



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

SL-0471

PDR

June 17, 1999

The Honorable Shirley Ann Jackson
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Jackson:

SUBJECT: SUMMARY REPORT - FOUR HUNDRED SIXTY SECOND MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, MAY 5-8, 1999, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 462nd meeting, May 5-8, 1999, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports and letters. In addition, the Committee authorized Dr. Larkins, Executive Director, to transmit the memoranda noted below:

REPORTS

- Modified Proposed Final Revision to 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (Report to Shirley Ann Jackson, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated May 11, 1999)
- Use of Mixed Oxide Fuel in Commercial Nuclear Power Plants (Report to Shirley Ann Jackson, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated May 17, 1999)
- Proposed Final Rule - Revisions to 10 CFR Parts 50 and 72 Concerning Changes, Tests and Experiments (Report to Shirley Ann Jackson, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated May 17, 1999)
- The Role of Defense In Depth in a Risk-Informed Regulatory System (Report to Shirley Ann Jackson, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated May 19, 1999)
- Review and Evaluation of the Nuclear Regulatory Commission's Safety Research Program (Report to Shirley Ann Jackson, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated June 4, 1999)

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LETTERS

- Proposed Resolution of Generic Safety Issue-158, "Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions" (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated May 14, 1999)
- Interim Letter on the Safety Aspects of the Baltimore Gas and Electric Company's License Renewal Application for Calvert Cliffs Nuclear Power Plant, Units 1 and 2 (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated May 19, 1999)
- Modifications Proposed by the Westinghouse Owners Group to the Core Damage Assessment Guidelines and Post Accident Sampling System Requirements (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated May 19, 1999)

MEMORANDA

- Draft Regulatory Guide 620: "Emergency Planning and Preparedness for Nuclear Reactors" (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated June 3, 1999)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Application of the Electric Power Research Institute (EPRI) Risk-Informed Method to Inservice Inspection

The Committee heard presentations by and held discussions with representatives of EPRI and the NRC staff regarding topical report EPRI TR-11657, "Revised Risk-Informed Inservice Inspection Procedure." In addition to discussing the technical aspects of the EPRI method (qualitative), the Committee discussed the staff's schedule for developing its draft Safety Evaluation Report (SER) on the EPRI topical report, the EPRI response to issues raised by the staff, and for reviewing the proposed final version of EPRI TR-11657 and associated proposed final SER.

Conclusion

The Committee plans to review the proposed final topical report and SER when they become available.

2. Proposed Final Revisions to 10 CFR 50.59 (Changes, Tests and Experiments)

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Nuclear Energy Institute (NEI) regarding the proposed final revisions to 10 CFR 50.59 and related requirements in 10 CFR Parts 50 and 72 concerning changes, tests, and experiments. The Committee previously met with the staff and NEI in March 1999 to discuss SECY-99-054 on this matter, and issued a report to the Commission dated March 22, 1999. The Committee discussed significant changes to the proposed rule which included the addition of two new criteria: (vii) result in a design basis limit for a fission product barrier being exceeded or altered, and (viii) result in a departure from a method of evaluation described in the FSAR [Final Safety Analysis Report] (as updated) used in establishing the design bases or in the safety analyses. The Committee discussed possible alternate rule language for these two criteria. The Committee also discussed the "substantial review" criterion regarding escalated enforcement and the possible introduction of a "zero increase" constraint for departure from a method of evaluation.

Conclusion

The Committee issued a report to Chairman Jackson, dated May 17, 1999, on this matter.

3. Safety Evaluation for the Calvert Cliffs Nuclear Power Plant (CCNPP) License Renewal Application

The Committee heard presentations by and held discussions with representatives of the NRC staff and Baltimore Gas and Electric Company (BGE) regarding the staff's SER for the Calvert Cliffs license renewal application. The ACRS members, the NRC staff, and BGE discussed how the license renewal process ensures identification of all applicable components, why existing aging management programs for time-independent mechanisms (e.g. intergranular stress corrosion cracking) need to be reviewed, how BGE will identify and manage emerging aging-induced degradation mechanisms, and potential areas for improving the license renewal process.

Conclusion

The Committee issued an interim letter to the NRC Executive Director for Operations dated May 19, 1999, on this matter.

4. Proposed Resolution of Generic Safety Issue (GSI)-158. "Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions"

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the proposed resolution of GSI-158. This issue was identified after operating experience and results of research on motor-operated valves, solenoid-operated valves, air-operated valves, and hydraulic-operated valves indicated that testing under static conditions did not always reveal how these valves would perform under design basis conditions. A number of failures of power-operated valves (POVs) had occurred as a result of inadequate design, installation, and maintenance. Based on the results of an analysis performed by the Idaho National Engineering and Environmental Laboratory (INEEL), which revealed that the potential reduction in risk from an improvement in the reliability of POVs will neither result in a substantial safety enhancement nor be cost effective, the staff has recommended closure of GSI-158. The Committee felt that the staff did not adequately address the central issue whether POVs are able to perform their intended functions under design basis dynamic conditions.

Conclusion

The Committee issued a letter to the Executive Director for Operations (EDO), dated May 14, 1999, on this matter. The Committee plans to continue its discussion with the staff regarding the resolution of its concern noted above.

5. Status of the Proposed Resolution of Generic Safety Issue (GSI)-165. "Spring-Actuated Safety and Relief Valve Reliability"

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning the status of staff activities related to the resolution of GSI-165. The staff stated that the actions taken to evaluate and resolve this GSI did not confirm the assumptions made in the initial prioritization. The review of related valve data only identified a single valve in one plant type that had the potential for failing the equipment train. The safety relief valve (SRV) was analyzed as a worst case and it showed that the increase in core damage frequency for that SRV is acceptable (6×10^{-6}).

Conclusion

The staff plans to brief the Committee on the proposed resolution of GSI-165 during the June 2-4, 1999 ACRS meeting.

6. Fire Protection Functional Inspection Program and Related Matters

The Committee heard presentations by and held discussions with representatives of the NRC staff and NEI regarding the fire protection functional inspection (FPFI) program and related fire protection issues. The staff presented background information regarding the FPFI program and also briefly discussed the development of a process for assessing the risk significance of fire protection program deficiencies and other fire protection inspection findings. The staff stated that the objectives of the FPFI program were to focus industry attention on reactor safety and to determine whether licensees are maintaining their licensing design basis for fire protection.

A representative of NEI presented the industry views of the current fire protection inspection program. NEI agrees with the staff that the current fire protection inspection program is to be subsumed into the oversight process and that there needs to be a balance between NRC inspections and industry self-assessments. However, NEI disagrees with the staff's plan to include the triennial inspection module in the oversight inspection process. NEI is developing performance indicators for industry use to ensure that there is an adequate balance and the appropriate level of self-assessment and NRC oversight. NEI plans to issue the performance indicators in mid-2000.

Conclusion

The Committee plans to continue its review of fire protection issues during future meetings.

7. Westinghouse Owners Group Proposal for Modification of Core Damage Assessment Guidelines and Post-Accident Sampling System Requirements

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Westinghouse Owners Group (WOG) regarding the WOG's proposed modifications to the core damage assessment guidelines (CDAG) and the post-accident sampling system (PASS) requirements. Representatives of the WOG stated that the modifications to the CDAG are based on knowledge of severe accidents that is more state-of-the-art, is focused on plant safety, meets regulatory requirements, and will better support accident management needs. Specifically,

reliance will be on the issue of fixed in-plant instrumentation (core exit thermocouples, containment high-range radiation monitors) for input to the CDAGs. Similarly, the PASS modifications were characterized as technically sound, comporting with regulatory requirements, an improvement to the effectiveness of the site emergency plan, and useful for planning severe accident recovery actions. The WOG proposes to remove most of the PASS sampling and accuracy requirements from the plant licensing basis, with the exception of a few select parameters (e.g., RCS boron, containment hydrogen), and to retain sampling capability for long-term cleanup and recovery planning.

Representatives of the NRC staff discussed the background, scope, status and results of their review of the WOG's proposed modifications. For the CDAG, the staff finds the revised guidelines result in more timely information and are an improvement over existing methodology. Regarding the PASS modifications, the staff finds most acceptable, a few acceptable with conditions, and one set (sampling of radionuclides from RCS and containment spaces) is still under review. NRR also has under review the issue of how the PASS capabilities will be maintained outside the licensing basis (e.g., include in Updated Final Safety Analysis Report, etc.).

Conclusion

The Committee issued a letter to the EDO, dated May 19, 1999, on this matter.

8. Use of Mixed Oxide Fuel in Commercial Nuclear Plants

The Committee completed its response to the Commission request, included in the March 5, 1999 Staff Requirements Memorandum, that the ACRS consider the impact on the revised source term if high burnup or mixed oxide fuel were used in place of conventional uranium fuel in commercial nuclear power plants.

Conclusion

The Committee issued a report to Chairman Jackson, dated May 17, 1999, on this matter.

9. Report to the Commission regarding the NRC Safety Research Program

The Committee completed its 1999 report regarding the NRC safety research program. The comments and recommendations provided by the Advisory Committee on Nuclear Waste (ACNW) on nuclear waste related research are included in this report. The report provides additional information concerning the

research needed to support Commission programs, especially risk-informed regulation. The report addresses research in 11 areas. These are:

- Probabilistic Risk Assessment
- Human Factors and Human-Machine Interface
- High Burnup Fuel and Mixed Oxide Fuel Performance
- Instrumentation and Control Systems
- Severe Accidents
- Fire Protection
- Thermal Hydraulics
- Integrity of Steam Generators
- Integrity of Pressure Vessels
- Environmentally Assisted Stress Corrosion Cracking
- Nuclear Waste-Related Research

Conclusion

The Committee issued its report to the Commission on the NRC Safety Research Program, dated June 4, 1999.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee discussed the response from the NRC Executive Director for Operations (EDO) dated March 31, 1999, to ACRS comments and recommendations included in the ACRS report dated February 23, 1999, concerning proposed improvements to the NRC inspection and assessment programs.

The Committee plans to continue its discussion of this matter during its review of the pilot applications of the revised inspection and assessment programs at future meetings.

- The Committee discussed the EDO response dated April 8, 1999, to ACRS comments and recommendations included in the ACRS report dated March 22, 1999, concerning SECY-99-054, "Plans for Final Rule - Revisions to 10 CFR Parts 50, 52, and 72: Requirements Concerning Changes, Tests, and Experiments."

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

- The Committee discussed the EDO response dated April 19, 1999, to the ACRS comments and recommendations included in the ACRS letter dated March 23,

1999, concerning the proposed rulemaking to modify the reactor event reporting requirements in 10 CFR 50.72 and 50.73.

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

- The Committee discussed the EDO response dated April 15, 1999, to the ACRS comments and recommendations included in the ACRS letter dated March 24, 1999, concerning the high burnup fuel phenomena identification and ranking tables (PIRT).

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

- The Committee discussed the EDO response dated April 23, 1999, to the ACRS comments and recommendations included in the ACRS letter dated March 24, 1999, concerning the guidance memorandum for implementation of the revised enforcement policy.

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

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from April 7 through May 5, 1999, the following Subcommittee meetings were held:

- Reliability and Probabilistic Risk Assessment and Regulatory Policies and Practices
- April 7, 1999

The Subcommittees discussed the staff's proposed approach for revising the Commission's Safety Goal Policy Statement.

- Reliability and Probabilistic Risk Assessment and Regulatory Policies and Practices
- April 21, 1999

The Subcommittees reviewed the staff's reconciliation of public comments on performance-based initiatives (SECY-98-132); plan for pursuing performance-based initiatives, candidate activities, and related matters; and NUREG/CR-5392, "Elements of an Approach to Performance-Based Regulatory Oversight."

- Plant License Renewal - April 28-29, 1999

The Subcommittee reviewed the Calvert Cliffs Plant license renewal application, the associated NRC Staff's Safety Evaluation Report, and related matters.

- Severe Accident Management - April 30, 1999

The Subcommittee reviewed the Westinghouse Owners Group's proposed revision to the Core Damage Assessment Guidelines and Post-Accident Sampling System requirements.

- Safety Research Program - May 4, 1999

The Subcommittee reviewed various elements of the NRC Safety Research Program and gathered information for use in preparing a report to the Commission on the NRC Safety Research Program.

- Planning and Procedures - May 5, 1999

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.

- Reliability and Probabilistic Risk Assessment and Regulatory Policies and Practices - May 5, 1999

The Subcommittees reviewed the proposed topical report prepared by the Electric Power Research Institute for risk-informed inservice inspection.

LIST OF FOLLOW-UP MATTERS FOR THE EXECUTIVE DIRECTOR FOR OPERATIONS

- The Committee plans to review the proposed final rulemaking to modify the reactor event reporting requirements in 10 CFR 50.72 and 50.73.
- The Committee plans to continue its review of proposed revisions to the enforcement policy during future meetings.
- The Committee plans to continue its review of pilot applications of the revised inspection and assessment programs during future meetings.
- The Committee plans to continue its review of proposed revisions to 10 CFR 50.59 during future meetings.

- The Committee plans to continue its discussion with the staff regarding its concerns associated with the proposed resolution of GSI-158, "Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions."
- The Committee plans to review the staff activities associated with the fire protection program during future meetings.

PROPOSED SCHEDULE FOR THE 463RD ACRS MEETING

The Committee agreed to consider the following during the 463rd ACRS Meeting, June 2-4, 1999:

Hydrogen Control Exemption Request for the San Onofre Nuclear Generating Station, Units 2 and 3

Briefing by and discussions with representatives of the Southern California Edison (SCE) and NRC staff regarding the request by SCE for a license exemption to the hydrogen control requirements for the San Onofre Nuclear Generating Station, Units 2 and 3, and the associated NRC staff's Safety Evaluation Report.

Status of the Pilot Application of the Revised Inspection and Assessment Programs

Briefing by and discussions with representatives of the NRC staff regarding the status of the pilot application of the revised inspection and assessment programs and related matters.

Proposed Risk-Based Performance Indicators

Briefing by and discussions with representatives of the NRC staff regarding the proposed risk-based performance indicators (PIs), trial application of PIs, and identification of thresholds for regulatory action.

Performance-Based Regulatory Initiatives and Related Matters

Briefing by and discussions with representatives of the NRC staff regarding performance-based regulatory initiatives and related matters.

Use of Averted Onsite Costs and Voluntary Initiatives in Regulatory Analyses

Briefing by and discussions with representatives of the NRC staff regarding proposed options for treating averted onsite costs and voluntary initiatives in regulatory analyses.

Development of a Low-Power and Shutdown Risk Program

Briefing by and discussions with representatives of the NRC staff regarding the status of development of a low-power and shutdown risk program.

Strategy for ACRS Review of License Renewal Activities

Discussion of a proposed ACRS strategy for reviewing plant-specific license renewal applications, industry topical reports, and related matters.

Options for Crediting Existing Programs for License Renewal

Briefing by and discussions with representatives of the NRC staff regarding proposed options for crediting existing NRC-approved programs for license renewal.

Proposed Resolution of Generic Safety Issue (GSI)-165, "Spring-Actuated Safety and Relief Valve Reliability"

Briefing by and discussions with representatives of the NRC staff regarding the proposed resolution of GSI-165.

Report of the Joint ACRS/ACNW Working Group

Report of the Joint ACRS/ACNW Working Group regarding matters discussed at the May 11, 1999 meeting and procedures for reviewing and commenting on items of mutual interest between ACRS and ACNW.

Perspective on Nuclear Safety and the Regulatory Process

Briefing by and discussions with Dr. Bonaca, ACRS Member, regarding his perspective on nuclear safety and the regulatory process.

Sincerely,

A handwritten signature in black ink that reads "Dana A. Powers". The signature is written in a cursive style with a large, prominent "D" at the beginning.

Dana A. Powers
Chairman