



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, D. C. 20555

September 7, 1983

Mr. William J. Dircks  
Executive Director for Operations  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Dear Mr. Dircks:

SUBJECT: ACRS REVIEW OF NRC STAFF RESOLUTION FOR UNRESOLVED SAFETY ISSUES  
A-1, "WATER HAMMER," AND A-43, "CONTAINMENT EMERGENCY SUMP  
PERFORMANCE"

During its 281st meeting, August 31-September 1, 1983, the Advisory Committee on Reactor Safeguards reviewed the NRC Staff resolution for Unresolved Safety Issues (USI's) A-1, "Water Hammer," and A-43, "Containment Emergency Sump Performance." These issues were discussed at Subcommittee meetings held on December 2-3, 1981 and May 10, 1983. The Committee also had the benefit of the referenced documents.

While we generally concur with the proposed resolution for USI's A-1 and A-43, we wish to bring the following specific points to your attention:

USI A-1

In the discussion of USI A-1, it became apparent that there may not have been sufficient attention given to the complicating effects of water hammer occurring in the course of abnormal events initiated by other causes. The scope of A-1 has been confined to evaluation of events initiated by water hammer, and the development of means to reduce the frequency and consequence of the types of events that actually have been experienced. We accept that scope for A-1, but believe that the more general question deserves attention. We would like to have a report from the NRC Staff describing the extent to which existing risk analyses have accounted for water hammer phenomena which could be postulated to render important preventive or mitigative systems inoperative or to otherwise worsen the course of transients or accidents which might threaten the public health and safety.

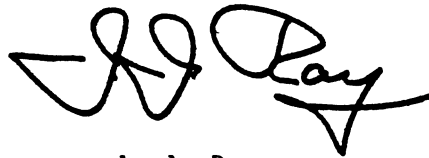
USI A-43

The NRC Staff review has indicated there is potential for pump failure if particulates are ingested in water-cooled bearings or seals. However, no specific review requirements for this item appear in the A-43 resolution document (NUREG-0869). We recommend that the final resolution of USI A-43 include explicit consideration of the consequences of particulate ingestion on pump performance as well as other possible effects, such as the plugging of various system's components.

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We believe that the estimates of probability of pipe breaks used in the A-43 analysis are reasonable values to assume given the present state of understanding of the nature of pipe failures and recent information about the extent of cracking in certain LWR primary piping systems. Although we agree it was properly applied in this case, we believe that the probabilistic and fracture mechanics arguments concerning leak before break, which were developed in support of a proposed resolution of the asymmetric loads issue, should not be too quickly nor too generally applied to other issues without very thorough analysis and review.

Sincerely,

A handwritten signature in black ink, appearing to read "J. J. Ray". The signature is stylized with loops and a long horizontal stroke at the end.

J. J. Ray  
Chairman

References:

1. U. S. Nuclear Regulatory Commission, "Evaluation of Water Hammer Occurrence in Nuclear Power Plants - Technical Findings Relevant to Unresolved Safety Issue A-1," USNRC Report NUREG-0927, dated May 1983
2. U. S. Nuclear Regulatory Commission, "Value-Impact Analysis for USI A-1, 'Water Hammer,'" USNRC Report NUREG-0993, dated May 1983
3. U. S. Nuclear Regulatory Commission, "Unresolved Safety Issue A-1, 'Water Hammer,'" USNRC Report SECY-83-188, dated May 16, 1983
4. U. S. Nuclear Regulatory Commission, "USI A-43, Resolution Positions," USNRC Report NUREG-0869, dated April 1983
5. U. S. Nuclear Regulatory Commission, "Containment Emergency Sump Performance - Technical Findings Related to Unresolved Safety Issue A-43," USNRC Report NUREG-0897, dated April 1983
6. U. S. Nuclear Regulatory Commission, "Unresolved Safety Issue A-43, 'Containment Emergency Sump Performance,'" USNRC Report SECY-83-149 dated April 27, 1983
7. Memorandum from A. W. Serkiz, NRC, to K. Kniel, NRC, "Report on the A-43 Public Meetings Held on June 1-2, 1983," dated June 8, 1983