



Electric Power  
Research Institute

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Mr. Samuel J. Chilk  
Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

U. S. NUCLEAR REGULATORY COMMISSION  
ADMINISTRATIVE SERVICES  
DIVISION

SUBJECT: Comments on NRC Proposed Policy for Advanced Reactors

Dear Mr. Chilk:

The Electric Power Research Institute (EPRI) is pleased to provide general and specific comments on "Regulatory Policy for Advanced Reactors," (SECY-84-453A).

The general EPRI comments are contained in the following paragraphs. The specific EPRI comments and responses to the questions contained in the subject policy are contained in Attachments 1 and 2, respectively.

EPRI supports the issuance of a policy statement intended to improve the licensing environment for advanced reactors. EPRI believes that the NRC can, through the adoption of an effective policy, minimize complexity and add stability and predictability in the licensing and regulation of advanced reactors. Such a policy statement is necessary if nuclear power is to be a viable option for electric power generation in the near future. In addition to setting forth the general design characteristics which contribute to more effective regulation, the policy statement should identify improvements in the regulatory process with the aim of achieving regulatory stabilization.

As discussed in the February 7, 1985, Industry/EPRI Presentation to the Commission, EPRI has embarked on a major industry program to develop detailed design requirements for advanced light water reactors with a prime objective of being economically competitive with other electrical generation options. The goals of this program are generally consistent with the thrust of the Commission's proposed policy statement and the policy should unambiguously encompass this program.

EPRI believes it is imperative that these requirements be developed in a stable licensing environment. Over the past three years, EPRI and the Industry have worked with the NRC staff to resolve current licensing issues applicable to

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advanced light water reactors. A methodology for identification, evaluation, and resolution of licensing issues has been developed which has been instrumental in closing a large number of issues potentially applicable to advanced light water reactors. A major redirection in the Commission's policy to improve the licensing environment for all advanced reactors can have a substantial and constructive impact on the current EPRI/Industry program.

To this end, Commission policy must establish overall safety requirements uniformly applicable to all advanced reactors, utilizing, for example, a safety goal such as is now under trial by NRC. But the policy must also recognize the different approaches that may be taken to develop advanced reactor designs. At this time there are two general approaches to advanced reactor design, potentially requiring different detailed regulatory criteria within the overall common framework. These differing approaches are: (1) advanced reactor designs based on evolutionary improvements demonstrated by current light water reactor technology; and (2) advanced reactor designs based on substantial changes or radical departures from current technologies.

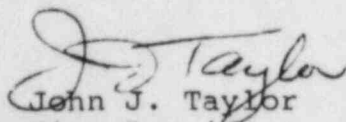
The proposed policy statement should clearly accommodate each approach to advanced reactor design. Because of the available technology and the need to have a viable nuclear option available in the near future, the LWR evolutionary approach will require specific, unambiguous regulatory definitions to assure regulatory stability. Such definition should include improvements in design criteria based on the large body of safety R&D data now available and on the extensive LWR operating experience. It is our judgment that these improved definitions can be less prescriptive. For advanced reactor concepts incorporating a radical departure from current technology, more general guidance would seem appropriate initially to assure that unnecessary constraints are not placed on the development of new design concepts and in the longer run, to accommodate major technical departures in such advanced designs.

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EPRI welcomes the opportunity to provide comments on the proposed NRC policy on advanced reactors. I would be pleased to discuss our comments and the EPRI Advanced Light Water Reactor Program with NRC representatives at their convenience.

Very truly yours,

A handwritten signature in cursive script, appearing to read "John J. Taylor".

John J. Taylor  
Vice President  
Nuclear Power

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## ATTACHMENT 1

The specific EPRI comments on "Regulatory Policy for Advanced Reactors," (SECY-84-453A) are as follows:

1. With respect to the earliest possible NRC involvement, EPRI concurs with the Commission's proposed policy which encourages early and frequent communication with interested parties on the characteristics of a proposed advanced reactor design. Further, it is important to establish a stable and predictable licensing and regulatory process for advanced reactors prior to the initiation of detail design. In this way, effective utilization of both industry and regulatory resources can be achieved. Thus, emphasis must be placed on establishing, as soon as practicable, a stable regulatory framework that is more resistant to unnecessary change.

2. With respect to desirable characteristics of advanced reactors, EPRI concurs with a design goal of a simpler and more reliable design with increased margins of safety which present less challenges to plant operators. However, it should be recognized that an advanced reactor design must achieve a balanced level of safety consistent with reliability and economic considerations to be a viable option. In developing advanced reactor design features to increase safety margins, all challenges to plant safety must be considered and appropriate provisions made to assure that an acceptable level of safety is attained commensurate with the event consequences and probability.

3. With respect to standardization, EPRI concurs that advanced reactor designs should have the goal of a complete standardized design consistent with the practicalities of constructing a plant in an orderly and economical manner. Conceptual designs should be reviewed with the Commission as soon as practical to establish the fundamental plant characteristics that are to be used in the licensing process. Once fundamental plant characteristics or a standardized design is approved, in order to eliminate unnecessary plant changes, a specific pre-established backfit process should be established and followed.

4. With respect to the NRC review of advanced reactors, EPRI recommends that for the evolutionary approach the current review process be followed to enhance the continuity of the review. The current reviewers are the ones most



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familiar with current technology and best able to review plants based on this technology. To assure focussed attention in implementing such a review, lead responsibility might be assigned to an advanced reactor review group to see that such reviews are obtained in a timely and in-depth manner. For advanced reactors based on radical design changes, an advanced reactor review group may well handle the entire review to assure that the development of new design and licensing criteria are accomplished in an efficient manner.

## ATTACHMENT 2

The EPRI responses to the questions contained in "Regulatory Policy for Advanced Reactors," (SECY-84-453A) are as follows:

1. The current regulatory process, with improvements, provides a workable framework for the requirements for advanced reactors based on evolutionary approaches and can provide the basis for a stable regulatory environment. An innovative regulatory approach potentially adds too much uncertainty in the licensing process to be acceptable for reactors anticipated to be operational in the 1990's.

EPRI believes that, in general, the current regulations are too prescriptive and in many cases overly conservative and recommends changes to current regulations to be applied to evolutionary advanced reactors based on the results of the major safety research results which NRC and the industry have obtained as well as from design, construction, and operating experience. Improvements in the current regulations should be considered in areas such as seismic criteria, piping integrity criteria, source term, emergency core cooling system criteria, quality assurance requirements, and technical specifications. Thus, EPRI recommends using the current regulatory process as the starting point for changing current regulations in an evolutionary manner as a means of achieving a stable licensing process for the evolutionary advanced reactors.

For advanced reactors based on radical design approaches, the use of performance standards appears to be a practical approach. Because a substantially longer period is anticipated for the development of these design concepts, it appears that the performance standards can be developed based on preliminary information as it becomes available and consistent with the initiation of the detailed design process. The overall safety goal should be common to all reactors.

2. EPRI believes that the Commission should encourage advanced reactor designs with larger safety margins based on inherent reactor design and process features where appropriate. This would allow more emphasis to be placed on the man-machine interface rather than the current over emphasis on events that exceed the design basis. This should be accomplished by designs that provide longer operator response times, simplify operator response and minimize diagnostic requirements. Further, advanced designs should be

based on best estimate, not conservative, analyses with a known quantifiable margin added at the end of the process. This analytical approach is necessary to assure a balanced design. In addition, once an acceptable margin of safety has been attained, changes which unnecessarily increase the safety margin should not be required if they affect the economic viability, reliability, or operability of the plant.

3. Consistent with the EPRI program, EPRI recommends that the Commission should encourage designs which reduce operator challenges and minimize plant complexity. Mandates tend to stifle the creativity necessary for an effective advanced design and should be avoided.

4. As previously discussed, two types of reactor design approaches should be included in the policy statement: (1) evolutionary designs based on current technology; and (2) radical design approaches. For evolutionary designs, the current general design criteria should be employed except in cases where the current criteria have been demonstrated to be excessively conservative and changes can be justified. This approach will provide a more stabilized approach to licensing. For advanced reactors based on radical design changes, development of new criteria may be required to reflect novel design features. In either case, the final criteria should be established before the final design begins and should not be changed during the design and construction processes.

5. Advanced reactor designs can only be judged on the basis of the total integrated plant design. Thus, it must be considered premature to prejudge the advanced designs that will be developed. Further, it must be demonstrated that an advanced design is economical, as well as safe, before it can be considered a viable concept. In general, as reflected in the EPRI program, EPRI believes that advanced designs should be based on a simpler and more reliable systems design approach which should be cost-effective.

6. The need for a demonstration or prototypical facility is dependent on the magnitude of change introduced by the advanced reactor design. For evolutionary approaches based on current technology, a demonstration facility should not be required because the basic design has previously been demonstrated. For advanced reactors based on radical design changes, it should be anticipated that a prototypical or demonstration facility will be required.