

MEMO

Re: Guidance on the SOARCA Uncertainty Quantification and Sensitivity Analysis

To: SOARCA Team

Through: S. P. Burns

From: K. Vierow  
Chair, SOARCA Peer Review Committee\*

Date: April 9, 2010

The SOARCA Team presented plans for an Uncertainty Quantification and Sensitivity Analysis to the SOARCA Peer Review Committee on March 3, 2010. Comments from Committee members and suggestions regarding this effort are provided below for consideration by the SOARCA team. There was no attempt to arrive at a consensus or influence any individual peer reviewer's opinions.

Bob Henry, David Leaver, Kevin O'Kula and Karen Vierow have provided input to this memo and concur with the sections that they did not compose.

1. Of the two methods presented for quantifying uncertainty, the "Inner" Weather Loop method is the appropriate method for evaluating the SOARCA results and for comparing with the previous NRC studies. A few sequence results should be explored through the "Outer" Weather Loop method to illustrate the influence of uncertainty in weather conditions at the time of the release.

The inner loop method preserves the perspective that the SOARCA source term is smaller and later in release to the environment than source terms used in previous risk work. In this manner, the modeling advancements and new insights from experimental testing of the past twenty years are reflected. The outer loop method provides results that are more influenced by the effects of site-specific weather. While the impact of site weather is important, it will statistically change little from year to year, and is not changeable through any SOARCA-based understanding or insights. Therefore, the inner loop method should better suit the objectives of the SOARCA project in discerning improved understanding of the risk from Nuclear Power Plant operation.

The outer loop, however, provides a mechanism for looking at more limiting weather conditions. By performing a limited number of sensitivity analyses with the outer loop method in addition to analyses by the inner loop method, the SOARCA project can provide some insights when considering the uncertainty of both the source term and the weather.

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2. The Uncertainty Quantification and Sensitivity Analysis study is essential to the credibility of the SOARCA project and should be documented as part of the SOARCA NUREG report, or as a stand-alone supporting reference.
3. The Uncertainty Quantification study is in its early stages of planning and was not available for Committee review. Nonetheless, the uncertainty analysis is an integral part of the SOARCA project, and the analysis could be regarded as incomplete if there is not an attempt to address uncertainty. The members of the Peer Review Committee concurring with this memo request the opportunity to review the uncertainty quantification effort. Parameter selection and parameter distributions require particular care. Updates as well as the final set to be used in the Uncertainty Quantification study are requested.

Ken Canavan, Bernard Clement, Jeff Gabor and Jacquelyn Yanch concur with the memo as it is written above.

Roger Kowieski stated that he concurs with the memo as written above and that “the Uncertainty Qualification study is essential to the credibility of the SOARCA project.”

Bruce Mrowca has not provided an opinion.

John Stevenson wrote the following statement, which is applicable to this memo. “For the other areas where you have requested input from the Peer Group, I consider them outside my areas of expertise so I am not commenting on them.”

**\*SOARCA Peer Review Committee Members:**

Ken Canavan  
Bernard Clement  
Jeff Gabor  
Robert Henry  
Roger Kowieski  
David Leaver  
Bruce Mrowca  
Kevin O’Kula  
John Stevenson  
Karen Vierow  
Jacquelyn Yanch