

May 11, 2001

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

SUBJECT: SUMMARY REPORT - 481ST MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS, APRIL 5-7, 2001
AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

Dear Chairman Meserve:

During its 481st meeting, April 5-7, 2001, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report and letters. In addition, the Committee authorized Dr. John T. Larkins, Executive Director, ACRS, to transmit the memoranda noted below:

REPORT

- Proposed Final License Renewal Guidance Documents (Report to Chairman Meserve, NRC, from George E. Apostolakis, Chairman, ACRS, dated April 13, 2001)

LETTERS

- Closure of Generic Safety Issue-170, "Reactivity Transients and Fuel Damage Criteria for High Burnup Fuel" (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated April 13, 2001)
- Interim Letter Related to the License Renewal of Edwin I. Hatch Nuclear Station, Units 1 and 2 (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated April 16, 2001)

MEMORANDA

- Proposed Final Regulatory Guide, DG-1069, "Fire Protection Program for Nuclear Power Plants During Decommissioning and Permanent Shutdown," (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated April 10, 2001)

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- Proposed Amendment to 10 CFR 50.55a, "Codes and Standards" (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated April 10, 2001)
- Draft Commission Paper Regarding the Safeguards Performance Assessment Pilot Program (Memorandum to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated April 10, 2001)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Interim Review of the License Renewal Application for Edwin I. Hatch Nuclear Plant Units 1 and 2

The Committee heard presentations by and held discussions with representatives of the NRC staff and Southern Nuclear Operating Company (SNC) regarding the license renewal application for Edwin I. Hatch Nuclear Plant, Units 1 and 2, associated NRC staff safety evaluation report (SER), selected Boiling Water Reactor Vessel and Internals Project (BWRVIP) topical reports and related staff safety evaluations. There are 18 open issues identified in the SER including five confirmatory items and four appeal issues. The staff and SNC met on March 29, 2001, to discuss the issues under appeal. The staff requested that the Committee not comment on the appeal issues at this time. The staff stated that it has completed its review of most of the BWRVIP reports and concluded that implementation of BWRVIP guidelines, as modified to address staff comments, will provide an acceptable level of quality for inspection and flaw evaluation of safety-related components.

Committee Action

The Committee provided an interim letter to the Executive Director for Operations on this matter dated April 13, 2001.

2. Proposed Final License Renewal Guidance Documents

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the proposed final versions of NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," NUREG-1801, "Generic Aging Lessons Learned (GALL) Report;" Regulatory Guide 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses,"

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and, NEI 95-10, Revision 3, "Industry Guidelines for Implementing the Requirements of 10 CFR Part 54--The License Renewal Rule." The staff plans to endorse NEI 95-10, Revision 3, in Regulatory Guide 1.188 without exception. As a result of the resolution of public comments, the staff has revised the guidance documents to increase focus on areas of concern, eliminate insignificant aging effects (e.g., wear/loss of material for the core support pads and the guide tube cards), improve clarity, and to include changes resulting from the resolution of technical issues between the staff and the industry. The staff, NEI, and current license renewal applicants are continuing discussions for resolving five residual issues. The staff will issue the documents in their current form. Any changes resulting from the continued discussions on the residual issues will be incorporated in a future update. The staff plans to update the GALL report periodically to incorporate the lessons learned from future reviews of license renewal applications.

Committee Action

The Committee provided a report to the Commission on this matter dated April 13, 2001.

3. Safety Issues Associated with the Use of Mixed Oxide (MOX) and High Burnup Fuels

The Committee discussed the safety issues associated with the use of high burnup and mixed oxide (MOX) fuels. Current NRC policy regarding high burnup fuel is to limit the peak rod burnups to 62 GWD/t. There are some indications that the nuclear industry is interested in fuel burnup higher than 62 GWD/t. The ACRS previously recommended that the NRC Office of Nuclear Regulatory Research (RES) find ways to identify the types of data required to support applications for these higher burnups. Especially important is to identify where experimental data must be used to substantiate predictions of analyses. RES responded with a well conceived program of Phenomena Identification and Ranking Tables (PIRTs). RES assembled a panel of world experts in fuel behavior to carry out the PIRTs effort.

Committee Action

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

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4. Thermal-Hydraulic Issues Associated with the AP1000 Passive Plant Design

The Committee heard presentations by and held discussion with representatives of the Westinghouse Electric Company, LLC, and the NRC staff regarding the status of the NRC's pre-application review for the AP1000 passive plant design. The Thermal-Hydraulic Phenomena Subcommittee held a meeting on March 15, 2001, to discuss this matter.

In accordance with prior NRC/Westinghouse agreement, review of AP1000 is proceeding in three Phases. Phase 1 (identification of issues that could impact licensing cost/schedule) is complete. Phase 2 (review of Phase 1 Issues) is ongoing. Submittal of the AP1000 Design Certification application comprises Phase 3. To date, Westinghouse has submitted documentation to address the issues of the sufficiency of AP600 test program to meet the strictures of 10 CFR Part 52 and will be submitting material to address the applicability of NRC-approved AP600 analysis codes for design certification of AP1000. Other issues to be addressed during Phase 2 include the acceptability of using AP600 Design Acceptance Criteria in selected areas, and the applicability of exemptions granted to the AP600 design.

The NRC staff noted that it is just beginning its review of the Phase 2 Issues and expects to request ACRS review of these issues in approximately six months.

Committee Action

No Committee action was taken on this matter at this time. Further ACRS review will be scheduled, pending completion of NRC staff review of the Phase 2 issues.

5. Draft Final Safety Evaluation Report for the South Texas Project Nuclear Operating Company (STPNOC) Exemption Request

The Committee heard presentations by and held discussions with representatives of the NRC staff and South Texas Project Nuclear Operating Company (STPNOC) concerning the treatment of structures, systems, and components (SSCs) in the STP request for exemptions from certain special treatments. NRC regulations in 10 CFR Parts 21, 50, and 100 contain special treatment requirements that impose controls to ensure the quality of SSCs that are safety-related, important to safety, or otherwise within the scope of the regulations.

A request for exemptions from the special treatment requirements of 10 CFR Parts 21, 50, and 100 was submitted by STPNOC on July 13, 1999, and supplemented on October 14 and 22, 1999, and January 26 and August 31, 2000. The submittal sought approval

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of processes for categorization and treatment of SSCs as the principal basis for granting the exemptions. STP used the NRC approved graded Quality Assurance (GQA) program to categorize certain SSCs in the plant.

The NRC review of STPNOC's treatment processes assumes that the design basis would not change, that the functional capability of SSCs would be maintained for design basis conditions, and, that the FSAR (the licensing basis for exemptions) would include high level descriptions of the programs on treatment of low-safety-significance SSCs.

There are open items on repair and replacement, inservice inspections of ASME code components, and environmental and seismic requirements.

Committee Action

This was a status and information briefing and no committee action was required. A presentation on the Safety Evaluation is scheduled for May.

6. Closure of Generic Safety Issue (GSI)-170, "Reactivity Transients and Fuel Damage Criteria for High Burnup Fuel"

The Committee discussed the staff's proposed closure of GSI-170. This GSI was originally initiated in 1995 to address the effects of high fuel burnup on fuel damage limits during design basis accidents. The staff has undertaken research programs to confirm the regulatory decision on the allowable level on fuel burnup. In addition, the staff has held a series of meetings with expert panels and pursued phenomena identification and ranking elicitation for loss-of-coolant accidents in pressurized water reactors (PWRs) and boiling water reactors (BWRs), rod ejection accidents in PWRs, and power oscillations in BWRs. The Committee had no objection to the proposed closure of GSI-170.

Committee Action

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

7. Subcommittee Report—Materials and Metallurgy

Dr. William Shack, Chairman of the ACRS Subcommittee on Materials and Metallurgy provided a report on the results of the March 16, 2001 joint meeting of the Materials and Metallurgy, Thermal-Hydraulic Phenomena, and Reliability and Probabilistic Risk Assessment Subcommittees. He stated that the purpose of this meeting was to discuss NRC staff and industry efforts to risk-inform the technical requirements of 10 CFR 50.46

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concerning emergency core cooling systems. Dr. Shack noted that the Subcommittees heard presentations by and held discussions with representatives of the Nuclear Energy Institute and the Westinghouse, Combustion Engineering, and Boiling Water Reactor Owners Groups concerning the industry proposal to redefine the large-break loss-of-coolant accident (LBLOCA) requirements using leak-before-break and probabilistic fracture mechanics. Dr. Shack informed the Committee that the staff is continuing to evaluate the industry's proposal but noted that the staff's preliminary views indicate that service data alone (lack of a LBLOCA event) does not appear to support eliminating LBLOCA requirements without further evaluation, that probabilistic analysis would have to be significantly more rigorous than previous risk-informed applications, and that analyses will have to consider more than active degradation mechanisms, e.g. other break sizes, causes, and weld repair history.

Dr. Shack noted that the Subcommittees also reviewed and approved the proposed final report on the NRC Safety Research Program, as authorized by the Committee during the March 2001 ACRS meeting.

Committee Action

The full Committee is scheduled to review the results of the staff's feasibility study regarding this matter during the June 6-8, 2001 ACRS meeting.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee discussed the response from the EDO, dated March 8, 2001, to ACRS comments and recommendations included in the ACRS letter dated February 9, 2001, concerning the draft American Nuclear Society industrial standard, BSR/ANS-58.21, "External Events PRA Methodology Standard."

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

- The Committee discussed the response from the EDO, dated March 13, 2001, to ACRS comments and recommendations included in the ACRS letter dated February 13, 2001, concerning the review of the Siemens Power Corporation (now "Framatome ANP") S-RELAP5 Code for Appendix K small-break loss-of-coolant accident analyses.

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 22, 2000, to the ACRS comments and recommendations included in the ACRS report dated November 15, 2000 concerning License Renewal Guidance Documents.

The Committee was not satisfied with the EDO response to the ACRS recommendation that the staff validate that the artificially aged cables used in the studies conducted to address GSI-168 (Environmental Qualification of Low-Voltage Instrumentation and Control Cables) issues are representative of 30-40 year old cables. The Committee plans to continue its discussion of this issue during its review of the proposed resolution of GSI-168.

- The Committee discussed the response from the EDO, dated March 2, 2001, to ACRS comments and recommendations included in the ACRS letter dated February 8, 2001, regarding the proposed resolution of GSI-152, "Design Basis for Valves that Might Be Subjected to Significant Blowdown Loads."

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

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from March 1 through April 4, 2001, the following Subcommittee meetings were held:

- Thermal-Hydraulic Phenomena - March 15, 2001

The Subcommittee reviewed the Westinghouse Electric Company's proposed approach to address thermal-hydraulic issues pertaining to its AP1000 passive plant design.

- Materials and Metallurgy, Thermal-Hydraulic Phenomena, and Reliability and Probabilistic Risk Assessment - March 16, 2001

The Subcommittees discussed NRC staff and industry efforts to risk-inform the technical requirements of 10 CFR 50.46 for emergency core cooling systems. The Subcommittees are scheduled to continue their review of this matter in late May 2001. The full Committee is scheduled to review the results of the staff's feasibility study on this matter during the June 6-8, 2001 ACRS meeting. The Subcommittee approved the proposed final ACRS report on the NRC Safety Research Program, as authorized by the ACRS during its April 2001 meeting.

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- Plant License Renewal - March 27-28, 2001

The Subcommittee reviewed selected Boiling Water Reactor Vessel and Internals Project (BWRVIP) reports applicable to Hatch license renewal and the proposed final revisions of license renewal regulatory guidance documents (Generic Aging Lessons Learned [GALL] Report, SRP, Regulatory Guide 1.188, and NEI 95-10).

- Planning and Procedures - April 4, 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 has postponed its discussion of issues pertaining to core power uprates until its July meeting. A subcommittee meeting to, in part, discuss these issues has been scheduled for June 12, 2001.
- The ACRS Advanced Reactors Subcommittee scheduled a work shop on regulatory challenges for future reactor designs on June 4-5, 2001. The Committee plans to discuss and follow this matter.
- The Committee decided not to review the draft Commission paper on the proposed Safeguards Performance Assessment (SPA) Pilot Program. However, the Committee decided to schedule a Subcommittee meeting in mid-2001 to review the status of NRC programs for nuclear power plant safeguards and security.
- During its review of the proposed resolution of GSI-168, the Committee plans to continue its discussion of its previous recommendation that the staff validate that the artificially aged cables used in the studies conducted to address GSI-168 issues, are representative of 30-40 year old cables.

PROPOSED SCHEDULE FOR THE 482ND ACRS MEETING

The Committee agreed to consider the following topics during the next ACRS meeting:

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Final Review of the License Renewal Application for Arkansas Nuclear One (ANO), Unit 1

Briefing by and discussions with representatives of the NRC staff and Entergy Operations, Inc. regarding the license renewal application and for ANO, Unit 1 and the associated staff's Safety Evaluation Report.

Members Attendance at the Commission Meeting on the Office of Nuclear Regulatory Research Programs and Performance

Drs. Powers and Wallis are scheduled to participate in this meeting which will be held on May 10, 2001, in the Commissioners' Conference Room at One White Flint North. Other members will be attending this meeting as observers.

Risk-Based Performance Indicators

Briefing by and discussions with representatives of the NRC staff regarding the staff's draft document entitled, "Risk-Based Performance Indicators: Results of Phase 1 Development," and related matters.

Discussion of South Texas Project Nuclear Operating Company (STPNOC) Exemption Request

The Committee will discuss the South Texas Project Nuclear Operating Company Exemption Request. **[Note: Due to the unavailability of the staff SER, this item has been postponed to the June 2001 ACRS meeting.]**

Meeting with the NRC Commissioners

Meeting with the NRC Commissioners, Commissioners' Conference Room, One White Flint North, to discuss the following: Proposed Framework for Risk-Informed changes to 10 CFR Part 50; South Texas Project Exemption Request; Issues Associated with Thermal-Hydraulic Codes; Status Report on Steam Generator Tube Integrity Issues; and, Status of ACRS Activities Associated with License Renewal.

Discussion of General Design Criteria

Briefing by and discussions with Mr. Sorensen, ACRS Senior Fellow, regarding his views on risk-informing the General Design Criteria that are included in Appendix A to 10 CFR Part 50.

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Spent Fuel Accident Risk at Decommissioning Plants

Briefing by and discussions with representatives of the NRC staff regarding the proposed options paper related to spent fuel accident risk at decommissioning nuclear power plants. **[Note: Due to the unavailability of the proposed options paper, this item has been postponed to the June 2001 ACRS meeting.]**

Sincerely,

/RA/

George E. Apostolakis
Chairman