



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, D.C. 20555-0001

March 3, 2000

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

SUBJECT: SUMMARY REPORT - FOUR HUNDRED SIXTY-NINTH MEETING OF  
THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, ON  
FEBRUARY 3-6, 2000, AND OTHER RELATED ACTIVITIES OF THE  
COMMITTEE

Dear Chairman Meserve:

During its 469th meeting, February 3-5, 2000, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports and letter:

REPORTS

- SECY-00-0011, "Evaluation of the Requirement for Licensees to Update Their Inservice Inspection and Inservice Testing Programs Every 120 Months" (Report to Richard A. Meserve, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated February 8, 2000)
- Importance Measures Derived from Probabilistic Risk Assessments (Report to Richard A. Meserve, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated February 11, 2000)
- Impediments to the Increased Use of Risk-Informed Regulation (Report to Richard A. Meserve, Chairman, NRC, from Dana A. Powers, Chairman, ACRS, dated February 14, 2000)

LETTER

- Revision of Appendix K, "ECCS Evaluation Models," to 10 CFR Part 50 (Letter to William D. Travers, Executive Director for Operations, NRC, from Dana A. Powers, Chairman, ACRS, dated February 11, 2000)

## HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

### 1. Technical Aspects Associated With the Revised Reactor Oversight Process and Related Matters

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning technical aspects of the revised reactor oversight process, including the technical adequacy of current and proposed performance indicators, significance of the determination process, and initial implementation issues. The Committee and the staff extensively discussed the objectives of the performance indicators in identifying adverse changes in performance; technical bases, sensitivity, and adequacy of thresholds; use of a 95<sup>th</sup> percentile criterion; sufficiency of generic values and design- and plant-specific considerations affecting the application of thresholds; collective risk from approaching thresholds in multiple areas rather than crossing a single threshold; and research that might be needed for Phase 3 decisionmaking to compensate for inadequacies in individual plant examinations and probabilistic risk assessments (PRAs). The Committee also discussed the staff's plans for initial program implementation in April 2000 and plans to reassess the program for full implementation after about a year. The Advisory Committee on Reactor Safeguards (ACRS) Subcommittee on Plant Operations met on January 20, 2000, to discuss these issues.

#### Conclusion

The Committee decided to continue its review during the ACRS meeting on March 2-4, 2000, when the proposed Commission paper would be available for review.

### 2. Proposed Final Amendment to 10 CFR 50.72 and 50.73

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Nuclear Energy Institute (NEI) concerning the proposed final amendment to 10 CFR 50.72 and 50.73 regarding reporting requirements. The Committee members, the staff, and NEI discussed the added requirement for reporting degraded components and the relationship between the added list of reportable system actuations and the engineered safety feature systems identified in the licensees' final safety analysis reports. The staff committed to hold a workshop concerning the added requirement for reporting degraded components.

### Conclusion

The Committee decided to review this issue after the staff holds a public workshop.

3. Proposed Regulatory Guide and Associated Document NEI 96-07, "Guidelines for 10 CFR 50.59 Safety Evaluations"

The Committee heard presentations by and held discussions with representatives of the NRC and NEI concerning NEI 96-07, "Guidelines for 10 CFR 50.59 Safety Evaluation," and the proposed regulatory guide.

NRC regulation 10 CFR 50.59 defines the conditions under which reactor licensees may make changes to their facilities or procedures or may conduct tests or experiments without prior NRC approval. Generally, these changes, tests, or experiments may be carried out unless they involve a change to the technical specifications, or an unreviewed safety question. In 1999, the NRC revised 10 CFR 50.59 to provide for more flexibility, primarily by allowing changes that have a minimal safety impact to be made without prior NRC approval. The final rule was approved on June 22, 1999, and was published on October 4, 1999.

NEI prepared NEI 96-07 (final draft dated January 18, 2000), which provides guidance for implementing the revised rule, and requested NRC endorsement in the regulatory guide. The rule revisions will become effective 90 days after approval of the guidance.

Currently, the staff is still reviewing NEI 96-07, and several open issues that need to be resolved. These open issues include fire protection plan changes; methods and guidance on plant-specific approvals; design basis limits for fission product barriers; and screening of design function, numerical values, and their relationship to maintenance assessments.

### Conclusion

The Committee believes that the staff has revised "Guidelines for 10 CFR 50.59 Safety Evaluations" to the point that further review of this material by ACRS would not add value.

4. Proposed Revision of the Commission's Safety Goal Policy Statement for Reactors

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning the proposed revision of the Commission's Safety Goal Policy Statement (SGPS) for nuclear power plants. This revision was driven by both Commission direction and recommendations from the ACRS. Changes to the SGPS are recommended in the following areas:

- Reflection of Current Agency Policy
- Treatment of Core Damage Frequency as a Fundamental Goal
- Treatment of Uncertainty
- Defense in Depth
- Safety Goal Structure and Adequate Protection
- Frequency of a Large Release of Radioactive Material
- Land Contamination and Overall Societal Impact
- Temporary Changes in Risk

The SGPS is still being reviewed by internal management, and the staff is scheduled to submit its recommendations to the Commission by March 30, 2000.

Conclusion

The Committee will continue its discussion of this issue during the March 2000 ACRS meeting.

5. Impediments to the Increased Use of Risk-Informed Regulation and the Use of Importance Measures in the Risk-Informing of 10 CFR Part 50

The Committee heard presentations by and held discussions with representatives of the NRC staff, NEI, and the industry-invited experts regarding the impediments to the increased use of risk-informed regulation and the use of importance measures in the risk informing of 10 CFR Part 50.

The staff stated that there are six key elements of the risk-informed regulation: (1) policy, (2) strategy, (3) knowledgeable staff, (4) decisionmaking, (5) tools, and (6) communication. The staff from NRR is working on the reactor safety policy, and the Commission has directed the staff in NMSS to develop safety goals and an approach for risk-informing in the NMSS activities. There will certainly be key challenges in the development of safety goals for the non-reactor activities because they have a number of different areas that are afflicted and have different levels of risk. In the area of strategy, the staff has a different

PRA implementation plan because the staff was criticized by the General Accounting Office for not having a real strategy for risk-informing of agency activities. The staff is developing such a strategy to cover the risk-informing PRA implementation plan. The third item is staffing, which also includes licensee staff. NRC has training programs in place and continue to review the training needs and the staffing level in this area. The fourth area is decisionmaking, which basically provides guidance documents, both for the industry and the staff to utilize. In the area of communication, the pilot programs provide an effective way of communicating with the industry and the stakeholders, and the NRC staff will also hold internal panel sessions to educate the staff.

The representatives of industry-invited experts made the following significant points regarding the impediments to the importance measures for risk-informed regulation:

- Difficulty in quantifying costs and benefits.
- Variations in PRA quality and scope.
- Duration of the regulatory review process.
- Lack of PRA standards to establish quality.
- No differentiation between design basis events and events that are likely to occur during plant life.
- No mechanism available or path by which to change safety-related component classification based on risk information.
- Lack of clarity or criteria in the degree to which risk-informed applications could be approved using only qualitative approaches versus those applications that use quantitative methods or both.
- Lack of training that demonstrates the complementary effect of blending deterministic and probabilistic approaches in decisionmaking.
- Misconception that PRA is too expensive relative to its benefits.
- Risk-ranking methods and uncertainty analyses that need further development.

- Importance measures that can identify what is important but do not necessarily identify what is not important.
- Performance of sensitivity studies regardless of the methods used, following classification of components into risk-significance categories to confirm the classification.

### Conclusion

The Committee issued reports to Chairman Meserve on importance measures and impediments dated February 11 and 15, 2000, respectively.

#### 6. Proposed Final Revision of Appendix K to 10 CFR Part 50

The Committee heard presentations by and held discussions with representatives of the NRC staff and the nuclear industry concerning the proposed final revision of Appendix K to 10 CFR Part 50. This change would relax the requirement that a licensee assume 1.02 times licensed power for the Appendix K emergency core cooling system analysis and allow licensees to seek credit in safety analyses for installation of highly accurate flow measurement systems. The ACRS had reviewed the proposed version of this rule revision during the July 1999 meeting. The staff issued the proposed version of this rule revision for public comment on October 1, 1999; the public comment period ended on December 15, 1999. Six respondents provided comments. All responses were positive, and the staff will make some minor clarifications in the Federal Register notice in response to these comments. The language of the proposed rule itself has not been modified.

During the discussion, members of the Committee indicated that the staff needs to provide guidance to licensees regarding appropriate accounting for measurement uncertainty in their safety analyses associated with the use of highly accurate flow instrumentation.

### Conclusion

The Committee issued a report to the EDO, dated February 11, 2000, on this issue.

#### 7. NRC Safety Research Program Report to the Commission

The Committee discussed its final draft of the ACRS Year 2000 report to the Commission on the NRC Safety Research Program.

### Conclusion

The Committee finalized its final draft report on this issue and sent an advance copy to the Commission on February 7, 2000.

### RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee discussed the response from the NRC Executive Director for Operations (EDO) dated January 13, 2000, to the ACRS comments and recommendations included in the ACRS report dated December 8, 1999, concerning a draft Commission paper regarding elimination of the 120-month update requirement from 10 CFR 50.55a, "Codes and standards."

The Committee was not satisfied with the EDO response. The Committee decided to prepare a reply to the EDO that would restate the Committee's recommendation that the 120-month update be retained.

- The Committee discussed the response from the NRC Executive Director for Operations (EDO) dated January 24, 2000, to the ACRS comments and recommendations included in the ACRS report dated December 10, 1999, concerning the safety aspects of the license renewal application for Calvert Cliffs Nuclear Power Plant.

The Committee was satisfied with the EDO response.

- The Committee discussed the response from the NRC Executive Director for Operations dated January 20, 2000, to comments and recommendations of the joint ACRS/ACNW report dated November 17, 1999, concerning implementing a framework for risk-informed regulation in the Office of Nuclear Material Safety and Safeguards.

The Committee referred this item to the ACRS/ACNW Joint Subcommittee for evaluation. The Committee plans to review the ACRS/ACNW Joint Subcommittee's recommendations during a future meeting.

### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from December 2, 1999, through February 2, 2000, the following

Subcommittee meetings were held:

- Reliability and Probabilistic Risk Assessment - December 15-16, 1999

The Subcommittee discussed the staff's programs for risk-based analysis of reactor operating experience, including special studies for common-cause failure analyses, system and component analyses, accident sequence precursor analyses. In addition, the staff's efforts in the area of risk-informed technical specifications and associated industry initiatives proposed by the Risk-Informed Technical Specification Task Force was discussed.

- Joint Subcommittee - January 13-14, 2000

The Advisory Committee on Reactor Safeguards and Advisory Committee on Nuclear Waste Joint Subcommittee discussed the defense-in-depth philosophy in the regulatory process, including its role in the licensing of a high-level waste repository, its role in revising the regulatory structure for nuclear reactors, and how the two applications should be related to each other. The discussion also included the role of defense in depth in the regulation of nuclear materials applications.

- Plant Operations - January 20, 2000

The Subcommittee discussed selected technical components of the revised reactor oversight process, including the updated significant determination process and plant performance indicators.

- Planning and Procedures - January 27-29, 2000

The Subcommittee discussed issues related to PRA quality, including development of industrial standards; use of importance measures in risk-informing 10 CFR Part 50; impediments to the increased use of risk-informed regulation; technical aspects of the revised reactor oversight process, including technical adequacy of the current and proposed performance indicators; and safety culture. In addition, the Subcommittee will discuss best estimate computer codes, technical quality of codes, and how they are used at the NRC. It will also discuss industry views of ACRS activities, self-assessment of ACRS performance in CY 1999, potential operational areas for improved effectiveness, positions on PRA issues, technical adequacy of the current and proposed performance indicators for the revised reactor oversight process.

- Planning and Procedures - February 2, 2000



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 decided to review the proposed final amendment to 10 CFR 50.72, "Immediate notification requirements for operating nuclear power reactors." and 50.73, "licensee event reporting system," after the staff meets with the Nuclear Energy Institute to discuss the added reporting requirement concerning degraded components.

#### PROPOSED SCHEDULE FOR THE 470TH ACRS MEETING

The Committee agreed to consider the following during the 470th ACRS Meeting, March 1-4, 2000:

- Development of Risk-Informed Revisions to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities"

Briefing by and discussions with representatives of the NRC staff regarding the status of developing risk-informed revisions to 10 CFR Part 50.

- Discussion of Topics for Meeting with the NRC Commissioners

Impediments to the increased use of risk-informed regulation; use of importance measures in regulatory applications, impact of the scope and quality of the PRA on importance measures, and threshold values for importance measures; technical adequacy of performance indicators.

- Technical Components Associated with Revised Reactor Oversight Process

Briefing by and discussions with representatives of the NRC staff regarding the technical components associated with the revised reactor oversight process, including the updated significant determination process, technical adequacy of the current and proposed plant performance indicators.

- Oconee Nuclear Power Plant License Renewal Application

Briefing by and discussions with representatives of the NRC staff and Duke Energy Corporation regarding the license renewal application for the Oconee

Nuclear Power Station and the associated NRC staff's Safety Evaluation Report.

- Proposed Final Amendment to 10 CFR 50.72 and 50.73

Discussions with representatives of the NRC staff regarding issues raised by the ACRS members during the February ACRS meeting, including the intent of the 10 CFR 50.73 requirement for reporting degraded components.

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

Discussions with representatives of the NRC staff, as needed, regarding the proposed final revision 3 to Regulatory Guide 1.160.


- Phenomena Identification and Ranking Table (PIRT) for High Burnup Fuel

Briefing by and discussions with representatives of the NRC staff regarding the use of PIRT process for high burnup fuel.

- Proposed Resolution of Generic Safety Issue B-17, "Criteria for Safety Related Operator Actions"

Briefing by and discussions with representatives of the NRC staff regarding the proposed resolution of Generic Safety Issue B-17.

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

CM2000003

The Honorable Richard A. Meserve

11

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