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A review of the Nuclear Regulatory Commission's (NRC) program for licensing the construction and operation of nuclear powerplants revealed many unscived problems. Utilities need 10 or more years for the completion of the plants, from the planning phase, through licensing procedures, to construction. This long leadtime contributes greatly to the high costs of building nuclear powerplants. Findings/Conclusions: NRC has changed some administrative practices and proposed legislation to reduce leadtimes. One change allows construction following completion of a portion of the permit application review. NRC is also encouraging the development of standard powerplant designs, and is proposing review of sites before receiving permit applications. State and local requirements are incompatible with some of these efforts and limit their effectiveness. Other factors contributing to long leadtimes are: (1) problems in assuring compatibility of parts of plants; (2) public opposition; (3) new safety technology; and (4) court decisions. Recommendations: The chairman of NRC should work jointly with the States to identify requirements in order to develop some commonality in the licensing process. (HTW)

00177

# *REPORT TO THE CONGRESS*

*BY THE COMPTROLLER GENERAL  
OF THE UNITED STATES*

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## Reducing Nuclear Powerplant Leadtimes: Many Obstacles Remain

### Nuclear Regulatory Commission

Utilities take 10 years to build nuclear powerplants. A shorter leadtime would provide electrical power to the nation sooner and would lower powerplant costs. The Nuclear Regulatory Commission has had limited success to date in reducing nuclear powerplant leadtimes, and the prospects are not good for reducing leadtimes in the future—due to increasing State and local government requirements, evolving safety criteria, and other factors, many of which are not under the Commission's control.



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

B-127945

To the President of the Senate and the  
Speaker of the House of Representatives

This report discusses the Nuclear Regulatory Commission's program for licensing the construction and operation of nuclear powerplants, and the factors affecting licensing and construction times.

We made this review as a part of our evaluation of the effectiveness of the Commission's licensing and related regulatory activities, as required by the Energy Reorganization Act of 1974 (42 U.S.C. 5876).

We are sending copies of this report to the Director, Office of Management and Budget; and to the Chairman, Nuclear Regulatory Commission.

  
ACTING Comptroller General  
of the United States

D I G E S T

Utilities need 10 or more years to (1) plan, (2) obtain Nuclear Regulatory Commission construction and operating licenses for, (3) obtain State and local government approval for, and (4) construct nuclear powerplants. This long lead-time contributes greatly to the high costs of building nuclear powerplants, which in turn have contributed to many utilities' decisions to defer or cancel construction of planned powerplants.

In recent years, the Commission has changed certain administrative practices and has proposed legislation to reduce powerplant lead-times while maintaining safety levels and protecting the environment. The Commission believes its new practices could reduce lead-times to 7 or 8 years and that it could further reduce leadtimes to about 6 years with changes in its legislative authority.

A key administrative Commission change allows utilities to begin some construction work, as soon as they complete the environmental and site suitability requirements of their construction permit application reviews. Previously, construction work could not begin until the Commission's powerplant design safety reviews were completed, and these were taking 2 or more years to complete. (See pp. 7.)

To further expedite construction, the Commission is proposing to review sites before receiving construction permit applications. Previously, the Commission had requested authority to grant early site permits and allow utilities to immediately begin construction once they submitted construction permit applications. (See pp. 8 to ?.)

State and local government requirements have limited and will continue to limit the

effectiveness of the Commission's efforts and its proposed legislative changes. State and local laws enacted and proposed since 1970 require reviews of utilities' powerplant projects which are not compatible with the Commission's timetable for early site approvals. Clearly, many States intend to actively participate--from land use and environmental perspectives--in the licensing of nuclear powerplants. The Chairman of the Commission should work with all the States to identify and compare various legal and procedural requirements, as a first step in developing some commonality in the licensing process and in reducing lead-times. (See pp. 11 to 13.)

The Commission has taken other steps to reduce nuclear powerplant leadtimes and to make its powerplant design safety review process more stable and predictable. These steps include (1) encouraging the development and use of standard nuclear powerplant designs (see pp. 7 and 8) and (2) more carefully controlling the manner in which new Commission safety requirements are applied to powerplants in design, licensing, and construction stages. (See pp. 10 to 11.)

Reduction of nuclear powerplant leadtimes to date has been limited. Safety reviews of construction permit applications which refer to standard powerplant designs have taken longer than expected because of the problems in assuring that all parts of the plant are compatible with each other and with individual site characteristics. (See pp. 7 to 8.) Other factors affecting leadtime include

- growing public opposition to nuclear power,
- changing regulatory requirements resulting from technological solutions to outstanding safety issues, and
- changing regulatory requirements caused by recent court cases. (See pp. 11 to 13.)

Therefore, even though some measures taken by the Commission are long term and have not been fully implemented, the prospects are not good for reducing future leadtimes for licensing and constructing nuclear powerplants. In fact, GAO believes that both the Commission and industry will have difficulty in maintaining the current timeframe of 10 years.

The Commission stated that it intends to work toward common Commission-State licensing procedures, and also expects to continue work toward improving licensing process efficiency in the areas of powerplant design standardization, early site reviews, and documentation of the bases for existing safety decisions.

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## ABBREVIATIONS

AEC	Atomic Energy Commission
GAO	General Accounting Office
NRC	Nuclear Regulatory Commission

## CHAPTER 1

### INTRODUCTION

In December 1957 the Shippingport Atomic Power Station in western Pennsylvania began feeding electric power into the distribution system of the Duquesne Light Company. This nuclear powerplant--jointly owned by Duquesne and the Atomic Energy Commission (AEC)--was the first to generate electricity for commercial use. By December 31, 1976, 62 other electrical utility-owned nuclear powerplants were operating and another 139 were either under construction or under some phase of the Nuclear Regulatory Commission's (NRC's) licensing process.

Before a utility can construct and operate a nuclear powerplant, it must obtain a Federal construction and operating license. Until January 19, 1975, construction and operating license applications were reviewed and licenses were issued by AEC's Director of Regulation. The Energy Reorganization Act of 1974 (42 U.S.C. 5801) transferred this responsibility to the Office of Nuclear Reactor Regulation of the newly established NRC. 1/

Before issuing construction and operating licenses, NRC must review utility applications and find that (1) there is reasonable assurance that a powerplant can be constructed and operated at the proposed location without undue risk to public health and safety, (2) issuing construction and operating licenses will not be harmful to national defense and security, (3) the utility requesting the license is financially and technically qualified to design and construct the proposed facility, and (4) issuing the requested license is in compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321).

1/Hereafter, actions taken before the reorganization act will be identified as NRC actions.

## CHAPTER 2

### OBSTACLES IN REDUCING NUCLEAR POWERPLANT LEADTIMES

Today's large nuclear powerplants cost from \$700 million to \$1 billion to construct. Much of this cost--up to 40 percent, according to one study--is interest and inflation encountered during the 10 or more years of leadtime--the timespan from the date a utility decides to build a plant until the date it becomes operational. Presently, high capital costs have contributed to many utilities' decisions to defer or cancel construction of planned units. Thus, the leadtimes for constructing nuclear powerplants are important factors in the economics of nuclear power, and any reductions in the present 10-year cycle would reduce capital costs and enable a utility to more quickly begin recovering the cost of the plant. Reduced leadtimes would also provide earlier on-line electrical power to meet increased energy demands.

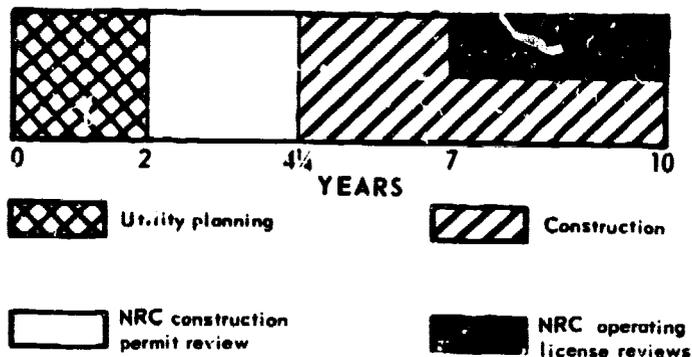
For several years the President and the Joint Committee on Atomic Energy have been concerned about the lengthy leadtimes and the President has requested the Nuclear Regulatory Commission to take steps to reduce them. NRC has in recent years implemented certain administrative changes in an attempt to reduce nuclear powerplant leadtimes from 10 years to 7 to 8 years without compromising safety. It has also requested changes in its legislative authority intended to further reduce leadtimes to about 6 years. To date, the administrative actions have had limited success at best, and the prospects are not good for achieving the desired reduced leadtimes for future nuclear powerplants because of (1) continual changes in regulatory safety requirements, (2) increasing public opposition, and (3) the number of State, local, and Federal environmental and land use requirements that must be met.

### NUCLEAR POWERPLANT LEADTIMES

The nuclear powerplant leadtime consists of (1) utility planning, (2) NRC construction permit review, (3) construction, and (4) NRC operating license review. As noted, the leadtime consists of activities both under NRC control and utility control. The times required to complete these phases are shown in figure 1. The timespans shown are based on average times for the plants we reviewed. Moreover, some of the requirements that must be satisfied in the process, such as State and local government requirements, are done

concurrently and thus overlap the phases shown below. A discussion of each of these major phases follows.

Figure 1



### Utility planning

The utility planning phase begins when the utility decides to construct a nuclear powerplant and ends when it submits a construction permit application to NRC. During this phase the utility (1) chooses a site and considers alternative sites, (2) prepares an environmental impact report based on environmental data collected over a 1-year period, and (3) prepares a preliminary safety analysis report describing plant design and how the design complies with NRC rules, regulations, and other safety requirements. These requirements include regulatory guides, industry codes and standards, technical positions applicable to types of nuclear powerplant systems, or staff positions on individual applications. In addition, utilities may have to prepare applications for State and local government licenses and permits.

As shown in Figure 1, utility planning currently takes about 2 years. NRC expects that this time could eventually be reduced to 6 months with legislative changes allowing full implementation of standardized plant designs and pre-approved, designated sites. As yet, no utility has obtained early NRC site review and then submitted an application using a standard plant design. However, we question whether these actions will achieve NRC's anticipated 6-month goal. In many States, utilities must collect environmental data over 6 months or longer in preparing State permit applications. For example, New York State requires a utility to collect environmental data for 1 year at a selected and an alternative site and then evaluate alternative site and facility combinations in its State permit application. Thus, in New York it is impossible for a utility to achieve the 6-month goal.

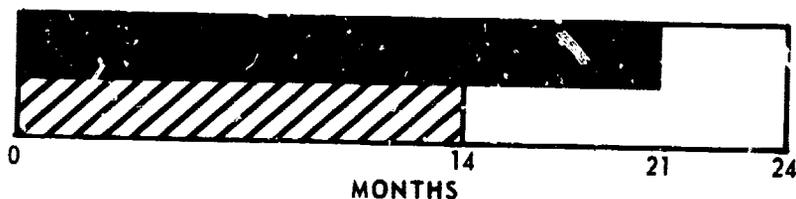
## NRC construction permit review process

The construction permit review process begins when NRC accepts the utility's application and continues until NRC issues a permit to begin construction. During this phase (1) the NRC staff reviews the safety and environmental data furnished by the utility, (2) the Advisory Committee on Reactor Safeguards <sup>1/</sup> conducts an independent safety review, (3) NRC and the Department of Justice review the utility's antitrust information to assess compliance with antitrust laws, and (4) the Atomic Safety and Licensing Board <sup>2/</sup> holds a required public hearing. To a great extent, these reviews are performed consecutively. If affirmative decisions follow each of the above reviews and hearings, NRC issues a construction permit and the utility begins site preparation and powerplant construction.

Figure 2(a) shows the average time taken to complete the construction permit review process for 17 applications accepted during calendar years 1971 to 1975 to construct 32 powerplants. Issuance of construction permits for these applications was not contested in NRC's public hearings. By contrast, during the same period, figure 2(b) shows the average timeframe for 24 applications to construct 44 powerplants which were contested on safety and/or environmental grounds in NRC's public hearings.

Figure 2(a)

Average review times for 17 uncontested applications accepted during 1971-1975.

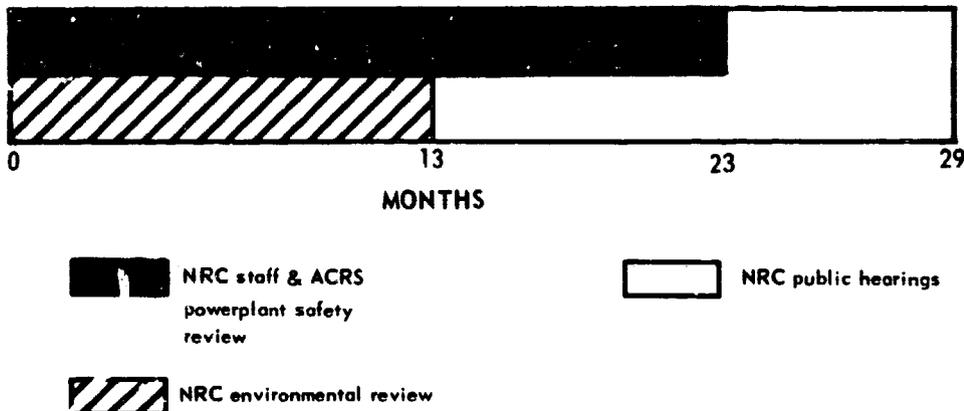


<sup>1/</sup>The Advisory Committee on Reactor Safeguards, consisting of a maximum of 15 members, is an independent committee established by the Congress and is statutorily required to conduct a safety review of each nuclear powerplant application.

<sup>2/</sup>An independent Board comprised of one lawyer, acting as Chairman, and two technically qualified persons. Members are selected from a panel of full- and part-time panel members appointed by NRC Commissioners.

Figure 2(b)

Average review times for 24 contested  
applications accepted during 1971-1975



NRC believes it is possible, with legislative changes allowing full implementation of plant standardization at a previously approved site, for a utility to begin construction immediately upon filing an application. Thus, NRC's goal is to eliminate the 2 or more years now required to authorize construction. We question whether it will achieve this goal, however, because of (1) changing environmental conditions requiring additional NRC staff reviews and public hearings and (2) State and local government requirements which may prevent utilities from beginning construction in this timeframe. (See pp. 8 to 9.)

Construction and NRC operating license review

Powerplant construction takes about 6 years during which the utility completes detailed design work, construction, and preoperation testing. Often, design changes occur at this time to (1) enhance methods of powerplant operation or maintenance, (2) incorporate better solutions to engineering problems, (3) reduce project costs, and (4) incorporate new or revised regulations or other safety requirements promulgated by NRC.

Other factors significantly affecting powerplant construction times include (1) project financing, (2) utility and construction contractor management abilities, (3) timely procurement and delivery of materials, (4) availability of labor skills, labor productivity and labor strikes, and (5) the weather.

Two or more years before construction is completed, the utility applies to NRC for an operating license which is required by law. Included with the application is a final safety analysis report and an updated environmental report. The final safety analysis report describes how the many systems and features of the project have been designed to comply with NRC's rules, regulations, and other safety requirements, while the updated environmental report shows any changes from the earlier report prepared at the construction permit stage.

NRC's operating license reviews are similar to its construction permit reviews, except that (1) another antitrust review is not required unless warranted by special circumstances and (2) a public hearing is not held unless requested by an interested party. The operating license review is timed to run parallel with construction so it can be completed when the powerplant is ready for nuclear fuel loading.

NRC expects that some saving of the utility's time for construction could be achieved through standardized plant designs and better management of NRC changes in design and other requirements during the construction period.

#### ACTIONS TAKEN OR PROPOSED TO REDUCE NUCLEAR POWERPLANT LEADTIMES

To reduce nuclear powerplant leadtimes toward the 6-year period requested by the President, NRC has begun to

- authorize utilities to begin limited construction work, following completion of the environmental and site suitability portions of its construction permit application reviews;
- encourage the development and use of standard nuclear powerplant designs; and
- review nuclear powerplant sites before receiving construction permit applications referencing the sites.

Only the limited construction work and standardization programs have been in effect long enough to have affected powerplant leadtimes--primarily at the construction permit stage. To date, construction permit review times have not been reduced as expected. Furthermore, we believe that reductions in leadtimes from early site reviews will also be less than NRC anticipates, for reasons discussed below. NRC officials, however, do not expect to realize for several years the full benefits of these measures in reducing powerplant leadtimes.

## Limited work authorization

In April 1974 NRC began authorizing utilities to conduct limited construction work before receiving construction permits. This work could not be started, however, until NRC had completed staff reviews and public hearings on environmental and site suitability factors. As shown in Figure 2 (a) and (b), NRC's environmental reviews have taken much less time than its powerplant design safety reviews. By further expediting both its environmental and site suitability reviews, NRC expected that it could issue limited work authorizations in 10 months--14 or more months before completing powerplant design safety reviews and issuing construction permits.

Nonetheless, it has taken an average of 18 months to complete staff reviews and public hearings for the 21 authorizations issued to date, and will take even longer for 5 current applications. Furthermore, three other utilities had to withdraw limited work authorization requests because they had been unable to obtain the various State approvals necessary before beginning construction.

To date, several factors have prevented NRC from achieving its 10-month goal. Some relate to satisfying legal requirements. For example, project environmental statements and several contested public hearings have taken longer to complete than expected and a major change in NRC's regulations affected other projects. Other factors, however, were outside NRC's control. For example, NRC had to defer issuing five limited work authorizations until the utilities obtained water quality certificates from States. Under the requirements of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1151), NRC may not authorize a utility to begin any nuclear powerplant construction work until it has obtained the required State certificate. This and other State requirements may continue to limit progress in achieving the 10-month limited work authorization goal.

## Standard nuclear powerplant designs

Under the standardization approach initiated in 1973, the NRC staff reviews and approves standard powerplant designs. Once a design has been approved, no modifications are to be made unless they offer "significant" safety improvements or are directed by a hearing board or the Commissioners.

NRC expects that a standard design will shorten lead-time by at least 1 year because (1) the utility would need

less time for preliminary design work and preparing its preliminary safety analysis report, (2) NRC would need less time to review the construction permit application, and (3) construction time could be shortened due to fewer construction-stage design modifications. NRC officials, nevertheless, believe these benefits of standardization are a long way off.

Utilities have submitted seven applications referencing standard designs to construct 21 nuclear powerplants, and NRC has issued construction permits on two of the applications. NRC's construction permit reviews of these applications have taken, or are projected to take, from 18 to 34 months to complete--as long as its reviews take without standardization.

A major reason why NRC has not realized shorter review times is that the standard designs utilities have referenced to date comprise only part of the powerplant design. No one contractor designs an entire nuclear powerplant. The nuclear reactor and reactor systems are designed by a reactor manufacturer, while the remaining systems and components are designed by architect-engineering firms. Furthermore, a nuclear powerplant design is greatly affected by the characteristics of the proposed site.

To date, the NRC staff has had difficulties determining if nonstandard and site-related portions of powerplant designs were compatible with standardized portions. In addition, utilities have changed their initial designs on their own initiative and have incorporated new NRC safety requirements. These changes all require additional NRC staff review. Each of these factors detracts from the advantages of standardization and lengthens the utility's planning and NRC's licensing process.

### Early site approval

NRC has proposed a change in its licensing regulations intended to further reduce its time for construction permit review. The proposed change would allow utilities to seek NRC site environmental and safety reviews up to 5 years before applying to construct powerplants at these sites. NRC expects that most environmental and site safety issues could be resolved at the early site review stage. By referencing a previously reviewed site in its construction permit application, a utility could expect to begin construction work as soon as the remaining issues--such as "need for power"--were resolved.

The early site review concept was also a key provision of NRC's proposed legislation intended to reduce nuclear

powerplant leadtimes from 10 to 6 years. The legislation would have authorized NRC to issue site permits to utilities upon completing its early site reviews, and would have allowed utilities to immediately begin construction work upon submitting applications referencing approved sites.

We question NRC's optimism in the amount of further leadtime reductions attainable from early site reviews. Environmental factors, such as need for power, are frequently contested in NRC's public hearings and are subject to change over relatively short time periods. Resolving these issues in staff reviews and subsequent contested public hearings may limit earlier starts on construction work. Indeed, in three recent cases, hearing Boards either reopened or held up NRC's public hearings in order to consider changing need for power projections.

Furthermore, increasing stringent State and local government requirements may prevent many utilities from seeking early NRC site reviews, or from beginning construction work soon after submitting construction permit applications referencing previously reviewed sites.

Since 1970, 23 States have enacted legislation requiring some form of preconstruction State reviews of utilities' powerplant projects. These laws often conflict with NRC's early site review concept because they do not authorize complete State reviews in compatible timeframes. New York State, for example, cannot begin its 2 or more year review until a utility applies to construct a specific powerplant at a selected site. Oregon, on the other hand, will approve sites for future use following 2-year reviews, but requires additional 8-month reviews of utilities' applications to construct specific powerplants at approved sites.

NRC has not yet adopted an early site review regulation, in part because State powerplant siting officials raised concerns that

- NRC early site approvals may unduly influence sound State and/or local government land use planning functions;
- States might disapprove sites already approved by NRC under its early site approval procedure; or, conversely,
- utilities might use the NRC early site approval procedure to win State approvals of their selected sites.

## In-house actions to streamline licensing process

NRC has implemented several measures which, while not specifically designed to shorten powerplant leadtimes, are intended to reduce opportunities for delays occurring in the utility planning, NRC licensing, and powerplant construction phases. Principal among these means is its program to add stability and predictability to its process of applying new safety requirements to powerplant projects in various stages of development.

### Efforts to add stability and predictability to NRC's staff safety reviews

Periodically NRC identifies new "significant" safety issues from experience accumulated by operating plants. Regulations or other safety requirements developed by NRC to resolve these issues may be applied to powerplant projects in all stages of development and to operating powerplants. Although this contributes to increased licensing and construction leadtimes--in order to redesign and/or reconstruct affected systems and components--NRC's primary responsibility is to insure that adequate powerplant levels of safety are maintained.

NRC also develops new requirements less significant to safety. In the past, these also were often imposed on projects under construction and construction permit review, contributing to longer powerplant leadtimes.

NRC has developed a program to control the manner in which new safety requirements, of varying degrees of safety importance, are applied to powerplant projects in design, licensing, and construction stages. It identified in a single document--the Standard Review Plan--all the safety requirements the NRC staff uses in construction permit and operating license reviews. Changes to the plan require approval of the Director, Office of Nuclear Reactor Regulation, after comparing the "value" of the expected improvement to its "impact" on powerplant project costs and schedules. NRC also began establishing schedules for imposing approved new requirements on future construction permit applications, applications under review, and powerplants operating or under construction.

This program, however, has not been entirely successful. We found examples wherein NRC's staff imposed new safety requirements on utilities' powerplant projects which had not been approved by NRC management. These changes can adversely affect the utilities' plans since they may result

in redesign, work stoppage, or costly construction modifications.

Strict adherence to this program should assist NRC in providing a more stable and predictable regulatory process. However, because important safety issues will continue to be identified as operating plant experience is gained, NRC will have no recourse but to develop regulations and other safety requirements to resolve these issues regardless of whether powerplant leadtimes are affected.

#### Early antitrust information

Another measure NRC has taken requires utilities to submit antitrust information at least 9 months before submitting their construction permit applications. Since any antitrust issue must, by law, be resolved before NRC issues a construction permit, the antitrust aspect of NRC's construction permit application reviews can adversely affect NRC's objective of shortening licensing times. The required early submission of antitrust information should remove antitrust matters as a factor for holding up the issuance of NRC construction permits for most projects. For one project, however, NRC expects its contested antitrust proceeding to take 39 months to complete.

#### Joint NRC-State hearings

A further step NRC has taken is to hold joint NRC-State public hearings on construction permit applications to expedite the NRC and State decisionmaking process while reducing the total time, effort, and expenditures of all parties. However, in one of the two joint hearings started to date, major differences in NRC and State hearing requirements exist which will lengthen the time NRC takes to issue a construction permit.

#### OBSERVATIONS ON THE PROSPECTS FOR REDUCING NUCLEAR POWERPLANT LEADTIMES

NRC is attempting to reduce the nuclear powerplant leadtime from 10 to 6 years. To meet this goal, it has taken certain administrative steps to reduce leadtime to 7 to 8 years and has proposed legislation designed to further shorten it to 6 years. We commend NRC's efforts but they have had little or no impact on reducing timeframes. We recognize that some of the measures taken are long term and have not been fully implemented. In our opinion, however, the factors now limiting NRC's success in reducing leadtimes to 7 to 8 years will continue to do so and will also preclude utilities from achieving the stated goal of 6 years.

We believe the 6-year goal is unrealistic and the programs implemented and proposed by NRC to achieve that goal will not appreciably reduce the present 10-year leadtime. In fact, we believe that both NRC and the industry will have difficulty in maintaining current timeframes of 10 years.

There are simply too many other factors involved that limit NRC's ability to reduce the leadtime, short of reducing the scope of its safety and environmental reviews. These other factors include:

- Growing State and local government requirements/restrictions which are intended to lessen environmental impacts but are diametrically opposed to NRC's actions to shorten powerplant leadtimes. In six recent licensing actions, State requirements, rather than NRC requirements, have precluded utilities from getting earlier construction starts.
- Growing public concern about nuclear power as shown by recent State nuclear moratorium initiatives. Expressions of this concern through widespread intervention in NRC nuclear powerplant licensing proceedings have resulted in more time needed to satisfy the public hearing requirements.
- Changes resulting from court decisions invalidating NRC regulations. A July 1976 Federal Court of Appeals decision invalidated portions of an existing NRC regulation for considering the environmental effects of the nuclear fuel cycle in construction and operating license proceedings. As a result of this decision, NRC stopped issuing limited work authorizations, construction permits, and full-power operating licenses until an internal study was completed and a proposed interim rule prepared. On November 5, 1976, NRC resumed issuing authorizations, permits, and licenses, conditioned on the outcome of the rulemaking proceeding.
- Changes resulting from technological advances and operating experience (for example, the development of new requirements for emergency core cooling systems and for new fire protection standards after the fire at the Brown's Ferry Nuclear Station). Because of its responsibility to protect the public health and safety, NRC will continue to impose new regulations and other safety requirements in its construction and operating license reviews as solutions to outstanding safety issues are developed. Since December 1972, the Advisory Committee on Reactor

Safeguards has identified 72 safety issues applicable to all, or a large number of, nuclear powerplants. To date, 41 of these issues have been completely resolved through additional regulations or other safety requirements. The application of important new safety requirements to powerplant projects has and will continue to limit the success of NRC's efforts to add stability and predictability to its licensing process.

## CONCLUSION

NRC believes that an essential element in reducing nuclear powerplant leadtimes is early site reviews before utilities select specific powerplant designs and submit construction permit applications. In this way, NRC believes that utilities could begin limited construction work about the time they submit construction permit applications. NRC has proposed a regulation to effect the early site approval concept consistent with its present legal authority and had previously proposed legislation to put the concept in the law.

The effectiveness of these proposals, however, depends on their compatibility with State and local governments' legal and procedural requirements, which vary among the States. Clearly, many States intend to actively participate--from land use planning and environmental perspectives--in regulating nuclear powerplants. NRC should, we believe, work jointly with all the States to identify and compare the various legal and procedural requirements as a first step in developing some commonality in the licensing process and in reducing the timeframe for getting powerplants on line.

## RECOMMENDATION

We recommend that the Chairman, NRC, work jointly with all the States to identify and compare the various legal and procedural requirements as a first step in developing some commonality in the licensing process and in reducing the timeframe needed for getting powerplants on line.

## AGENCY COMMENTS

NRC generally agreed with our recommendation and told us that implementing actions will be developed following the completion of a current study. In addition to working toward common NRC-State licensing procedures, NRC said it expects to continue work toward improving licensing process efficiency in the areas of (1) powerplant design standardization, (2) early site reviews, and (3) documentation of the bases for existing safety decisions.

## CHAPTER 3

### SCOPE OF REVIEW

We made our review at

- NRC headquarters, Bethesda, Md;
- Duke Power Company, Charlotte, N.C.;
- General Public Utilities Service Corporation, Parsippany, N.J.;
- Long Island Lighting Company, Hicksville, N.Y.; and
- Portland General Electric Company, Portland, Oreg.

We also attended the January 1976 Atomic Industrial Forum "Workshop on Reactor Licensing and Safety" and the June 1976 joint NRC-National Governors' Conference "Second Annual Powerplant Siting Conference."

We interviewed NRC management officials and staff members, as well as electric utility personnel involved in the nuclear power plant licensing process. We examined NRC and electric utility documents, records, reports, and files relating to (1) the planning, (2) NRC and other Federal and State licensing, and (3) construction of nuclear powerplants.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

December 22, 1976

Mr. Monte Canfield, Jr.  
Director  
Energy and Materials Division  
United States General  
Accounting Office  
Washington, D. C. 20548

Dear Mr. Canfield:

We have received and reviewed a draft of the GAO report entitled "Reducing Nuclear Power Plant Lead Times: Many Obstacles Remain," and GAO has considered our detailed comments separately.

There are several points in which the report either fails to make clear or does not provide proper emphasis on the role of the NRC in reducing "lead times." These points can be briefly summarized as follows:

1. NRC's primary responsibility is the protection of the health and safety of the public and the common defense and security of the United States. The exercise of that responsibility through the licensing process is not limited by the constraint of time or by any other concerns, however they may be expressed. The legitimate concerns over the efficiency of the licensing process, as expressed in this report, must be considered in this context.
2. The Commission has taken several steps, as indicated in the report, to reduce lead times, but this effort should be expressed in terms of reducing those portions of the lead time affected by the licensing process. The report leaves the impression that the whole time period is somehow under the control of the Commission. In fact, the licensing process is on the critical path of the planning and construction process for no more than about three years of that 10 year period. Furthermore, these steps should be viewed in the context of NRC making more efficient licensing paths available to the industry should it want to take advantage of them. The report does not reflect this perspective. One example of this can be found in the Digest with the statement ". . . we believe that the Commission will have difficulty in maintaining current time frames of 10 years." The point that should be made, if the premise is accepted, is that the industry will have difficulty in maintaining current time frames of 10 years.

3. The point could be made, in stronger fashion, that many of the factors that mitigate against reducing lead times are, in fact, beyond the control of the Commission. However, one factor within that sphere of control is "evolving safety criteria" as discussed in the Efforts to add stability and predictability to NRC Staff safety reviews section of the report. What is missing in this part of the report is the important observation that changes in safety requirements almost always stem from experience accumulated by plants now in operation. As more plants are licensed to operate, this experience will increase significantly. It is, and will continue to be, the principal reason for changing safety requirements.

There is one minor point of the report which should also be raised, only to provide factual clarification. In the Limited Work Authorization section, the point is made that such work could not be started until after completed staff reviews and public hearings on environmental and site safety matters. The environmental hearing, in fact, considers environmental and site suitability matters. More specific site safety matters are considered in the radiological safety part of the hearing process, usually after the completion of the environmental part of the hearing.

Summarizing the above points, and our review of the GAO report, we do not agree that the licensing process is the dominant factor in current power plant lead times. Our studies indicate that high capital costs in light of problems utilities have been encountering obtaining construction financing over the last few years, need for power as a function of predicted load growth, and construction problems account for the major portion of delays over the period of time covered by the GAO report.

NRC does, however, recognize the requirement for continuing improvement in the licensing process. In this regard, as the report notes, legislation was before the 94th Congress which would have permitted significantly greater efficiencies in the reactor licensing process, should license applicants chose to take advantage of them. We also are working with individual states to encourage Federal, State cooperation in power reactor licensing through such things as early site reviews, joint hearings, etc. NRC is also conducting a study of ways to improve efficiency in environmental decision making at the State and Federal levels.

The recommendation of your report is, therefore, only one aspect of improving licensing process efficiency; an aspect on which we expect to continue work in the major areas of use of preliminary design authority

for standardized plants in license applications, particularly for delayed plants; development of more effective NRC-State agreements where reactor license applications interfaces exist; perfecting methods whereby applicants will be encouraged to undertake early site reviews; and improvement in developing documentation of the bases for existing ongoing safety decisions.

Sincerely,



Lee V. Gossick  
Executive Director  
for Operations

