



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

SL-0444

PDR 5/8/97

November 11, 1996

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-FIFTH MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, OCTOBER 9-12,
1996, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 435th meeting, October 9-12, 1996, the Advisory
Committee on Reactor Safeguards (ACRS) discussed several matters
and completed the following reports and letter:

REPORTS

Capability of the NRC SCDAP/RELAP5 Code to Predict Temperatures and
Flows in Steam Generators Under Severe-Accident Conditions (Report
to Shirley Ann Jackson, Chairman, NRC, from T.S. Kress, Chairman,
ACRS, dated October 22, 1996.)

Thermal-Hydraulics Research Plan (Report to Shirley Ann Jackson,
Chairman, NRC, from T.S. Kress, Chairman, ACRS, dated October 21,
1996.)

LETTER

Draft Update of Standard Review Plan, Chapter 7, "Instrumentation
and Controls" (Letter to James M. Taylor, Executive Director for
Operations, NRC, from T.S. Kress, Chairman, ACRS, dated October 23,
1996)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

Meeting with the Advisory Committee on Nuclear Safety (Canada)

On October 9, 1996, the ACRS met with members of the Advisory
Committee on Nuclear Safety (ACNS) of Canada and discussed several
items of mutual interest, including the following:

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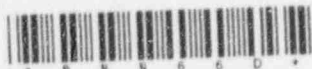
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1. Risk-Informed, Performance-Based Regulation

The Committee heard presentations by and held discussions with representatives of the ACNS regarding activities in the area of risk-informed, performance-based regulation. Specific discussions included definitions of risk-informed and performance-based concepts, regulatory approaches to defense-in-depth, possible use of Safety Goals on a plant-specific basis, consideration of uncertainty in evaluating risk, differences in the levels for conducting probabilistic risk assessment (PRA) in the U.S. and Canada, and the possibility for risk evaluation to be an additional regulatory burden.

2. Plant Aging

The Committee held discussions with the ACNS concerning plant aging issues. The Committee summarized its reviews of NRC activities related to the aging of United States nuclear plant components. The ACNS summarized the status of the development of the Canadian regulatory document related to aging and associated industry activities.

3. Operator Training/Simulator Use

Representatives of the ACRS and Canadian ACNS discussed the issue of operator training and simulator use. It was apparent by the issues raised that both the U.S. and Canadian nuclear utilities employ similar training methods (i.e., the Systems Approach to Training - SAT), and both are making use of simulators for operator training and licensing examinations.

ACRS member Dr. Apostolakis raised the issue of the impact of human errors on plant safety, specifically, the concern with so-called circumvention behavior where people intentionally violate procedures by taking "short-cuts." He noted that this behavior can be caused by the lack of a formal "safety culture." ACRS member Dr. Seale said that licensees must enforce the discipline associated with a proper safety culture.

4. Digital Instrumentation and Control Systems

The Committee heard presentations by and held discussions with representatives of the ACNS regarding activities in the area of digital instrumentation and control (I&C) systems. The Committee discussed issues related to the independent studies being performed by the National Academy of Sciences/National Research Council (NAS/NRC) and expectation for integration of the NAS/NRC Phase 2 study insights into the proposed Standard Review Plan and associated regulatory guidance being developed by the NRC staff. They also discussed the history and

experience of Canadian utilities and regulatory approaches for digital I&C systems.

On October 10-12, 1996, the following topics were discussed with the staff and other interested parties:

1. Status of NRC Strategic Assessment and Rebaselining Effort

The Deputy Executive Director for Nuclear Reactor Regulation, Regional Operations and Research, briefed the Committee regarding the status of the NRC strategic assessment and rebaselining effort. The strategic plan is a principal outcome of the strategic assessment and rebaselining initiated by the NRC Chairman. The strategic plan will establish the framework that will guide future NRC decision-making and help the agency to meet its responsibility for protecting the public health and safety and the environment. The staff developed Direction-Setting Issue Papers on 16 issues with Commission preliminary views, a strategic planning framework paper that explains how the issues relate to the NRC strategic plan and how the plan will be developed, and a stakeholder involvement process paper. All three documents have been made available to NRC internal and external stakeholders to provide comments prior to November 15, 1996.

Conclusion

This briefing was for information only; however, individual ACRS Members may make comments on certain Direction-Setting Issues prior to the closure of the comment period.

2. Digital Instrumentation and Control Systems

The Committee heard presentations by and held discussions with representatives of the NRC staff and its contractor, the Lawrence Livermore National Laboratory (LLNL), regarding the draft update of Standard Review Plan (SRP) sections and Branch Technical Positions for the review of digital instrumentation and control (I&C) systems.

Based on this review and earlier discussions in March and May 1996, the Committee concluded that it had no objection to the staff proposal to issue the draft SRP Chapter 7, Instrumentation and Controls, for public comment. However, the ACRS plans to continue discussions with the NRC staff regarding issues identified in its letter dated June 6, 1996. These issues include the level of detail provided in the regulatory guides, the balance in the guidance between the review of the design process and the assessment of the product, the linkage between Chapter 7 and other SRP chapters, and graded approaches based on importance to safety.

Conclusion

The Committee issued a letter to the Executive Director for Operations dated October 23, 1996, on this matter.

3. Control Room Back-Panel Fire at Palo Verde Unit 2

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the results and findings of the investigation of the April 4, 1996, event that involved two related fires in a back panel of the control room at Palo Verde Unit 2.

On April 4, 1996, an alert was declared at Palo Verde Unit 2, due to two related fires in a back panel of the main control room. These fires were associated with a voltage regulating transformer which supplied power to the train B essential lighting uninterruptible power supply panel. These fires affected one train of the essential emergency lighting distribution panel in the control room. The fires were promptly detected and extinguished and posed no safety threat to the plant, which was shut down for a refueling outage at that time.

The licensee's root-cause investigation indicated that the core of the regulating transformer coils caused a short circuit fault to station ground through the transformer's panel ground. The licensee also determined that, because the neutral leg of the transformer was not grounded, the fault current propagated through the station ground into panels located in the control room. The overcurrent resulting from the fault caused the fires in the control room.

Since the fire, the licensee has modified the circuit by grounding the transformer's neutral leg and fusing the output of the transformer's secondary to protect the circuits supplied from the transformer from fault propagation.

Conclusion

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

4. NRC Office of Nuclear Regulatory Research Five-Year Thermal Hydraulics Research Program Plan

Representatives of the NRC Office of Nuclear Regulatory Research (RES) and the Office of Nuclear Reactor Regulation gave presentations to the ACRS on the scope, goals, and approach of the RES Five-Year Thermal-Hydraulics Program Plan. The centerpiece of this Plan is the program to upgrade/revise

the suite of NRC thermal-hydraulic codes. Also included in the Plan are a pilot project to explore promising means to upgrade these codes, a comprehensive program of separate- and integral-effects tests, and a plan to enhance and maintain in-house research capabilities.

Conclusion

The ACRS issued a report to Chairman Jackson dated October 21, 1996, on this matter.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

The Committee discussed the response from the NRC Executive Director for Operations dated September 13, 1996, responding to ACRS comments and recommendations included in the ACRS report dated August 15, 1996, concerning SECY-96-128, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design."

The Committee decided that it was satisfied with the EDO's response. Since the Electric Power Research Institute (EPRI) raised concerns related to the policy issues, the Committee requested that an ACRS fellow review the EPRI concerns.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from September 12, 1996 through October 9, 1996, the following Subcommittee meetings were held:

- Thermal Hydraulic Phenomena - September 18-19, 1996

The Subcommittee on Thermal Hydraulic Phenomena met with representatives of the NRC staff to review the status of the thermal-hydraulic research program and the associated budget.

- Human Factors - September 20, 1996

The Subcommittee on Human Factors met with the NRC staff to discuss the latest draft of the NRC Human Performance Program Plan, the collection of human performance data, the development of human factors inspection guidelines, and the human factors research program.

- Planning and Procedures - October 8, 1996

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.

• Instrumentation and Control Systems and Computers/Electrical Power Systems - October 8, 1996

The Subcommittees on Instrumentation and Control Systems and Computers and on Electrical Power Systems held a joint meeting with the NRC staff to continue their review of the proposed Standard Review Plan sections, Regulatory Guides, and Branch Technical Positions related to digital instrumentation and control systems.

PROPOSED SCHEDULE FOR THE 436TH ACRS MEETING

The Committee agreed to consider the following during the 436th ACRS Meeting, November 7-9, 1996:

Proposed Rule on Steam Generator Integrity - The Committee will hear presentations by and hold discussions with representatives of the NRC staff, Nuclear Energy Institute (NEI), and Electric Power Research Institute regarding the proposed rule on steam generator integrity and an associated regulatory guide. Other interested parties will participate, as appropriate.

Risk-Based Analysis of Reactor Operating Experience - The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the staff activities associated with risk-based analysis of reactor operating experience, the accident sequence precursor program, development of risk-based performance indicators, and related matters. Representatives of the nuclear industry will participate, as appropriate.

Revised Source Term for Operating Reactors - The Committee will hear presentations by and hold discussions with representatives of the NRC staff, NEI, and Entergy Operations Inc., regarding the use of revised source term for operating plants and the NRC staff's proposed approach for reviewing applications for license amendments. Other interested parties will participate, as appropriate.

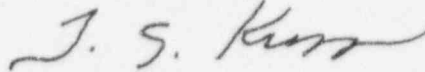
Emergency Planning for Advanced Reactors - The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding a simplified approach to emergency planning for advanced reactors. Representatives of the nuclear industry will participate, as appropriate.

Nitrogen Bubble in the Reactor Coolant System at the Haddam Neck Nuclear Power Plant - The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the findings and recommendations of the Augmented Inspection Team which investigated the August 28, 1996 event at the Haddam Neck

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Nuclear Power Plant that involved creation of a nitrogen bubble in the reactor coolant system.

Sincerely,

A handwritten signature in cursive script, appearing to read "T. S. Kress".

T. S. Kress
Chairman