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

June 29, 2009

The Honorable Gregory B. Jaczko
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: SUMMARY REPORT – 563rd MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, JUNE 3-4, 2009, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

Dear Chairman Jaczko:

During its 563rd meeting, June 3-4, 2009, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report, letters, and memorandum:

REPORT

Report to Gregory B. Jaczko, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Report on the Safety Aspects of the License Renewal Application for the National Bureau of Standards Test Reactor, dated June 16, 2009

LETTERS

Letters to R. W. Borchardt, Executive Director for Operations, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Draft Final Revision 2 to Regulatory Guides 1.21, "Measuring, Evaluating and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste," and 4.1, "Radiological Environmental Monitoring for Nuclear Power Plants," dated June 17, 2009

- Safety Evaluation for the Mitsubishi Heavy Industries Topical Report MUAP-07006-P, Revision 2, "Defense-In-Depth and Diversity," Related to the US-APWR Design, dated June 25, 2009

MEMORANDUM

Memorandum to R. W. Borchardt, Executive Director for Operations, NRC, from Edwin M. Hackett, Executive Director, ACRS:

- Proposed Revisions to Regulatory Guides 1.174, 1.177, 1.40, 1.68.2, 1.159, DG-3037, and 1.183, dated June 9, 2009

HIGHLIGHTS OF KEY ISSUES

1. License Renewal Application and the Revised Final Safety Evaluation Report for the National Bureau of Standards Test Reactor

The Committee met with representatives of the National Institute of Standards and Technology (NIST), the applicant, and the NRC staff to discuss the license renewal application for the National Bureau of Standards Reactor (NBSR) and the associated NRC staff's revised final Safety Evaluation Report (SER). Specifically, the discussion was focused on the resolution of one open item related to flow coast-down data used in the loss-of-offsite power accident analysis.

While responding to a question raised at an earlier ACRS Subcommittee meeting, the applicant discovered that the pump coast-down curve for the RELAP analysis was compared to the data measured under different conditions. The applicant promptly reported the error to the NRC on March 30, 2009, and it was briefly discussed during the previous ACRS meeting on April 2, 2009. This was treated as a license renewal open item.

Since then, the applicant has completed its re-analysis. During the meeting, the applicant showed a comparison of the revised flow coast-down data and the flow used in the prior analysis. NIST representatives described the results of the re-analysis and stated that the results do not alter the conclusions presented in the SER.

The NRC staff described its independent review and calculation to assess the safety significance of the error. The staff also discussed the review of the applicant's re-analysis. Based on its review, the staff concluded that there is reasonable assurance that a loss-of-offsite power will not result in fuel damage and that the consequences of the accident are bounded by the Maximum Hypothetical Accident.

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated June 16, 2009, recommending that the NIST application for renewal of the NBSR operating license be approved.

2. Draft Final Regulatory Guides 1.21 and 4.1

The Committee met with representatives of the NRC staff and the Nuclear Energy Institute to discuss Draft Final Regulatory Guide 1.21 (DG-1186), "Measuring, Evaluating, and Reporting Radioactive Materials in Liquid and Gaseous Effluents and Solid Waste," and Draft Final Regulatory Guide 4.1 (DG-4013), "Radiological Environmental Monitoring for Nuclear Power Plants." Both Regulatory Guides were issued for public comment in November 2008. The staff described how the public comments were addressed. The representative from NEI noted a need for an integrated approach implementing guidance documents in this area. The current guides are more than 30 years old, and the revisions are intended to update the NRC staff's guidance and incorporate insights and recommendations from NRC's Liquid Radioactive Release Lessons Learned Task Force.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated June 17, 2009, recommending that Revision 2 of Regulatory Guide 1.21 and of Regulatory Guide 4.1 be issued.

3. Pellet-Clad Interaction Failures under Extended Power Uprate Conditions

The Committee met with representatives of the NRC staff and industry to discuss the potential need for developing regulatory criteria to protect against pellet-clad interaction (PCI) failures. On December 20, 2007, the ACRS issued a report to the Commission on the Susquehanna Steam Electric Station Extended Power Uprate. The added comments in that report expressed concern about the use of non-barrier fuel, which is not specifically designed to protect against PCI failures. During the June 3-4, 2009, ACRS meeting, data were presented to the Committee showing that PCI failures may occur in less than five minutes during certain transients, thereby precluding operator actions. NRC staff stated that PCI failures are of low safety significance. Further, developing rules for PCI failures constitutes a change in regulatory position and requires consideration of backfitting. Industry representatives from AREVA, Global Nuclear Fuel, and the Electric Power Research Institute presented various views opposing new regulatory criteria on PCI failures.

Committee Action

The Committee decided that this is not an immediate safety concern and a letter is not needed.

4. Diversity and Defense-in-Depth Topical Report Associated with the US-APWR Design

The Committee met with representatives of the NRC staff to discuss the Safety Evaluation for Revision 2 of Mitsubishi Heavy Industries (MHI) Topical Report MUAP-07006-P, “Defense-in-Depth and Diversity,” for the U.S. Advanced Pressurized Water Reactor (US-APWR). The Topical Report describes MHI’s generic methodology to address defense-in-depth and diversity in digital I&C systems. The staff discussed the scope of the topical report and points of discussion identified during the May 21, 2009, Subcommittee meeting to review this matter. The staff also described its findings and conclusions. The staff concluded that the approach documented in the Topical Report and responses to the requests for additional information conform to regulatory requirements. This conclusion is subject to the satisfactory completion of 11 design certification application specific action items documented in the Safety Evaluation.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated June 25, 2009, recommending that the staff’s Safety Evaluation be issued.

5. Quality Assessment of Selected Research Projects

The Committee discussed the results of the ACRS Panels’ review of the quality assessment of the NRC research projects on the following topics: NUREG/CR-6964, “Crack Growth Rates and Metallographic Examinations of Alloy 600 and Alloy 82/182 from Field and Laboratory Materials

Testing in PWR Environments," and Draft NUREG/CR-XXXX, "Diversity Strategies for Nuclear Power Plant Instrumentation and Control Systems."

Committee Action

The Committee plans to discuss its draft report on the assessment of the quality of the above projects during its meeting on July 8-10, 2009.

6. Meeting with the Commission

On June 4, 2009, the Committee met with the NRC Commissioners to discuss topics of mutual interest, including the following:

- Crediting Containment Accident Pressure in the NPSH Calculations
- Pressurized Thermal Shock Rule
- Digital Instrumentation and Control Matters
- Options to Revise NRC Regulations Based on the International Commission on Radiation Protection (ICRP) Recommendations / Progress on Recommendations of the Independent External Review Panel on the Materials Licensing Program

Committee Action

In the June 8, 2009, Staff Requirements Memorandum (SRM), the Commission directed the staff to continue working to resolve the differences of opinion between the Committee and the staff concerning containment overpressure credit. The Committee will interact with the staff, as needed, in resolving the issue.

7. Reliability and PRA Subcommittee Report

The Chairman of the Reliability and PRA Subcommittee provided a report to the Committee summarizing the results of the June 1-2, 2009, meeting with the NRC staff on the (i) proposed Revision 1 to Regulatory Guide (RG) 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," and proposed Standard Review Plan (SRP) Section 9.5.1.2, "Risk-Informed, Performance-Based Fire Protection," (ii) development of guidelines for performing human reliability analysis in fire probabilistic risk assessments, and (iii) risk metrics for new light-water reactor risk-informed applications.

During the Subcommittee meeting, the staff explained proposed changes to RG 1.205 (DG-1218). This Guide endorses Revision 2 to NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48(c)," and includes integrated lessons learned from observation visits, fire PRA reviews, and plant License Amendment Request (LAR) reviews. The guidance in the proposed new SRP Section 9.5.1.2 is consistent with the proposed changes to RG 1.205.

The EPRI representative stated that RG 1.205 requires the use of conservative methods from NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," and

deviations from these methods will require prior NRC approvals. He further stated that outdated prescriptive and conservative methods should not be imposed on the licensees and, instead, the guidance provided in RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," should be considered appropriate.

The staff also presented the issues and options for the implementation of risk metrics for new light water reactor risk-informed applications. The staff discussed the risk-informed initiatives and high level goals and objectives for new reactors, the current risk-informed framework, the new reactor implementation issues, the revised options based on stakeholder feedback, and the preliminary evaluation of options. The staff stated that in the near term, risk-informed applications for new reactors have been proposed as risk-managed technical specifications.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the EDO's response of May 8, 2009, to comments and recommendations included in the April 9, 2009, ACRS letter on the 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." The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of May 18, 2009, to comments and recommendations included in the April 21, 2009, ACRS letter on Draft Final Regulatory Guide 1.211, "Qualification of Safety-Related Cables and Field Splices for Nuclear Power Plants." The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of April 28, 2009, to comments and recommendations included in the March 19, 2009 ACRS letter on Draft Final Regulatory Guide 5.73, "Fatigue Management of Nuclear Power Plant Personnel." The Committee decided that it was satisfied with the EDO's response.

SCHEDULE FOR THE 564th ACRS MEETING

The following topics are scheduled for the 564th ACRS meeting to be held on July 8-10, 2009:

- License Renewal Application and the Final Safety Evaluation Report for the Beaver Valley Power Station

- Draft Final Revision 3 to Regulatory Guide 1.100, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants"

- Applicability of TRACE Code to Evaluate New Light Water Reactor Designs

- Format and Content of the Biennial Research Report to the Commission on the NRC Safety Research Program

- Design Certification/Combined License Interim Staff Guidance – 006, and Nuclear Energy Institute document NEI 08-08, Revision 1

- Draft Final Regulatory Guide 1.215, “Guidance for ITAAC Closure under 10 CFR Part 52”
- Quality Assessment of Selected Research Projects

Sincerely,

/RA/

Mario V. Bonaca
Chairman

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- Quality Assessment of Selected Research Projects

Sincerely,

/RA/

Mario V. Bonaca
Chairman

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ACRS Branch B
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H. Nourbakhsh
J. Flack
J. Riner
C. Jaegers
T. Bloomer
B. Champ
A. Bates
S. McKelvin
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