be accomplished. The wastes which would result from the reprocessing cycle were not of any great immediate concern. They were small in magnitude. The NFS wastes totalled 600,000 gallons of liquid now in tanks in West Valley, New York. High level wastes from reprocessing can be solidified using existing technology. As solidified wastes, they would take up a very small volume. They would, of course, have to be stored safely. But there was not going to be an overwhelming bulk of high level radioactive wastes, as people looked at the problem in the 1970s. There had been many studies, all of which showed that an ultimate repository could be designed and built with confidence. The utilities were following this program, but at a distance. I think they relied excessively on the promises that were emanating from the AEC. They assumed that ultimate repositories would be built when they were needed. That of course has changed drastically in the last two years. Now, there are two utility groups which are very actively pursuing the government, pressing it to act faster. The industry organizations active in the nuclear field, such as the Atomic Industrial Forum, Edison Electrical Institute, and American Nuclear Energy Council, are all vigorously pushing both the agencies and Congress to enact solutions. But in the early 1970s, this was not so much the case.

In April of 1977, the Carter Administration decided that reproces-

sing had to be indefinitely deferred.⁷ Basing its action on proliferation concerns, the Carter Administration's decision means that no commercial reprocessing can take place in the foreseeable future. The decision was taken notwithstanding the fact that foreign utilities, and foreign reprocessors, were continuing to pursue their plans for reprocessing and recycling, and notwithstanding the valuable resources contained in spent fuel that would be in essence thrown away. As a result of the Administration's decision, the utilities are now faced with a very difficult problem. Whereas before they were assuming spent fuel would be shipped to a reprocessing plant and taken care of from there, now the utilities find their spent fuel pools rapidly filling up with spent fuel and nowhere to send it.⁸

Utilities originally designed their spent fuel pools, in essence a water-filled pool at every nuclear reactor, to hold about one and a third cores of nuclear fuel. This would allow fuel to be discharged from the reactor to cool and lose some of its intense radioactivity before it was shipped to the reprocessing plant. However, now, without any reprocessing plants to ship to, nuclear reactors are rapidly losing their ability to take fuel into their spent fuel pools. Eventually what would happen is that no more fuel would be able to be discharged from the reactor. The reactor could not be refueled on its annual cycle, and it would have to be shut down. Considering the investments which utilities have been making in nuclear power plants, and the amount on which they depend on nuclear power to meet their power needs, this would obviously be a very drastic solution.

The response by utilities to this problem has been to increase the storage capacity of the spent fuel pools, not by changing their outer dimensions, but by increasing the density at which spent fuel is stored. They have done this by installing different spent fuel racks, and in some cases by putting in neutron absorbing materials. In many cases this has taken care of the immediate problem. Many reactors are now, with densification, capable of storing their own spent fuel until the 1990s. However, some reactors will run out of spent fuel capacity, even with densification, some time during the early to mid-1980s. Of course, as other speakers have indicated before, the densification process involves an amendment to the utility's NRC license and therefore

7. 13 WEEKLY COMP. OF PRES. DOC. 502-07 (April 7, 1977).

8. U.S. DEPARTMENT OF ENERGY, REPORT OF TASK FORCE FOR REVIEW OF NUCLEAR WASTE MANAGEMENT 67 (1978); 1 U.S. NUCLEAR REGULATORY COMMISSION, DRAFT-GENERIC ENVIRONMENTAL IMPACT STATEMENT ON HANDLING AND STORAGE OF SPENT LIGHT WATER POWER REACTOR FUEL 3-6 (Table 3.2) (1978).

an opportunity for a public hearing. More and more of these kinds of applications are being contested. In our firm, we have completed one such proceeding⁹ and have two others pending, with heated opposition by environmental groups and state agencies. One of the cases is being appealed to the United States Court of Appeals for the D.C. Circuit.¹⁰ An NRC determination on the scope of its licensing responsibilities has been challenged in the United States Court of Appeals for the Second Circuit¹¹ and this is certain to generate more litigation in the future. Should some of the court decisions turn out unfavorably, utilities might well be unable even to increase the capacity of their own spent fuel pools. This, of course, would bring closer the day when the reactors would simply be unable to operate any further.

There are other alternatives which the utilities may be able to undertake. One is to ship fuel from one reactor that has a crowded spent fuel pool to another. This has already been done by one utility. Another alternative would be to build a completely separate facility off site for storing spent fuel, a so-called away-from-reactor facility or AFR. At the present, such AFR facilities are not available. Such spent fuel pools did exist at the reprocessing plants. The one at West Valley has some spent fuel in it, but NFS has announced it will not accept any more. General Electric has some capacity in its Morris plant, but the Attorney General of the State of Illinois is fighting before the NRC to keep G.E. from accepting any more spent fuel. The Barnwell reprocessing plant has a spent fuel pool which is empty, but AGNS has said that they will not accept any spent fuel. Exxon, having scrapped its plans for a reprocessing plant, is saying that it will not build a spent fuel storage facility at Oak Ridge either.

Another alternative to store spent fuel would be commercial away-from-reactor facilities. However, a number of problems make it very unlikely that any commercial entity would decide to go ahead with one. In the first place, there is no certainty that such a facility would be allowed to operate for very long. Unless we know when an ultimate geologic storage facility is going to be in operation, we really cannot tell what the useful life of a spent fuel storage facility would be. At the same time, if reprocessing should be allowed some time in the future,

9. Northern States Power Company (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455 (January 27, 1978).

10. Minnesota Pollution Control Agency v. Nuclear Regulatory Commission, D.C. Cir. No. 78-1269 (Petition filed March 21, 1978).

11. Natural Resources Defense Council v. Nuclear Regulatory Commission, 2d Cir. No. 77-4157 (Petition filed August 25, 1977).

the need for the AFR facility might diminish. So this leaves the utilities with two problems. One is the near term problem of what to do with spent fuel, and the second is the long term problem of what to do with spent fuel if there is no reprocessing, or what to do with high level wastes if reprocessing should be allowed.

For the near term problem, the problem of spent fuel storage, there really is no dispute as to the availability of technology. Spent fuel pools exist at every reactor. They have been used for over thirty years. Long term storage of individual spent fuel assemblies in excess of fourteen years has already been accomplished. Technical studies show that there is no reason why storage in a spent fuel pool for twenty to a hundred years could not be done. But capacity is a problem. Densification at individual reactors does have a limit, and there seems to be little, if any, commercial interest in building a separate facility. Many people have expressed, as a result, a concern that individual reactors would be turned into de facto permanent spent fuel storage and disposal areas. This is one of the reasons that the staff of the Ohio Power Siting Commission has opposed the application for the Erie plant that I mentioned before. They are concerned that unless there is some place to which spent fuel can be sent from the reactor, the reactor site will become a permanent repository and at least that staff of that state agency does not want to see a permanent repository in that state.

On October 18, 1977, DOE issued an announcement which at least on paper would seem to help the problem.¹² DOE announced that it would accept and take title to spent fuel which has been discharged from commercial nuclear reactors, and they would be responsible for both the storage and the ultimate disposal of that fuel. This would be done on payment of a one-time fee by the utilities. That fee would cover both interim storage and ultimate disposal. Since that time, DOE has taken a number of steps to try to implement its policy. One is to solicit any commercial interest in building a storage facility for spent fuel. There were some responses. However, no one showed any interest in building such a facility unless they were given government guarantees. In other words, the government might as well build its own facility, because private entities were not willing to take those kinds of risks, especially when the government was holding all the cards. At the same time, DOE solicited from the utilities interest in how much spent fuel and on what time schedule utilities would want to deliver to DOE.

12. DOE Press Release R-77-017, *DOE Announces New Spent Fuel Policy* (October 18, 1977).

Unfortunately, that request for interest seemed to ignore one of the basic issues which underlies spent fuel and waste disposal problems. This is the need for an assured solution, not only for the physical reason of having a place to put the fuel, but also for the reason of allowing state agencies to say that there is a solution to the spent fuel problem, that we know we can go ahead and allow these plants to be built, because we know spent fuel will be taken care of in time. Unfortunately, the DOE budget proposal for fiscal 1978 indicates that DOE may not intend to do very much. Only about three million dollars has been allocated for interim storage of commercial fuel, hardly enough to do the kinds of paper studies which DOE has undertaken. Interestingly enough, DOE was willing to budget twice that amount for interim storage in this country of foreign spent fuel.

For the near term problem, what utilities are really in need of is certainty. They must have that certainty if the de facto moratorium on building new nuclear plants is to be lifted. The federal government has issued numerous policy statements over the past twenty years. Unfortunately, because those policy statements have not been carried out, state agencies and private citizens and environmental groups distrust them. They greet them with disbelief. One interesting example is in the Ohio Siting Commission proceeding that I referred to, where the Commission Staff collected all the policy statements that AEC, ERDA and DOE have been issuing for the past twenty years, all of which said that there is a solution to waste management and it is here and we are going to have it on this kind of time schedule. Obviously that has not occurred, and because it has not occurred, it is said that such pronouncements should not be believed. So another policy statement by the federal government clearly is not going to resolve the problem.

From our vantage point, the best solution seems to be Congressional action. Basically what is needed is a political commitment. That commitment cannot be given by DOE, but it can be given by Congress. We need a political commitment to a timely solution. We also need a political commitment to avoid the constant changes in policies which we have seen coming out of the federal government. What the utilities need is certainty, and we need it in two different areas. We need certainty that as of a time certain a facility will be available to store spent fuel. We also need to know with certainty what the cost is, regardless of the actual dollar amount. We need to know, in essence, a fixed price.

To get a spent fuel storage facility built, on a timely basis, it seems to us that there are two things that are needed. One is that Congress must say to the appropriate executive agencies and regulatory agencies of the federal government, that as of a certain date you will have a facility in operation. The federal government has often issued announcements that they will have radioactive waste facilities in operation by a date certain, but those dates unfortunately come and go. A Congressional mandate of a date would stand on somewhat of a different footing.

Also we need a solution to the NEPA problem. One of the major factors which has held up implementation of radioactive waste management has been the National Environmental Policy Act.¹³ The retrievable surface storage facility was cancelled largely because EPA and CEQ said that kind of a program would not comply with NEPA, in that it was only considering interim solutions and did not examine the ultimate solution. But if full compliance with NEPA is to be accomplished, DOE would have to search the entire country for alternative sites. It would also have to do an elaborate analysis as to the need for the facility. That kind of study could get into questions such as the need for power until the year 2,000, how many nuclear power plants are there going to be, when is reprocessing going to be available, and when is the ultimate repository going to be in operation. All of those kinds of questions would only serve to make a NEPA statement on this kind of a program a gold mine for litigation, something which would undoubtedly tie the program up in court for years and years to come.

Another thing that is needed and which Congressional action could provide is a resolution of the jurisdictional conflict. Right now, NRC clearly has licensing authority over commercial nuclear facilities. However, EPA apparently has authority to set over-all standards. DOE has authority, and of course the states are now asserting with greater and greater intensity, their right to set standards and regulate, to say what ought to or ought not to be done. All those factors have to be resolved if we are to have a facility available on a timely schedule.

As far as the need for a cost certain, there are two ways this can be accomplished. One is for Congress to fix a cost; this is the fee which utilities will be charged on a unit basis, for storing and disposing of spent fuel. A record on which to base such a fee could be developed at hearings, and that fee could be escalated over time, at least to take into

13. 42 U.S.C. §§ 4321-4347 (1976).

account cost-of-living increases. The other alternative would be to have Congress establish a very well-defined criteria so that DOE could set the fees within Congressionally determined boundaries. This is the method that is currently used in setting the cost of uranium enrichment.¹⁴ The fee must also be made a one-time fee, and not subject to later readjustment as actual costs increase. Otherwise, not only would we have uncertainty, we would have a total lack of certainty. Unless utilities know what the fees are going to be, they cannot really fully evaluate the cost of a nuclear fuel cycle and cannot make the coal versus nuclear economic comparison.

V. RADIOACTIVE WASTE DISPOSAL

The long term problem is much more difficult. While I believe that the technology is fairly well established, I speak as a political scientist and not a physical scientist. But ERDA has put out an extensive technical report,¹⁵ known as the Technical Alternatives Document, which analyzes the techniques needed for radioactive waste disposal. It found that there is an available, demonstrated technology at every step of the process, from solidification of the high level wastes, to transportation, to placement in a geologic medium. It also found that all these steps had been tested. What the report showed is that the real need was the political decision to implement the program. But one of the difficulties is that people are demanding that there be absolute assurance that the project will work, that the technology is satisfactory. As a legal matter, absolute assurance is not required. The Atomic Energy Act¹⁶ as interpreted by the Supreme Court,¹⁷ clearly establishes the standard of reasonable assurance, not absolute assurance. In any event, it is difficult to conceive of the kind of testing that one could do to give absolute assurance that a geologic storage facility would last for the hundreds of thousands of years that people talk about. But we do need a solution to the problem. Even more important than having that solution in place, is to assure people that the solution will be in place. Once that assurance is somehow disseminated amongst the American people, much of the opposition that is found in state agencies and interested public citizens ought to be resolved.

14. 42 U.S.C. § 2201(v) (1976).

15. Alternatives for Managing Wastes from Reactors and Post-Fission Operations in the LWR Fuel Cycle, Energy Research and Development Administration Report 76-43.

16. Atomic Energy Act of 1954, 42 U.S.C. § 2011-2296 (1976).

17. *See* Power Reactor Development Co. v. International Union, 367 U.S. 396 (1961).

One thing which is not often realized is that the same solution would be needed even if nuclear power had never existed. As a result of the defense program, very large volumes of nuclear waste have existed since the 1940's.¹⁸ They continue to exist, and are currently being stored in underground tanks, double-walled tanks in most cases, in Hanford, in Idaho, and at Savannah River. This storage is basically safe. There have been some releases due to leaks in some of the very old tanks. All of the studies that I am aware of indicate that even with those leaks there has been no hazard to public health and safety.¹⁹ That kind of tank storage could be maintained indefinitely, if it were not for the question of public confidence. Those defense wastes cannot be made to go away by abolishing nuclear power. Nor can they be made to go away if the moratorium on new nuclear power plants continues. And even if no more nuclear plants are built, the existing plants have already generated a backlog of spent fuel which must be disposed of.

Another problem that has to be faced is what to do with the spent fuel. Ultimately the wastes from the nuclear fuel cycle will have to be removed from the biosphere. But if there is some chance that spent fuel will ultimately be reprocessed by using a proliferation-resistant system, does it really make sense to put that spent fuel in a salt mine where its retrieval may become very difficult? Are we throwing away a resource which may in the future become increasingly valuable, and should we make that decision now when we have not even evaluated alternative fuel cycles, alternative reprocessing techniques, which might meet the President's objections?

VI. PUBLIC ACCEPTABILITY OF NUCLEAR POWER

As discussed earlier, I think the major problem is one of public acceptability. This raises some philosophical questions as to who is the public. As I indicated before, there is widespread public acceptance of nuclear power. On the other hand, there are some environmentalists and others who are committed to stopping nuclear power, at virtually any price. And there are also those who are not ideologically committed to an anti-nuclear world who have serious questions. I think we

18. As a result of military activities from the middle 1940s to the present, the former Atomic Energy Commission and its successor, ERDA, have generated about 215 million gallons of liquid high level radioactive waste. This compares with 600,000 gallons of similar waste generated by the commercial nuclear power industry. M. WILLRICH, *RADIOACTIVE WASTE MANAGEMENT AND REGULATION* 2-16 through 2-17 (1976).

19. See NATIONAL RESEARCH COUNCIL, *RADIOACTIVE WASTES AT THE HANFORD RESERVATION: A TECHNICAL REVIEW* (1978).

must be clear that the procedures which are established to site and develop ultimate storage facilities for radioactive wastes ought not to be tailored to those persons who are ideologically opposed to nuclear power. For they will never be convinced. The procedures ought to be tailored to those people with legitimate public interests, and to state agencies. Somehow, these people must be brought into the process.

A number of possible techniques have been suggested. One is the science court, where an independent group of scientists would be established, weigh the evidence, and reach a verdict. This procedure in fact has already been applied. I think the studies by the National Academy of Science, by the American Physical Society, by the Ford Foundation, all of which were made by people essentially disinterested in nuclear power, all concluded that geologic disposal was appropriate. Another recent suggestion has been the negotiated settlement, setting up a panel of mediators, people from the industry, people from nuclear opposition, people from government, and letting them negotiate a resolution to the problem. There was a recent project done on coal mining using this process. It worked reasonably well. However, as soon as that report came out, those environmentalists who were not included for one reason or another in the project, criticized the results as giving away too much, as retreating from prior environmentalist victories.²⁰ Here too there may be no easy way out.

However, it seems to me, since we are dealing with a political as much as a technical problem in the siting of a long-term repository, again we need a clear Congressional commitment. We need Congress to establish time limits, both for DOE to come in with a program, one that is not going to change, and for that program to proceed to the selection of a site and construction of a facility. It would certainly be very helpful if at Congressional hearings, representatives of those states who would welcome a repository for nuclear wastes in their states, would come forward and say so. Schemes such as financial incentives offered to states would also be considered. But somehow we have to get around the parochial state attitudes which have surfaced in some cases.

As an example, a bill passed last year in the state of Minnesota, and Minnesota is a state which has three operating nuclear reactors and depends on nuclear power for much of its electric generation, said no nuclear waste generated in this state may be permanently stored in this

20. See 6 ENERGY DAILY No. 29 (February 10, 1978), No. 52 (March 16, 1978).

state, and Minnesota will not take nuclear waste from any other state.²¹ In other words, the Minnesota legislation in effect says, "We won't take your waste, and you have to take our waste." Somehow that kind of attitude has to be dealt with. We also have to, through Congressional action, do away with the repetitive policy evaluations. Every time a new Administration takes office, every time new people take over at AEC or at ERDA or at DOE, there seems to be an obligation to bring in a new group of people and study the problem all over again. By this time we have developed rooms full of studies, but no facilities. Somehow that has to be either stopped or slowed down. The decision has to be made. It is a hard political decision, but that decision has to be made and it has to be implemented.

VII. CONCLUSION

I think the final thing we must avoid is the "solution" that the nuclear opponents would favor. Their answer would be to not have any more nuclear plants until there is a solution in existence to the waste management problem. And at the same time, we must not wait to implement a solution to the waste management problem until all conceivable studies have been done. That kind of paralysis does disservice to everyone, and certainly is not in the best interests of this country.

21. Act of June 2, 1977, ch. 416, 1977 Minn. Sess. Law Serv. (West) 1066 (codified at MINN. STAT. ANN. §§ 116C.71-.74 (West Supp. 1978)).