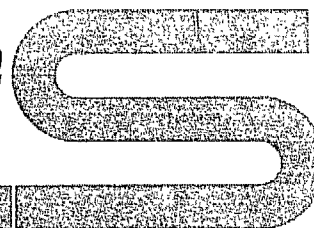


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PUBLIC ACCEPTANCE OF NUCLEAR POWER IN THE UNITED STATES

The Role of the National Environmental Policy Act

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As many of you know the United States has only two major political parties -- Republican and Democratic -- and their programs differ from each other more in degree than in kind. Yet each party shelters a broad spectrum of political belief, from left to right; at election time, the leaders of each party try to bring its liberals and conservatives into a single camp for the impending battle. This job is principally that of one person, known as the national party chairman. As you might imagine, this is an extremely difficult and frustrating task. Recently, a journalist asked the Democratic National Chairman to describe his job. It is, the Chairman answered, "Like dancing with a bear. You don't stop when you are tired; you stop when the bear is tired."

At the risk of stretching a simile beyond permissible bounds, I would like to suggest that a part of the nuclear debate around the world involves public skepticism about dancing with a bear. In spite of frequent statements to the contrary by the proponents of nuclear energy we still have a choice, the world is not yet irrevocably committed to nuclear power. If we do commit ourselves fully to its embrace, however, we know we may not find it easy to withdraw

even if we find that the various demands of nuclear power upon our political, social, economic, and environmental resources are more fatiguing than we anticipated. Once we surrender to the attractions of this energetic partner, we may not find it easy to sever the liaison if our ardor cools.

Some nuclear specialists assure us that the dangers in a commitment to nuclear power have been overstated, and that the benefits vastly outweigh the risks. Other specialists, with apparently equivalent credentials, argue that the dangers have been minimized. The general public, hoping for guidance in specialized matters from its technological mandarins, is beset in this one by Nobel Prize-winners on both sides of the question. Which set of advocates should they trust?

The problem is of obvious importance in democratic societies, those in which major national decisions are influenced -- if not ultimately decided -- by the voter, informed or not. But even in societies organized upon other principles of government the question remains equally important: for in those nations where decisions are made by a relative few, those few tend to be specialists primarily in the processes of attaining and retaining power. In other respects, they are not specialists. They are not engineers or physicists or biologists, but laymen who must try to sift the opinions of specialists and produce an answer in the best interests of their people. However the decision is made, therefore, we are dealing with

essentially the same problem: the accountability of the expert to the non-expert; the technologists to the public... where public acceptance is the ultimate measure of technical success.

This paper discusses one way in which this problem is being addressed in the U.S. Our answer may not be applicable to every nation, but perhaps our experience may be helpful. For I think we have come up with a reasonably good mechanism for at least approaching a problem that is provocative not only from a social policy point of view, but also from an intellectual point of view. The mechanism to which I refer is provided by the National Environmental Policy Act, which provides a process which involves the technologists, the public and the issues in a way which is unique to American government.

However, before I begin I would first like to briefly review the purposes of NEPA and its principle features. I will then turn to the specific question of public acceptance of nuclear power in the United States and the role that NEPA has played, in reactor licensing and in other parts of the nuclear fuel cycle. Finally, I will discuss some possible implications for nations which are presently building nuclear power reactors or are seeking to achieve public acceptance of other fuel cycle facilities. Central to my discussion is my belief that there is in today's world a desire for citizens to participate in technological decisions which can affect society. This is certainly the case in the U.S. and I believe it is so for many of the other nations of the world.

The National Environmental Policy Act of 1969, declared it to be a national policy of the United States to encourage productive and enjoyable harmony between man and his environment and to promote efforts to protect that environment. It also established the Council on Environmental Quality whose Chairman serves as the chief or principle environmental policy adviser to the President and most importantly, it provided that major Federal actions significantly affecting the quality of human environment should be accompanied by a detailed statement which fully describes the environmental impact of the proposed action, as well as, describing all reasonable alternatives to it. These detailed statements, known as Environmental Impact Statements or EIS's, are filed with the Council on Environmental Quality, which has the responsibility for overseeing implementation of NEPA throughout the United States Government. I wish to make it quite clear that NEPA does not in itself prohibit Federal agencies from implementing any proposed action, no matter how grave the environmental consequences. It simply requires that any Federal agency proposing an action will have the benefit of a full understanding of the probable impacts of that action, as well as knowledge of reasonable alternatives. Each year approximately 30,000 proposed Federal actions are reviewed by U.S. agencies to determine whether or not they will require an environmental impact statement. The test for need is simple; is it a major Federal action and if so, will it significantly affect the quality of the human environment? In most cases the answer is no and these assessments result in a negative

declaration. Since its implementation, NEPA has resulted in 7,500 environmental impact statements being filed with the Council on Environmental Quality and made available to Federal, state and local governmental agencies and most importantly, to the public. The Council on Environmental Quality, or CEQ has issued guidelines to Federal agencies on implementing NEPA effectively. It also monitors agency activities to assure compliance. Once the environmental impact statement process has been satisfactorily completed, agencies are free to make decisions and implement them as they see fit. Much has been said about the legal obstacles which NEPA presents to agency proposals. An inspection of the record, however, reveals that the vast majority of lawsuits filed under NEPA have been for two principle reasons. The first is the failure on the part of the Federal agency to file an environmental impact statement when one is required. The second is the inadequacy of an impact statement in fully describing the impacts of the proposed action. A principle result of NEPA and the environmental impact process has been to better inform U.S. Government decisionmakers. Because completion of the requirements of NEPA must precede Government decisions, EIS's have become an integral part of the decisionmaking process in most Federal agencies. Initially, the vast majority of environmental impact statements treated individual projects. The trend in recent years, however, has been toward more generic or programmatic impact statements dealing with far reaching and long range U.S. decisions potentially affecting the environment. As an example the NEPA process is currently

being utilized in the U.S. to guide programs and decisions on such diverse subjects as the conduct of research involving recombinant DNA, the supersonic transport, or SST, approval of liquefied natural gas (LNG) terminals, selection of a route to move Alaskan natural gas to the lower United States, the space shuttle, use of plutonium powered pacemakers, and the selection of offshore superports.

I would now like to turn to the specific topic at hand, that is, the role that NEPA has played in public acceptance in nuclear power in the United States. In any discussion of public acceptance of nuclear power one must be careful to describe just what part of the nuclear fuel cycle has been accepted by the public, as well as the degree and the nature of the public acceptance which has been achieved. In the United States the part of the nuclear fuel cycle which has received by far the greatest level of public acceptance is the nuclear power plant. As of October 31, 1976, 62 commercial power plants were licensed to operate and construction permits for an additional 72 reactors had also been granted. When compared with the 116 operating reactors worldwide and the additional 118 reactors currently under construction it can be seen that the United States has nearly 50% of those numbers. Both the 20 years of experience in licensing nuclear reactors beginning in 1957 with the first reactor at Shippingport, Pennsylvania and the relatively large numbers of reactors licensed in a single country are strong indications that a relatively high

level of public acceptance has been achieved. This situation provides an opportunity to learn something of how public acceptance, at least of nuclear power reactors, evolved in an advanced, industrialized country. Reactor licensing in the United States is performed by the Nuclear Regulatory Commission which prepares a draft environmental impact statement prior to deciding whether or not a construction permit should be issued and if so under what conditions. Following issuance of the draft EIS the public has a formal period (45 days) to comment on all aspects of the proposed action. The NRC must then consider all comments made by Federal, state, local agencies, and members of the public and respond to those comments in a final version of the statement. The final EIS is then entered as evidence in the NRC licensing proceeding. The NRC proceedings, which are open to the public allow for further public involvement before the licensing board makes a final decision on the proposed nuclear facility. This formal mechanism which is required by law, guarantees public involvement in the decisionmaking process. In my view, this guarantee of public participation, is responsible more than any other single factor for the high degree of public acceptance of nuclear power reactors in the United States today.

As of 1976, over 125 draft environmental impact statements had been prepared by the NRC on reactor licenses. The EIS served both as a focal point for expression of public concern and interest and as the primary means for communicating direct environmental, as well as secondary socio-economic information to public officials as well as private citizens,

concerning the impacts of proposed nuclear facilities.

The record of public acceptance of other parts of the nuclear fuel cycle, however, is not as clear, in part because there have been far fewer fuel cycle facilities licensed. While the on-going nuclear debate in the United States does involve some questions of reactor safety, the primary concerns have been with the impacts and implications of other fuel cycle facilities, namely the disposal of radioactive wastes and the safeguarding of special nuclear materials. The various referenda in the individual states in the United States have generally all involved concerns over the management of radioactive wastes and the provision of adequate safeguards for the fuel cycle as well as questions of reactor safety.

It is becoming more and more common for agencies which license or approve many projects of a similar nature to describe the cumulative effects of a particular kind of action, in a generic environmental impact statement in order to determine in advance, what changes in the overall process may be necessary to reduce adverse impacts. A good example is the generic environmental impact statement currently under preparation by the Nuclear Regulatory Commission which deals with the uranium mill licensing program. The licensing of individual uranium mills over a given period of time can result in substantial cumulative adverse environmental impacts. In addition, the mill licensing program must deal with the question of the decommissioning of the mills and the abandoning of the tailings



can be stabilized for long periods of time in order to assure for many years that even though a previously licensed mill may no longer be in operation, sufficient resources will be available to maintain the mill tailings piles in an acceptable condition.

In the area of radioactive waste management, the Energy and Research Development Administration (ERDA) is preparing a generic environmental impact statement which will describe ERDA's research and development programs to demonstrate safe and environmentally acceptable methods for disposing of commercial high-level radioactive wastes. This program EIS will describe waste management alternatives currently being developed as well as their environmental impacts. This generic impact statement, which is scheduled to be released by ERDA in late 1977, will go further than any EIS has in the past, in responding to public expressions of concern over the disposal of these wastes. These concerns which are sometimes referred to as non-technical issues related to radioactive waste management alternatives, deal with social, economic, legal and institutional aspects of the waste management solutions. Here, for the first time important questions concerning risks to the public, the burdening of future generations with the responsibility of caring for this generation's nuclear wastes, and questions generally involving the costs and benefits of the waste management program to U.S. society, will be dealt with in far greater detail than ever before. This draft impact statement will eventually become the subject of public hearings held by ERDA to further develop public comment and views on their waste management program.

The Nuclear Regulatory Commission, which must license ERDA nuclear waste facilities, will develop and adopt criteria related not only to such specific questions as performance criteria for high-level radioactive waste solids, but also criteria directed toward the acceptability of deep geologic disposal sites selected by ERDA. These criteria, will be the subject of environmental impact statements and therefore will be used to provide a timely formal mechanism for public input into establishment of such criteria. Another example of the role of NEPA in U.S. decisionmaking in areas which must necessarily achieve a degree of public acceptance, is the decision on whether or not to permit wide-scale use of plutonium in the U.S. in the lightwater reactor fuel cycle. The statement prepared by the NRC on this subject, known as Generic Environmental Impact Statement on Mixed Oxide Fuels or GESMO, has been published in two parts. One which deals with environmental health and safety aspects of wide-scale use of plutonium, is the subject of continuing hearings in the United States. A draft supplement to GESMO, dealing with the safeguard implementations and their alternatives, has also been filed and is now undergoing review by the public and by Federal, state and local agencies. It too will be the subject of hearings before a decision is rendered by the NRC on wide-scale use.

As you see a number of major decisions concerning the nuclear fuel cycle are currently under NEPA review by U.S. agencies. The primary focal point of these reviews and the means of communicating important issues related to those decisions are the environmental statements required by NEPA.

The past few years have seen a growing reluctance on the part of the public in other countries to accept nuclear power facilities. It is interesting to observe that the focal point of this public opposition to the nuclear power seems to be the licensing of nuclear reactors. A number of recent incidents in France and Germany have taken place at the construction sites for reactor facilities. Just as some of the referenda related to nuclear power in the United States, which I referred to earlier, have involved such unresolved problems of nuclear waste disposal, so, too are many of these same concerns being expressed by the demonstrators. This suggests to me that at least some of this public concern may stem from the belief that the full consequences and impacts of construction and operation of nuclear reactors have not been adequately addressed or considered. It also suggests that the public believes it is entitled to have a greater input into considerations of this sort.

One of the principal strengths of the environmental impact statement is that it not only serves as a formal document in which the questions on all the impacts of reactor construction and operation must be addressed, but additionally, it provides a mechanism for public concerns to be heard. It is a guarantee, more or less, that public input can be made and will be heard by the responsible agencies. Where strong local public opposition to nuclear reactors now exists, it may not necessarily stem entirely or even partly from radical, political considerations

as is sometimes claimed by nuclear proponents; instead, it may stem from a lack of understanding and a fear that the construction of certain facilities will result in changes seriously affecting the surrounding natural environment in adverse ways. I refer not only to the traditional natural environmental effects but also to the questions of threats to the social and economic well being of individuals who live near proposed nuclear sites. In the United States the environmental impact statement must specifically address these questions and provide suitable answers to the public and to their elected officials concerning the consequences of construction of nuclear facilities.

I believe several conclusions can be drawn from the U.S. and world experience. First, as I stated earlier, there seems to be a growing public desire worldwide to participate in those decisions of a technological nature which may directly or indirectly affect the public's well being. This desire seems to be most advanced in the United States and Western countries but it is developing in others. Secondly, a large benefit may be derived by providing a formal mechanism with which to hear public concern and by permitting public participation in those decisions. I believe that many countries contemplating or involved in the development of a large nuclear power industry would benefit greatly from consideration of adopting measures which do essentially the two things, which, in my view, have done more than any other to both make NEPA work successfully and help achieve public acceptance of nuclear power in the United States. The first is the requirement

to describe to the fullest extent practicable the likely effects of the proposed action, to put this description in a concise understandable form and to make this description available to the public. The second is to provide the public with the opportunity to express their views concerning the proposed action. These have been two extremely important elements of success in achieving public acceptance of nuclear reactors in the United States, and they will be invaluable in resolving future technical issues such as disposing of radioactive wastes or closing the nuclear fuel cycle in the United States. Even with these steps however, public acceptance may not be easily achieved.

In the nuclear power debate -- as well as with debates over other people -- it seems to me there are at least two kinds of limits which may operate. First, the limits on the expert's prerogative; that is, what kinds of questions do his training and experience give him an exclusive right to answer? And second, the limits on private citizen's rights: what kinds of decisions should the non-expert be able to veto, in the face of all scientific assertion or even evidence? We would not, for example, dream of taking a public opinion poll to determine the square root of two, or the atomic weight of potassium; such calculations we reserve to experts.

Emotional simplicity about troublesome issues -- that is, exploiting the inherently controversial nature of

a passionately debated subject -- can lead to bad decisions that stem not from the objective merit of conflicting views, but from the talent of the advocates. A highly skilled, highly paid lawyer may win a not-guilty verdict for a criminal against a young, inexperienced, or inadequate prosecutor: this is one of the ambiguities with which human beings are forced to live. And in the nuclear power debate, we must also live with ambiguity: the experts on both sides of the question must exert themselves to the utmost, to present their best arguments. Having done that, however, we must abide the verdict of our lay jury. For we are not dealing with the square root of two, or with some other item of scientific assertion whose truth or falsity leaves untouched the daily lives of our people. We are dealing with a global, perhaps irrevocable decision that will commit human kind to a lasting embrace: once we take up dancing with this bear, the option of breaking off an exhausting, depleting relationship is no longer ours. It will not matter if we are tired; we will have to wait until the bear is tired. And if the tenor of my remarks suggests delay in the aggressive development of nuclear power, I can only associate myself with the closing remarks of Sir Brian Flowers in his December lecture to the British Nuclear Energy Society:

We have time to effect a reconciliation between views that at present are merely polarized -- according to the standards and values of a society that is both technological and humane. This time should not be seen as a delay; it should be a very busy time for all of us.

