

December 20, 2002

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

Dear Dr. Travers:

**SUBJECT: DRAFT FINAL AMERICAN NUCLEAR SOCIETY EXTERNAL EVENTS  
PROBABILISTIC RISK ASSESSMENT METHODOLOGY STANDARD**

During the 498<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, December 5-7, 2002, we met with Dr. R. Budnitz, Chairman of the American Nuclear Society (ANS) External Events Working Group, to discuss the draft final ANS External Events Probabilistic Risk Assessment (PRA) Methodology Standard (BSR/ANS 58.21).

## **CONCLUSIONS**

- The draft final ANS External Events PRA Methodology Standard adds to the standards available to assist in preparing PRAs for nuclear power plants.
- The Standard defines requirements for three capability categories of external events PRAs that differ in terms of their level of resolution, conservatism, and use of site-specific data.
- The Standard does not address the issue of seismically induced fires. ANS is currently working on a standard for fire PRA. The interface between the fire PRA and external events PRA will need attention.

## **DISCUSSION**

The NRC is moving toward greater use of risk information in the regulation of nuclear plants, and that move is creating growing demands for high-quality PRAs. Specifically, these demands are for risk assessments dealing with internal events, external events, events initiated by fire, and events during low-power and shutdown operations. The usual methods for ensuring quality for engineering analyses such as risk assessments are checking compliance with recognized standards and peer reviews.

The American Society of Mechanical Engineers (ASME) has already developed a Standard for internal events. A draft standard for external events has recently been prepared by ANS and is

currently undergoing the usual approval processes established by ANS and the American National Standards Institute (ANSI). An essential part of the standard is peer review.

The ANS Standard is consistent with the ASME Standard for internal events. Indeed, the ANS Standard for external events presumes the availability of a risk assessment of internal events. The ANS Standard defines requirements for three PRA “capability categories” that differ in terms of their level of resolution, conservatism, and use of plant-specific data.

Requirements for each of the capability categories are quite similar and even identical in many cases. Consequently, the requirements require interpretation to ascertain the capability category. Little guidance is provided on how to interpret these requirements in terms of PRA capability. Standards for PRAs take the form of guidance and not prescriptive analytic methods typical of other engineering standards. It is unlikely, therefore, that completely reproducible peer review evaluations of the capability categories could be derived from the ANS Standard or any other PRA standard.

The ANS Standard addresses seismic events, high-wind events, and external-flooding events. Much of the Standard is devoted to seismic events which is appropriate. The Standard does not address seismically induced fires. Such fires could be significant risk contributors and must be considered in risk assessments needed to support risk-informed regulation concerning external events. ANS is currently working on a standard for fire PRA. The interface between the fire PRA and external events PRA will need attention.

The ANS Standard includes materials describing and setting requirements for the seismic margins method of plant analysis. It is unclear why this non-probabilistic method is addressed in a PRA standard. On the other hand, the material on the seismic margins method does not detract from the material on probabilistic methods.

We congratulate the authors on taking a good step toward developing an External Events PRA Methodology Standard and especially for their attention to the treatment of uncertainty.

Sincerely,

**/RA/**

George E. Apostolakis  
Chairman

References:

1. American Nuclear Society, “External Events PRA Methodology Standard,” BSR/ANS 58.21, November 2002.
2. American Society of Mechanical Engineers, “Probabilistic Risk Assessment for Nuclear Power Plant Applications,” RA-S, 2002