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Washington, D.C. 20585

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

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

Dear Mr. Chilk:

This letter provides the Department of Energy's comments on the Nuclear Regulatory Commission's (NRC) proposed policy statement regarding regulation of advanced nuclear powerplants as published in Federal Register on March 26, 1985. The answers to questions posed in that statement are provided in the enclosure.

The Department considers that it is critically important to improve the efficiency of the nuclear licensing and regulatory process and has had introduced into both Houses of Congress the "Nuclear Facility Standardization Act of 1985" to accomplish that objective. Any policy statement on the regulation of advanced reactors should be supplementary and complementary to that prime objective.

Within the above context, the Department endorses the Commission's intent to establish a basis for evaluating the technical merits of safety provided by the design features of advanced reactors and to develop an efficient licensing environment for these powerplants. We believe the development of regulations for advanced reactors that are truly less prescriptive and that rely more upon top level criteria and standards will constitute a major accomplishment. The policy statement should provide for the establishment of regulations for advanced reactors that encourage maximum flexibility in design approaches to meet safety criteria. The development of these criteria should provide standards that are easily measured to determine if criteria have been met.

Our agreement with these objectives is demonstrated by the emphasis we have been placing in our advanced reactor program to develop advanced designs that are reliable, economic, and meet safety requirements in a more demonstrable fashion. As part of our effort to achieve this objective, we are emphasizing utilization of innovative, and state-of-the-art technology to develop simplified standardized designs that include passive safety features. We expect that these efforts and NRC's policy for these powerplants will result in a less controversial and more efficient licensing process and minimized licensing costs.

Accordingly, we support the issuance of a policy statement on the topic of regulation of advanced reactors. The proposed policy statement should be

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add: Dennis K. Rathbun, H-1013
James G. Beckley, H-1013

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revised to make clear that the Commission intends to minimize the application of prescriptive regulations to licensing of advanced reactors and to eliminate the prescriptive design overtones that the present policy statement contains. The proposed policy should provide a clear statement encouraging the development of advanced reactors with the general characteristics described above but should not identify specific design solutions or features. Also, the revised statement should continue to limit the application of this policy to advanced reactors and specifically exclude concepts such as the final designs for evolutionary light water concepts currently being developed by commercial reactor vendors. Moreover, the policy statement should make clear that any standards that are evolved during the development of advanced reactors should not be applied in a backfit mode to existing powerplant designs.

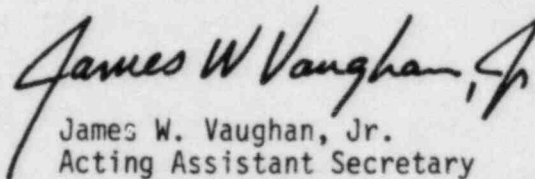
Also, the criteria for advanced reactor plants need not and should not be more strict than the criteria for current powerplants. Although it is anticipated that advanced reactors will achieve balanced improvements in economics and safety through design simplification, inclusion of passive features in these designs and improvements in the regulatory process, we do not believe that there is a basis to impose stricter criteria on these concepts.

We also endorse the Commission's proposed policy to encourage interactions among NRC, the Department, and the industry to review new designs at an early stage of development. We believe the establishment of an advanced reactor group within the NRC to function as the focal point for these interactions was appropriate and has been extremely helpful in our ongoing efforts.

Accordingly, we have been working with the NRC staff to develop plans and schedules for early discussion and review of the advanced reactor designs sponsored by the Department. We believe that this process is the best means for evaluating the design features important to the regulation of advanced reactors. We anticipate that the advanced reactor group will be vested with the resources and authority to conduct the necessary interactions and make recommendations to the Commission regarding the acceptability and licensability of advanced designs.

We look forward to your continued cooperation and assistance in the review of advanced reactors and would be pleased to respond in more detail should the need arise.

Sincerely,

A handwritten signature in dark ink, reading "James W. Vaughan, Jr." with a stylized flourish at the end.

James W. Vaughan, Jr.
Acting Assistant Secretary
for Nuclear Energy

Enclosure

cc:
Chairman, N. Palladino, NRC
Commissioner J. Asselstine, NRC
Commissioner F. Bernthal, NRC
Commissioner T. Roberts, NRC
Commissioner L. Zech, NRC
Executive Director for
Operations, W. Dircks, NRC

Department of Energy Comments and Answers to Questions Posed in the
Proposed Policy Statement for Regulation of Advanced Reactors
Issued by the Nuclear Regulatory Commission (NRC)
in the Federal Register on March 26, 1985

General

1. The scope of the proposed policy statement is appropriate. The proposed policy statement dealing with regulation of advanced nuclear powerplants should be viewed as one of several mechanisms for internally reforming the administrative process of nuclear reactor regulation governing plants for which construction permit applications have not been submitted.
2. The policy statement focuses on prescribing design features as the means to improve the efficiency of the licensing process and does not address the critical importance of rationalizing the administrative regulatory process itself. We believe that if the policy statement is not consistent with actions such as those contained in our proposed licensing reform legislation, investment risks of new powerplants may not be acceptable.
3. A range of policy approaches exist; some policy approaches may be well suited to the regulation of some reactor concepts but cause undue hardship for others. We recognize that you have considered a number of options before selecting the approach in the proposed policy statement. We believe that our comments and responses to your questions may lead you to consider alternate approaches. Presented below are some such viable alternatives:
 - o Regulatory requirements that eliminate whole classes of candidate concepts, such as requirements that any new reactor employ passive safety systems (the proposed policy statement would seem to be of this form).
 - o Process improvements only (backfit reform, standardization, Standard Review Plan updating); probably best suited for improved or evolutionary adaptations of operating Light Water Reactors (LWR's) and not recommended for the kind of reactors considered under the proposed policy statement.
 - o Process improvements together with incentives to develop designs which would make compliance with NRC requirements easier, or give greater public assurance that severe accidents would have relatively benign consequences.
 - o An additional set of requirements for new designs such as a requirement to demonstrate compliance by system performance tests (moving away from the demonstrate-by-analysis approach associated with current requirements and designs).

- o A fundamental restructuring of the regulatory process for new reactors. For example, if the intent is to develop the framework for applications in the mid-1990's, a top-down approach could be employed, based on safety goals and PRA; a move away from deterministic criteria and new procedures based on risk based criteria or performance based criteria could be the basis for a new approach.

The evident shortcomings of the present system strongly support the use of top level criteria, implemented through a predictable, well defined review process. Absent some showing of significant disadvantage of such an approach for advanced reactors, the Department recommends that the Commission move in this direction.

Responses to the Questions Posed in NRC Policy Statement for Regulation of Advanced Nuclear Powerplants

NRC Question Number 1

Should NRC's regulatory approach be revised to reduce dependence on prescriptive regulations and, instead, establish less prescriptive design objectives, such as performance standards? If so, in what aspects of nuclear powerplant design (for example, reactor core power density, reactor core heat removal, containment, and siting) might the performance standards approach be applied most effectively? How could the implementation of these performance standards be verified?

DOE Response:

NRC's regulatory approach should be revised to reduce dependence on regulations that effectively prescribe design features. Unless this is changed, implementation of the policy will exact a heavy penalty, both in terms of discouraging innovation and in terms of limiting the applicants' flexibility in seeking a balanced approach to safety. Less prescriptive design objectives, including approaches which start from the specification of top level safety criteria, should be a useful alternative to existing practices, and their use will require definition of criteria, and acceptable methodologies for showing compliance with such criteria. Accordingly, we recommend that the Commission's regulatory approach consist of:

1. establishing top level safety criteria.
2. establishing a predictable, well defined regulatory process.

This well defined regulatory process should identify the information that will be required by NRC and the methodology it will use to evaluate this information to determine if the top level criteria have been satisfied. In turn, the designer, constructor and operator should be provided the flexibility to propose the approaches and requirements that each of these respective institutions will use to satisfy both the top level safety criteria and economic requirements. These institutions should also be provided the flexibility to propose standards or lower level criteria that will be used with the above prescribed methodology to determine if design requirements have been met. Each institution should also be provided the

flexibility to propose the combination of tests, analysis, and standards developed by recognized technical societies, etc. that the institution will utilize to provide sufficient confidence that the safety criteria will be met.

This approach should also facilitate the ability of the public and others to follow and thus concur with decisions and actions taken by NRC and the owner operator throughout the design, construction and operation of these powerplants. This understanding is mandatory for optimizing the efficiency of the licensing process and optimizing the ability of the design, construction, and operation to meet the safety criteria in a cost effective manner.

We recognize that the implementation of this approach will not be simple and we recommend that the policy statement provide for early interactions between NRC and the Department's advanced reactor program to remove obstacles to the implementation of this approach.

NRC Question Number 2

Should the regulations for advanced reactors require more inherent safety margin in their design? If so, should the emphasis be on providing features that permit more time for operator response to off-normal conditions, or should the emphasis be on providing systems that are capable of functioning under conditions that exceed the design basis?

DOE Response:

No. The regulations for advanced reactors should provide flexibility in the design approach to meet the basic safety requirements. The proposed policy statement encourages "more inherent safety margin". That term is undefined and susceptible to varying interpretations. There is no fundamental reason for requiring stricter criteria than applied to current generation LWR's. In any event, before any attempt is made to encourage use of systems that permit more time for operator response to off-normal condition or systems that are capable of functioning under conditions that exceed the design basis, any benefit of such requirements should be weighed against other overall changes in plant investment risk or health risks and other important factors such as system complexity, constructibility and maintainability.

NRC Question Number 3

Should licensing regulations for advanced reactors mandate simplified designs which require the fewest operator actions, and the minimum number of components needed for achieving and maintaining safe shutdown conditions, thereby facilitating operator comprehension and reliable system function for off normal conditions?

DOE Response:

We believe that the NRC should not mandate design simplification. Clearly, system choices that facilitate operator comprehension and reliable functions should be encouraged. However, the designers should have the flexibility to strike a balance between those features that provide greater

time for operator action against impacts on plant economics so long as safety goals are met.

NRC Question Number 4

Should the NRC develop general design criteria for advanced reactors by modifying the existing regulations, which were developed for the current generation of light water reactors, or by developing a new set of general design criteria applicable to specific concepts which are brought before the Commission?

DOE Response:

We believe a set of design criteria should be established for each class of advanced reactor concepts. We also believe these criteria should be developed as part of interactions between NRC and each of the Department's advanced reactor programs during the development of the individual concepts, and should reflect the unique features and characteristics of those concepts.

NRC Question Number 5

Should the NRC favor advanced reactor designs that concentrate the primary safety functions in very few large systems (rather than in multiple subsystems), thereby minimizing the need for complex benefit and cost balancing in the engineering of safe reactors?

DOE Response:

We do not believe that NRC should favor any specific advanced reactor design features or approaches.

NRC Question Number 6

What degree of proof would be sufficient for the NRC to find that a new design is based on technology which is either proven or can be demonstrated by a satisfactory technology development program? For example, is it necessary or advisable to require a prototypical demonstration of an advanced reactor concept prior to final licensing of a commercial facility?

DOE Response:

There is an extensive base of regulatory precedence on the level of data required to substantiate compliance with regulatory requirements. Demonstration of a concept as an additional licensing requirement for new reactors, or as a substitute requirement, needs to be considered in the context of a review of a specific design. Therefore, full scale testing of a prototypical reactor or major subsystem thereof, should not be a requirement, per se, but maybe a permissible alternative.