

February 28, 2001

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

SUBJECT: SUMMARY REPORT - 479TH MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS, FEBRUARY 1-3, 2001 AND
OTHER RELATED ACTIVITIES OF THE COMMITTEE

Dear Chairman Meserve:

During its 479th meeting, February 1-3, 2001, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following letters.

LETTERS

1. Proposed Resolution of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to Significant Blowdown Loads" (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated February 8, 2001)
2. Draft ANS External Events PRA Methodology Standard (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated February 9, 2001)
3. Review of the Siemens Power Corporation S-RELAP5 Code to Appendix K Small-Break Loss-of-Coolant Accident Analyses (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated February 13, 2001)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project

The Committee heard a presentation by and held discussions with representatives of the NRC staff concerning the treatment of uncertainties in the elements of the pressurized thermal shock (PTS) technical basis reevaluation project. The staff highlighted efforts to develop a generic approach for screening criteria through the evaluation of four individual

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plants: Oconee Unit 1, Calvert Cliffs Unit 1, Palisades, and Beaver Valley Unit 1. The Committee and staff discussed the approach for assessing uncertainties in estimates of PTS risk, proposed screening criteria, framework for evaluating PRA event sequence analysis, thermal-hydraulic analysis, and probabilistic fracture mechanics stress-strength analysis. The Committee discussed extensively the proposed binning process for event sequences and thermal-hydraulic code analysis used to develop screening criteria. At the conclusion of the meeting, the Committee requested and the staff agreed to illustrate how the process might work using a single event sequence during a future subcommittee meeting. The Subcommittees on Materials and Metallurgy and on Thermal-Hydraulic Phenomena met on January 18, 2001, concerning this matter.

Committee Action

The Committee plans to continue its review of this matter during future meetings.

2. Siemens S-RELAP5 Appendix K Small-Break LOCA

The Committee heard presentations by and held discussions with representatives of the Siemens Power Corporation (SPC) and the NRC staff concerning the NRC staff's approval of the SPC S-RELAP5 thermal-hydraulic code for small-break loss-of-coolant accident (SBLOCA) analyses, pursuant to the requirements of Appendix K to 10 CFR Part 50. A representative of the NRC staff discussed its review milestones, assessment of the S-RELAP5 code, and regulatory requirements governing Appendix K code reviews. The staff stated that it finds S-RELAP5 acceptable for use in satisfying the Appendix K requirements for analyses of SBLOCAs. SPC representatives discussed the origin and details of S-RELAP5, and SPCs SBLOCA methodology. SPC stated that its methodology shows that the S-RELAP5 SBLOCA code is convergent and robust. The Subcommittee on Thermal-Hydraulic Phenomena met on January 16-17, 2001, concerning this matter.

Committee Action

The Committee provided a letter to the Executive Director for Operations on this matter, dated February 13, 2001.

3. Proposed ANS Standard on External-Events PRA

The Committee heard presentations by and held discussions with representatives of the American Nuclear Society (ANS) External Events Working Group concerning draft BSR/ANS-58.21, "External Events PRA Methodology Standard." The Committee

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discussed the ANS Standard's treatment of risk from external events, e.g., earthquakes, high winds, external floods. The Committee considered the scarcity of statistical evidence for events of sufficient magnitude to cause plant damage and the need for expert judgment to develop the necessary probability distributions for risk assessment. The Committee discussed the proposed requirements for assessing uncertainties in the risk analysis. The Committee also discussed the need for consistency of definitions and terminology between the ANS Standard and the proposed standard for internal events under development by the American Society of Mechanical Engineers.

Committee Action

The Committee provided a letter dated February 9, 2001, to the Executive Director for Operations, on this matter.

4. Reprioritization of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to Significant Blowdown Loads"

The Committee heard presentations by and held discussions with the representatives of the NRC staff regarding the Proposed Resolution of Generic Safety Issue (GSI)-152, "Design Bases for Valves that Might be Subjected to Significant Blowdown Loads".

The NRC staff presented a brief background regarding GSI-152. The staff stated that GSI-152 was established to address the concern raised by the ACRS in 1989 during the review of activities related to GSI-87, "Failure of HPCI Steam Line Without Isolation." The concern was that while the valves might meet the NRC-approved design bases, the design bases might not address the need for the valve to close against the differential pressure resulting from a large high energy pipe break. Subsequently GSI-87 was closed. Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," was issued to focus specifically on the ability of motor-operated valves to operate under design basis conditions. The staff issued Supplement 3, "Consideration of the Results of NRC-Sponsored Tests of Motor-Operated Valves," to GL89-10 to ensure the capability of containment isolation valves in the reactor water cleanup, high pressure coolant injection, and reactor core isolation cooling systems in boiling water reactor plants to isolate the largest credible downstream pipe break. The Office of Nuclear Regulatory Research performed tests for the closure of GSI-87, which showed weaknesses in valve performance attributes both to motors and to valve mechanisms. Industry sponsored research programs confirmed the weaknesses identified in the NRC testing program.

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Based on the issuance of Supplement 3 to GL89-10 and subsequent staff and industry initiatives, the staff has proposed to close this generic safety issue.

Committee Action

The Committee sent a letter dated February 8, 2001, to the Executive Director for Operations on this matter.

5. Regulatory Effectiveness of the ATWS Rule

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning the Regulatory Effectiveness of the Anticipated Transients Without Scram (ATWS) rule. RES is reviewing several regulations to determine if the requirements set forth in these regulations are achieving their desired outcomes. The goal of this evaluation is to determine whether the rules were effective. The effectiveness of the ATWS rule was determined by comparing regulatory expectations to outcomes. The staff concluded that the ATWS rule was effective in reducing ATWS risk and that the cost of implementing the rule was reasonable. However, uncertainties in reactor protection system reliability and mitigative capability may warrant further attention to ensure that the expected levels of safety are maintained.

Committee Action

A letter to the Chairman was deferred until the March meeting.

6. Overview of Mixed Oxide Fuel Fabrication Facility

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the proposed Mixed Oxide (MOX) fuel fabrication facility to be constructed at the Department of Energy's (DOE's) Savannah River Plant site. The MOX project is part of a bilateral plutonium disposition agreement between the United States and Russia and is intended to reduce nuclear proliferation. The objective of this agreement is to take 34 metric tons of surplus plutonium from the weapons programs and irreversibly convert it into forms that are unusable for weapons. In this approach, the United States plans to take 25 metric tons of plutonium and convert it into MOX fuel for use in commercial reactors. The remaining 9 metric tons would be immobilized with vitrified high level waste.

As part of this program, the NRC expects to receive a license application from the applicant (Duke, Cogema, and Stone & Webster) to license a MOX fuel fabrication facility under 10 CFR Part 70, Domestic Licensing of Special Nuclear Material. As part

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of the plutonium disposition program, DOE submitted environmental impact statement to the staff on December 19, 2000. The applicant plans to submit the application for construction of the facility to the staff in February 2001. The amendments for use of MOX lead test assemblies at McGuire nuclear station is expected in August 2001.

Committee Action

This briefing was for information only and no Committee action was required.

7. Meeting with the NRC Chairman

The Committee met with NRC Chairman Meserve to discuss items of mutual interest.

8. NRC Safety Research Program

The Committee discussed the 2001 ACRS report to the Commission on NRC Safety Research Program. The Committee will continue its deliberation on the proposed report in March 2001. The Committee indicated that the report would focus on the longer-term research activities to ensure that the Commission will carry out its safety mission efficiently and effectively in the future.

Committee Action

The Committee plans to finalize its draft report at the March 2001 ACRS meeting.

9. ACRS/ACNW Joint Subcommittee Report

Dr. Thomas Kress, Co-Chairman of the ACRS/ACNW Joint Subcommittee, provided a report on the results of the January 19, 2001 Subcommittee meeting. He informed the Committee that the Joint Subcommittee discussed risk assessment methods associated with Integrated Safety Analysis (ISA) and the status of risk-informed activities in the Office of Nuclear Material Safety and Safeguards. Dr. Kress noted that the Joint Subcommittee also heard a presentation by a DOE representative concerning risk analysis methods and applications associated with the DOE Integrated Safety Management (ISM) program. Dr. Kress said that the Joint Subcommittee plans to: 1) review an actual ISA summary, when available (e.g., MOX fuel or BWXT), 2) review the staff's reconciliation of NUREG-1520 Standard Review Plan Chapter 3 for ISAs, 3) review a risk-informed case study, when available, and 4) evaluate the issue of consistency in risk analysis across NRC programs, including the application of PRA methods relative to proposed approaches for NMSS licensed activities.

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Committee Action

The Joint Subcommittee plans to review the matters noted above.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee discussed the response from the EDO, dated January 11, 2001, to ACRS comments and recommendations included in the ACRS letter dated December 14, 2000, concerning the Nuclear Energy Institute Draft Report, NEI-99-03, "Control Room Habitability Assessment Guidance".

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

- The Committee discussed the response from the EDO, dated December 11, 2000, to ACRS comments and recommendations included in the ACRS letter dated November 20, 2000, concerning proposed framework for risk-informed changes to the technical requirements of 10 CFR Part 50.

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

- The Committee discussed the response from the EDO, dated December 14, 2000, to ACRS comments and recommendations included in the ACRS letter dated October 12, 2000, concerning the pressurized thermal shock technical basis reevaluation project.

The Committee decided that it was satisfied with the EDO's response. The Committee plans to continue its review of this matter during future meetings.

- The Committee discussed the response from the EDO, dated January 11, 2001, to ACRS comments and recommendations included in the ACRS letter dated December 15, 2000, concerning proposed final Regulatory Guide DG-1053, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence."

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

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- The Committee discussed the response from the EDO, dated December 20, 2000, to ACRS comments and recommendations included in the ACRS letter dated November 20, 2000, concerning BWROG proposal to use safety relief valves and low pressure systems as a redundant safe shutdown path to satisfy the requirements of 10 CFR Part 50, Appendix R.

The Committee plans to review the staff's safety evaluation report on this matter during a future meeting.

- The Committee discussed the response from the EDO, dated January 18, 2001, to ACRS comments and recommendations included in the ACRS report dated November 8, 2000, concerning draft final technical study of spent fuel pool accident risk at decommissioning nuclear power plants.

The Committee decided to continue its discussion of this matter during future meetings.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from December 6 through January 31, 2001, the following Subcommittee meetings were held:

- Plant Operations Subcommittee - December 6, 2000

The Subcommittee discussed changes to the Revised Reactor Oversight Process since implementation of the pilot program.

- Thermal-Hydraulic Phenomena Subcommittee - January 16-17, 2001

The Subcommittee discussed the NRC/Electric Power Research Institute cooperative study to resolve Generic Letter 96-06 waterhammer issues. EPRI has drafted a report, TR-113594, "Resolution of Generic Letter 96-06 Waterhammer Issues". The Subcommittee previously reviewed this matter during a November 17, 1999 meeting. At the conclusion of the January 16-17 meeting, both the Subcommittee and NRR staff identified open issues for resolution by EPRI.

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- ACRS/ACNW Joint Subcommittee - January 19, 2001

The ACRS/ACNW Joint Subcommittee discussed risk assessment methods associated with Integrated Safety Analysis (ISA) and the status of risk-informed activities in the Office of Nuclear Material Safety and Safeguards. The Joint Subcommittee also discussed risk analysis methods and applications associated with the Department of Energy (DOE) Integrated Safety Management (ISM) program.

- Extended Planning and Procedures Subcommittee - January 22-24, 2001

The Subcommittee discussed stakeholder views of ACRS activities, self-assessment of ACRS performance in CY 2000, potential operational areas for improved effectiveness, and the annual ACRS report to the Commission on the NRC Safety Research Program.

- Planning and Procedures - January 31, 2001

The Planning and Procedures 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 FOLLOW-UP MATTERS FOR THE EXECUTIVE DIRECTOR FOR OPERATIONS

- The Committee plans to review the revised documentation supporting the realistic version of the Siemens S-RELAP5 thermal-hydraulic code.
- During the discussion of the treatment of uncertainties in the elements of the PTS Technical Basis Reevaluation Project, the staff committed to illustrate how the proposed binning process might work using a single event sequence at a future Subcommittee meeting.
- The ACRS/ACNW Joint Subcommittee plans to review: an actual integrated safety analyses (ISAs) summary (e.g., MOX fuel or BWxT); the staff's reconciliation of NUREG-1520 SRP Chapter 3 for ISAs; a risk-informed case study; consistency in risk analysis across NRC programs; and risk-informed initiations in NMSS.
- The Committee plans to review the proposed final ANS Standard on external events PRA after reconciliation of public comments.

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- The Committee would like to be kept informed of the resolution of the DPO issues associated with steam generator tube integrity.
- The Committee plans to continue its review of the pressured thermal shock technical basis reevaluation project during future meetings.
- The Committee plans to review the staff's safety evaluation report on the BWROG proposal to use safety relief valves and low pressure systems as a redundant safe shutdown path to satisfy the requirements of 10 CFR Part 50, Appendix R.
- The Committee plans to continue its discussion of spent fuel pool accident risk at decommissioning nuclear power plants.

PROPOSED SCHEDULE FOR THE 480TH ACRS MEETING

The Committee agreed to consider the following topics during the 480th ACRS Meeting, March 1-3, 2001:

RETRAN-3D Thermal-Hydraulic Transient Analysis Code

Report by the Chairman of the Thermal-Hydraulic Phenomena Subcommittee regarding the EPRI RETRAN-3D thermal-hydraulic transient analysis code, associated staff's Safety Evaluation Report, and resolution of issues previously raised by the ACRS. [Note: A portion of this session may be closed to discuss EPRI proprietary information.]

Interim Review of the License Renewal Application for Arkansas Nuclear One, Unit 1

Report by the Chairman of the Plant License Renewal Subcommittee regarding the license renewal application for Arkansas Nuclear One, Unit 1 and the associated staff's Safety Evaluation Report.

Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants

Briefing by and discussions with representatives of the NRC staff regarding significant findings and recommendations of the final report on spent fuel pool accident risk at decommissioning plants, new developments, status of developing proposed options, and related matters.

Management Directive 6.4 Associated with the Revised Generic Issue Process

Briefing by and discussions with representatives of the NRC staff regarding Management Directive 6.4 related to the Revised Generic Issue process, results of the case study

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performed to determine the effectiveness of using the Management Directive to implement the revised Generic Issue process, and related matters.

British Nuclear Powered Submarine Incident

Briefing by and discussions with representatives of the DOD/DOE Naval Reactors regarding the recent incident on the British Nuclear Powered Submarine (HMS TIRELESS). [Note: This session will be closed to discuss information classified "Confidential - Restricted Data - Government Sensitive" .]

Operating Event at V. C. Summer Nuclear Station

Briefing by and discussions with representatives of the NRC staff regarding the October 7, 2000 incident at the V. C. Summer Nuclear Station, involving degraded reactor coolant system pressure boundary, findings and conclusions resulting from the staff's investigation of this event, and corrective actions taken by the licensee and industry organizations.

Trip Report

The cognizant ACRS Member and staff engineer will provide a trip report on the Nuclear Energy Institute (NEI) Fire Protection Forum held in San Diego on February 5-7, 2001.

Subcommittee Report

Report by the Chairmen of the Plant Operations and Reliability and Probabilistic Risk Assessment Subcommittees regarding the South Texas Project Exemption Request that was discussed during a meeting on February 21, 2001.

Sincerely,

/RA/

George E. Apostolakis
Chairman