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Honorable Nunzio J. Palladino  
Chairman  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Dr. Palladino:

SUBJECT: ACRS COMMENTS REGARDING NRC REVIEW OF ADVANCED REACTOR  
DESIGNS

During its 311th and 312th meetings, March 13-15 and April 10-12, 1986, the Advisory Committee on Reactor Safeguards heard presentations by the NRR Staff, DOE personnel, and DOE industrial subcontractors on one advanced gas-cooled reactor (GCR) design and two advanced liquid-metal reactor (LMR) designs. These designs are in their early stages, and a unique feature of the design efforts is that NRR personnel have provided safety input very early in the conceptual design stage. This approach, which is in accord with the NRC Advanced Reactor Policy Statement, contrasts with that followed in the design of most of the current generation light water reactors (LWRs) wherein a finalized design was presented to NRC for review and approval (or disapproval). The ACRS believes that significant safety benefits can result from an early interaction between the NRC and the designers and that NRC can have a fundamental influence on the safety aspects of a design if its input is provided at an early stage when design changes can be made both easily and without substantive cost. This contrasts with the situation wherein a finished design is presented to NRC and the latter has considerable difficulty influencing the safety design of the reactor other than through "patches" or "add ons," as some have described the process. The ACRS has recommended the early-interaction approach in the past, and we continue to support it strongly.

These design efforts are directed toward achieving high levels of safety as well as toward achieving low costs and improved operating features. They are thus aimed toward implementing the policy of the Congress as expressed in the Atomic Energy Act. Many innovative features are evolving. For example:

1. LMR designs are being developed which the designers believe would tolerate, without core melt or significant radiation release, very severe accidents such as loss of flow without scram, power excursion without scram (both commonly referred to as ATWS for LWRs), and loss of heat sink without scram. These designs are being influenced by tests run during the past months on EBR-II in Idaho, which have proved that some LMRs can indeed tolerate such severe accidents without public health effects.
2. The designers believe that the need for emergency evacuation planning for the surrounding population can be totally or almost totally eliminated.
3. The reactors which are evolving are small, modular units that

would be built in a central factory and shipped by truck, rail, or barge to a site. With factory fabrication, it should be possible to eliminate most of the QA/QC problems which have harassed the current LWRs. With small units, the capital costs per unit should be low, a feature attractive to prospective purchasers.

4. Designs may evolve for which no operator actions would be required in the case of some severe accidents, fires, or types of sabotage for at least several hours.

These and many more innovative features are evolving. However, in order to optimize a design, it may not be necessary to incorporate safety features which would be required in a current LWR. The designers believe that they cannot be innovative in selected areas only; they believe they must be innovative across the board if they are to succeed.

We have been told by NRR Staff that their budget is being reduced drastically and that it may be necessary to terminate the early interactions with DOE. We are also told by DOE that it will be a great loss if this interaction ceases, that DOE and its subcontractors will be unable to proceed effectively without NRC safety input and regulatory guidance. Further, DOE will probably need to share costs with industry, and the latter may be more inclined to provide financial support if DOE can make some sort of statement that NRC considers the designs to be licensable.

We believe that it would be very shortsighted for NRC to terminate this effort for budgetary reasons. We realize that the agency has severe financial problems, but the total amount of resources involved here is very small, and we strongly urge a continuation of this modest effort. If DOE proceeds without NRC input, the NRC may have missed a golden opportunity to influence reactor safety. If DOE stops, the NRC may bear part of the responsibility for failure of the Congressional policy.

Although the comments above have been based on GCR and LMR activities which have been before us recently, the underlying considerations pertain fully as much and perhaps even more to advanced LWRs now being developed and designed by various U.S. organizations.

Sincerely,

David A. Ward  
Chairman

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