

D890119

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: MARK I CONTAINMENT PERFORMANCE IMPROVEMENT PROGRAM

During the 345th meeting of the Advisory Committee on Reactor Safeguards, January 12-14, 1989, we heard a staff presentation on their draft proposed paper entitled, "Mark I Containment Performance Improvement Program." This matter was also discussed during our 344th meeting, December 15-16, 1988, and by our Subcommittee on Containment Systems on December 6, 1988. The Committee also discussed this issue during meetings held in July and December 1986 and December 1987. We also had the benefit of the documents referenced.

Mark I BWR plants have been singled out for special attention because of indications of a high probability that their containments may not be effective in mitigating severe core melt accidents. A conditional failure probability as high as 90 percent has been estimated for some accident sequences. Even if this estimate is shown to be valid, indications are that these plants do not present a risk to the public that is larger than average for LWRs, because the probability of core melt (i.e., the need for containment) is calculated to be lower than is typical for PWRs.

The package of improvements for Mark I plants being proposed by the staff is primarily directed toward lowering the probability of core melt without changing noticeably the conditional probability of containment failure. The staff has documented estimates of a factor of five to ten in the reduction of core melt probability due to internal accident initiators for plants that incorporate the proposed recommendations. Estimates of improvement in containment performance have not been calculated, although there are statements that the probability of failure will be reduced. We were told in an oral presentation that the improvements might reduce the conditional probability of failure to less than 50 percent. It was emphasized that this was only an estimate.

We have previously expressed our opinion that the Commission's safety goal is an appropriate standard for establishing how safe plants should be. We also have suggested in our letter dated April 15, 1986, that an implementation plan for the safety goal should provide a framework for assuring that plants have adequate defense in depth as well as assuring that they meet quantitative risk standards. As a class, Mark I plants, as indicated by several PRAs for particular plants, appear to conform to the quantitative risk standards. These plants may not have an appropriate balance between prevention and mitigation.*

On the basis of a limited analysis of the potential costs and benefits of the proposed improvements, the staff concludes that the improvements are generally cost beneficial and are thereby justified for all 24 Mark

I plants. We do not agree. A number of assumptions used in the analysis seem not to provide a fair and balanced comparison of potential costs and benefits. It appears to us that there would be a wide variation in the conclusions if the analysis were done for each individual plant.

We conclude that no risk-based reason has been identified which justifies singling out Mark I plants from the general population of LWRs. There is a program to look at all plants to identify any possible "risk outliers." This is the Individual Plant Examination (IPE) program. We believe that Mark I plants should be analyzed as a part of this program and that vulnerabilities in individual plants can thereby be identified, analyzed, and corrected where necessary.

We recommend that the proposed improvement plan for Mark I containments be dropped so that licensee and NRC resources can concentrate on the more effective IPE approach.

Sincerely,

Forrest J. Remick
Chairman

* For this discussion, we define prevention as those activities intended to keep the core from melting, and mitigation as those activities intended to keep fission products released from a melted core away from the public.

References

1. Draft Proposed Paper from V. Stello, Jr., Executive Director for Operations, to the Commissioners, Subject: Mark I Containment Performance Improvement Program (Predecisional), received January 13, 1989
2. U. S. Nuclear Regulatory Commission, Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities - 10 CFR 50.54(f)," November 23, 1988

→