



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

SL-0472

PDR

July 27, 1999

The Honorable Greta Joy Dicus
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Dicus:

SUBJECT: SUMMARY REPORT - FOUR HUNDRED SIXTY-THIRD MEETING OF
THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, JUNE 2-4,
1999, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 463rd meeting, June 2-4, 1999, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report and letters. In addition, the Committee authorized Dr. Larkins, Executive Director, to transmit the memoranda noted below:

REPORT

- Development of a Low-Power and Shutdown Risk Assessment Program (Report to Shirley Ann Jackson, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated June 11, 1999)

LETTERS

- Proposed Resolution of Generic Safety Issue-165, Spring-Actuated Safety and Relief Valve Reliability (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated June 9, 1999)
- Pilot Application of the Revised Inspection and Assessment Programs, Risk-Based Performance Indicators, and Performance-Based Regulatory Initiatives and Related Matters (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated June 10, 1999)
- Proposed Options for Using Averted Onsite Costs and Voluntary Initiatives in Regulatory Analyses (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated June 11, 1999)

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MEMORANDA

- Proposed Final Rule Amending the Fitness-for-Duty Rule (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated June 9, 1999)
- Exemption Request to the Hydrogen Control Requirements for the San Onofre Nuclear Generating Station, Units 2 and 3 (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated June 9, 1999)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

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

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Southern California Edison Company (SCE) regarding the SCE request for an exemption to the hydrogen control requirements for the San Onofre Nuclear Generating Station (SONGS). Specifically, SCE requests elimination of all regulatory requirements for containment hydrogen monitors and purge capability from the SONGS design basis. Contrary to its initial exemption request, SCE intends to maintain regulatory requirements for containment hydrogen monitors. This request was made pursuant to "Task Zero" of the NEI "Whole Plant" study, consistent with implementation of risk-informed regulation. NRC plans to grant the exemption request. However, SCE will not remove the recombiner and purge equipment. This equipment will be maintained for use in accordance with the Severe Accident Mitigation Guidelines and SCE agreed to notify the NRC if, in the future, it intends to abandon this equipment.

Conclusion

The Committee authorized the insurance of a memorandum from the ACRS Executive Director to the NRC Executive Director for Operations, dated June 9, 1999 on this matter.

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

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the revised inspection and assessment programs (Reactor Oversight Process). Three items were discussed: status update, the Significance Determination Process (SDP), and future activities. Regarding

program status, the staff has issued for public comment the procedures governing the baseline inspection program. The performance indicator manual is nearly complete and work is ongoing in the areas of the enforcement policy and the training of NRC inspectors. The pilot plant programs have officially begun at nine plants. The Committee and staff discussed the SDP which was developed to align inspection findings to the performance indicators for plant assessment. The staff performed a feasibility review to evaluate the usability of the SDP. Work to be accomplished includes completion of the pilot plant program by the end of 1999, development of additional performance indicators (e.g., shutdown, fire, etc.), completion of training of the inspection staff, and the conduct of public workshops on the revised Reactor Oversight Process. The Committee and staff also discussed the staff's plans to form a Federal Advisory Committee to provide independent feedback on the results of the pilots.

Conclusion

The Committee issued a letter to the Executive Director for Operations dated June 10, 1999, on revised inspection and assessment programs, risk-based performance indicators, and performance-based initiatives and related matters.

3. Subcommittee Report - Thermal-Hydraulic Phenomena Subcommittee Meeting, May 26, 1999

Dr. Graham Wallis, Chairman, Thermal-Hydraulic Phenomena Subcommittee, reported on the results of the May 26, 1999 Subcommittee meeting. The issues discussed included: (1) proposed revision of Appendix K to 10 CFR Part 50 to allow small cost beneficial power uprates through the use of highly accurate flow meters, (2) a report on the status of the Electric Power Research Institute (EPRI) RETRAN-3D transient code review; and (3) a round-table discussion on the development of NRC's code review guidelines. For item (1), Dr. Wallis stated that the Subcommittee's reaction to the proposed revision of Appendix K was favorable; the Committee will review this matter during its July meeting. For item (2), the review will likely be delayed pending the receipt of a submittal from EPRI containing a revision to a major code model. In addition, Dr. Wallis stated that he has raised a number of significant concerns with the code, based on a review of the code manual. Regarding item (3), the Subcommittee held a round-table discussion with regard to the principles and criterion that need to be included in the code review guidelines. Representatives of NRR, RES, the RETRAN Users Group, and Westinghouse Electric Company participated in this discussion. Dr. Wallis intends to provide the Committee a write-up summarizing the results of this discussion.

Conclusion

The Committee will hold a discussions during its July meeting on the status of the RETRAN-3D code review.

4. Proposed Risk-Based Performance Indicators

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding a proposed approach to developing risk-based performance indicators (PIs). The Committee and staff discussed the use of current PIs in the revised Reactor Oversight Process and the staff's schedule for developing risk-based PIs. The Committee and staff discussed the staff's paper entitled, "Development of Risk-Based Performance Indicators." Committee members extensively discussed issues related to plant- or design-specific PIs, use of PI thresholds, sampling intervals for PIs, consideration of uncertainty, and possible development of PIs for safety culture. The staff plans to present the subject paper at PSA '99 and expects to integrate its approach into a future paper to the Commission.

Conclusion

The Committee's comments on this matter are included in a letter to the NRC Executive Director for Operations, dated June 10, 1999, on the staff's approach to developing risk-based PIs, pilot application of the revised inspection and assessment programs, and performance-based initiatives and related matters (see Item 2).

5. Performance-Based Regulatory Initiatives and Related Matters

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the staff's draft Commission paper entitled, "Plans for Pursuing Performance-Based Initiatives." The Committee and staff discussed current NRC performance-based initiatives, input from the April 1999 public stakeholders meeting, and issues and recommendations contained in the letter from the Nuclear Energy Institute (NEI) dated May 13, 1999. The Committee extensively discussed the need to document lessons-learned from current NRC activities and to develop a set of principles and recommendations for future programs.

Conclusion

The Committee's comments on this matter are included in a letter to the NRC Executive Director for Operations, dated June 10, 1999, on performance-based

initiatives, pilot application of the revised inspection and assessment programs, and the staff's approach to developing risk-based Pis and related matters (see Item 2).

6. Use of Averted Onsite Costs and Voluntary Initiatives in Regulatory Analyses

The Committee heard presentations by and held discussions with representatives of the NRC staff and NEI regarding the use of averted onsite costs and voluntary initiatives in regulatory analyses. The Committee discussed the policy of using averted onsite costs in regulatory analyses with respect to maintaining adequate protection and meeting the intent of the safety goals. The Committee and staff discussed the proposed options for crediting voluntary initiatives in regulatory analyses. The Committee and NEI discussed the requirements for the NRC to follow executive directives concerning the performance of regulatory analyses, the screening process associated with the backfit rule, and the possible use of core damage frequency in screening proposed regulations.

Conclusion

The Committee issued a letter to the NRC Executive Director for Operations, dated June 11, 1999, on this matter.

7. Development of a Low-Power and Shutdown Risk Assessment Program

The Committee heard a presentation by and held discussions with representatives of the NRC staff regarding the NRC staff's plans and status for developing a low-power and shutdown (LPSD) risk assessment program. The Committee noted that previous NRC studies and operational events indicate that LPSD risk is comparable to risk during full-power operations. In its April 18, 1997 report, the Committee expressed the position that it is essential to establish a more complete understanding of LPSD risk. The Committee discussed two distinct types of application for LPSD risk assessments; namely, (1) risk management of outages and (2) risk-informing regulations and decisionmaking. The Committee recommended that the staff develop a research program that includes the capability to make comprehensive, defensible, and quantitative shutdown risk assessments.

Conclusion

The Committee issued a report to Chairman Jackson dated June 11, 1999, on this matter.

8. Strategy for ACRS Review of License Renewal Activities

The Committee heard a presentation by and held discussions with Dr. Mario Bonaca, Chairman of the Plant License Renewal Subcommittee, regarding a proposed strategy for its review of license renewal activities. He presented proposals on how the Committee should review the staff's safety evaluation reports related to individual license renewal applications, evaluate the effectiveness of the license renewal process, and evaluate policy issues. He presented a proposed checklist for guiding Committee reviews and evaluations, and listed the expected Committee products.

Conclusion

The Committee decided to continue its discussion regarding ACRS review of license renewal activities during future meetings.

9. Options for Crediting Existing Programs for License Renewal

The Committee heard a presentation by and held discussions with the NRC staff regarding the status of a proposed Commission paper concerning crediting existing programs for license renewal. The proposed Commission paper had not been issued and the staff did not discuss its recommendations included in the paper. The Committee and staff discussed different possible interpretations of the word "demonstrate," how to ensure a stable and predictable license renewal process, and the schedule for future Committee review of this issue.

Conclusion

The Committee decided to review the proposed Commission paper after it is issued.

10. Proposed Resolution of Generic Safety Issue 165, "Spring-Actuated Safety and Relief Valve Reliability"

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning the proposed resolution of Generic Safety Issue (GSI)-165, "Spring-Actuated Safety Relief Valve Reliability."

The staff stated that GSI-165 was identified after licensees, on a number of occasions, reported that spring-actuated safety and relief valves (SRVs) failed to meet set point criteria within the desired tolerance. At the Sheron Harris plant, failure of an SRV had potentially degraded the capability of the high head safety injection system to perform its intended safety function. This failure went

undetected for a significant period of time. The primary concern of this GSI was that failure of SRVs in safety-related support systems could cause a significant diversion of flow from these systems and thus prevent the systems from performing their design safety function.

To resolve this GSI, the staff conducted a study with the technical assistance of the Idaho National Engineering and Environmental Laboratory (INEEL). The review of related valve data only identified a single valve in one plant type that had the potential for failing the train. The SRV was analyzed as a worst case and it showed that the increase in core damage frequency (CDF) of 6×10^{-6} per reactor-year for that SRV is acceptable. The staff stated that this CDF is a conservative estimate of risk since the assumed SRV failure rate includes all failure modes, most of which do not lead to significant flow diversion of the associated train. The staff further stated that the review of licensee event reports and the nuclear plant reliability data system database did not identify any other instances of valve spring failure besides the one at the Sheron Harris plant. Additional testing requirements, which are required in the 1986 edition of American Society of Mechanical Engineers (ASME) Code, were endorsed by NRC in the 1992 update of 10 CFR 50.55a. On the basis of this testing requirements and the staff's evaluation of this GSI, the staff proposed to resolve this issue without issuing any further requirements.

Conclusion

The Committee issued a letter to the NRC Executive Director for Operations, dated June 9, 1999, on this matter.

11. Report of the Joint ACRS/ACNW Working Group

The Subcommittee Chairman reported on the matters discussed during the May 11, 1999 meeting of the Joint ACRS/ACNW Working Group and procedures for reviewing and commenting on items of mutual interest between ACRS and ACNW. The Committee agreed with the protocol proposed by the ACRS/ACNW Working Group for the joint ACRS/ACNW review of items of mutual interest.

12. Perspective on Nuclear Safety and the Regulatory Process

Dr. Bonaca, ACRS Member presented to the Committee his perspective on nuclear safety and the regulatory process.

13. Site Visit to the Susquehanna Steam Electric Station and Meeting with the NRC Region I Personnel

The Committee discussed the schedule for touring the Susquehanna Steam Electric Station, specific plant areas to be visited, proposed issues for discussion with the licensee, and topics for meeting with representatives of the NRC Region I Office.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee discussed the response from the NRC Executive Director for Operations (EDO) dated May 12, 1999, to the ACRS comments and recommendations included in the ACRS letter dated March 24, 1999, concerning the application of Westinghouse realistic LOCA analysis methodology to upper plenum injection plants.

The Committee expressed concern with some aspects of the EDO's response. The Committee plans to continue its discussion on this matter in conjunction with its review of the staff's program to develop guidelines governing NRC's review of transient and accident codes.

- The Committee discussed the response from the NRC Executive Director for Operations (EDO) dated May 10, 1999, to the ACRS comments and recommendations included in the ACRS letter dated April 19, 1999, concerning SECY-99-017, "Proposed Amendment to 10 CFR 50.55a."

The Committee decided that it was satisfied with the EDO's response and plans to continue its discussion of this matter after the reconciliation of public comments concerning the elimination of the 120-month update requirement.

- The Committee discussed the response from the EDO dated May 12, 1999, to the ACRS comments and recommendations included in the ACRS letter dated March 22, 1999, concerning the lessons learned from the ACRS review of the AP600 design.

The Committee decided that it was satisfied with the EDO's response and plans to continue its review of the environmental qualification of passive autocatalytic recombiners during a future meeting.

- The Committee discussed the response from the NRC Executive Director for Operations dated May 13, 1999, to ACRS comments and recommendations in the ACRS report dated March 25, 1999, concerning the proposed ASME Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications.

The Committee decided that it was satisfied with the EDO's response. The Committee plans to review the proposed revision to Regulatory Guide 1.174 and associated final ASME Standard, when available.

- The Committee discussed the response from the NRC Executive Director for Operations dated May 24, 1999, to ACRS comments and recommendations in the ACRS report dated April 19, 1999, concerning the status of efforts on revising the Commission's Safety Goal Policy Statement.

The Committee decided that it was satisfied with the EDO's response. The Committee plans to continue its review of proposed revisions to the Policy Statement during future meetings.

- The Committee discussed the response from the Executive Director for Operations dated May 26, 1999, to ACRS comments and recommendations in the ACRS report dated April 23, 1999, concerning proposed revisions to the NRC generic communications process.

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

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from May 6 through June 1, 1999, the following Subcommittee meetings were held:

- Joint ACRS/ACNW Working Group - May 11, 1999

The Joint Working Group discussed the staff's proposed framework (SECY-99-100) for risk-informed regulation in the Office of Nuclear Material Safety and Safeguards.

- Thermal-Hydraulic Phenomena - May 26, 1999

The Subcommittee reviewed the: (1) status of the resolution of Generic Safety Issue 23, "Reactor Coolant Pump Seal Failures," (2) proposed rule to revise Appendix K to 10 CFR 50.46 to allow small, cost beneficial power uprates, and (3) status of the EPRI RETRAN-3D transient thermal-hydraulic code review and proposed ACRS structured discussion on the development of code review guidelines.

- Severe Accident Management - May 27, 1999

The Subcommittee reviewed the application of the Southern California Edison Company's exemption to the hydrogen control requirements for the San Onofre Nuclear Generating Station, Units 2 and 3.

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

- The Committee plans to hear a briefing on the proposed elimination of the 120-month update requirement in 10 CFR 50.55a, "Codes and standards," after the staff holds a workshop on this issue and reconciles public comments.
- The Committee plans to hear a briefing concerning proposed options for crediting existing programs in the license renewal process after the associated Commission paper is issued.
- The Committee plans to continue its review of the environmental qualification of passive autocatalytic recombiners during a future meeting.
- The Committee plans to review the proposed revision to Regulatory Guide 1.174 and associated final ASME Standard, when available.
- The Committee plans to continue its review of proposed revisions to the Safety Goal Policy Statement during future meetings.
- The Committee expressed concern with some aspects of the EDO's response, dated May 12, 1999, to the ACRS letter dated March 24, 1999, on the application of Westinghouse realistic LOCA analysis methodology to upper plenum injection plants. The Committee plans to continue its discussion of this matter in conjunction with its review of the staff's program to develop guidelines governing the NRC's review of transient and analysis codes.

PROPOSED SCHEDULE FOR THE 464TH ACRS MEETING

The Committee agreed to consider the following during the 464th ACRS Meeting, July 14-16, 1999:

Electric Power Research Institute (EPRI) RETRAN-3D Thermal-Hydraulic Transient Analysis Code

Briefing by and discussions with representatives of the NRC staff regarding the status of the review of the EPRI RETRAN 3-D thermal-hydraulic transient analysis code.

Proposed Revision to Appendix K of 10 CFR Part 50

Briefing by and discussions with representatives of the NRC staff regarding a proposed revision to Appendix K, "ECCS Evaluation Models," to allow minor power level increases, and related matters.

Options for Crediting Existing Programs for License Renewal

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

Proposed Revision 3 to Regulatory Guide 1.160 (DG-1082), "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants"

Briefing by and discussions with representatives of the NRC staff regarding the proposed revision 3 to Regulatory Guide 1.160.

Proposed Approach for Revising 10 CFR 50.61, Pressurized Thermal Shock Rule

Briefing by and discussions with representatives of the NRC staff regarding the staff's proposed approach for revising the Pressurized Thermal Shock Rule.

Proposed Final Regulatory Guide for Updating Final Safety Analysis Reports

Briefing by and discussions with representatives of the NRC staff and the Nuclear Energy Institute regarding proposed final Regulatory Guide for Updating the Final Safety Analysis Reports and related matters.

Control Room Habitability

Briefing by and discussions with: Dr. Kovach, an invited expert, on control room habitability issues; representatives of the NRC staff on staff activities associated with resolving control room habitability issues; and representatives of the Nuclear Energy Institute regarding industry activities related to control room habitability.

Proposed Amendment to 10 CFR 50.55a, "Codes and Standards"

Briefing by and discussions with representatives of the NRC staff, the Nuclear Energy Institute, and ASME regarding the proposed amendment to 10 CFR 50.55a, including the proposed staff position on eliminating the regulatory requirement for licensees to update their inservice inspection and inservice testing programs every 120 months.

Subcommittee Report

Report by the Chairman of the ACRS Subcommittees on Reliability and Probabilistic Risk Assessment and on Regulatory Policies and Practices regarding matters discussed at the July 13, 1999, joint meeting, including the development of risk-informed revisions to 10 CFR Part 50, proposed definitions and scope changes related to structures, systems, and components, as well as policy issues and special studies.

Proposed Plan for Preparation of the Annual ACRS Report to the Commission

Discussion of a proposed plan for preparing the next annual ACRS report to the Commission on the NRC Safety Research Program.

Highlights from Incident Reporting System (Closed)

Briefing by and discussions with representatives of the NRC staff regarding highlights of events that occurred at foreign nuclear plants during 1997 and 1998 and associated safety significance.

Sincerely,

A handwritten signature in black ink that reads "Dana A. Powers". The signature is fluid and cursive, with the first name "Dana" being the most prominent part.

Dana A. Powers
Chairman