



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

SL-0448

PDR 5/8/97

April 4, 1997

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

Dear Chairman Jackson:

SUBJECT: SUMMARY REPORT - FOUR HUNDRED THIRTY-NINTH MEETING OF THE  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, MARCH 6-8,  
1997, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 439th meeting, March 6-8, 1997, 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

- Proposed Standard Review Plan Sections and Regulatory Guides for Risk-Informed, Performance-Based Regulation (Report to Shirley Ann Jackson, Chairman, NRC, from R. L. Seale, Chairman, ACRS, dated March 17, 1997)
- Recommendations for Appointment of ACRS Members (Report to Shirley Ann Jackson, Chairman, NRC, from R. L. Seale, Chairman, ACRS, dated March 19, 1997)

LETTERS

- Publication of Proposed Journal Article Containing ROSA Test Data (Letter to L. Joseph Callan, Executive Director for Operations, NRC, from R. L. Seale, Chairman, ACRS, dated March 17, 1997)
- NRC Office of Nuclear Regulatory Research Program to Demonstrate the Adequacy of the RELAP5/MOD3 Code to Analyze AP600 Passive Plant Behavior (Letter to L. Joseph Callan, Executive Director for Operations, NRC, from R. L. Seale, Chairman, ACRS, dated March 19, 1997)

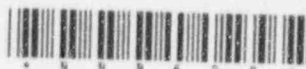
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MEMORANDA

- Proposed Generic Letter Regarding Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While in a Shutdown Condition (Memorandum to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 14, 1997)
- Draft Regulatory Guide DG-1060, "FASB Standards for Decommissioning Cost Accounting" (Memorandum to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 19, 1997)
- Draft Regulatory Guide DG-1067, "Decommissioning of Nuclear Power Reactors" (Memorandum to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 19, 1997)
- Draft Commission Paper to Provide a Status Report and Modified Approach for Fire Protection Rulemaking (Memorandum to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 24, 1997)
- Draft Regulatory Guide DG-1070, "Requirements for Sampling for Dedicating Simple, Metallic Commercial Grade Items in Nuclear Power Plants" (Memorandum to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 25, 1997)
- Proposed Amendments to 10 CFR Part 55, "Initial Licensed Operator Examination Requirements" (Memorandum to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 25, 1997)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Capability of RELAP5/MOD 3 Code to Assess the AP600 Design

The Committee reviewed the NRC Office of Nuclear Regulatory Research (RES) Program to demonstrate the adequacy of the RELAP5/MOD3.2.1.2 code for analyzing the behavior of the Westinghouse AP600 passive plant design. The RES Program consisted of the following key elements: (1) two scaling studies conducted by NRC contractors at the University of California-Santa Barbara and Brookhaven National Laboratory. These studies demonstrated that data from several integral and separate-effects test facilities are applicable to AP600 and can be used to validate the RELAP5/MOD3.2.1.2 code for assess-

ing the ability of AP600 to meet design basis accident criteria; (2) calculations to both establish that the RELAP5 models and constitutive equations are applicable to AP600 conditions, and to demonstrate reasonable agreement for small-break loss-of-coolant accident code predictions of the test facilities vs. the nominal plant design.

RES also briefly discussed its thermal-hydraulic code upgrade plan. The goal of the plan is to consolidate RES analytical capabilities into a single state-of-the-art plant transient code for both light water reactor (LWR) and advanced LWR analyses.

#### Conclusion

The Committee issued a letter to the Executive Director for Operations, dated March 19, 1997, on this matter.

#### 2. Release of AP600 Test Data from ROSA Test Facility

The Committee was requested by the Executive Director for Operations to provide advice concerning plans by RES to publish a paper containing test data obtained from the Japanese ROSA test facility. Westinghouse objected to the publication of this paper in its current form, maintaining that it would release data that could be used to derive proprietary information on certain aspects of the AP600 design. The NRC staff has taken the position that publication of this paper will not divulge any proprietary design information.

The Committee heard presentations by and held discussions with representatives of the NRC staff and the Westinghouse Electric Corporation regarding this matter.

#### Conclusion

The Committee issued a letter to the Executive Director for Operations, dated March 17, 1997, on this matter.

#### 3. Arthur Andersen Report, "Recommendations to Improve the Senior Management Meeting Process"

The Committee heard a presentation by and held discussions with representatives of the staff, Arthur Andersen Consulting Company, and the Nuclear Energy Institute (NEI) concerning the report prepared by Arthur Andersen Consulting Company titled "Recommendations to Improve the Senior Management Meeting Process." The report concluded that the senior managers were sometimes slow to take action and that the results of the meetings have been inconsistent. The Committee discussed the

development of objective senior management meeting (SMM) performance indicators and absolute criteria for SMM actions; the amount of available data, and the cause and effect of economic pressures on plant processes. Of particular interest to the Committee were the prospects of developing meaningful performance indicators for SMM operations and management effectiveness, and the flaws in the consensus building process.

#### Conclusion

The Committee decided that the Plant Operations Subcommittee should review future staff activities in this area.

#### 4. Risk-Informed, Performance-Based Regulation and Related Matters

The Committee held discussions with representatives of the NRC staff regarding policy and technical matters related to the development of Standard Review Plan (SRP) sections and Regulatory Guides for risk-informed, performance-based regulation. The ACRS discussed the general guidance SRP section and associated Regulatory Guide as well as related documents for Technical Specifications, inservice testing, and graded quality assurance. The ACRS Subcommittee on Probabilistic Risk Assessment (PRA) met with representatives of the NRC staff and of the industry on October 31, November 1, 21, 22, 1996, and January 28, February 20 and 21, 1997, regarding these matters.

#### Conclusion

The Committee issued a report to Chairman Jackson, dated March 17, 1997, on this matter. The Committee plans to review the proposed SRP section and a Regulatory Guide associated with risk-informed, performance-based inservice inspection after they have been completed by the staff.

#### 5. Independent Safety Assessment of the Maine Yankee Atomic Power Station

The Committee heard presentations by and held discussions with the NRC staff regarding the results of the safety assessment of the Maine Yankee Atomic Power Station performed by an independent team. The conclusions of and root causes of the problems at Maine Yankee identified by the team which are delineated in the October 7, 1996 report, include the following:



### Conclusions

- Overall performance at Maine Yankee was adequate for operation, although a number of deficiencies were identified by the team in each of the areas assessed, including such issues as identification and resolution of problems, scope and evaluation of testing, and declining material conditions.
- Maine Yankee was in general conformance with its licensing basis, although significant items of nonconformance were identified.
- Performance in the area of operations was very good, with strengths noted in the areas of operator performance during routine and transient operating conditions, shift turnovers, use of risk information to ensure safe operations, and the involvement of management in day-to-day operations. Weaknesses were noted in the areas of "workarounds" and compensatory measures which unnecessarily burdened the operators or complicated their response to transient conditions.
- In the area of maintenance, performance was good overall; however, testing was weak.
- The quality of engineering work was mixed, but considered good overall.
- The licensee's self-assessments were generally good; however, they occasionally failed to identify weaknesses or incorrectly characterized the significance of the findings. Furthermore, some corrective actions were not timely and others were ineffective, leading to repetitive problems.

### Root Causes

- Economic pressure to be a low-cost energy producer limited available resources to address corrective actions and some plant upgrades. Management effectively prioritized available resources, but financial pressures caused the postponement of some needed programs and actions.
- The lack of a questioning culture resulted in the failure to identify or promptly correct significant problems in areas perceived to be of low safety significance. Management appeared to be complacent with the current level of safety performance and there did not appear to be a clear incentive for improvement.

### Conclusions

This briefing was for information only. No Committee action is required.

#### 6. National Academy of Sciences/National Research Council Phase 2 Study Report

The National Academy of Sciences/National Research Council (NAS/NRC) Committee members and the ACRS discussed the results and recommendations of the NAS/NRC Phase 2 study report on digital instrumentation and control (I&C) systems. The NAS/NRC Committee was charged by the U.S. NRC to recommend guidelines for regulating and certifying the use of digital I&C systems in nuclear power plants. The study was carried out in two phases. In Phase 1, the NAS/NRC Committee defined the important safety and reliability issues that arise from the introduction of digital I&C technology in nuclear power plants. The Committee identified six technical issues and two strategic issues. In performing its Phase 2 study, the NAS/NRC Committee limited its work to those issues identified in the Phase 1 study. The Phase 2 study included consideration of retrofitting digital I&C systems in operating plants as well as using them in future plants.

### Conclusion

The Committee postponed its comments until after a meeting of its Subcommittee on I&C and Computers, to be held in May 1997, during which the NRC staff will discuss its views on the Phase 2 study and other issues related to the Standard Review Plan Chapter 7 update.

#### 7. Department of Energy Proposal for Tritium Production

Representatives of the Department of Energy (DOE) briefed the ACRS regarding the proposal for tritium production. DOE is pursuing a dual path to evaluate and develop a primary tritium capability. The two options under consideration are accelerator production and tritium production in commercial light water reactors (CLWRs). The two options present fundamentally different technical issues that must be evaluated to determine the basis for selection.

DOE has tasked the Pacific Northwest National Laboratory (PNNL) to develop and qualify the design and fabrication requirements for a tritium producing burnable absorber rod (TPBAR) lead test assembly in CLWRs. PNNL developed the design of TPBAR using lithium, rather than boron, in pressurized water reactor fuel assemblies. As a result of irradiation by neutrons in the reactor core, lithium placed in the

target rods is converted to tritium. The irradiated TPBAR would be removed from the fuel assemblies and shipped to another location for tritium extraction.

### Conclusion

This briefing was for information only. No Committee action was required at this time. The Committee plans to continue its discussion of this matter after the staff has completed its evaluation of the DOE proposal.

### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from February 6 through March 5, 1997, the following Subcommittee meetings were held:

- Thermal-Hydraulic Phenomena - February 12-14, 1997

The Subcommittee on Thermal Hydraulic Phenomena met with representatives of the Office of Nuclear Regulatory Research (RES) to review the RES RELAP5 AP600 code applicability program.

- Thermal-Hydraulic Phenomena - February 19, 1997

The Subcommittee on Thermal Hydraulic Phenomena met with representatives of the NRC staff and Westinghouse Electric Corporation to review technical issues associated with publication of AP600-related test data generated at the ROSA test facility.

- Probabilistic Risk Assessment - February 20-21, 1997

The Subcommittee on Probabilistic Risk Assessment met with the NRC staff to discuss the staff's approach to codifying risk-informed, performance-based regulation through the development of Standard Review Plan sections and associated regulatory guides.

- Materials and Metallurgy and Severe Accidents - March 4-5, 1997

The Subcommittees on Materials and Metallurgy and on Severe Accidents held a joint meeting to review the regulatory analysis and technical bases for the steam generator tube integrity rule and an associated regulatory guide.

- Planning and Procedures - March 5, 1997

The Planning and Procedures Subcommittee discussed proposed ACRS activities, practices, and procedures for conducting Committee business and organizational and personnel matters relating to the ACRS and its staff.

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

- The Committee decided to review the proposed Generic Letter regarding Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While in a Shutdown Condition after reconciliation of public comments. [A memorandum was sent to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 14, 1997.]
- The Committee decided not to review the Draft Commission Paper that Provides a Status Report and Modified Approach for Fire Protection Rulemaking. The Committee, however, plans to review the comprehensive and integrated plan for transitioning to a risk-informed, performance-based regulatory structure for fire protection requirements after it has been developed by the staff. [A memorandum was sent to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 24, 1997.]
- The Committee decided to consider reviewing Draft Regulatory Guide DG-1070, "Requirements for Sampling for Dedicating Simple, Metallic Commercial Grade Items in Nuclear Power Plants," after reconciliation of public comments. The Committee has no objection to the issuance of this Draft Regulatory Guide for public comment. [A memorandum was sent to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 25, 1997.]
- The Committee decided to review the proposed Amendments to 10 CFR Part 55, "Initial Licensed Operator Examination Requirements," after reconciliation of public comments. The Committee has no objection to the issuance of these proposed amendments for public comment. [A memorandum was sent to L. Joseph Callan, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS, dated March 25, 1997.]
- The Commission plans to review the proposed final SRP sections, Regulatory Guides, and Branch Technical Positions associated with digital I&C systems, along with the staff's resolution of the recommendations of the NAS/NRC Phase 2 study during the June 11-13, 1997 ACRS meeting.



- The Committee plans to review the proposed SRP section and a Regulatory Guide associated with risk-informed, performance-based inservice inspection after they have been employed by the staff.
- The ACRS Subcommittee on Plant Operations plans to follow up on the future staff activities associated with the Arthur Andersen study regarding the NRC Senior Management Meeting process and the development of performance indicators.
- The Committee plans to discuss the staff's evaluation of the DOE tritium production program after it has been completed by the staff.

#### PROPOSED SCHEDULE FOR THE 430TH ACRS MEETING

The Committee agreed to consider the following during the 430th ACRS Meeting, April 3-5, 1997:

Proposed Regulatory Approach Associated with Steam Generator Integrity - The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the proposed regulatory approach for dealing with steam generator integrity issues. Representatives of the nuclear industry will participate, as appropriate.

Consequences of Reactor Water Cleanup System Line Break Outside Containment - The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the status of the report of the study performed by the staff on the consequences of reactor water cleanup system line break outside containment. Representatives of the nuclear industry will participate, as appropriate.

Subcommittee Report - The Committee will hear a report by the Chairman of the Thermal-Hydraulic Phenomena Subcommittee regarding the items discussed during the March 28, 1997 Subcommittee meeting.

Proposed Regulatory Guidance Related to Implementation of 10 CFR 50.59 Requirements - The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the proposed regulatory guidance for assessing the adequacy of the licensees' process for implementing the requirements of 10 CFR 50.59, "Changes, Tests and Experiments." Representatives of the nuclear industry will participate, as appropriate.

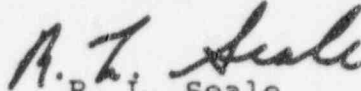
Boraflex Degradation in Spent Fuel Pool Storage Racks - The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the resolution of issues associated with the degradation of Boraflex used in spent fuel pool storage racks and licensee responses to Generic Letter 96-04,

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"Boraflex Degradation in Spent Fuel Storage Racks." Representatives of the nuclear industry will participate, as appropriate.

Use of Potassium Iodide After a Severe Accident - The Committee will hear presentations by and hold discussions with the representatives of the NRC staff regarding the NRC policy on the use of potassium iodide after a severe accident and other related issues. Representatives of the nuclear industry and other interested parties will participate, as appropriate.

Sincerely,

  
R. L. Seale  
Chairman