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

SL-0525

November 3, 2004

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT - 516th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, OCTOBER 7-9, 2004, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 516th meeting, October 7-9, 2004, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letters, and memoranda:

REPORTS:

Reports to Nils J. Diaz, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Draft NUREG-XXXX, "The Report on the Independent Verification of the Mitigating Systems Performance Index (MSPI) Results for the Pilot Plants," dated October 14, 2004

- Safety Evaluation of the Industry Guidelines Related to Pressurized Water Reactor Sump Performance, dated October 18, 2004

- Proposed Resolution of Generic Safety Issue 185, "Control of Recriticality Following Small-Break LOCAs in PWRs," dated October 22, 2004

- Report on an "Overview of Differences in Nuclear Safety Regulatory Approaches and Requirements Between United States And Other Countries," dated November 3, 2004

LETTER:

Letter to Luis A. Reyes, Executive Director for Operations, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Review of ACR-700 Pre-Application Safety Assessment Report dated October 14, 2004

MEMORANDA:

Memoranda to Luis A. Reyes, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS:

- Draft Final Regulatory Guide DG-1085, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," and NUREG-1713, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors," dated October 12, 2004

- Draft NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," dated October 12, 2004

- Seabrook Station, Unit No. 1 - Advisory Committee on Reactor Safeguards Review of Stretch Power Uprate Amendment (TAC No. MC2364), dated October 13, 2004

- Anonymous Letter Concerning the TRACE Computer Code Development and Review Practices, dated October 14, 2004

OTHER:

- Letter to David O'Brien, Commissioner, Vermont Department of Public Service, from Mario V. Bonaca, Chairman, ACRS, Subject: Vermont Yankee Extended Power Uprate Request, dated October 18, 2004

HIGHLIGHTS OF KEY ISSUES

1. Safety Evaluation of the Industry Guidelines Related to Pressurized Water Reactor (PWR) Sump Performance

The Committee met with representatives of the NRC staff, its contractors, and the Nuclear Energy Institute (NEI) to discuss the staff's draft safety evaluation (SE) of the industry guidelines associated with the resolution of Generic Safety Issue (GSI)191, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized Water Reactors (PWRs)." The ACRS Subcommittee on Thermal-Hydraulic Phenomena reviewed this matter during a meeting on September 22-23, 2004. The Committee heard the staff's presentations, and it also heard comments from industry, and it recommended that the SE not be issued in its present form. Industry expressed concern about the implementation of the guidance report as modified by the staff's SE.

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated October 18, 2004. In its letter, the Committee concluded that both the SE and the NEI guidance report contain too many technical faults and limitations to provide the basis for a defensible and robust long-term solution to GSI 191. The Committee described some of the faults and limitations in the present technical knowledge base that need to be addressed so that acceptable guidance can be developed. The Committee also recommended that the staff clarify the level of quality and acceptability that it expects from industry-sponsored experiments to fill in the gaps in the analytical and experimental data base. The Committee recommended that the risk-informed approach that has been explored by the staff be extended to treat the entire sequence of phenomena during the scenario, and develop a quantitative assessment of the model uncertainties related to the phenomena that could be used in the application of the Regulatory Guide 1.174 process to this situation. Based on the above, the Committee recommended that the SE not be issued in its current form.

2. Pre-Application Safety Assessment Report for the Advanced CANDU 700 (ACR-700) Design

The Committee held discussions with representatives of the NRC staff and the Atomic Energy of Canada Limited (AECL) Technologies regarding the staff's pre-application safety assessment report (PASAR) for the 700 Mwe ACR-700 design.

The ACR-700 pre-application review is being conducted in two phases. Phase 1 was a series of familiarization meetings designed to provide the staff with a general overview of the ACR-700 design. Phase 1 of the ACR-700 pre-application review has been completed and the ACR-700 pre-application review is currently in Phase 2. The objective of Phase 2 is to provide more information about the ACR-700 design to facilitate the staff's review of 13 focus topics, and to provide feedback to AECL prior to their application for standard design certification.

AECL's view is that the ACR-700 design will meet the applicable NRC regulations with the overall objective is to achieve high confidence in the acceptability of the design certification application. Currently, the staff is concluding that based on the materials submitted by AECL, including responses to requests for additional information, the applicant will need to pursue a number of technical issues in more detail.

Committee Action

The Committee issued a letter to the EDO on this matter dated October 14, 2004, commending the staff on an excellent job on its pre-application review of the focus topics, for which the staff had identified technical, regulatory, and policy issues.

3. Proposed Recommendations for Resolving GSI-185, "Control of Recriticality Following Small-Break LOCAs in PWRs"

The Committee met with representatives of the NRC staff and its contractors regarding the proposed recommendations for resolving GSI-185. The Committee discussed the proposed draft report on this issue that was prepared by the Office of Nuclear Regulatory Research (RES) to provide the technical basis for closure of the GSI. Overall, the low probability of this event, coupled with the limited consequences that were calculated by RES, support the conclusion that GSI-185 can be considered resolved for all operating PWRs.

Committee Action

The Committee issued a report on this matter and concluded that GSI-185 can be closed without imposition of any new regulatory requirements for all existing PWRs.

4. Mitigating Systems Performance Index Program

The Committee held discussions with the staff members of RES and the Office of Nuclear Reactor Regulation (NRR) regarding the status of the Mitigating Systems Performance Index (MSPI) program.

The NRC presentation on the MSPI was made by Pat Baranowsky and Don Dube, RES, and Stuart Richards, NRR. The purpose of this project is to develop a risk-informed indicator that includes unreliability and safety system unavailability (SSU). The MSPI is a measure of the deviation of actual plant system unavailability and component unreliabilities from historical baseline values, where each element is weighted by plant-specific risk importance measures. The MSPI eliminates known problems with the existing SSU Indicator, accounts for unavailability and unreliability of a system, weighted relative to their risk-importance, uses plant PRA models, identifies changes in equipment performance and variations, and uses data consistent with other methods.

Committee Action

The Committee wrote a report, dated October 14, 2004, concluding that the MSPI is substantially superior to the group of safety system unavailability performance indicators, which it replaces. The report recommends that draft NUREG-XXXX be issued, its recommendations implemented, and the process for incorporating the MSPI into the Reactor Oversight Process continue.

5. Technology Neutral Framework for Future Plant Licensing

The Committee held discussions with the NRC staff regarding the regulatory structure for new plant licensing, Part 1: technology-neutral framework. Previously, the staff had identified seven policy issues fundamental to licensing non-light water reactor designs. Four of these issues

would be included in the development of the framework document for future plant licensing. These four issues are the definition for defense-in-depth, the use of probabilistic approach to establish the licensing basis, the use of scenario-specific source terms for licensing decisions, and the advisability of revision of the emergency planning zone. The Commission has approved the staff's approach for these four issues.

Two issues for which the Commission requested the staff to provide further details are the issue of requiring modular reactor designs account for the integrated risk posed by multiple reactors, and the issue of functional containment performance standards. The Commission disapproved the staff's recommendation related to the issue of international codes and standards. Potential new policy issues could include the level of safety, security, and selective implementation. The staff plans to issue a draft SECY-paper that includes a draft framework with recommendations on the new policy issues by December 31, 2004.

Committee Action

The staff's briefing was provided for information only. The Committee plans to review the proposed draft SECY-paper during the December 2-4, 2004 ACRS meeting.

6. Assessment of the Quality of the NRC Research Projects

RES is required to have an independent evaluation of the quality of its research programs. This evaluation is mandated by the Government Performance and Results Act (GPRA) and needs to be in place during the next fiscal year. The Committee has agreed to assist RES in assessing the effectiveness and utility of the NRC research programs. The Committee has previously approved the strategy for the review of the quality of selected research projects. This strategy is to be tried during FY 2004 and refined in FY 2005. During the October 7-9, 2004 ACRS meeting, the Committee discussed the assessment of the quality of the NRC research projects on Sump Performance and on MACCS Code.

Committee Action

The Committee plans to discuss the draft report on assessment of the quality of the research projects on Sump Blockage and on MACCS Code during November 2-4, 2004 ACRS meeting.

7. Divergence in Regulatory Approaches and Requirements Between U.S. and Other Countries

In an April 28, 2003 Staff Requirements Memorandum (SRM), resulting from the April 11, 2003 meeting with Advisory Committee on Reactor Safeguards (ACRS), the Commission stated that "In the course of its routine activities of reviewing and advising the Commission on reactor issues, the Committee should explore and consider other international regulatory approaches. Where there are significant differences in regulatory approaches and requirements, The Commission should be informed." Dr. Nourbakhsh, ACRS Senior Staff Engineer has prepared a report to be used by the ACRS in responding to the Commission. During the October 7-9,

2004 ACRS meeting, the Committee discussed the report, prepared by Dr. Nourbakhsh, regarding divergence in regulatory approaches between U.S. and other Countries. The Committee approved a report to transmit this report to the Commission.

Committee Action

The Committee issued a report, dated November 3, 2004, transmitting the report on differences in regulatory approaches and requirements between U.S. and other countries to the Commission. The Committee will endeavor to keep the Commission informed of significant differences in regulatory requirements of other countries that comes to its attention.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the EDO's October 1, 2004 response to the Committee's July 16, 2004 concerning Generic Letter 2004-02, "Proposed Draft Final Generic Letter on Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at PWRs".

The Committee had recommended issuance of the generic letter, and it was issued on September 14, 2004. The Committee also recommended that staff should continue to perform confirmatory research in areas where the technical basis of the guidance is uncertain, and on issues that are not directly addressed by the guidance proposed by the Nuclear Energy Institute (NEI). The EDO replied that the staff intends to "continue confirmatory research consistent with your recommendations." However, the EDO declined to initiate any new research to confirm the technical basis in the guidance because it "would not be timely for the resolution of GSI-191". As discussed in its letter regarding the draft SE for the NEI Guidance Report, the Committee continues to believe that additional research needs to be performed to support the technical basis for resolution of GSI-191.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from September 8, 2004, through October 6, 2004, the following Subcommittee meetings were held:

- Thermal Hydraulic Phenomena Subcommittee - September 22-23, 2004

The Subcommittee reviewed the staff's final safety evaluation report on the industry guidelines related to resolution of GSI-191, "Assessment of Debris Accumulation on PWR Sump Performance." In addition, the Subcommittee reviewed the final staff resolution of GSI-185, "Control of Recriticality Following Small-Break LOCAs in PWRs."

- Planning and Procedures - October 6, 2004

The Subcommittee discussed proposed ACRS activities, practices, and procedures for conducting Committee business and organizational and personnel matters relating to ACRS and its staff.

LIST OF MATTERS FOR THE ATTENTION OF THE EDO

- The Committee forwarded to the EDO an anonymous letter that was sent to two ACRS members concerning the development, verification, and validation of the TRACE thermal-hydraulic system analysis code. The letter was very similar in tone to an anonymous email that was sent to one of these ACRS members in March, 2004. That email was also forwarded to the EDO for his information.

PROPOSED SCHEDULE FOR THE 517th ACRS MEETING

The Committee agreed to consider the following topics during the 517th ACRS meeting, to be held on November 4-6, 2004:

- Proposed Rule Language for Risk-Informing 10 CFR 50.46
- Proactive Materials Degradation Assessment Program
- Proposed Rule on Post-Fire Operator Manual Actions
- Grid Reliability Issues and Related Significant Operating Events
- Status of Early Site Permit Reviews
- Assessment of the Quality of Selected NRC Research Projects
- Plant License Renewal Subcommittee Report

Sincerely,

/RA/

Mario V. Bonaca
Chairman