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Mr. James M. Taylor
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Taylor

SUBJECT: EVALUATION OF RISKS DURING LOW POWER AND SHUTDOWN
OPERATIONS OF NUCLEAR POWER PLANTS

During the 376th meeting of the Advisory Committee on Reactor Safeguards, August 8-9, 1991, we continued our discussion of the NRC staff program to address the risks posed by nuclear power plants during low power and shutdown operations. We had previously received a status report on this program from the staff during our 374th meeting, June 6-7, 1991. During the same meeting, we also heard a presentation from NUMARC concerning industry efforts to address this issue. Our Joint Subcommittee on Plant Operations and Probabilistic Risk Assessment had met with representatives of the staff and NUMARC on June 5-6, 1991, concerning this matter. We also had the benefit of the documents referenced.

We share the staff's concern that this issue needs to be addressed in a thorough and systematic manner and are favorably impressed with the approach being taken. We are encouraged that the industry is also actively pursuing this issue.

There are three aspects of the staff's shutdown risk study that we believe merit comment:

1. The staff was unable to provide us with the information concerning the design of containment equipment hatches that we had requested during our review of NRC Generic Letter 88-17 on loss of decay heat removal. We had asked how many plants have hatches that are pressure-seating and could be easily closed if the containment were in danger of being pressurized, as opposed to plants having pressure-opening hatch designs that require essentially full bolting to accomplish sealing under pressure. This appears to us to be an important question that could be answered by referring to available information. A related issue concerns the ability of the licensees to effect closure of their equipment hatches when AC power is not available. The March 1990 loss-of-power event that occurred at Vogtle, Unit 1, demonstrated the importance of this consideration. The NRC staff has stated that these matters will be addressed as part of the shutdown risk study.
2. One component of the shutdown risk study is the development of two PRAs designed to quantify risks posed by low power and shutdown operations. The two plants, Surry and Grand Gulf, chosen for these studies are among those previously modeled

as part of the NUREG-1150 studies. We pointed out to the staff that neither of these plants is a good surrogate for the U.S. population of operating reactors. Surry is one of the few PWRs that has isolation valves in its reactor coolant system which permits the licensee to minimize operation at "mid-loop" conditions. Grand Gulf represents the BWR/6 product line; as such, it is representative of only a small fraction of the total population of operating BWRs.

The staff acknowledged this point, but argued that the review of these plants in the NUREG-1150 effort aids in evaluation of shutdown risk. The willingness of the owner/operators to participate in this study was also a consideration. The degree to which these plants can be considered representative of their surrogate populations will need to be established if the shutdown PRA studies are to be relied on in making regulatory decisions concerning the resolution of this issue.

3. Another concern deals with the NRC staff's modeling approach for the PRA studies. The staff has a two-pronged effort under way. For the short term, a coarse "screening analysis" using "conservative" assumptions will be performed on a schedule that supports the staff's commitment to provide recommendations by the end of the year on measures to minimize shutdown risk. For the long term, a more complete PRA study will be conducted. The long-term effort will not be complete at least until some time during 1992-93.

The staff's discussion of the conservatism being used in these screening analyses raised concerns with us as to the usefulness of this work. For example, we were told that modeling of human error would be dealt with by assuming that, in most cases, the operator makes the wrong decision in taking action during sequences that could lead to core damage. Since these studies will presumably play some role in the recommendations that the staff will present later this year concerning amelioration of shutdown risk, we caution that PRAs performed in this manner can lead to badly flawed regulatory decisions.

Our views on the use of PRA in the regulatory process are further discussed in our report of July 19, 1991, to Chairman Selin. We recommend that the staff carefully consider the comments presented in that report.

We wish to be kept informed regarding the resolution of the above matters, and we will continue to monitor the progress of the staff and industry programs.

Sincerely,

David A. Ward
Chairman

References:

1. Memorandum dated October 22, 1990, from J. Taylor, Executive Director for Operations, NRC, for the Commissioners, Subject: Staff Plan for Evaluating Safety Risks During Shutdown and Low Power Operation.
2. Memorandum dated September 5, 1990, from J. Taylor, Executive Director for Operations, NRC, for the Commissioners, Subject: Shutdown Risks in Evolutionary and Advanced Reactors.