ACRSR-1905

July 20, 2000

Dr. William D. Travers
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Dr. Travers:

SUBJECT: PROPOSED FINAL ASME STANDARD FOR PROBABILISTIC RISK ASSESSMENT FOR NUCLEAR POWER PLANT APPLICATIONS

During the 474th meeting of the Advisory Committee on Reactor Safeguards, July 12-14, 2000, we met with representatives of the American Society of Mechanical Engineers (ASME) Committee on Nuclear Risk Management (CNRM) to discuss the proposed final Standard for Probabilistic Risk Assessment (PRA) for Nuclear Power Plant Applications. Our Subcommittee on Reliability and PRA met with the ASME CNRM on June 28, 2000, to discuss this matter. We previously reviewed a draft version of the ASME Standard and commented in a letter dated March 25, 1999.

Conclusions and Recommendations

1. The proposed Standard is not a traditional "design-to" engineering standard or a procedures guide. Consequently, any argument that a PRA should be accepted by the staff simply because it meets the Standard would not be valid.

2. The Standard should be useful because it provides a framework for the systematic assessment of PRA elements. This will aid staff reviews by identifying weak elements in a PRA. Because the Standard can accommodate a wide range of PRA quality, however, the staff will still need to make a case-by-case assessment of the adequacy of the PRA.

3. The three categories of PRA requirements proposed in the Standard deal reasonably with the wide range of risk-informed decisions. The differences among the categories should be delineated more clearly, especially the treatment of uncertainties.

4. The discussion of the categories of requirements needed for particular regulatory applications that is given in Section 1.5, "Application Categories," can be misleading and should be deleted.

5. More guidance and examples should be given on the circumstances under which supplementary analyses would be needed and how they would enhance the scope and level of detail in a PRA.

Discussion

The quality of PRA is at the heart of a successful risk-informed regulatory system. The term “quality” includes many things, such as issues of scope, detail, and technical adequacy of the analyses. PRAs are very ambitious. To model everything that is relevant in a particular situation, including hardware failures, human performance, as well as physical and chemical phenomena, is extremely difficult. Defining PRA quality *a priori* is a highly subjective and very difficult task, given the varied nature of potential risk-informed decisions. Thus, PRA quality should be evaluated in the context of the decision the PRA supports. If, for instance, a particular decision is insensitive to recovery actions, a PRA that does not include such actions would not suffer in quality for that particular decision.

The Standard recognizes this difficulty and proposes three categories of requirements that determine the range of applications for which a PRA would be appropriate. The delineation of the differences among categories is not always clear and this situation is exacerbated by the fact that the Standard relies primarily on tables with limited accompanying text. More details on the differences among the categories and further elaboration on the requirements would be beneficial.

The NRC staff will ultimately have to decide whether the submitted risk information is sufficient and of adequate quality to support a particular risk-informed decision. The categories and the associated requirements will facilitate this process by helping all parties involved establish a common PRA language and by providing a framework within which potential weaknesses of the PRA could be identified early in the decisionmaking process.

The Standard should not be viewed in the same way as other, more traditional, “design-to” standards usually associated with ASME. PRAs of a wide range of quality could be said to meet the requirements of the Standard. Consequently, any argument that a PRA should be accepted by the staff simply because it meets the Standard is moot. The discussion of the categories of requirements needed for a particular regulatory application provided in Section 1.5 of the Standard should be deleted to avoid misunderstandings and misleading expectations. We were told by the ASME representatives that they would consider revising this Section to avoid these problems.

For a given application, the Standard allows the use of supplementary analyses to augment the PRA but does not provide guidance on the scope and level of detail of these analyses relative to that provided for the categories. Lack of such guidance may increase the NRC staff effort required to assess the appropriateness of the supplementary analyses in risk-informed decisionmaking.

We offered a number of detailed comments on the Standard that the ASME representatives agreed to consider. We look forward to reviewing the staff's work related to this matter.

Sincerely,

/RA/

Dana A. Powers
Chairman

References:

1. Letter dated June 14, 2000, from G. M. Eisenberg, ASME International, to M. Markley, ACRS, transmitting Draft #12 of Proposed ASME Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications, dated May 30, 2000.
2. American Society of Mechanical Engineers, "White Paper and Guidance to Reviewers of the Draft ASME Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated June 13, 2000.
3. Letter dated March 25, 1999, from Dana A. Powers, Chairman, Advisory Committee on Reactor Safeguards, to William D. Travers, Executive Director for Operations, NRC, Subject: Proposed ASME Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications (Phase 1).