



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

SL-0527

February 1, 2005

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT - 518th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, DECEMBER 2-4, 2004, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 518th meeting, December 2-4, 2004, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report, letters, and memorandum:

REPORT:

Report to Nils J. Diaz, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Estimating Loss-of-Coolant Accident Frequencies Through the Elicitation Process, dated December 10, 2004

LETTERS:

Letters to Luis A. Reyes, Executive Director for Operations, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Interim Letter — Regulatory Structure for New Plant Licensing: Technology-Neutral Framework, dated December 9, 2004
- Safety Evaluation of the Industry Guidelines Related to Pressurized Water Reactor Sump Performance, dated December 10, 2004
- Risk-Informing 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," dated December 17, 2004

MEMORANDUM:

Memorandum to Luis A. Reyes, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS:

- Proposed Rule-AP1000 Design Certification, dated December 7, 2004

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HIGHLIGHTS OF KEY ISSUES

1. Expert Elicitation on Large-Break LOCA Frequencies

The Committee met with representatives of the NRC staff to review the draft NUREG Report, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process." The expert elicitation is to be used by the staff to determine an appropriate alternative break size to support the development of a proposed rule to risk-inform the requirements addressing large-break LOCAs.

Committee Action:

The Committee issued a report to the NRC Chairman on December 10, 2004, recommending that the draft NUREG Report be revised prior to being issued for public comment. The Committee provided several comments and suggestions for revising the report. The Committee felt that the Report was a work in progress and is not ready for public comment. The Committee would like to review the revised NUREG report.

2. Proposed Rule for Risk-Informing 10 CFR 50.46

The Committee met with the NRC staff, the Nuclear Energy Institute, Westinghouse Owners Group, and members of the public to review a draft version of a proposed rule for a voluntary alternative to 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors." In a Staff Requirements Memorandum dated July 1, 2004, the Commission approved the development of a proposed rule to risk-inform the requirements addressing LBLOCAs. The proposed rule was to use the initiating event frequencies from the expert elicitation process and other relevant information to guide the determination of an appropriate alternative break size.

Committee Action:

The Committee issued a letter to the EDO on December 17, 2004, recommending that the results of the opinion elicitation be further reviewed and assessed by the staff before finalizing the selection of the transition break size. The Committee also recommended that a better quantitative understanding of the possible risk benefits of a smaller transition break size is needed to arrive at a final choice of the transition break size. The Committee would like to review any draft new rule before it is issued for public comment.

3. Technical Basis for Potential Revision of the Pressurized Thermal Shock (PTS) Screening Criteria in the PTS Rule

The Committee met with representatives of the NRC and its contractors to discuss the staff's technical basis for a potential revision to the PTS screening criteria in 10 CFR 50.61. The Subcommittees on Materials and Metallurgy, Thermal Hydraulic Phenomena, and Reliability

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and Probabilistic Risk Assessment reviewed this issue during a meeting on November 30-December 1, 2004. The staff also discussed its responses to peer review comments in the areas of thermal hydraulics, probabilistic risk assessment, and probabilistic fracture mechanics. The Office of Nuclear Regulatory Research (RES) initiated a project in 1999 to develop a technical basis for a potential revision to the Pressurized Thermal Shock (PTS) screening criteria in 10 CFR 50.61. Two central features of the research approach were a focus on the use of more realistic models and an explicit treatment of uncertainties. The Committee has previously reviewed the methodology and the initial results of the PTS Technical Basis Reevaluation Project. The staff concurred with the ACRS recommendation in its report of February 21, 2003, that supported plans for an external peer review of the technical work. RES solicited a panel of experts to perform independent review of the technical basis report, and all supporting documentation that comprises the basis for its recommended revisions to the PTS rule. The staff has also concurred, in most part, with the Committee recommendation in its report of February 21, 2003, that the draft technical basis report needs substantial revision to describe more clearly the basic phenomena, issues, approaches, and conclusions. However, the draft NUREG-1809, "Thermal Hydraulic Evaluations of Pressurized Thermal Shock," has not yet been completed.

Committee Action

The Committee Plans to further discuss the technical basis for potential revision of the PTS screening criteria in the PTS rule during the March 3-5, 2005 ACRS meeting, subject to the timely availability of draft NUREG-1809.

4. Draft Commission Paper on Technology Neutral Framework for Future Plant Licensing

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the subject draft Commission paper. The staff is developing a regulatory structure for new plant licensing that consists of four major parts: a technology-neutral framework; a set of technology-neutral requirements; a technology-specific framework; and technology-specific regulatory guides. The staff has developed a draft report regarding Part 1: a technology-neutral framework. Work has not been initiated on the other three parts.

The subject draft Commission paper provides a status report on the staff's effort to date on the regulatory structure for new plant licensing, a status of the policy issues, and a proposed schedule for development and implementation of the regulatory structure for new plant licensing.

Committee Action

The Committee issued a letter to the EDO on this matter, dated December 9, 2004, stating that the staff has a strategic approach and is articulating the difficult technical and policy issues. In addition, the Committee believes that such work has the potential to provide a more efficient and more coherent regulatory system. The Committee will continue its follow-up on the staff's progress.

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5. Subcommittee Report — Draft NUREG document on Treatment of Uncertainties

The Chairman of the ACRS Subcommittee on Reliability and Probabilistic Risk Assessment provided a status on the development of the draft NUREG document on treatment of uncertainties. The Subcommittee Chairman was encouraged by the work being performed by EPRI in support of this effort. The Subcommittee plans to review a draft of the NUREG which will most likely endorse the guidance being developed by industry in 2005.

Committee Action:

This was an information briefing. No action was taken by the Committee on this matter at this time.

6. Subcommittee Report — Arkansas Nuclear One, Unit 2 License Renewal

The Chairman of the Plant License Renewal Subcommittee provided a report to the Committee summarizing the results of the December 1, 2004, Subcommittee meeting with the NRC staff and representatives of Entergy Operations, Inc. (Entergy) to review the NRC staff's Draft Safety Evaluation Report (SER) related to the License Renewal Application for Arkansas Nuclear One Unit 2 (ANO2). The current operating license expires on July 17, 2018. The applicant has requested approval for continued operation for a period of 20 years beyond the current license expiration date. During the meeting, Entergy described the operating history, major equipment replacements, application of GALL, and commitment process for ANO2. The staff noted that ANO2 is the second plant to be reviewed using on-site audits to verify consistency with GALL. The staff has determined that there are no open or confirmatory items regarding this application. The Draft SER listed 3 license conditions and concluded that the applicant has met the requirements for license renewal.

Committee Action

The Committee will review the final SER and hold discussions with the staff and applicant during the June 2005 ACRS meeting.

7. Election of ACRS Officers for CY 2005

The Committee elected Graham B. Wallis as ACRS Chairman, William J. Shack as ACRS Vice Chairman, and John D. Sieber as Member-at-Large for the Planning and Procedures Subcommittee for 2005.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the follow-up response from RES dated November 19, 2004 to the response from the EDO, dated July 2, 2003, concerning the proposed revision to Regulatory Guide 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping." The Committee decided that it was satisfied with RES' response.

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- The Committee considered the response from the EDO, dated November 23, 2004, on the draft NUREG-Series report, entitled "The Report on the Independent Verification of the Mitigating Systems Performance Index (MSPI) Results for the Pilot Plants." The Committee decided it was satisfied with the EDO's response.

The staff committed to keeping the ACRS informed as the staff moves forward with incorporating the MSPI into the Reactor Oversight Process.

- The Committee considered the EDO's November 26, 2004 response to the ACRS's letter of October 18, 2004, summarizing the results of the Committee's review of the proposed staff safety evaluation of the Industry Guidelines Related to PWR Sump Performance. The Committee did not consider the EDO's response to be acceptable. The Committee responded with another letter to the EDO, dated December 10, 2004, which acknowledged the desire of the staff to move forward with the resolution of this issue. The Committee also noted that the staff has alerted the responsible national standards organization about technical shortcomings in one of their guidance documents. Overall, however, the Committee continues to believe that both the safety evaluation and the guidance document contain technical faults and limitations that will have to be corrected at some stage in order for the methods to be sufficiently robust and durable to support sound regulatory decisions.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from November 4, 2004, through December 1, 2004, the following Subcommittee meetings were held:

- Reliability and Probabilistic Risk Assessment Subcommittee - November 16, 2004

The Subcommittee discussed the development of guidance on the treatment of uncertainties.

- Regulatory Policies and Practices Subcommittee - November 16, 2004

The Subcommittee reviewed the draft proposed NUREG documenting the expert elicitation on large break loss-of-coolant accident frequencies.

- Materials and Metallurgy, Thermal-Hydraulic Phenomena, Reliability and Probabilistic Risk Assessment Subcommittees - November 30 and December 1, 2004

The joint Subcommittees discussed the PTS technical basis re-evaluation. The revised technical basis document peer review comments were also discussed. The Subcommittees will refer this subject to the December 2004 full Committee subject to a satisfactory review.

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- Plant License Renewal - Arkansas Nuclear One - December 1, 2004

The Subcommittee reviewed the License Renewal Application and associated draft SER for Arkansas Nuclear One Unit 2.

- Planning and Procedures - December 1, 2004

The 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 MATTERS FOR THE ATTENTION OF THE EDO

- The Committee plans to review the revised draft NUREG Report, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," in March 2005.
- The Committee would like to review any new draft rule for risk-informing 10 CFR 50.46 before it is issued for public comment.
- The Committee decided not to review industry responses to Generic Letter 2004-01, "Requirements for Steam Generator Tube Inspections." The Committee was not provided an opportunity to review this generic letter prior to its issuance. In the future, the Committee would like to have an opportunity to review proposed generic communications prior to issuing them for public comment.
- The Committee plans to review the technical basis for potential revision of the PTS screening criteria in the PTS Rule during its March 2005 meeting, subject to the timely availability of Draft NUREG-1809, "Thermal-Hydraulic Evaluation of Pressurized Thermal Shock."
- The Committee plans to review the draft NUREG document on treatment of uncertainties in 2005.
- The Committee would like the opportunity to review the AP1000 design certification draft final rule after reconciliation of public comments.
- The Committee plans to continue its follow-up on the staff's progress regarding the technology-neutral framework for future plant licensing.

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PROPOSED SCHEDULE FOR THE 519th ACRS MEETING

The Committee agreed to consider the following topics during the 519th ACRS meeting, to be held on February 10-12, 2005:

- Power Uprate for Waterford Nuclear Plant
- Mixed Oxide (MOX) Fuel Fabrication Facility
- Plant License Renewal Subcommittee Report
- Assessment of the Quality of the Selected NRC Research Projects

Sincerely,

/RA/

Mario V. Bonaca
Chairman