

D880816

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

Dear Chairman Zech:

SUBJECT: PROPOSED RESOLUTION OF USI A-17, "SYSTEMS INTERACTIONS IN
NUCLEAR POWER PLANTS"

During the 340th meeting of the Advisory Committee on Reactor Safeguards, August 11-13, 1988, we discussed with members of the NRC Staff the proposed resolution of USI A-17, "Systems Interactions in Nuclear Power Plants." This matter was considered also during our 338th meeting, June 2-4, 1988. Our Subcommittee on Auxiliary Systems discussed this matter with representatives from the NRC Staff and Oak Ridge National Laboratory during its meeting on August 10, 1988. During the review, we had the benefit of the documents referenced. Our most recent comments on this subject were provided to you in a report dated May 13, 1986.

The systems interaction issue was first identified as a safety concern by the ACRS in 1974, and designated as a USI in 1978. Since then, there has been considerable difficulty in defining the issue and establishing its scope. As now defined by the Staff, USI A-17 is limited to: "Actions or inactions (not necessarily failures) of various systems (subsystems, divisions, trains), components, or structures resulting from a single credible failure within one system, component, or structure and propagation to other systems, components, or structures by inconspicuous or unanticipated interdependencies..." If such a systems interaction is found to be undesirable from the safety viewpoint, it is called an adverse systems interaction.

We interpret this definition to mean that an initiating event such as an equipment failure is required before a systems interaction can take place. The initiating event may cause many things to happen including the failure of other equipment to function. Most of these resulting failures will not be considered systems interactions because expected failure of equipment to function or to malfunction in a particular way is an anticipated occurrence. Only if an occurrence involves inconspicuous or unanticipated interdependencies or failure modes does it become a systems interaction, and it is an adverse systems interaction only if it is found to be undesirable (i.e., adverse to plant safety).

The proposed resolution does not encompass the full spectrum of potential systems interactions that have been identified. Some of the omissions are the result of assumptions and limitations imposed by the Staff in order to achieve resolution. Our remaining concerns are expected to be addressed in the Multiple System Response Program (MSRP).

Although the proposed resolution of USI A-17 does not represent a comprehensive, and probably not a final, resolution of our concerns about systems interactions, we believe that the potential for a continuing effort through the MSRP is a step in the right direction. In addition, and equally important, systems interactions, some of which may be adverse to safety, will continue to be revealed by operating experience in existing plants. These should be evaluated by the Staff as they occur, and the lessons learned incorporated into the requirements and practices of the agency.

In summary, we believe that the proposed resolution has a real potential to reduce risk. Since the systems interactions issue is so comprehensive, it is unlikely that it will ever be "resolved" in the sense that all adverse systems interactions will be found and corrected. We are willing to accept the proposed resolution of USI A-17. This acceptance, however, is based on the expectation that the efforts in the MSRP and the search for systems interactions in operating experience will be continued.

We point out, however, that the proposed resolution does not address systems interactions for future plants, especially those plants involving design certification based on conformance with the EPRI requirements for advanced light water reactors. These requirements commit only to conformance with the resolution of USI A-17, which, as we have pointed out above, does not constitute a truly comprehensive resolution of the full spectrum of our concerns regarding systems interactions.

The proposed resolution of USI A-17 represents a useful step in the direction of reducing plant risk due to adverse systems interactions for the present generation of plants. We recommend that it be issued for public comment. After the public comment period, we expect to review the proposed final resolution together with the public comments.

Sincerely,

W. Kerr
Chairman

References:

1. U.S. Nuclear Regulatory Commission, Draft NUREG-1174, "Evaluation of Systems Interactions in Nuclear Power Plants," Technical Findings Related to Unresolved Safety Issue A-17, April 1987
2. U.S. Nuclear Regulatory Commission, Draft NUREG-1229, "Regulatory Analysis for Proposed Resolution of USI A-17, Systems Interactions in Nuclear Power Plants," May 1987
3. Draft Generic Letter, with Attachments, from NRR to All Holders of Construction Permits or Operating Licenses, regarding Resolution of Unresolved Safety Issue A-17, "Systems Interactions in Nuclear Power Plants" (undated)
4. Draft Letter Report, "Concerns Regarding Resolution of a Number of Specific Regulatory Issues," prepared by Nuclear Operations Analysis Center, Oak Ridge National Laboratory, dated May 29, 1988 (internal use only)

→