SL-0502

July 10, 2002

The Honorable Richard A. Meserve
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Meserve:

SUBJECT: SUMMARY REPORT - 493rd MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, JUNE 6-8, 2002 AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 493rd meeting, June 6-8, 2002, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports and letters.

REPORTS:

The following reports were issued to Chairman Meserve, NRC, from George E. Apostolakis, Chairman, ACRS:

- Proposed Revision to 10 CFR 50.48 Endorsing NFPA-805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants" dated June 17, 2002

- Policy Issues Related to Advanced Reactor Licensing dated June 17, 2002

- Vessel Head Penetrations and Vessel Head Degradation dated June 20, 2002

LETTERS:

The following letters were issued to William D. Travers, Executive Director for Operations (EDO), NRC, from George E. Apostolakis, Chairman, ACRS:

- Proposed Technical Assessment of Generic Safety Issue-168, "Environmental Qualification of Low-voltage Instrumentation and Control Cables" dated June 17, 2002

- Recommendations Proposed by the Office of Nuclear Regulatory Research for Resolving Generic Safety Issue-189, "Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion During a Severe Accident" dated June 17, 2002

HIGHLIGHTS OF KEY ISSUES

1. CRDM Cracking of Vessel Head Penetrations and Vessel Head Degradation

The Committee heard presentations by and held discussions with representatives of the Electric Power Research Institute/Materials Reliability Program (EPRI/MRP), First Energy Nuclear Operating Company (FENOC), and the NRC staff regarding vessel head penetration cracking and degradation and the data relevant to these issues.

FENOC presented information on the Davis-Besse reactor pressure vessel (RPV) closure head activities including replacement considerations, examinations of the Midland head which is to replace the current degraded head, plans for a new head purchase, and additional information on their root cause analysis. The MRP provided data on the crack growth rate curve and its application, probabilistic fracture mechanics analysis, and the industry inspection plan. The staff presented information on its assessment of margin available at Davis-Besse, the priority ranking of plants responding to Bulletin 2002-01, the implementation goals of the Inspection Manual Chapter 0350 Panel, the objectives and scope of the Lessons Learned Task Force, the inspection methods and frequencies being considered for management of the cracking and degradation issues, and comments on the industry's inspection plan.

The staff and industry are working together to resolve differences related to the inspection plan and other cracking and degradation issues.

Committee Action

The Committee issued a report to Chairman Meserve on this matter dated June 20, 2002, concluding that understanding of the issues related to cracking and degradation are progressing, but additional work is still needed. The Committee plans to hold additional meetings with the staff on these issues.

2. Technical Assessment of Generic Safety Issue (GSI)-189, Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion During a Severe Accident

The Committee heard presentations by and held discussions with representatives of the NRC staff and their consultants, the Union of Concerned Scientists (UCS), and members of the public regarding the recommendations proposed by the Office of Nuclear Regulatory Research (RES) to resolve Generic Safety Issue (GSI)-189. The Committee members, the staff, a representative of UCS, and members of the public discussed the background for the GSI, the options evaluated by RES for resolving the issue, RES cost benefit analysis and associated bases, and the uncertainties associated with the benefit cost analysis.

Committee Action

The Committee issued a letter to the EDO on this matter dated June 17, 2002, recommending that RES complete its additional analyses to quantify the uncertainties prior to providing the technical assessment results to the Office of Nuclear Reactor Regulation (NRR), and that NRR factor the uncertainties into the final resolution of GSI-189.

3. Technical Assessment of GSI-168, Environmental Qualification of Low-Voltage Instrumentation and Control (I&C) Cables

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the technical assessment of GSI-168. The Committee discussed RES's conclusion that the current environmental qualification process for I&C cables is adequate for the duration of the current license term of 40 years. The Committee also discussed RES's proposed recommendations to NRR to resolve GSI-168.

Committee Action

The Committee issued a letter to the EDO on this matter dated June 17, 2002. The Committee recommended that cable test results and other pertinent information be disseminated to the nuclear industry through a generic communication, and that the generic communication also include a discussion of the treatment of I&C cables during the license renewal term.

4. Development of Reliability/Availability Performance Indicators and Industry Trends

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the agency's pilot program to risk-inform the performance indicator (PI) process associated with the revised Reactor Oversight Process (ROP). The pilot program is aimed at monitoring the unavailability and unreliability of selected mitigating safety systems and attempts to revamp results into one that produces a risk-informed PI; i.e. Pilot-MSPI (Mitigating System Performance Indicator). This effort is part of the Mitigating Systems Cornerstone.

Committee Action

This was an information briefing. No Committee action was taken at this meeting. The Committee will keep informed of staff activities with a follow-up joint meeting of the ACRS Subcommittees on Plant Operations and on Reliability and Probabilistic Risk Assessment in the fall of 2002.

5. Technical and Policy Issues Related to Advanced Reactors

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding issues that have potential policy implications for advanced reactor licensing and the staff's plans for seeking Commission's guidance for resolving these issues. The staff identified five policy issues: event selection and safety classification; fuel performance and qualification; source term; containment versus confinement; and emergency evacuation. In addition, the staff identified two overarching issues: the implementation of the Commission's "expectation" that advanced reactors will provide enhanced safety margins; and the relationship between the NRC's safety requirements and international safety requirements.

Committee Action

The Committee issued a report to Chairman Meserve on this matter dated June 17, 2002, recommending that the existing agency positions on some of these policy issues be reevaluated because of new perspectives on risk-informed regulation and defense in depth, as well as anticipated new reactor designs. In addition, the need for greater specificity in the application of defense in depth should be made a separate overarching issue.

6. Proposed Rulemaking to Endorse National Fire Protection Association 805 Standard, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants"

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Nuclear Energy Institute (NEI) regarding the proposed revision to 10 CFR 50.48, endorsing National Fire Protection Association (NFPA) Standard 805 as a risk-informed and performance-based standard for determining fire protection requirements in commercial nuclear power plants. The Committee members, the NRC staff, and NEI representatives discussed the proposed rule, the NFPA 805 Standard, the plan for implementation of the rule, the development of implementation guidance by NEI, and the resolution of concerns identified by NEI.

Committee Action

The Committee issued a letter to the EDO on this matter dated June 17, 2002, recommending that the proposed rule be issued for public comment.

7. Generic Resolution of Voids in the Concrete Containment Walls

The issue of voids in the concrete containment walls was raised by a member of the public during the Committee's review of the Turkey Point license renewal application. The Committee discussed this issue during its April 2002 meeting and concluded that it has been properly addressed for Turkey Point. However, the Committee requested that the staff address the generic resolution of voids in the concrete containment walls. During the June 2002 ACRS meeting, the staff provided details of how voids would normally be detected during construction and testing of the containment. In addition, the staff provided information in support of the staff's conclusion that potential undetected voids in concrete structures do not have any generic safety implications.

Committee Action

The Committee found the staff's answer to be responsive to its concern. No further concerns were identified.

8. Format and Content of the 2003 ACRS Report on the NRC Safety Research Program

The Committee discussed the format, content, schedule, and member assignments for the 2003 ACRS report to the Commission on the NRC Safety Research Program.

Committee Action

The Committee will continue its efforts regarding the 2003 ACRS report on the NRC Safety Research Program during future meetings.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee discussed the EDO's response of May 13, 2002 to comments and recommendations included in the ACRS March 19, 2002 report related to Risk-Informing Special Treatment Requirements of 10 CFR Part 50 (Option 2).

  Several Committee members continue to disagree with the staff on the value of uncertainty analysis to support development of importance measures and changes in core damage frequency (ΔCDF).

  The Committee decided to continue its discussion of this matter during the July 2002 meeting.

- The Committee considered the response from the EDO, dated May 6, 2002, to comments and recommendations included in the ACRS report dated March 14, 2002, concerning Arkansas Nuclear One, Unit 2 Extended Power Uprate.

  The Committee decided to continue its discussion of this matter during the July 2002 meeting.

- The Committee considered the response from the EDO dated May 31, 2002, to comments and recommendations included in the ACRS report dated April 19, 2002, concerning a report on the safety aspects of the license renewal application for the Turkey Point Nuclear Plant, Units 3 & 4.

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

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from May 2, 2002 through May 31, 2002, the following Subcommittee meetings were held:

- Reliability and Probabilistic Risk Assessment and Plant Operations - May 30, 2002

The Subcommittees reviewed the staff's initiatives to integrate the NRC program for risk-based analysis of reactor operating experience into the reactor oversight process, specifically the development of reliability/availability performance indicators and industry trends.

- Planning and Procedures - May 30, 2002

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

- Materials and Metallurgy, Thermal-Hydraulic Phenomena, and Reliability and Probabilistic Risk Assessment - May 31, 2002

The Subcommittees discussed the status of staff efforts at risk-informing 10 CFR 50.46 and related changes to Appendix K and Generic Design Criterion 35 (GDC-35) for emergency core cooling systems (ECCS). The discussion centered on the four principal technical areas related to risk-informing ECCS requirements; namely a) ECCS reliability requirements, b) ECCS acceptance criteria, c) ECCS evaluation model requirements, and d) the spectrum of break sizes to be considered.

LIST OF MATTERS FOR THE ATTENTION OF THE EDO

- The Committee plans to review the proposed resolution of GSI-168, "Environmental Qualification of Low-Voltage Instrumentation and Control Cables."

- The Committee plans to review the additional analyses and the proposed RES recommendations to NRR for resolving GSI-189, "Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion During a Severe Accident."

- The Committee plans to continue its discussion of the May 13, 2002 ACRS report related to Risk-Informing Special Treatment Requirements of 10 CFR Part 50 (Option 2) during the July 10-12, 2002 ACRS meeting.

- The Committee plans to continue its discussion of the May 6, 2002 EDO response to the March 14, 2002 ACRS report concerning Arkansas Nuclear One, Unit 2 Extended Power Uprate during the July 10-12, 2002 ACRS meeting.

- The Committee plans to continue its discussion of issues associated with CRDM cracking of vessel head penetrations and vessel head degradation during future meetings.

- The Committee plans to continue its discussion of the staff's progress in developing reliability/availability performance indicators during future meetings.

- The Committee plans to continue its interaction with the staff on possible approaches and options for resolving policy issues related to advanced reactor licensing.

PROPOSED SCHEDULE FOR THE 494th ACRS MEETING

The Committee, in addition to meeting with the NRC Commissioners, agreed to consider the following topics during the 494th ACRS meeting, July 10-12, 2002:

- Pressurized Thermal Shock (PTS) Reevaluation Project: Risk Acceptance Criteria

- Draft Final Revision 1 to Regulatory Guide 1.174, "An Approach to Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and Associated Standard Review Plan Chapter 19

- Risk-Informed Regulation Implementation Plan

- Advanced Reactors Research Plan

- Overview of NRC Research Activities in the Seismic Area

- Development of Review Standard for Reviewing Core Power Uprate Applications

- Application of the Probabilistic Fracture Mechanics Methodologies to Reactor Vessel Integrity Assessment

- Format and Content of the 2003 ACRS Report on the NRC Safety Research Program

Sincerely,

/RA/

George E. Apostolakis
Chairman