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

SL-0534

October 5, 2005

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

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT - 525th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, SEPTEMBER 8-10, 2005 AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 525th meeting, September 8-10, 2005, 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 Graham B. Wallis, Chairman, ACRS:

- Report on Two Policy Issues Related to New Plant Licensing, dated September 21, 2005
- Report on the Safety Aspects of the License Renewal Applications for the Millstone Power Station, Units 2 and 3, dated September 22, 2005
- Draft Final Revisions to Generic License Renewal Guidance Documents, dated September 22, 2005

LETTERS:

Letters to Luis A. Reyes, Executive Director for Operations (EDO), NRC, from Graham B. Wallis, Chairman, ACRS:

- Proposed Revision 4 to Regulatory Guide 1.82, “Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident,” dated September 20, 2005
- Interim Letter: Exelon Generation Company, LLC, Application for Early Site Permit and the Associated NRC Staff’s Draft Safety Evaluation Report, dated September 22, 2005
- Report on a Proposed Technical Basis for Revision of the Embrittlement Criteria in 10 CFR 50.46, dated September 23, 2005

MEMORANDA:

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

- Draft Final Regulatory Guide 3.71, "Nuclear Criticality Safety Standards for Fuels and Materials Facilities," dated September 14, 2005

- ACRS Review of the North Anna Early Site Permit Application - Final Safety Evaluation Report Changed Pages Prior to Publishing as NUREG, dated September 20, 2005

- Proposed Rule: Licenses, Certifications, and Approvals for Nuclear Power Plants, 10 CFR Part 52 and Conforming Amendments to Parts 1, 2, 10, 19, 20, 21, 25, 26, 50, 51, 54, 55, 72, 73, 95, 140, 170, and 171, dated September 20, 2005

- Proposed Revision to Standard Review Plan Section 6.2.1.3, "Mass and Energy Release Analysis for Postulated Loss-of-Coolant Accidents," dated September 22, 2005

- Proposed Draft Regulatory Guide DG-8028, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants," dated September 23, 2005

HIGHLIGHTS OF KEY ISSUES

1. Final Review of the License Renewal Application for Millstone Power Station, Units 2 and 3

The Committee met with NRC staff and representatives of Dominion Nuclear Connecticut, Inc. (DNC) to review the license renewal applications for the Millstone Power Station (MPS), Units 2 and 3 and the associated NRC staff's final Safety Evaluation Report (SER). DNC requested approval for continued operation of each unit for 20 years beyond the current license expiration dates. The operating licenses for Units 2 and 3 expire on July 31, 2015, and November 25, 2025, respectively. Unit 2 is a four-loop Combustion Engineering pressurized water reactor (PWR) that is licensed to operate at 895 MWe. Unit 3 is a four-loop Westinghouse PWR that is licensed to operate at 1195 MWe. Unit 1 is permanently defueled but certain structures such as the turbine building and control room/radwaste treatment building are within the scope of license renewal for Units 2 and 3.

The draft SER was issued in February 2005 and contained six open items. All these open items have been resolved to the satisfaction of the staff.

In the draft SER, the staff granted an exception to the Fire Protection Program in that there are no aging effects requiring management for halon and carbon dioxide fire protection systems. Based on ACRS members' comments and further staff review, this exception was withdrawn. DNC has committed to manage aging of halon and carbon dioxide systems consistent with the Generic Aging Lessons Learned (GALL) Report.

The staff described the recent performance of MPS Units 2 and 3 as well as recent inspection findings. In the August 2005 final SER, the staff concluded that the applicant has satisfied the requirements of 10 CFR Part 54.

In a letter to the ACRS Chairman, dated September 7, 2005, a member of the public representing the Connecticut Coalition Against Millstone made several claims that were not discussed in the SER. These include equipment failures, alleged cases of cancer, and the recent (April 17, 2005) shutdown of Unit 3 due to a "tin whisker" causing a short on a circuit board. The Committee plans to discuss a proposed response to this letter at its October meeting.

Committee Action

The Committee issued a report to the NRC Chairman regarding this matter, dated September 22, 2005, concluding that the programs established and committed to by the applicant provide reasonable assurance that MPS, Units 2 and 3 can be operated in accordance with their current licensing basis for the period of extended operation without undue risk to the health and safety of the public. The Committee recommended that the applications for renewal of the operating licenses for MPS, Units 2 and 3 be approved.

2. Interim Review of the Exelon/Clinton Early Site Permit Application

The Committee heard presentations by and held discussions with representatives of the NRC staff and Exelon Generation Company, LLC (the applicant) regarding the application for an early site permit (ESP) for the Clinton site, and the related staff's draft SER.

Exelon Generation Company, LLC, has applied for an ESP for locating nuclear power plants or modules having a total power generation rate of 2400 to 6800 MWt on the site where the Clinton plant, a boiling water reactor (BWR6) within a Mark III containment, is currently operating. The ESP application is based on the plant parameter envelope approach since the applicant has not identified the particular reactor technology that will be adopted. The applicant has chosen to characterize the seismic hazard using a methodology that differs from that utilized in previous ESPs.

Committee Action

The Committee issued a letter to the NRC Executive Director for Operations on this matter, dated September 22, 2005. The Committee recommended that a thorough, expeditious review of the applicant's performance-based seismic hazard analysis methodology be conducted, recognizing that this methodology may be used by applicants for purposes other than ESPs.

3. Proposed Revision 4 to Regulatory Guide 1.82, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident"

During its consideration of the Proposed Revision 4 to Regulatory Guide (RG) 1.82, the Committee heard from the staff and from members of the public, including the State of Vermont. The Committee considered its previous position on granting containment overpressure credit, as stated in its December 12, 1997 letter (i.e., "selectively granting credit for small amounts of overpressure for a few cases may be justified") and more recently in its

letter dated September 30, 2003. In that letter, the Committee recommended issuing Revision 3 to RG 1.82. That RG included a provision to grant, only where necessary, some containment accident pressure credit for some operating reactors with the caveat that "this should be minimized to the extent possible."

The Committee is concerned that the position that the overpressure should be conservatively calculated is the only explicit restriction on the use of overpressure credit given in the proposed revision of the RG. It believes that additional restrictive guidance should be placed on the granting of overpressure credit. Before such credit can be granted, licensees should demonstrate that there are no practical alternative approaches that can eliminate the need for such credit. Such credit should be granted only for robust containments for which there are positive means for indication of containment integrity such as inerted and sub-atmospheric containments. The time intervals for which such credit is needed should be limited to a few hours, commensurate with the demonstrated capability of all associated equipment to perform its intended functions during this time period.

Committee Action

The Committee issued a letter to the NRC EDO on this matter, dated September 20, 2005. The Committee recommended that the RG be revised to include restrictions as discussed above before it is released for public comment.

4. Possible Alternative Embrittlement Criteria to Those in 10 CFR 50.46

The Committee heard a presentation from the staff concerning a new technical basis for revision of the embrittlement criteria in 10 CFR 50.46. The NRC's Office of Nuclear Regulatory Research (RES) has undertaken, in cooperation with the nuclear industry, a confirmatory research program to understand the behavior of fuel cladding at the higher levels of fuel burnup that are becoming common within the nuclear power industry. This research has identified new mechanisms of cladding embrittlement and has improved the understanding of embrittlement mechanisms known at the time the current regulations were written. Based on these early research findings, the RES staff is proposing a revision to the embrittlement criteria that support the regulations that would eliminate reference to specific types of zirconium alloy cladding.

Committee Action

The Committee issued a letter to the EDO on this matter, dated September 23, 2005. The Committee recommended that the staff continue to move forward with the establishment of revised criteria for fuel performance during loss-of-coolant accidents (LOCAs) and write the requirements at a high level, with specific guidance provided in regulatory guides. The staff should also continue to perform the necessary research to validate its proposed process.

5. Draft Final Updates to License Renewal Guidance Documents

The Committee met with representatives of the NRC staff and the Nuclear Energy Institute (NEI) to discuss draft final revisions to generic license renewal guidance documents. The staff revised NUREG-1800 (Standard Review Plan for License Renewal Applications for Nuclear Power Plants), NUREG-1801 (GALL Report), and RG 1.188 (Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses). The staff also drafted

NUREG-1832 (Analysis of Public Comments on the Revised License Renewal Guidance Documents) and NUREG-1833 (Technical Bases for Revision to the License Renewal Guidance Documents) to support these revisions. Comments made by ACRS members are addressed in Appendix B of NUREG-1832. New aging management programs (AMPs) that have been added to the GALL Report include the One-time Inspection of ASME Code Class 1 Small-Bore Piping Program, the External Surfaces Monitoring Program, the Metal-Enclosed Bus Program and Electrical Cable Connections not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program. The draft final revision to RG 1.188 endorses NEI 95-10, Revision 6 (Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule). The updated license renewal guidance documents consider comments from stakeholders and reflect the staff's current position. The staff concluded that the new documents will increase the efficiency, effectiveness, and consistency of the license renewal review process.

NEI complemented the staff on its effort to update the license renewal guidance documents and provided additional comments on two new AMPs: Metal Enclosed Bus and Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements. In the Metal Enclosed Bus AMP the staff recommends testing of bolted connections in metal enclosed buses every ten years. Visual inspections may be performed every five years as an alternative to testing. NEI questioned the basis for the five year visual inspection interval. NEI also plans to discuss with the staff the aging effects addressed by the AMP on Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.

Committee Action

The Committee issued a report to the NRC Chairman regarding this matter, dated September 22, 2005, recommending that the draft final revisions to the generic license renewal guidance documents be approved for issuance and that the staff continue to evaluate the need for revisions to the guidance documents in order to maintain them current.

6. Meeting with the EDO, Deputy EDOs, and NRC Program Office Directors

The ACRS met with the EDO, Deputy EDOs, and Office Directors of Nuclear Reactor Regulation, Nuclear Regulatory Research (RES), and Nuclear Security and Incident Response to discuss items of mutual interest, including license renewal, new reactors, power uprate issues, fire protection, PWR sump performance issues and emergency preparedness. The EDO and the ACRS Chairman agree that the meeting was useful and that holding such meetings in the future would be mutually beneficial.

7. Interim Results of the Quality Assessment of Selected NRC Research Projects

The NRC Strategic Plan that was developed in accordance with the requirements of the Government Performance and Results Act (GPRA) requires that RES have an independent evaluation of the quality of its research programs. The Committee has agreed to assist RES in assessing the quality of selected research projects. During the September 8-10, 2005 ACRS meeting, the Committee discussed the interim results of the cognizant ACRS panel's quality assessment of the NRC research projects on: Standardized Plant Analysis Risk (SPAR) Models Development Program; Steam Generator Tube Integrity Program at the Argonne National Laboratory; and the Thermal Hydraulic Test Program at the Penn State University.

Committee Action

The Committee plans to discuss the draft report on ACRS assessment of the quality of the selected NRC research projects during its October 6-8, 2005 meeting.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the EDO's response of July 15, 2005, to comments and recommendations included in the ACRS interim letter dated June 9, 2005, concerning the safety aspects of the license renewal application for the Point Beach Nuclear Plant, Units 1 and 2. The Committee decided that it was satisfied with the EDO's response.

  The staff committed to performing a followup inspection under Inspection Procedure (IP) 71002. If the license is renewed, the staff will also conduct a post-approval site inspection for license renewal in accordance with IP 71003 before the period of extended operation begins.

- The Committee considered the EDO's response of July 8, 2005, to the ACRS memorandum dated June 3, 2005. The Committee received a letter from Roger Stoller, Chairman of the American Society for Testing and Materials Committee on Nuclear Technology, expressing his concerns about the lack of NRC staff participation in ASTM standards development activities. The Committee forwarded this letter to the EDO and requested a response regarding how these concerns would be addressed.

  The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of August 17, 2005, to comments and recommendations included in the ACRS letter dated May 13, 2005, concerning report on the safety aspects of the license renewal application for the Arkansas Nuclear One, Unit 2.

  The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of August 12, 2005, to comments and recommendations included in the ACRS interim letter dated June 14, 2005, concerning the staff's draft safety evaluation report on the Grand Gulf early site permit application.

  The Committee decided that it was not completely satisfied with the EDO's response regarding the exposition on threats posed by transportation accidents on the river adjacent to the proposed site, and the prognostication of the weather over the next 65 years based just on historical frequencies of severe weather events. The Committee plans to continue its discussion of this matter with the staff during its review of the final SER.

  The staff has committed to discuss the Committee's comments and concerns during the ACRS review of the final SER.

- The Committee considered the EDO's response of August 2, 2005, to comments and recommendations included in the ACRS letter dated June 14, 2005, concerning the risk-informed, performance-based, fire protection regulatory guide. The Committee decided that it was satisfied with the EDO's response.

  The staff committed to revise the RG to address majority of the ACRS comments and recommendations and provide the draft final RG and industry guidance document for ACRS review.

- The Committee considered the EDO's response of July 20, 2005, to comments and recommendations included in the ACRS letter dated June 10, 2005, concerning the draft final NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities." The Committee decided that it was satisfied with the EDO's response.

  The staff has committed to further identify, quantify, and document the uncertainties associated with fire probabilistic risk analyses. Also, if new insights are gained, the staff committed to consider the need to revise NUREG/CR-6850.

- The Committee considered the EDO's response of July 8, 2005, to comments and recommendations included in the ACRS Report dated June 10, 2005, concerning a draft Commission Paper, "Risk-Informed Alternatives to the Single Failure Criterion."

  The Committee decided that it was satisfied with the EDO's response. The Committee plans to discuss further developments in this area as part of its review of the program plan being developed for a risk-informed, performance-based revision to 10 CFR Part 50.

- The Committee considered the EDO's response of September 1, 2005, to comments and conclusions included in the ACRS report dated July 18, 2005, concerning the Dominion Nuclear North Anna, LLC, ESP application and the associated NRC final safety evaluation report. The Committee decided that it was satisfied with the EDO's response.

  The staff committed to interact with the ACRS starting in FY 2006 and to identify issues in the ESP Review Standard that should be modified for the planned revisions to the SRP. The staff committed to interact with the ACRS in developing lessons learned to improve and streamline the ESP process for future applications.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from July 5, 2005, through September 7, 2005, the following Subcommittee meetings were held:

- Planning and Procedures - July 5, 2005

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

- Thermal-Hydraulic Phenomena Subcommittee - July 19-20, 2005

The Subcommittee reviewed the latest proposed staff revision to Regulatory Guide 1.82 related to Emergency Core Cooling System Net Positive Suction Head. The staff described its plans to provide guidance related to containment overpressure credit. The staff presented the results of ongoing research concerning interactions of reactor coolant with debris in the reactor containment sump.

- Reactor Fuels Subcommittee - July 27-28, 2005

The Subcommittee continued its discussion on the proposed criteria for reactor fuel during LOCAs and reactivity insertion events.

- Plant Operations Subcommittee - August 24-25, 2005

The Subcommittee met with representatives of the NRC Region II Office in Atlanta, GA and discussed regional inspection, enforcement, and operational activities.

LIST OF MATTERS FOR THE ATTENTION OF THE EDO

- In early 2006, the Committee plans to review the final SER associated with the Exelon Generation Company, LLC, application for an ESP.

- The Committee plans in early 2006 to review the draft final version of the proposed rule for licenses, Certifications, and approvals for nuclear power plants, 10 CFR Part 52 and conforming amendments to Parts 1, 2, 10, 19, 20, 21, 25, 26, 50, 51, 54, 55, 72, 73, 95, 140, 170, and 171, after reconciliation of public comments.

- The Committee plans to continue its discussion with the NRC staff regarding policy issues related to new plant licensing and the associated technology-neutral framework document.

- The Committee decided to review the proposed draft Generic Letter 2005-XX, “Steam Generator Tube Integrity and Associated Technical Specifications.”

- The Committee plans to review the Browns Ferry Restart Panel’s Report prior to restart of Browns Ferry Unit One.

- The Committee plans to review the program plan being developed for a risk-informed, performance-based revision to 10 CFR Part 50, as well as further developments associated with risk-informed alternatives to the single failure criterion.

- The Committee plans to forward the letter dated September 7, 2005 from the Connecticut Commission against Millstone to the EDO for possible action.

- The Committee plans to review licensee responses to Generic Letter 2004-02: Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors.

- The Committee plans to review the draft final version of Regulatory Guide, DG-8028, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants."

PROPOSED SCHEDULE FOR THE 526th ACRS MEETING

The Committee agreed to consider the following topics during the 526th ACRS meeting, to be held on October 6-8, 2005:

- Interim Review of the License Renewal Application for the Browns Ferry Nuclear Plant, Units 1, 2, and 3

- Proposed Recommendations for Resolving Generic Safety Issue (GSI)-80, "Pipe Break Effects on Control Rod Drive Hydraulic Lines in the Drywells of Boiling Water Reactor Mark I and II Containments"

- Resolution of ACRS Comments on the Draft Final Regulatory Guide, "Risk-Informed, Performance-Based Fire Protection for Existing Light Water Nuclear Power Plants"

- Davis-Besse Reactor Pressure Vessel Head Integrity Calculations

- Quality Assessment of the Selected NRC Research Projects

- Licensees' Responses to the Bulletin on "Emergency Preparedness and Response Actions for Security-Based Events"

- NRC Staff's Response to the ACRS Letter on the Proposed Revision 4 to Regulatory Guide 1.82, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident"

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

Sincerely,

/RA/

Graham B. Wallis
Chairman