D860917

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

Dear Mr. Zech:

SUBJECT: ACRS COMMENTS ON THE RESOLUTION OF USI A-46, "SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS"

During its 316th meeting, August 7-9, 1986, and its 317th meeting, September 11-13, 1986, the Advisory Committee on Reactor Safeguards reviewed the proposed resolution of Unresolved Safety Issue (USI) A-46, "Seismic Qualification of Equipment in Operating Plants." During our review, we had the benefit of discussions with representatives of the Seismic Qualification Utilities Group (SQUG) and the NRC Staff, as well as the benefit of the documents referenced. The ACRS Subcommittee on Reliability Assurance met on this topic on August 5, 1986 in Washington, D.C.

Over the past several years, the ACRS has had the benefit of numerous other briefings on the status of USI A-46. On each occasion we endorsed the approach being pursued by the NRC Staff in conjunction with SQUG as being appropriate.

USI A-46 applies to all nuclear plants not licensed under current seismic qualification practice as defined in Regulatory Guide 1.100, IEEE Standard 344-1975, and Section 3.10 of the Standard Review Plan. Although we are still in agreement with the general approach for resolution of USI A-46, we have the following concerns relating to the final resolution and the proposed implementation procedure. Where the concerns relate to components, most of the items are nonseismically qualified components outside of containment.

1. The required seismic adequacy review will identify the minimum set of plant equipment required for safe, hot shutdown following an earthquake. This minimum set will be protected from seismically induced failure of other equipment which could threaten the integrity or operability of the set. It is our understanding that the adequacy review will include a search for such failures, but will be limited to equipment whose failure can result in direct physical impact or electrical interaction with the set. Omitted are indirect interactions such as may be caused, for example, by flooding from the failure of a nonseismically qualified tank or pipe in the vicinity but beyond the physical impact range. We believe that a search for such indirect interactions should be included.

2. When performing a seismic adequacy review, it appears logical to consider the seismic event as a simultaneous challenge to all plant structures, systems, and components. All credible accompanying failures should be considered as concurrent when forecasting consequences. It is not clear that such a requirement exists. It

should be recognized that past studies have explored safety issues, such as flooding from pipe rupture, on the basis of only one such event occurring at a time. The safety conclusions from these studies will not necessarily apply for the seismic case wherein a combination of events may occur simultaneously.

3. The absence of any mention of seismically induced fires is noteworthy. We believe this issue should be explored in sufficient depth, within the scope of the final resolution, to justify why such fires need not be considered, if this is indeed the case.

4. In addition, seismically induced actuations of fire protection features are not within the scope of the USI A-46 resolution. No reasonable justification is presented to support this omission. It may be inappropriate to rely on 10 CFR Part 50, Appendix R analyses, since they include an inadvertent actuation as a singular event for which safe shutdown may be achieved by redundant equipment located beyond the affected area. For the seismic case, multiple actuations may be possible and at least one inadvertent actuation might directly affect the minimum set of equipment required for safe shutdown. It appears to us that the kinds of components and control arrangements found in fire protection features could be susceptible to the failure modes identified by SQUG for other nonseismic equipment. Therefore, inadvertent actuation and its full impact on the equipment environments should be included in the required seismic adequacy review.

5. It is our understanding that the assumption is made that, irrespective of size or seismic qualification, there will be no seismically induced failures of high-energy pipes. (The proposed resolution remains silent on moderate energy pipes.) We believe that this may be an unrealistic assumption for smaller, high- (or moderate) energy pipes unless supported by a plant-specific study which verifies that even the smallest air, instrument, or water lines will not fail, and are not susceptible to physical interaction damage resulting from failures of nearby nonqualified structures or components. If such failures can occur, they should be considered concurrent with the earthquake and any adverse environmental effects fully analyzed. If such failures result directly or indirectly in a small LOCA, then the adequacy of the minimum set of safe shutdown equipment to cope with its consequences should be included in the analysis.

As of this date, the final resolution of USI A-46 has not yet been presented to the Committee to Review Generic Requirements (CRGR). We wish to be informed of the outcome of the CRGR review.

Additional comments by ACRS Member David Okrent are presented below.

Sincerely,

David A. Ward
Chairman

Additional Comments by ACRS Member David Okrent

It is not clear that the background of empirical experience for components beyond the first eight classes studied is sufficiently comprehensive to cover its application to other classes of equipment. I recommend that the Senior Seismic Review and Advisory Panel (SSRAP) be asked to provide detailed review and comments in writing for each class of components, spelling out the strengths and deficiencies of the data for the surrogate qualification task. Individual members of SSRAP should be encouraged to identify any and all points of concern.

The Staff appears to be subsuming the issue of relay chatter into USI A-46 for relay performance at the SSE level. I believe that this aspect of the work requires input from PRA studies into how serious relay chatter would be. Considerable assurance should be demonstrated that relay chatter would not cause serious consequences.

Many of the older plants, which have had the benefit of seismic walkdowns as part of USI A-45, exhibited significant deficiencies, including anchorages, battery supports or spacers, and some vital water tanks. I am concerned that there may still be a significant number of operating plants which have such deficiencies and that they are not being uncovered and remedied promptly. I recommend that the Staff minimize as much as possible the time by which all likely candidate plants have the benefit of seismic walkdowns, without waiting until other aspects of A-46, A-45, etc. have been resolved.

References:

1. U.S. Nuclear Regulatory Commission, "Seismic Qualification of Equipment in Operating Nuclear Power Plants," Unresolved Safety Issue A-46, USNRC Report NUREG-1030 (Internal Review Version), transmitted by memorandum from T. P. Speis, NRC, to NRC Division Directors dated June 30, 1986
2. U.S. Nuclear Regulatory Commission, "Regulatory Analysis for Proposed Resolution of Unresolved Safety Issue A-46, Seismic Qualification of Equipment in Operating Plants," USNRC Report NUREG-1211

(Internal Review Version), transmitted by memorandum from T. P. Speis, NRC, to NRC Division Directors dated June 30, 1986