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# NUCLEAR POWER PLANT REGULATION

Eric S. Beckjord\*

## I. INTRODUCTION

I am very glad to participate in the National Energy Forum, 1978. I like the theme, "Is the Government Hurting or Helping?" It is a challenge, and I guess the jury is still out on this question. I am going to discuss, briefly, the regulatory activities of the government on nuclear energy. As you know, the National Energy Plan calls for a significant contribution of nuclear power over the years ahead. As of 1977, nuclear power provides about twelve percent of the kilowat hours in this country. It is interesting to note that it surpassed hydroelectric energy generation in this past year. By the year 2000, it is expected that nuclear power will draw equal to coal, providing about forty percent of the nation's electrical needs. There is a long way to go from here to there, and it is a fact that the difficulties in the past few years have served to slow nuclear power development.

Specifically, in three years, there has been a net loss of fourteen nuclear power plants. That is to say, there was a net of fourteen cancellations over new power plant sales. So, at this point, there is some question as to exactly what is going to happen to nuclear power. This is perhaps difficult to understand in view of the energy needs, but there are reasons for this and I am going to talk about the regulatory actions. Actually, there are perhaps four or five main reasons for this slowdown in the nuclear program: (1) regulatory actions, (2) financing problems, (3) design complexity, (4) construction management deficiencies, and (5) labor problems. I am going to talk about the regulatory problems.

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## II. PROBLEMS IN NUCLEAR REGULATION

Just to give you a little illustration of what the regulatory problems have led to, in the period 1963 to 1965, the average time between the filing and the approval of an application for a construction permit of a plant was about nine months. By 1970, with the passage of the National Environmental Policy Act,<sup>1</sup> that period of time had grown to twenty months. Today it averages in excess of forty months, and that number still continues to rise. Actually, it takes about five years to build a nuclear power plant. Today we have the situation where it may take ten or twelve years, including the licensing and regulatory process. The most notable example here of severe problems for the utility industry is in the Seabrook nuclear power plant, which has been well publicized recently. So it is obvious that something needs to be done about this to bring the total time down from the ten or twelve years to something closer to the actual construction time for the plant. What can be done? Before discussing solutions, it would be helpful to briefly outline the regulatory process. That process has two steps today. First, is the application for a construction permit, which essentially is the filing of information related to building a plant at a particular site. The second step is the issuance of the operating license, and that is a virtual repeat of the construction application process, but it takes place at the time that the plant construction is almost complete and in preparation for operation. I should say that the federal government's part in licensing is not the entire step in regulatory matters. There are reviews that are conducted by the Environmental Protection Agency, by the Corps of Army Engineers, and by numerous state and local agencies. In fact, in the case of the Sun Desert plant in California, the utility company, if they are successful in getting that plant licensed finally, will have had to obtain ninety-one permits in order to build and operate that plant. That is quite a number of permits. There are sixteen states in which the laws on plant siting require that long-term forecasts of energy needs must also be completed. So as you can see, there is a lot of activity both on the part of the federal government and growing activity on the part of the states.

## III. LICENSING OF NUCLEAR PLANTS

If you examine the licensing process, the construction permit phase is the part that has been causing most of the delays. So the question is

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1. National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4347 (1976).

how can that be shortened. It is apparent that what has to be done is to take licensing actions off of the critical path. There are perhaps five or six ways in which this can be done: first, generic licensing of standard designs; second, pre-approval of sites for plants; third, delegation of environmental reviews to the states; fourth, waiver of the mandatory Advisory Committee on Reactor Safeguards (ACRS) review; and finally, one-stop licensing.

Standardization—what is it that standardization can do? A nuclear plant consists of about four main parts. There is the nuclear steam supply equipment, there is the turbine generator, there is the balance of plant—that is all the valves, motors, pumps, and piping, and finally there is the civil works, or the buildings in which this equipment resides. Actually, standardization has gone fairly far in the nuclear steam supply area, but it has not gone very far in the remaining areas. There are reasons for this. Utilities prefer their individual designs. There are many architect engineers in the business, and they each have their own design preference. Finally, there are differences from one site to another, most notably in the area of seismic conditions, which may require design against earthquakes. These are the reasons that there are non-standard designs. But there have been attempts to standardize design, and there are some notable exceptions which provide useful examples to follow. The idea here is that if a design can be standardized in all of these four areas instead of just one, then a very extensive review of the entire design, a very thorough review, can be done once, and then when that same standard plan is applied again to a new site it will not be necessary to repeat that detailed review. Since the detailed engineering review of a plant takes a couple of years, it is evident that doing it once, and not having to repeat it, would save a lot of time.

The second way to accelerate the construction permit phase is early site approval. What this means is the following: at this time, the Nuclear Regulatory Commission cannot separate the review of a specific site and the plant that is to be built there. In other words, the site review has to be done at the time when the plant application is made. The idea would be to pre-review sites before construction is to start and to give approval of those sites. They could then be held in readiness by utilities. One could do what is referred to as “site-banking.” In other words, the utility could have a site ready at the time when it needs to start construction of a power plant. Thus, because of the lengthy time that it has taken, in-site review could save a lot of time. It

could remove this part from the critical path, and that could be very important.

Another important step is the delegation of environmental review and the review of need for power to the states. This is important now because in fact there is duplication. The Nuclear Regulatory Commission is required to do this review under current regulations, and a number of states are also doing reviews. Since these things often happen in series, it is apparent that time could be saved in this part of the process by delegating this review responsibility to the states.

The public hearing process is an important factor in the long delays in plant construction because we find that it is a matter of record that the same issues keep coming up again and again, and there is reconsideration and relitigation of these issues. If the public hearings were limited to consideration of new issues or significant changes in the information regarding prior issues, this would reduce the lead time.

The fourth area in which to save time is the ACRS. This is a review that is required for every plant that is licensed now. The ACRS is a group of independent experts taken from many disciplines around the country whose responsibility is to do an independent review of the technical decisions of the Nuclear Regulatory Commission staff. With a standardized plant design, the independent review could be done again once, or perhaps several times by ACRS, but it would not have to be done every time. The result would be a saving of licensing time.

I have talked about the construction permit, because that is where most of the delay occurs now. I think we have to look ahead to the operating license, because that could become an important contribution to delay in the future. The idea here is the technique called "one-stop licensing." This would be a process whereby a utility could apply for both a construction permit and the operating license at the same time. I think this is compatible with the idea of standard plant design, and it would be another way by which lengthy reviews could be avoided.

I want to emphasize one point. The objective of improving the licensing process is to increase the utility of nuclear energy today, to enable plants to get on the line sooner. It is not in any way to reduce nuclear safety. There has been a lot of emphasis in the past year on this question. The President has made a policy statement on nuclear safety, and Congress has put its own views into legislation calling for continued efforts to improve nuclear safety. Those of you who may have studied this area or looked into it, know that the subject has been controversial, but you may also be aware that the safety record of nu-

clear plants is a very good one. When you compare the hazards of nuclear power with the hazards from other sources, nuclear power looks very good. At least I happen to think so, and there is a good bit of evidence for this view.

As we continue to work on nuclear safety, we are going to have to develop an objective standard of what an acceptable risk is. The risks of nuclear power today are perhaps ten thousand times smaller than the risks of natural occurrences or manmade disasters, such as aircraft crashes. And the question is finally going to have to be addressed, how safe is safe enough? I think that is a question that will be addressed over the next five to ten years.

#### IV. CONCLUSION

Finally, I would just like to state that there are problems in the nuclear regulatory area. I think people are well aware of what they are. People in the federal government are working on changes in order to improve the process without sacrificing safety. As to whether the government is helping or hurting, I don't know. When the jury comes in on this question, I hope that there will be evidence for them to conclude that the federal government is helping.