UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

April 9, 2009

Mr. R. W. Borchardt
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: DRAFT FINAL REVISION 2 TO REGULATORY GUIDE 1.200, "AN APPROACH FOR DETERMINING THE TECHNICAL ADEQUACY OF PROBABILISTIC RISK ASSESSMENT RESULTS FOR RISK-INFORMED ACTIVITIES"

Dear Mr. Borchardt:

During the 561st meeting of the Advisory Committee on Reactor Safeguards, April 2-4, 2009, we completed our review of the Draft Final Revision 2 to Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." During our 560th meeting, March 5-7, 2009, we met with representatives of the NRC staff to discuss this Regulatory Guide and related matters. During our review, we had the benefit of the documents referenced.

CONCLUSION AND RECOMMENDATION

1. We agree with the staff's issuance of Revision 2 to RG 1.200.

2. The existing guidance on how to perform probabilistic risk assessments (PRAs) for nuclear power plants should be updated.

DISCUSSION

RG 1.200 describes an acceptable approach for determining the technical adequacy of a PRA to be used for regulatory decisionmaking. It endorses, with certain qualifications and clarifications, the ASME/ANS Consensus PRA Standard and the Nuclear Energy Institute peer review process. RG 1.200 is intended to reduce the need for the NRC staff to perform an in-depth review of the base PRA that is used to support an application.

We reviewed the original version of RG 1.200 (formerly DG-1122) and provided a report to the Commission dated September 22, 2003, recommending that it be issued for trial use. We agreed with the staff's decision to develop a separate regulatory guide on how to perform sensitivity and uncertainty analyses. RG 1.200 was issued for trial use in February 2004 and five trial applications were conducted. In 2006, we reviewed Revision 1 to RG 1.200 that incorporated lessons learned from the trial applications. In our October 23, 2006, letter, we recommended that Revision 1 to RG 1.200 be issued after reconciliation of public comments. Revision 1 was issued in January 2007.

Since the issuance of Revision 1, the PRA standards and industry guidance have been updated (e.g., to include internal fire). Subsequently, the staff prepared a draft Revision 2 to RG 1.200, as DG-1200, which was issued for public comment in June 2008.

Revision 2 to RG 1.200 refers to NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making." In our February 23, 2009, letter, we commented that although NUREG-1855 provides good guidance for the identification of sources of model uncertainty, it lacks guidance on quantification of model uncertainty. We recommended that the staff develop methods for the quantification and integration of model uncertainties in risk-informed decisions.

Revision 2 to RG 1.200 is a major step toward the implementation of the Commission's phased approach to PRA quality. Significant progress has been made in the development and staff endorsement of national consensus PRA standards and associated industry guidance documents. Efforts are also under way through the professional societies to develop PRA standards addressing the remaining risk contributors (e.g., low-power and shutdown modes of operation). These national consensus PRA standards provide specific guidance on what the risk assessment should include. However, the existing guidance on how to perform PRA is spotty. NUREG-6823 provides guidance on current methods for parameter estimation. NUREG-0492, "Fault Tree Handbook," is an excellent resource but should be updated to include refinements in fault tree analysis and associated computer codes. NUREG/CR-2300, "PRA Procedures Guide, A Guide to the Performance of Probabilistic Risk Assessments for Nuclear Power Plants," is archaic; updated guidance for the broad range of PRA activities is sorely needed.

Enhanced confidence in PRA increases the quality of risk-informed regulatory decisionmaking. Updating the PRA Procedures Guide and other PRA guidance documents is an important step in that process.

Sincerely,

/RA/

Mario V. Bonaca
Chairman

References:

1. Memorandum from Michael Case, Director, Division of Engineering, Office of Nuclear Regulatory Research, to Edwin M. Hackett, Executive Director, ACRS, Subject: Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" dated February 10, 2009 (ML090410042)

2. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" Revision 1 January 2007

3. ASME/ANS RA-S-2008, “Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications,” Revision 1 RA-S-2002, ASME, New York, New York dated April 2008

4. NEI 05-04, “Process for Performing Follow-on PRA Peer Reviews Using the ASME PRA Standard,” Revision 2, Nuclear Energy Institute, Washington, DC dated November 2008

5. NEI 07-12, “Fire Probabilistic Risk Assessment (FPRA) Peer Review Process Guidelines,” Draft Version H, Revision 0, Nuclear Energy Institute, Washington, DC dated November 2008

6. Report from Mario V. Bonaca, Chairman, Advisory Committee on Reactor Safeguards, to Nils J. Diaz, Chairman, U.S. Nuclear Regulatory Commission, Subject: Draft Final Regulatory Guide x.xxx, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities (formerly DG-1122)” dated September 22, 2003 (ML032681088)

7. Letter from Graham B. Wallis, Chairman, Advisory Committee on Reactor Safeguards, to Luis Reyes, Executive Director for Operations U.S. Nuclear Regulatory Commission, Subject: Draft Revision 1 to Regulatory Guide 1.200 (DG-1161), “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,” and SRP Section 19.1, “Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities” dated October 23, 2006 (ML063030068)

8. Letter from Mario V. Bonaca, Chairman, Advisory Committee on Reactor Safeguards, to R. W. Borchardt, Executive Director for Operations U.S. Nuclear Regulatory Commission, Subject: Draft Final NUREG-1855, “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking,” and Draft Appendix A, “Example Implementation of the Process for the Treatment of PRA Uncertainty in a Risk-Informed Regulatory Application” February 23, 2009 (ML090490652)

9. U.S. Nuclear Regulatory Commission, NUREG-1855, “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making” November 2007 (ML080040199)

10. U.S. Nuclear Regulatory Commission, NUREG/CR-6823, “Handbook of Parameter Estimation for Probabilistic Risk Assessment” September 2003 (ML083540681)

11. U.S. Nuclear Regulatory Commission, NUREG-0492, “Fault Tree Handbook” 1981

12. U.S. Nuclear Regulatory Commission, NUREG/CR-2300, “PRA Procedures Guide, a Guide to the Performance of Probabilistic Risk Assessments for Nuclear Power Plants,” Volumes 1 and 2 January 1983 (ML063560439 and ML063560440)

3. ASME/ANS RA-S-2008, “Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications,” Revision 1 RA-S-2002, ASME, New York, New York dated April 2008

4. NEI 05-04, “Process for Performing Follow-on PRA Peer Reviews Using the ASME PRA Standard,” Revision 2, Nuclear Energy Institute, Washington, DC dated November 2008

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Letter to the Honorable Dale E. Klein, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS, dated April 9, 2009

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