



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

February 28, 2001

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

SUBJECT: SUMMARY REPORT - 479TH MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS, FEBRUARY 1-3, 2001
AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

Dear Chairman Meserve:

During its 479th meeting, February 1-3, 2001, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following letters.

LETTERS

1. Proposed Resolution of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to Significant Blowdown Loads" (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated February 8, 2001)
2. Draft ANS External Events PRA Methodology Standard (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated February 9, 2001)
3. Review of the Siemens Power Corporation S-RELAP5 Code to Appendix K Small-Break Loss-of-Coolant Accident Analyses (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated February 13, 2001)

HIGHLIGHTS OF KEY ISSUES CONSIDERED BY THE COMMITTEE

1. Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project

The Committee heard a presentation by and held discussions with representatives of the NRC staff concerning the treatment of uncertainties in the elements of the pressurized thermal shock (PTS) technical basis reevaluation project. The staff highlighted efforts to develop a generic approach for screening criteria through the

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evaluation of four individual plants: Oconee Unit 1, Calvert Cliffs Unit 1, Palisades, and Beaver Valley Unit 1. The Committee and staff discussed the approach for assessing uncertainties in estimates of PTS risk, proposed screening criteria, framework for evaluating PRA event sequence analysis, thermal-hydraulic analysis, and probabilistic fracture mechanics stress-strength analysis. The Committee discussed extensively the proposed binning process for event sequences and thermal-hydraulic code analysis used to develop screening criteria. At the conclusion of the meeting, the Committee requested and the staff agreed to illustrate how the process might work using a single event sequence during a future subcommittee meeting. The Subcommittees on Materials and Metallurgy and on Thermal-Hydraulic Phenomena met on January 18, 2001, concerning this matter.

Committee Action

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

2. Siemens S-RELAP5 Appendix K Small-Break LOCA

The Committee heard presentations by and held discussions with representatives of the Siemens Power Corporation (SPC) and the NRC staff concerning the NRC staff's approval of the SPC S-RELAP5 thermal-hydraulic code for small-break loss-of-coolant accident (SBLOCA) analyses, pursuant to the requirements of Appendix K to 10 CFR Part 50. A representative of the NRC staff discussed its review milestones, assessment of the S-RELAP5 code, and regulatory requirements governing Appendix K code reviews. The staff stated that it finds S-RELAP5 acceptable for use in satisfying the Appendix K requirements for analyses of SBLOCAs. SPC representatives discussed the origin and details of S-RELAP5, and SPCs SBLOCA methodology. SPC stated that its methodology shows that the S-RELAP5 SBLOCA code is convergent and robust. The Subcommittee on Thermal-Hydraulic Phenomena met on January 16-17, 2001, concerning this matter.

Committee Action

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

3. Proposed ANS Standard on External-Events PRA

The Committee heard presentations by and held discussions with representatives of the American Nuclear Society (ANS) External Events Working Group concerning draft

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BSR/ANS-58.21, "External Events PRA Methodology Standard." The Committee discussed the ANS Standard's treatment of risk from external events, e.g., earthquakes, high winds, external floods. The Committee considered the scarcity of statistical evidence for events of sufficient magnitude to cause plant damage and the need for expert judgment to develop the necessary probability distributions for risk assessment. The Committee discussed the proposed requirements for assessing uncertainties in the risk analysis. The Committee also discussed the need for consistency of definitions and terminology between the ANS Standard and the proposed standard for internal events under development by the American Society of Mechanical Engineers.

Committee Action

The Committee provided a letter dated February 9, 2001, to the Executive Director for Operations, on this matter.

4. Reprioritization of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to Significant Blowdown Loads"

The Committee heard presentations by and held discussions with the representatives of the NRC staff regarding the Proposed Resolution of Generic Safety Issue (GSI)-152, "Design Bases for Valves that Might be Subjected to Significant Blowdown Loads".

The NRC staff presented a brief background regarding GSI-152. The staff stated that GSI-152 was established to address the concern raised by the ACRS in 1989 during the review of activities related to GSI-87, "Failure of HPCI Steam Line Without Isolation." The concern was that while the valves might meet the NRC-approved design bases, the design bases might not address the need for the valve to close against the differential pressure resulting from a large high energy pipe break. Subsequently GSI-87 was closed. Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," was issued to focus specifically on the ability of motor-operated valves to operate under design basis conditions. The staff issued Supplement 3, "Consideration of the Results of NRC-Sponsored Tests of Motor-Operated Valves," to GL89-10 to ensure the capability of containment isolation valves in the reactor water cleanup, high pressure coolant injection, and reactor core isolation cooling systems in boiling water reactor plants to isolate the largest credible downstream pipe break. The Office of Nuclear Regulatory Research performed tests for the closure of GSI-87, which showed weaknesses in valve performance attributes both to motors and to valve mechanisms. Industry sponsored research programs confirmed the weaknesses identified in the NRC testing program.

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Based on the issuance of Supplement 3 to GL89-10 and subsequent staff and industry initiatives, the staff has proposed to close this generic safety issue.

Committee Action

The Committee sent a letter dated February 8, 2001, to the Executive Director for Operations on this matter.

5. Regulatory Effectiveness of the ATWS Rule

The Committee heard presentations by and held discussions with representatives of the NRC staff concerning the Regulatory Effectiveness of the Anticipated Transients Without Scram (ATWS) rule. RES is reviewing several regulations to determine if the requirements set forth in these regulations are achieving their desired outcomes. The goal of this evaluation is to determine whether the rules were effective. The effectiveness of the ATWS rule was determined by comparing regulatory expectations to outcomes. The staff concluded that the ATWS rule was effective in reducing ATWS risk and that the cost of implementing the rule was reasonable. However, uncertainties in reactor protection system reliability and mitigative capability may warrant further attention to ensure that the expected levels of safety are maintained.

Committee Action

A letter to the Chairman was deferred until the March meeting.

6. Overview of Mixed Oxide Fuel Fabrication Facility

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding the proposed Mixed Oxide (MOX) fuel fabrication facility to be constructed at the Department of Energy's (DOE's) Savannah River Plant site. The MOX project is part of a bilateral plutonium disposition agreement between the United States and Russia and is intended to reduce nuclear proliferation. The objective of this agreement is to take 34 metric tons of surplus plutonium from the weapons programs and irreversibly convert it into forms that are unusable for weapons. In this approach, the United States plans to take 25 metric tons of plutonium and convert it into MOX fuel for use in commercial reactors. The remaining 9 metric tons would be immobilized with vitrified high level waste.

As part of this program, the NRC expects to receive a license application from the applicant (Duke, Cogema, and Stone & Webster) to license a MOX fuel fabrication facility under 10 CFR Part 70, Domestic Licensing of Special Nuclear Material. As part

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of the plutonium disposition program, DOE submitted environmental impact statement to the staff on December 19, 2000. The applicant plans to submit the application for construction of the facility to the staff in February 2001. The amendments for use of MOX lead test assemblies at McGuire nuclear station is expected in August 2001.

Committee Action

This briefing was for information only and no Committee action was required.

7. Meeting with the NRC Chairman

The Committee met with NRC Chairman Meserve to discuss items of mutual interest.

8. NRC Safety Research Program

The Committee discussed the 2001 ACRS report to the Commission on NRC Safety Research Program. The Committee will continue its deliberation on the proposed report in March 2001. The Committee indicated that the report would focus on the longer-term research activities to ensure that the Commission will carry out its safety mission efficiently and effectively in the future.

Committee Action

The Committee plans to finalize its draft report at the March 2001 ACRS meeting.

9. ACRS/ACNW Joint Subcommittee Report

Dr. Thomas Kress, Co-Chairman of the ACRS/ACNW Joint Subcommittee, provided a report on the results of the January 19, 2001 Subcommittee meeting. He informed the Committee that the Joint Subcommittee discussed risk assessment methods associated with Integrated Safety Analysis (ISA) and the status of risk-informed activities in the Office of Nuclear Material Safety and Safeguards. Dr. Kress noted that the Joint Subcommittee also heard a presentation by a DOE representative concerning risk analysis methods and applications associated with the DOE Integrated Safety Management (ISM) program. Dr. Kress said that the Joint Subcommittee plans to: 1) review an actual ISA summary, when available (e.g., MOX fuel or BWXT), 2) review the staff's reconciliation of NUREG-1520 Standard Review Plan Chapter 3 for ISAs, 3) review a risk-informed case study, when available, and 4) evaluate the issue of consistency in risk analysis across NRC programs, including the application of PRA methods relative to proposed approaches for NMSS licensed activities.

Committee Action

The Joint Subcommittee plans to review the matters noted above.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS

- The Committee discussed the response from the EDO, dated January 11, 2001, to ACRS comments and recommendations included in the ACRS letter dated December 14, 2000, concerning the Nuclear Energy Institute Draft Report, NEI-99-03, "Control Room Habitability Assessment Guidance".

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

- The Committee discussed the response from the EDO, dated December 11, 2000, to ACRS comments and recommendations included in the ACRS letter dated November 20, 2000, concerning proposed framework for risk-informed changes to the technical requirements of 10 CFR Part 50.

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

- The Committee discussed the response from the EDO, dated December 14, 2000, to ACRS comments and recommendations included in the ACRS letter dated October 12, 2000, concerning the pressurized thermal shock technical basis reevaluation project.

The Committee decided that it was satisfied with the EDO's response. The Committee plans to continue its review of this matter during future meetings.

- The Committee discussed the response from the EDO, dated January 11, 2001, to ACRS comments and recommendations included in the ACRS letter dated December 15, 2000, concerning proposed final Regulatory Guide DG-1053, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence."

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

- The Committee discussed the response from the EDO, dated December 20,

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2000, to ACRS comments and recommendations included in the ACRS letter dated November 20, 2000, concerning BWROG proposal to use safety relief valves and low pressure systems as a redundant safe shutdown path to satisfy the requirements of 10 CFR Part 50, Appendix R.

The Committee plans to review the staff's safety evaluation report on this matter during a future meeting.

- The Committee discussed the response from the EDO, dated January 18, 2001, to ACRS comments and recommendations included in the ACRS report dated November 8, 2000, concerning draft final technical study of spent fuel pool accident risk at decommissioning nuclear power plants.

The Committee decided to continue its discussion of this matter during future meetings.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from December 6 through January 31, 2001, the following Subcommittee meetings were held:

- Plant Operations Subcommittee - December 6, 2000

The Subcommittee discussed changes to the Revised Reactor Oversight Process since implementation of the pilot program.

- Thermal-Hydraulic Phenomena Subcommittee - January 16-17, 2001

The Subcommittee discussed the NRC/Electric Power Research Institute cooperative study to resolve Generic Letter 96-06 waterhammer issues. EPRI has drafted a report, TR-113594, "Resolution of Generic Letter 96-06 Waterhammer Issues". The Subcommittee previously reviewed this matter during a November 17, 1999 meeting. At the conclusion of the January 16-17 meeting, both the Subcommittee and NRR staff identified open issues for resolution by EPRI.

- ACRS/ACNW Joint Subcommittee - January 19, 2001

The ACRS/ACNW Joint Subcommittee discussed risk assessment methods associated with Integrated Safety Analysis (ISA) and the status of risk-informed

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activities in the Office of Nuclear Material Safety and Safeguards. The Joint Subcommittee also discussed risk analysis methods and applications associated with the Department of Energy (DOE) Integrated Safety Management (ISM) program.

- Extended Planning and Procedures Subcommittee - January 22-24, 2001

The Subcommittee discussed stakeholder views of ACRS activities, self-assessment of ACRS performance in CY 2000, potential operational areas for improved effectiveness, and the annual ACRS report to the Commission on the NRC Safety Research Program.

- Planning and Procedures - January 31, 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 plans to review the revised documentation supporting the realistic version of the Siemens S-RELAP5 thermal-hydraulic code.
- During the discussion of the treatment of uncertainties in the elements of the PTS Technical Basis Reevaluation Project, the staff committed to illustrate how the proposed binning process might work using a single event sequence at a future Subcommittee meeting.
- The ACRS/ACNW Joint Subcommittee plans to review: an actual integrated safety analyses (ISAs) summary (e.g., MOX fuel or BWxT); the staff's reconciliation of NUREG-1520 SRP Chapter 3 for ISAs; a risk-informed case study; consistency in risk analysis across NRC programs; and risk-informed initiations in NMSS.
- The Committee plans to review the proposed final ANS Standard on external events PRA after reconciliation of public comments.
- The Committee would like to be kept informed of the resolution of the DPO issues associated with steam generator tube integrity.

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- The Committee plans to continue its review of the pressured thermal shock technical basis reevaluation project during future meetings.
- The Committee plans to review the staff's safety evaluation report on the BWROG proposal to use safety relief valves and low pressure systems as a redundant safe shutdown path to satisfy the requirements of 10 CFR Part 50, Appendix R.
- The Committee plans to continue its discussion of spent fuel pool accident risk at decommissioning nuclear power plants.

PROPOSED SCHEDULE FOR THE 480TH ACRS MEETING

The Committee agreed to consider the following topics during the 480th ACRS Meeting, March 1-3, 2001:

RETRAN-3D Thermal-Hydraulic Transient Analysis Code

Report by the Chairman of the Thermal-Hydraulic Phenomena Subcommittee regarding the EPRI RETRAN-3D thermal-hydraulic transient analysis code, associated staff's Safety Evaluation Report, and resolution of issues previously raised by the ACRS. [Note: A portion of this session may be closed to discuss EPRI proprietary information.]

Interim Review of the License Renewal Application for Arkansas Nuclear One, Unit 1

Report by the Chairman of the Plant License Renewal Subcommittee regarding the license renewal application for Arkansas Nuclear One, Unit 1 and the associated staff's Safety Evaluation Report.

Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants

Briefing by and discussions with representatives of the NRC staff regarding significant findings and recommendations of the final report on spent fuel pool accident risk at decommissioning plants, new developments, status of developing proposed options, and related matters.

Management Directive 6.4 Associated with the Revised Generic Issue Process

Briefing by and discussions with representatives of the NRC staff regarding Management Directive 6.4 related to the Revised Generic Issue process, results of the case study performed to determine the effectiveness of using the Management Directive to implement the revised Generic Issue process, and related matters.

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British Nuclear Powered Submarine Incident

Briefing by and discussions with representatives of the DOD/DOE Naval Reactors regarding the recent incident on the British Nuclear Powered Submarine (HMS TIRELESS). [Note: This session will be closed to discuss information classified "Confidential - Restricted Data - Government Sensitive" .]

Operating Event at V. C. Summer Nuclear Station

Briefing by and discussions with representatives of the NRC staff regarding the October 7, 2000 incident at the V. C. Summer Nuclear Station, involving degraded reactor coolant system pressure boundary, findings and conclusions resulting from the staff's investigation of this event, and corrective actions taken by the licensee and industry organizations.

Trip Report

The cognizant ACRS Member and staff engineer will provide a trip report on the Nuclear Energy Institute (NEI) Fire Protection Forum held in San Diego on February 5-7, 2001.

Subcommittee Report

Report by the Chairmen of the Plant Operations and Reliability and Probabilistic Risk Assessment Subcommittees regarding the South Texas Project Exemption Request that was discussed during a meeting on February 21, 2001.

Sincerely,



George E. Apostolakis
Chairman

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LETTERS

- Proposed Resolution of Generic Safety Issue-152, "Design Basis for Valves that
Might be Subjected to Significant Blowdown Loads" (Letter to William D. Travers,
Executive Director for Operations, NRC, from George E. Apostolakis, Chairman,
ACRS, dated February 8, 2001)
- Draft ANS External Events PRA Methodology Standard (Letter to William D.
Travers, Executive Director for Operations, NRC, from George E. Apostolakis,
Chairman, ACRS, dated February 9, 2001)

- Review of the Siemens Power Corporation S-RELAP5 Code to Appendix K Small-Break Loss-of-Coolant Accident Analyses (Letter to William D. Travers, Executive Director for Operations, NRC, from George E. Apostolakis, Chairman, ACRS, dated February 13, 2001)

APPENDICES

- I. *Federal Register Notice*
- II. Meeting Schedule and Outline
- III. Attendees
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- V. List of Documents Provided to the Committee

CERTIFIED

MINUTES OF THE 479TH MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
FEBRUARY 1-3, 2001
ROCKVILLE, MARYLAND

The 479th meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on February 1-3, 2001. Notice of this meeting was published in the *Federal Register* on December 27, 2000 (65 FR 81906) (Appendix I). The purpose of this meeting was to discuss and take appropriate action on the items listed in the meeting schedule and outline (Appendix II). The meeting was open to public attendance. There were no written statements or requests for time to make oral statements from members of the public regarding the meeting.

A transcript of selected portions of the meeting was kept and is available in the NRC Public Document Room at the One White Flint North Building, Mail Stop 1F-15, Rockville, MD, 20852-2738. [Copies of the transcript are available for purchase from Neal R. Gross and Co., Inc., 1323 Rhode Island Avenue, NW, Washington, DC 20005-3701, and on the ACRS/ACNW Web page at (www.NRC.gov/ACRS/ACNW).]

ATTENDEES

ACRS Members: ACRS Members: Dr. George Apostolakis (Chairman), Dr. Mario V. Bonaca (Vice Chairman), Dr. Thomas S. Kress, Mr. Graham M. Leitch, Dr. Dana A. Powers, Dr. William J. Shack, Dr. Robert L. Seale, Mr. John D. Sieber, Dr. Robert E. Uhrig, and Dr. Graham B. Wallis. For a list of other attendees, see Appendix III.

I. Chairman's Report (Open)

[Note: Dr. John T. Larkins was the Designated Federal Official for this portion of the meeting.]

Dr. George E. Apostolakis, Committee Chairman, convened the meeting at 8:30 a.m. and reviewed the schedule for the meeting. He summarized the agenda topics for this meeting and discussed the administrative items for consideration by the full Committee.

II. Treatment of Uncertainties in the Elements of the PTS Technical Basis
Reevaluation Project (Open)

[Note: Mr. Paul A. Boehnert was the Designated Federal Official for this portion of the meeting.]

Dr. William Shack, Chairman of the ACRS Subcommittee on Materials and Metallurgy introduced the topic to the Committee. He stated that the Committee last met to discuss issues related to the pressurized thermal shock (PTS) technical basis reevaluation project in October 2000 and provided a letter to the EDO dated October 12, 2000. At that time, the Committee questioned the treatment of uncertainties relative to the probabilistic fracture mechanics approach being used by the staff in the FAVOR code. He noted that the Subcommittees on Materials and Metallurgy and on Thermal-Hydraulic Phenomena met on January 18, 2001, to discuss the staff's progress in this area.

NRC Staff Presentation

Messrs. Michael Mayfield and Nathan Siu, RES, presented the staff's approach concerning the treatment of uncertainties in the elements of the PTS technical basis reevaluation project. They highlighted efforts to develop a generic approach for screening criteria through the evaluation of four individual plants: Oconee Unit 1, Calvert Cliffs Unit 1, Palisades, and Beaver Valley Unit 1. They also presented the staff's approach for assessing uncertainties in estimates of PTS risk, proposed screening criteria, framework for evaluating PRA event sequence analysis, thermal-hydraulic analysis, and probabilistic fracture mechanics stress-strength analysis. Significant points made during the presentation included:

- The staff's work assessment of uncertainties related to PTS risk is a work-in-progress. The staff would like to meet with the Committee/Subcommittees as more is learned from the individual plant applications and as the FAVOR code is modified.
- The staff proposes to use a binning process for event sequences and thermal-hydraulic code analysis. The results of this binning will be used to develop scenario screening criteria.
- Key issues under development include: PRA event sequence analysis, thermal-hydraulic analysis, probabilistic fracture mechanics analysis, and uncertainty in the binning process.

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- The staff contends that its approach treats uncertainties consistently across different disciplines and that most uncertainties are quantified. The staff plans to document its revised approach and results in a White Paper update.
- The staff may consider revising the PTS Rule (10 CFR 50.61) to allow for some relaxation in requirements based on the results of both the reevaluation and individual plant applications.

Dr. Powers questioned why the staff is reevaluating the technical basis of the PTS Rule. The staff stated that a number of improvements have been made in the methods for probabilistic fracture mechanics analysis such that it may be possible to reconsider the significant conservatism present in the original rule. The staff suggested that industry interest derived from the experience at Yankee Atomic Nuclear Power Station and noted that this would be the first major application of risk-informed methodology to an adequate protection rule.

Dr. Shack questioned, if the PTS Rule is overly conservative, why only one plant (Palisades) hit the screening criteria limit. The staff stated that the industry has questioned how the NRC might consider chemical analysis and suggested that decisions be based on credible technology rather than on conservatism.

Dr. Seale questioned whether there was a disagreement related to neutron fluence attenuation. Dr. Powers questioned the rationale for selecting the 95th percentile for screening criteria. The staff stated that there was some disagreement mostly related to the evaluation of uncertainties. The staff stated that they plan to quantify parameter uncertainties but noted that some uncertainties cannot be calculated, in particular, model uncertainties. The staff stated that a final determination has not been made on the actual screening criteria. The staff emphasized that they plan to establish boundary conditions through the binning process.

Dr. Apostolakis suggested that the staff consider the risk analysis work being done on the high-level waste repository, since the question of scope could be addressed in a similar manner. The staff agreed to consider this suggestion.

Dr. Powers suggested that there is a need for additional research on vessel embrittlement. He stated that the correlations are semi-empirical in that they only include evaluation of the fluence, the effects of copper and nickel, and product form. The staff stated that they are looking at boundary conditions and variations. Dr. Shack stated that the key lies in evaluating pressurized versus non-pressurized conditions.

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At the conclusion of the meeting, the Committee requested, and the staff agreed, to provide an illustration of how the process might work using a single event sequence during a future Subcommittee meeting that will be scheduled in May or June 2001.

Committee Action

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

III. Siemens S-RELAP5 Appendix K Small-Break LOCA Code (Open)

[Note: Mr. Paul A. Boehnert was the Designated Official for this portion of the meeting.]

The Committee heard presentations by and held discussions with representatives of the Siemens Power Corporation (SPC) and the NRC staff concerning the NRC staff's approval of the SPC S-RELAP5 thermal-hydraulic code for SBLOCA accident analyses, pursuant to the requirements of Appendix K to 10 CFR Part 50. A representative of the NRC staff discussed its review milestones, assessment of the S-RELAP5 code, and regulatory requirements governing Appendix K code reviews. NRR stated that it finds S-RELAP5 acceptable for use in satisfying the requirements for analyses of SBLOCAs under the requirements of 10 CFR Part 50, Appendix K. SPC representatives discussed the origin and details of S-RELAP5, and SPCs SBLOCA methodology. Siemens stated that its methodology shows that the S-RELAP5 SBLOCA code is convergent and robust. The Subcommittee on Thermal-Hydraulic Phenomena met on January 16-17, 2001, concerning this matter.

Committee Action

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

IV. Proposed ANS Standard on External-Events PRA (Open)

[Note: Mr. Michael T. Markley was the Designated Federal Official for this portion of the meeting.]

Dr. George Apostolakis, Chairman of the ACRS Subcommittee on Reliability and Probabilistic Risk Assessment, introduced this topic to the Committee. He stated that the purpose of this meeting was to review the proposed American Nuclear Society (ANS) draft Standard on external-events probabilistic risk assessment (PRA). He introduced Mr. Robert Budnitz, Chairman of the ANS External Events Working Group which developed draft BSR/ANS-58.21, "External Events PRA Methodology Standard."

ANS Presentation

Mr. Robert Budnitz of Future Resources, Inc., led the presentation for ANS. Messrs. Ravi Ravindra, EQE, Inc., and Mr. Nilesh Chokshi, NRC/RES, of the External Events Working Group provided supporting discussion. Significant points made during the presentation include:

- External events, e.g., earthquakes, high winds, and external floods, are major contributors to risk because of the potential dependent failures of plant safety systems and because they may limit evacuation and/or emergency response capability.
- The ANS Standard was designed to be consistent with and complement the proposed standard for internal events under development by the American Society of Mechanical Engineers (ASME). ANS representatives highlighted the importance for a common language and definition of terms to exist between the two Standards.
- Unlike the ASME Standard, the ANS Standard does not partition risk into three categories. The ANS Standard provides an approach similar to the ASME Category II (moderate risk characterization required). The ANS Standard also provides an approach that corresponds roughly to ASME Category I (bounding or low-level risk characterization).
- Plant walkdowns will be needed to ensure important site characteristics are properly captured in the analysis. Peer review and the use of expert opinion will be needed to complete the analysis.
- The proposed ANS Standard has been partially funded by the Office of Research. Another ANS Standard, under development for low-power and shutdown events, is also partially funded by the NRC.

NEI Presentation

Mr. Adrian Heymer, of the Nuclear Energy Institute (NEI), provided a brief presentation to the Committee on the ANS Standard. He stated that the proposed Standard was only recently made available for public comment. Significant points made during the presentation include:

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- Preliminary feedback from the NSSS Owners Groups and the Electric Power Research Institute (EPRI) indicated that the seismic margins portion of the ANS Standard may be difficult to use without a seismic PRA. ANS representatives responded stating that about 50 plants have done seismic margins analysis using the EPRI method, and it is likely that a majority of the plants will meet the requirements of the ANS Standard.
- NEI recommended that the distinction between what constitutes an adequate seismic margins analysis versus criteria for a seismic PRA be clarified.

Dr. Bonaca expressed the view that the categorization of risk was appropriately partitioned in the proposed ANS Standard. Dr. Shack reiterated that there are two ways to use the seismic margins analysis (i.e., moderate risk characterization using PRA and bounding analysis). Several Committee members stated that they prefer the ANS approach to the three categories used in the ASME Standard for internal events.

Dr. Apostolakis questioned how modeling uncertainty was accounted for in the ANS Standard. ANS representatives stated that they would be considered differently at different plants because there are more than 100 operating nuclear plants with different PRAs and human reliability analysis methods. ANS representatives further stated that some licensees will use sensitivity studies to assess "credible" plant damage scenarios. Dr. Kress expressed the view that sensitivity studies are not needed if a rigorous uncertainty analysis is performed.

Dr. Powers and Apostolakis questioned the consistency in the definition of terms between the ANS and ASME Standards. ANS representatives stated that the definition of terms should be identical to those in the ASME Standard and agreed to examine them more closely.

Overall, the Committee expressed favorable views concerning the initial effort to develop the draft ANS Standard. Dr. Shack noted that relationship between the requirements and commentary sections resembles a more traditional "design-to" standard. Dr. Apostolakis stated that the Standard provides a good listing of notes and references. The Committee offered a number of detailed comments that the ANS representatives agreed to consider.

Committee Action

The Committee sent a letter to the Executive Director for Operations on this matter dated February 9, 2001.

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V. Reprioritization of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to Significant Blowdown Loads" (Open)

[Note: Mr. Amarjit Singh was the Designated Federal Official for this portion of the meeting.]

Mr. Graham M. Leitch, Vice Chairman of the ACRS Subcommittee on Plant Systems, introduced this topic to the Committee. He stated that the purpose of this session was to discuss the proposed Resolution of Generic Safety Issue-152 (GSI-152), "Design Bases for Valves that Might be Subjected to Significant Blowdown Loads".

NRC Staff Presentation

Mr. Kenneth Karwoski led the discussions for the staff. He presented a brief background regarding GSI-152. He stated that this issue was raised by the ACRS in 1989 during the review of activities related to GSI-87, "Failure of HPCI Steam Line Without Isolation." The concern was that while the valves might meet the NRC approved design bases, the design bases might not address the need for the valve to close against the differential pressure resulting from a large size high energy pipe break. Subsequently GSI-87 was closed.

While GL 89-10 was insufficient to completely address ACRS concerns regarding the adequacy of the design basis, certain aspects of the generic letter established a need for licensees to revisit the design basis. The design basis for certain normally open primary system MOVs (for example, those serving the reactor water cleanup system and the steam supply to the high-pressure coolant injection and reactor core isolation cooling system turbines in boiling water reactors) demand that these MOVs close to isolate the largest postulated downstream break outside the containment. However, a break in the line should be considered in the analyses if MOV operation is relied on in the design basis.

The staff followed GL 89-10 with Information Notice (IN) 90-40, dated June 5, 1990 presenting the results of two years of testing initiated during the closeout of GSI-87. This information, in conjunction with the design-basis information prepared to respond to GL 89-10, was sufficient to identify weaknesses in certain valves. On July 6, 1990, the BWR Owners Group supplied the NRC with the results of a survey of MOV data on the containment isolation MOVs in the steam supply lines of HPCI and RCIC, and in the supply line for the reactor water cleanup (RWCUC) system. An evaluation of the MOV data indicated that about a third of these valves might not be able to isolate the blowdown flow from a postulated pipe break.

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These findings were addressed in Supplement 3 to GL 89-10. Supplement 3 stated there was a need to assign a high priority to correct any deficiencies in the HPCI, RCIC and RWCU MOVs. Supplement 3 also noted important mitigative features (i.e., margin on assumed valve capability in the design phase, concurrently operating redundant valves which would share the pressure difference, and system depressurization) which would allow the valves to close against a lower pressure differential. Another factor cited in Supplement 3 was the ability to detect a leak and take corrective action while the maximum pressure difference is across the leak instead of across the valve.

In the early 1990s, the NRC staff conducted inspections of the licensees' GL 89-10 programs, including their evaluations of the design-bases. The results from the inspections confirmed that concern of differential pressure across the valve had been addressed. Deficiencies in the design bases were identified and corrected. This information was shared with the industry in Information Notices 96-48 and 97-07.

Based on the issuance of Supplement 3 to GL 89-10 and subsequent staff and industry initiatives, the staff proposed to closeout this issue.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter dated February 8, 2001.

VI. Regulatory Effectiveness of the ATWS Rule

[Mrs. Maggalean W. Weston was the Designated Federal Official for this portion of the meeting.]

Dr. Thomas S. Kress, Chairman of the ACRS Subcommittee on Regulatory Policies and Practices, introduced this topic to the committee. He indicated that the Committee had not discussed this topic previously.

NRC Staff Presentation

The staff presentation on the Regulatory Effectiveness of the ATWS Rule was made by Mr. William Raughley, RES. Mr. George Lanik, RES, also participated in the presentation. In attendance and responding to questions as needed were Mr. Jack Rosenthal, and Mr. Farouk Eltawila, both of RES. RES is reviewing several major regulations to determine if the requirements set forth in these regulations are achieving their desired outcomes. The anticipated transient without scram (ATWS) rule is one of the effectiveness reviews.

The goal of the review was to determine whether the ATWS rule and the recommendations issued with it are effective in achieving their desired outcomes and whether certain areas may need attention. An ATWS is an anticipated operational occurrence followed by the failure of the reactor trip portion of the reactor protection system (RPS).

The outcomes used in the assessment for comparison were obtained from the NRC performance indicator program, licensing event reports (LERs), reliability studies, a survey of PWR moderator temperature coefficients (MTCs), and other vendor information. The RPS reliability data were obtained from studies that model the RPS system.

The assessment shows that the mean frequency of automatic scrams decreased from approximately 4/reactor years in 1983 to 0.5/reactor years since 1997. This alone accounts for a reduction of nearly one order of magnitude in the frequency of an ATWS – P(ATWS). RPS reliability dominates the risk from an ATWS. There have been no total failures of the RPS system since the ATWS rule was issued. Operating experience shows that the mean RPS unreliability expectations of $<1E-5$ /reactor year have been met and are about an order of magnitude better than the RPS reliability estimates before the ATWS rule.

Although past data shows that the risk from ATWS is in the range foreseen when the ATWS rule was issued, several issues have the potential to erode past achievements. These issues are:

- RPS reliability estimates are subject to large uncertainties.
- ATWS PWR mitigation capability is highly dependent on the MTC.
- ATWS mitigation on a BWR is highly dependent on operator actions.

The assessment concludes that the ATWS rule has been effective in installing modifications, reducing ATWS risk, and implementing the rule at reasonable cost. However, uncertainties in RPS reliability and mitigative capability warrant continued attention to maintain the expected levels of safety and to improve effectiveness.

Committee Action

A letter to the Chairman was deferred until the March meeting.

VII. Overview of Mixed Oxide Fuel Fabrication Facility

[Note: Mr. Amarjit Singh was the Designated Federal Official for this portion of the meeting.]

Mr. John D. Sieber, Chairman of the ACRS Subcommittee on Fire Protection, introduced this topic to the Committee. He stated that the purpose of this meeting was to hear presentations from the representatives of the NRC staff regarding the proposed Mixed Oxide (MOX) Fuel Fabrication Facility at the Department of Energy's (DOE's) Savannah River Plant site.

NRC Staff Presentation

Mr. Tim Johnson, NMSS, led the discussion for the NRC staff. He briefly presented the history and background on the MOX project. The MOX project is part of a bilateral plutonium disposition agreement between the United States and Russia. This agreement was intended to reduce nuclear proliferation. The objective of this agreement was to take 34 metric tons of surplus from the weapons programs and irreversibly convert it into forms that are unusable for weapons. In this approach, the United States plans to take 25 metric tons of material and convert it into mixed oxide fuel for use in commercial reactors and the remaining 9 metric tons would be immobilized with vitrified high level waste.

As part of this program, the NRC expects to receive a license application from the applicant (Duke Cogema Stone and Webster) to license a mixed oxide (MOX) fuel fabrication facility under 10 CFR Part 70. Under Part 70, the MOX facility is classified as a plutonium processing and fuel fabrication plant. An applicant for a license to possess and use special nuclear material at a plutonium processing and fuel fabrication facility must obtain the NRC's approval prior to starting facility construction. This means that the NRC will conduct two reviews. The first review will determine if the NRC can grant the applicant a construction approval. The NRC makes this determination based on contents of the license application that are specifically required by Part 70 for construction approval. The required material is described in detail in 10 CFR 70.22(f).

The second review will determine if the NRC can grant the applicant a possession and use license for special nuclear material. The NRC makes this determination based on the full content of the license application as described in all of 10 CFR 70.22(f) and Subpart H to 10 CFR Part 70.

As part of the plutonium disposition program, DOE submitted an environmental impact statement to the staff on December 19, 2000. The applicant plans to submit its

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application for construction of the facility to the staff in the near future. The amendments for use of MOX lead test assemblies at McGuire nuclear station is expected in August of 2001.

A Standard Review Plan (SRP) was developed to provide guidance to the staff reviewers in the Office of Nuclear Material Safety and Safeguards who will perform safety, safeguards, and environmental reviews of the anticipated application for a license to possess and use special nuclear material for the MOX facility-including the construction approval review. The NRC developed NUREG-1718 in parallel with NUREG-1520, 'Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility," which the NRC staff is currently developing to support a rulemaking for 10 CFR Part 70. The NRC staff has attempted to ensure that this SRP is consistent with the requirements of the ongoing rulemaking. The NRC staff has also attempted to ensure that, where applicable for a MOX facility, NUREG-1718 is consistent with the draft of NUREG-1520. However, reviewers should be aware that the NUREG-1718 document incorporates guidance that makes it specific for a MOX facility.

Committee Action

This briefing was information only and no Committee action was required.

VIII. NRC Safety Research Program

The Committee discussed the 2001 ACRS report to the Commission on the NRC Safety Research Program. The Committee will continue its deliberation on the proposed report in March 2001. The Committee indicated that the report would focus on the longer-term research activities to ensure that the Commission will carry out its safety mission efficiently and effectively in the future.

Committee Action

The Committee plans to finalize its draft report at the March 2001 ACRS meeting.

IX. ACRS/ACNW Joint Subcommittee Report

Dr. Thomas Kress, Co-Chairman of the ACRS/ACNW Joint Subcommittee, provided a report on the results of the January 19, 2001 Subcommittee meeting. He informed the Committee that the Joint Subcommittee discussed risk assessment methods associated with Integrated Safety Analysis (ISA) and the status of risk-informed activities in the Office of Nuclear Material Safety and Safeguards. Dr. Kress noted that the Joint Subcommittee also heard a presentation by a DOE representative concerning

risk analysis methods and applications associated with the DOE Integrated Safety Management (ISM) program. Dr. Kress said that the Joint Subcommittee plans to: 1) review an actual ISA summary, when available (e.g., MOX fuel or BWXT), 2) review the staff's reconciliation of NUREG-1520 Standard Review Plan Chapter 3 for ISAs, 3) review a risk-informed case study, when available, and 4) evaluate the issue of consistency in risk analysis across NRC programs, including the application of PRA methods relative to proposed approaches for NMSS licensed activities.

X. Executive Session (Open)

[Note: Dr. John T. Larkins was the Designated Federal Official for this portion of the meeting.]

A. Reconciliation of ACRS Comments and Recommendations

[Note: Mr. Sam Duraiswamy was the Designated Federal Official for this portion of the meeting.]

- The Committee discussed the response from the EDO, dated January 11, 2001, to ACRS comments and recommendations included in the ACRS letter dated December 14, 2000, concerning the Nuclear Energy Institute Draft Report, NEI-99-03, "Control Room Habitability Assessment Guidance".

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

- The Committee discussed the response from the EDO, dated December 11, 2000, to ACRS comments and recommendations included in the ACRS letter dated November 20, 2000, concerning proposed framework for risk-informed changes to the technical requirements of 10 CFR Part 50.

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

- The Committee discussed the response from the EDO, dated December 14, 2000, to ACRS comments and recommendations included in the ACRS letter dated October 12, 2000, concerning the pressurized thermal shock technical basis reevaluation project.

The Committee decided that it was satisfied with the EDO's response. The Committee plans to continue its review of this matter during future meetings.

- The Committee discussed the response from the EDO, dated January 11, 2001, to ACRS comments and recommendations included in the ACRS letter dated December 15, 2000, concerning proposed final Regulatory Guide DG-1053, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence."

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

- The Committee discussed the response from the EDO, dated December 20, 2000, to ACRS comments and recommendations included in the ACRS letter dated November 20, 2000, concerning BWROG proposal to use safety relief valves and low pressure systems as a redundant safe shutdown path to satisfy the requirements of 10 CFR Part 50, Appendix R.

The Committee plans to review the staff's safety evaluation report on this matter during a future meeting.

- The Committee discussed the response from the EDO, dated January 18, 2001, to ACRS comments and recommendations included in the ACRS report dated November 8, 2000, concerning draft final technical study of spent fuel pool accident risk at decommissioning nuclear power plants.

The Committee decided to continue its discussion of this matter during future meetings.

B. Report on the Meeting of the Planning and Procedures Subcommittee (Open)

— Review of the Member Assignments and Priorities for ACRS Reports and Letters for the February ACRS Meeting

Member assignments and priorities for ACRS reports and letters for the February ACRS meeting were discussed. Reports and letters that would benefit from additional consideration at future ACRS meeting were also discussed.

— Anticipated Workload for ACRS Members

The anticipated workload of the ACRS members through April 2001 was discussed. The objectives were:

- Review the reasons for the scheduling of each activity and the expected work product and to make changes, as appropriate

- Manage the members' workload for these meetings
- Plan and schedule items for ACRS discussion of topical and emerging issues

During this session, the Subcommittee discussed and developed recommendations on the items that require Committee decision.

— ACRS Action Plan for CY 2001

During the December 2000 ACRS meeting, the Committee approved the ACRS Action Plan for CY 2001. The Action Plan was sent to all Commissioners and is scheduled to be published in February 2001.

— Assignments for Reviewing the Safety Evaluation Report (SER) Associated with ANO, Unit 1 License Renewal Application

The ACRS reviewed the ANO, Unit 1 license renewal application and the associated staff SER during the March 2001 ACRS meeting. Depending on the significance of the open issues, the Committee will issue an interim report. The ACRS Subcommittee on Plant License Renewal held a meeting on February 22, 2001 to review this matter. Proposed assignments for reviewing various chapters of the staff SER were discussed.

— Assignments for Reviewing Selected Reports of the Boiling Water Reactor Vessel Internals Project (BWRVIP) Reports Associated with Hatch License Renewal and License Renewal Guidance Documents

The Plant License Renewal Subcommittee plans to review this matter during a meeting on March 28, 2001. The Subcommittee plans to review selected BWRVIP reports pertinent to the Hatch license renewal application and the proposed final revisions to license renewal guidance documents (SRP, GALL, and Regulatory Guide) on March 27, 2001. The Committee will review the license renewal application for Edwin I. Hatch Nuclear Plant and the associated staff SER during its April meeting.

A list of BWRVIP documents for review and the ACRS member assignments for reviewing these documents will be provided during the March meeting. Assignments for reviewing the license renewal guidance documents will also be provided at the March meeting. The selected BWRVIP documents, associated

staff safety evaluation, and the proposed final license renewal guidance documents will be sent to the members when they become available.

— Potential Candidates for ACRS Membership

The members interviewed four candidates during the February 2001 ACRS meeting for potential membership on the ACRS. The ACRS Member Candidate Screening Panel plans to send a slate of candidates to the Commission subsequent to completing the interviews.

— ACRS/ACNW Joint Subcommittee Meeting

The ACRS/ACNW Joint Subcommittee held a meeting on January 19, 2001 to discuss the proposed Standard Review Plan for evaluating integrated safety assessments (ISAs), application of ISAs to the MOX fuel fabrication facility, BWXT Naval fuels facility, and other matters related to risk-informing regulation in NMSS regulations. Dr. Kress, ACRS member of Joint Subcommittee, provided a report to the Committee on the results of the January 19, 2001 meeting.

— Commitments Resulting From the ACRS Retreat

The Committee held a retreat on January 22-24, 2001, to discuss various matters, including ACRS self assessment, stakeholders' comments on ACRS performance, selected key ACRS products, and other issues pertinent to ACRS operation. A list of commitments resulting from the retreat was discussed. The Subcommittee identified specific issues to be addressed by the ACRS in CY 2001, such as: design margins, risk-informing Appendices A and B of 10 CFR Part 50, adequacy of regulatory analyses, AP 1000, new generation reactors, and Revised Reactor Oversight Process.

— Pay Increase for Members

On January 22, 2001, a request was submitted to the Commission for a salary increase for ACRS members, consistent with the recently approved pay increase for Executive Level IV employees.

— ACRS Member 130-Day Limit

Based on the number of days worked that members claimed through the first quarter of this fiscal year, it is projected that many members will exceed the 130-

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day limit on special government employees by fiscal year's end. Members are reminded that exceeding the 130-day limit may trigger additional conflict of interest restrictions that could potentially impact their ability to work on certain contracts.

C. Future Meeting Agenda

Appendix IV summarizes the proposed items endorsed by the Committee for the 480th ACRS Meeting, March 1-3, 2001.

The 479th ACRS meeting was adjourned at 11:45 a.m. on February 3, 2001.



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

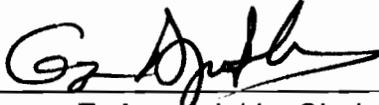
March 19, 2001

MEMORANDUM TO: Sherry Meador, Technical Secretary
Advisory Committee on Reactor Safeguards

FROM: George E. Apostolakis, Chairman
Advisory Committee on Reactor Safeguards

SUBJECT: CERTIFIED MINUTES OF THE 479th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
(ACRS), FEBRUARY 1-3, 2001

I certify that based on my review of the minutes from the 479th ACRS full Committee meeting, and to the best of my knowledge and belief, I have observed no substantive errors or omissions in the record of this proceeding subject to the comments noted below.



George E. Apostolakis, Chairman

March 19, 2001
Date

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



March 12, 2001

MEMORANDUM TO: ACRS Members

FROM: Sherry Meador *Sherry Meador*
Technical Secretary

SUBJECT: PROPOSED MINUTES OF THE 479th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS -
FEBRUARY 1-3, 2000

Enclosed are the proposed minutes of the 479th meeting of the ACRS. This draft is being provided to give you an opportunity to review the record of this meeting and provide comments. Your comments will be incorporated into the final certified set of minutes as appropriate.

Attachment:
As stated

FOR FURTHER INFORMATION CONTACT:

Andrew L. Bates, Office of the Secretary,
400 M Street, SW, Washington, DC 20555; telephone:
(202) 415-1963.

Dated: December 20, 2000.

Andrew L. Bates,

Advisory Committee Management Officer.

[FR Doc. 00-33008 Filed 12-26-00; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

* Advisory Committee on Reactor Safeguards; Meeting Notice

In accordance with the purposes of sections 29 and 182b. of the Atomic Energy Act (42 U.S.C. 2039, 2232b), the Advisory Committee on Reactor Safeguards will hold a meeting on February 1-3, 2001, in Conference Room T-2B3, 11545 Rockville Pike, Rockville, Maryland. The date of this meeting was previously published in the *Federal Register* on Friday, November 17, 2000 (65 FR 69578).

Thursday, February 1, 2001

8:30 A.M.-8:35 A.M.: Opening Remarks by the ACRS Chairman (Open)—The ACRS Chairman will make opening remarks regarding the conduct of the meeting.

8:35 A.M.-10:15 A.M.: Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding treatment of uncertainties in the elements of the Pressurized Thermal Shock (PTS) Reevaluation Project.

10:30 A.M.-12 Noon: Siemens S-RELAP5 Appendix K Small-Break LOCA Code (Open/Closed)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff and Siemens Power Corporation regarding the Siemens S-RELAP5 Appendix K Small-Break Loss-of-Coolant Accident (LOCA) Code and the associated NRC staff Safety Evaluation Report. [Note: A portion of this session may be closed to discuss Siemens Power Corporation proprietary information applicable to this matter.]

1 P.M.-2:30 P.M.: Proposed ANS Standard on External-Events PRA (Open)—The Committee will hear presentations by and hold discussions with representatives of the American Nuclear Society (ANS) regarding the proposed ANS Standard on external-events PRA.

2:45 P.M.-4 P.M.: Reprioritization of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to

Significant Blowdown Loads" (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding reprioritization of Generic Safety Issue-152 and the reasons therefor, and related matters.

4 P.M.-5 P.M.: Break and Preparation of Draft ACRS Reports (Open)—Cognizant ACRS members will prepare draft reports, as needed, for consideration by the full Committee.

5 P.M.-7 P.M.: Discussion of Proposed ACRS Reports (Open)—The Committee will discuss proposed ACRS reports on matters considered during this meeting.

Friday, February 2, 2001

8:30 A.M.-8:35 A.M.: Opening Remarks by the ACRS Chairman (Open)—The ACRS Chairman will make opening remarks regarding the conduct of the meeting.

8:35 A.M.-10 A.M.: Regulatory Effectiveness of the ATWS Rule (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the staff's assessment of the regulatory effectiveness of the Anticipated Transients Without Scram (ATWS) Rule.

10:15 A.M.-11:45 A.M.: Overview of Mixed Oxide Fuel Fabrication Facility (Open)—The Committee will hear presentations by and hold discussions with representatives of the Department of Energy (DOE) and the NRC staff regarding the proposed Mixed Oxide Fuel Fabrication Facility to be constructed at the DOE's Savannah River Plant site.

1 P.M.-2 P.M.: Meeting with the NRC Chairman (Open)—The Committee will meet with the NRC Chairman Meserve to discuss items of mutual interest.

2:15 P.M.-3:15 P.M.: NRC Safety Research Program (Open)—The Committee will discuss the annual ACRS report to the Commission on the NRC Safety Research Program.

3:15 P.M.-3:45 P.M.: Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open)—The Committee will discuss the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future meetings. Also, it will hear a report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, and organizational and personnel matters relating to the ACRS.

3:45 P.M.-4 P.M.: Reconciliation of ACRS Comments and Recommendations (Open)—The Committee will discuss the responses from the NRC Executive Director for

Operations (EDO) to comments and recommendations included in recent ACRS reports and letters. The EDO responses are expected to be made available to the Committee prior to the meeting.

4 P.M.-5 P.M.: Break and Preparation of Draft ACRS Reports (Open)—Cognizant ACRS members will prepare draft reports, as needed, for consideration by the full Committee.

5 P.M.-7 P.M.: Discussion of Proposed ACRS Reports (Open)—The Committee will discuss proposed ACRS reports.

Saturday, February 3, 2001

8:30 A.M.-12:30 P.M.: Proposed ACRS Reports (Open)—The Committee will continue its discussion of proposed ACRS reports.

12:30 P.M.-1 P.M.: Miscellaneous (Open)—The Committee will discuss matters related to the conduct of Committee activities and matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

Procedures for the conduct of and participation in ACRS meetings were published in the *Federal Register* on October 11, 2000 (65 FR 60476). In accordance with these procedures, oral or written views may be presented by members of the public, including representatives of the nuclear industry. Electronic recordings will be permitted only during the open portions of the meeting and questions may be asked only by members of the Committee, its consultants, and staff. Persons desiring to make oral statements should notify Mr. James E. Lyons, ACRS, five days before the meeting, if possible, so that appropriate arrangements can be made to allow necessary time during the meeting for such statements. Use of still, motion picture, and television cameras during the meeting may be limited to selected portions of the meeting as determined by the Chairman.

Information regarding the time to be set aside for this purpose may be obtained by contacting Mr. James E. Lyons prior to the meeting. In view of the possibility that the schedule for ACRS meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should check with Mr. James E. Lyons if such rescheduling would result in major inconvenience.

In accordance with Subsection 10(d) P.L. 92-463, I have determined that it is necessary to close a portion of this meeting noted above to discuss proprietary information per 5 U.S.C. 552b(c)(4).

Further information regarding topics to be discussed, whether the meeting has been canceled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements, and the time allotted therefor can be obtained by contacting Mr. James E. Lyons (telephone 301-415-7371), between 7:30 a.m. and 4:15 p.m., EST.

ACRS meeting agenda, meeting transcripts, and letter reports are available for downloading or viewing on the internet at <http://www.nrc.gov/ACRSACNW>.

Videoteleconferencing service is available for observing open sessions of ACRS meetings. Those wishing to use this service for observing ACRS meetings should contact Mr. Theron Brown, ACRS Audio Visual Technician (301-415-8066), between 7:30 a.m. and 3:45 p.m., EST, at least 10 days before the meeting to ensure the availability of this service. Individuals or organizations requesting this service will be responsible for telephone line charges and for providing the equipment facilities that they use to establish the videoteleconferencing link. The availability of videoteleconferencing services is not guaranteed.

Dated: December 20, 2000.

Andrew L. Bates,

Advisory Committee Management Officer.

FR Doc. 00-33010 Filed 12-26-00; 8:45 am]

BILLING CODE 7890-01-P

NUCLEAR REGULATORY COMMISSION

Biweekly Notice; Applications and Amendments to Facility Operating Licenses Involving No Significant Hazards Considerations

I. Background

Pursuant to Public Law 97-415, the U.S. Nuclear Regulatory Commission (the Commission or NRC staff) is publishing this regular biweekly notice. Public Law 97-415 revised section 189 of the Atomic Energy Act of 1954, as amended (the Act), to require the Commission to publish notice of any amendments issued, or proposed to be issued, under a new provision of section 189 of the Act. This provision grants the Commission the authority to issue and make immediately effective any amendment to an operating license upon a determination by the Commission that such amendment involves no significant hazards consideration, notwithstanding theendency before the Commission of a request for a hearing from any person.

This biweekly notice includes all notices of amendments issued, or proposed to be issued from December 4, 2000, through December 15, 2000. The last biweekly notice was published on December 13, 2000.

Notice of Consideration of Issuance of Amendments to Facility Operating Licenses, Proposed No Significant Hazards Consideration Determination, and Opportunity for a Hearing

The Commission has made a proposed determination that the following amendment requests involve no significant hazards consideration. Under the Commission's regulations in 10 CFR 50.92, this means that operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. The basis for this proposed determination for each amendment request is shown below.

The Commission is seeking public comments on this proposed determination. Any comments received within 30 days after the date of publication of this notice will be considered in making any final determination.

Normally, the Commission will not issue the amendment until the expiration of the 30-day notice period. However, should circumstances change during the notice period such that failure to act in a timely way would result, for example, in derating or shutdown of the facility, the Commission may issue the license amendment before the expiration of the 30-day notice period, provided that its final determination is that the amendment involves no significant hazards consideration. The final determination will consider all public and State comments received before action is taken. Should the Commission take this action, it will publish in the *Federal Register* a notice of issuance and provide for opportunity for a hearing after issuance. The Commission expects that the need to take this action will occur very infrequently.

Written comments may be submitted by mail to the Chief, Rules Review and Directives Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and should cite the publication date and page number of this *Federal Register*

notice. Written comments may also be delivered to Room 6D22, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland from 7:30 a.m. to 4:15 p.m. Federal workdays. Copies of written comments received may be examined at the NRC Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC. The filing of requests for a hearing and petitions for leave to intervene is discussed below.

By January 26, 2001, the licensee may file a request for a hearing with respect to issuance of the amendment to the subject facility operating license and any person whose interest may be affected by this proceeding and who wishes to participate as a party in the proceeding must file a written request for a hearing and a petition for leave to intervene. Requests for a hearing and a petition for leave to intervene shall be filed in accordance with the Commission's "Rules of Practice for Domestic Licensing Proceedings" in 10 CFR Part 2. Interested persons should consult a current copy of 10 CFR 2.714 which is available at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC, and electronically from the ADAMS Public Library component on the NRC Web site, <http://www.nrc.gov> (the Electronic Reading Room). If a request for a hearing or petition for leave to intervene is filed by the above date, the Commission or an Atomic Safety and Licensing Board, designated by the Commission or by the Chairman of the Atomic Safety and Licensing Board Panel, will rule on the request and/or petition; and the Secretary or the designated Atomic Safety and Licensing Board will issue a notice of a hearing or an appropriate order.

As required by 10 CFR 2.714, a petition for leave to intervene shall set forth with particularity the interest of the petitioner in the proceeding, and how that interest may be affected by the results of the proceeding. The petition should specifically explain the reasons why intervention should be permitted with particular reference to the following factors: (1) The nature of the petitioner's right under the Act to be made a party to the proceeding; (2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding; and (3) the possible effect of any order which may be entered in the proceeding on the petitioner's interest. The petition should also identify the specific aspect(s) of the subject matter of the proceeding as to which petitioner wishes to intervene. Any person who has filed a petition for



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

December 19, 2000

SCHEDULE AND OUTLINE FOR DISCUSSION
479TH ACRS MEETING
FEBRUARY 1-3, 2001

THURSDAY, FEBRUARY 1, 2001, CONFERENCE ROOM 2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 1) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open)
 1.1) Opening statement (GEA/JTL)
 1.2) Items of current interest (GEA/SD)
 1.3) Priorities for preparation of ACRS reports (GEA/JTL/SD)
- 2) 8:35 - 10:15 A.M. Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project (Open) (WJS/GBW/MTM)
 2.1) Remarks by the Subcommittee Chairman
 2.2) Briefing by and discussions with representatives of the NRC staff regarding treatment of uncertainties in the elements of the Pressurized Thermal Shock (PTS) Reevaluation Project.
- Representatives of the nuclear industry will provide their views, as appropriate.
- 10:15 - 10:³⁵ A.M. *****BREAK*****
- 3) ^{35 - 11:40} 10:~~30~~ - 12:00 Noon Siemens S-RELAP5 Appendix K Small-Break LOCA Code (Open/Closed) (GBW/PAB)
 3.1) Remarks by the Subcommittee Chairman
 3.2) Briefing by and discussions with representatives of the NRC staff and Siemens Power Corporation regarding the Siemens S-RELAP5 Appendix K Small-Break Loss-of-Coolant Accident (LOCA) Code and the associated NRC staff Safety Evaluation Report.
- NOTE: A portion of this session may be closed to discuss Siemens Power Corporation proprietary information applicable to this matter.
- ^{11:40} 12:00 - 1:00 P.M. *****LUNCH*****
- 4) 1:00 - 2:30 P.M. Proposed ANS Standard on External-Events PRA (Open) (GEA/MTM)
 4.1) Remarks by the Subcommittee Chairman
 4.2) Briefing by and discussions with representatives of the American Nuclear Society (ANS) regarding the proposed ANS Standard on external-events PRA.

Representatives of the NRC staff will provide their views, as appropriate.

^{35 50}
2:30 - 2:45 P.M.
^{50-3:10}
2:45 - 4:00 P.M.

BREAK

- 5) Reprioritization of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to Significant Blowdown Loads" (GML/AS)
- 5.1) Remarks by the Acting Subcommittee Chairman
 - 5.2) Briefing by and discussions with representatives of the NRC staff regarding reprioritization of Generic Safety Issue-152 and the reasons therefor, and related matters.

Representatives of the nuclear industry will provide their views, as appropriate.

^{3:10 - 4:00}
4:00 - 5:00 P.M.

6) Break and Preparation of Draft ACRS Reports (Open)
Cognizant ACRS members will prepare draft reports, as needed, for consideration by the full Committee.

^{4:00 - 4:45}
5:00 - 7:00 P.M.

7) Proposed ACRS Reports (Open)
Discussion of proposed ACRS reports on:

- 7.1) Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project (WJS/GBW/MTM)
- ^{5:00-5:45} 7.2) Siemens S-RELAP5 Appendix K Small-Break LOCA Code (GBW/PAB)
- 7.3) Proposed ANS Standard on External-Events PRA (GEA/MTM)
- ^{4:00-4:20} 7.4) Reprioritization of Generic Safety Issue-152 (GML/AS)
- ^{4:20-5:00} *Discuss Research Report*

FRIDAY, FEBRUARY 2, 2001, CONFERENCE ROOM 2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

8) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (GEA/JTL/SD)

- 9) ^{9:50} 8:35 - 10:00 A.M. Regulatory Effectiveness of the ATWS Rule (Open) (TSK/MWW)
- 9.1) Remarks by the Subcommittee Chairman
 - 9.2) Briefing by and discussions with representatives of the NRC staff regarding the staff's assessment of the regulatory effectiveness of the Anticipated Transients Without Scram (ATWS) Rule (10 CFR 50.62).

Representatives of the nuclear industry will provide their views, as appropriate.

^{9:50}
10:00 - 10:15 A.M.

BREAK

- 10) 10:15 - 11:45 A.M. Overview of Mixed Oxide Fuel Fabrication Facility (Open) (JDS/AS)
 10.1) Remarks by the Subcommittee Chairman
 10.2) Briefing by and discussions with representatives of the Department of Energy (DOE) and the NRC staff regarding the proposed Mixed Oxide Fuel Fabrication Facility to be constructed at the DOE's Savannah River Plant site.
- 1:10*
 11:45 - ~~1:00~~ P.M. *****LUNCH*****
- 11) *1:10 -*
~~1:00~~ - 2:00 P.M. Meeting with the NRC Chairman (GEA/JTL)
 11.1) Remarks by the ACRS Chairman
 11.2) Meeting with the NRC Chairman Meserve to discuss items of mutual interest.
- 2:00 - 2:15 P.M. *****BREAK*****
- 12) *3:45*
 2:15 - ~~3:15~~ P.M. NRC Safety Research Program (Open) (DAP/MME)
 12.1) Remarks by the Subcommittee Chairman
 12.2) Discussion of the annual ACRS report to the Commission on the NRC Safety Research Program.
- Representatives of the NRC staff will provide their views, as appropriate.
- 13) *3:45 - 4:35*
~~3:15~~ - ~~3:45~~ P.M. Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (GEA/JTL/JEL)
 13.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.
 13.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, organizational and personnel matters relating to the ACRS.
- 14) *4:35 - 4:55*
~~3:45~~ - ~~4:00~~ P.M. Reconciliation of ACRS Comments and Recommendations (Open) (GEA, et al./SD, et al.)
 Discussion of the responses from the NRC Executive Director for Operations to comments and recommendations included in recent ACRS reports and letters.
- 15) 4:00 - 5:00 P.M. Break and Preparation of Draft ACRS Reports
 Cognizant ACRS members will prepare draft reports, as needed, for consideration by the full Committee.

- 16) 5:00 - ^{7:10}7:00 P.M. Proposed ACRS Reports (Open)
 Discussion of proposed ACRS reports on:
- 4:55-5:15/6:30-7:10 16.1) Regulatory Effectiveness of the ATWS Rule (TSK/MWW)
 5:30-6:10 16.2) Reprioritization of Generic Safety Issue-152 (GML/AS)
 5:15-5:20 16.3) Proposed ANS Standard on External-Events PRA
 (GEA/MTM)
 16.4) Siemens S-RELAP5 Appendix K Small-Break LOCA Code
 (GBW/PAB)
 16.5) Treatment of Uncertainties in the Elements of the PTS
 Technical Basis Reevaluation Project (WJS/GBW/MTM)
 16.6) NRC Safety Research Program Report (DAP/MME)

**SATURDAY, FEBRUARY 3, 2001, CONFERENCE ROOM 2B3, TWO WHITE FLINT NORTH,
 ROCKVILLE, MARYLAND**

- 17) 8:30 - ^{11:45}12:30 P.M. Proposed ACRS Reports (Open)
 (10:15-10:30 A.M.-BREAK) Continue discussion of proposed ACRS reports listed under Item 16.

- ~~18) 12:30 - 1:00 P.M. Miscellaneous (Open) (GEA/JTL)
 Discussion of matters related to the conduct of Committee
 activities and matters and specific issues that were not
 completed during previous meetings, as time and availability
 of information permit.~~

NOTE:

- Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.
- Number of copies of the presentation materials to be provided to the ACRS - 35.

APPENDIX III: MEETING ATTENDEES

479TH ACRS MEETING
FEBRUARY 1-3, 2001

NRC STAFF (February 1, 2001)

S. Malik, RES
N. Siu, RES
F. Eltawila, RES
N. Chokshi, RES
F. Cherny, RES
E. Thornsby, RES
W. Jones, RES
H. Woods, RES
M. Kirk, RES
J. Flack, RES
J. Mitchell, RES
R. Kennedy, RES
H. Graves, RES
K. Karwoski, RES
S. Bahadur, RES
M. Mayfield, RES
O. Gormley, RES
H. Vandermolen, RES
E. Throm, NRR
G. Parry, NRR
R. Landy, NRR
R. Caruso, NRR
J. Wermiel, NRR
M. Shucibi, NRR
J. Hyship, NRR
S. Dinsmore, NRR
D. Harrison, NRR
T. Scarbrough, NRR

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

Y. Chang, UMD	T. Taminami, Tokyo Electric
J. Holm, Siemens	J. Stetkar, Stetkar & Assoc.
J. Kelly, Siemens	A. Heymer, NEI
A. Mosley, UMD	J. Russell, CNWRA
M. Ravindra, EQE Intl	

NRC STAFF (February 2, 2001)

F. Eltawila, RES
J. Mitchell, RES
J. Rosenthal, RES
T. Mo, RES
D. Harrison, NRR
R. Caruso, NRR
C. Patel, NRR
U. Shoop, NRR
T. Johnson, NMSS
B. Gleaves, NMSS
E. Leads, NMSS
C. Abrams, NMSS
T. Harris, NMSS
J. Davis, NMSS
R. Pierson, NMSS
W. Smith, NMSS
R. Wescott, NMSS
S. Steele, NMSS
J. Hull, OGC

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

P. Hastings, DCS
T. Taminami, Tokyo Electric
F. Killar, NEI
T. Clements, Nuclear Control Institute
P. Rhoads, DOE
J. Russell, CNWRA
W. Henry, Duke Energy
J. Weil, McGraw-Hill
H. Fontecilla, Dominion
R. Bickers, McGraw-Hill



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

February 8, 2001

**SCHEDULE AND OUTLINE FOR DISCUSSION
480TH ACRS MEETING
MARCH 1-3, 2001**

**THURSDAY, MARCH 1, 2001, CONFERENCE ROOM 2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

- 1) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open)
 - 1.1) Opening statement (GEA/JTL/SD)
 - 1.2) Items of current interest (GEA/SD)
 - 1.3) Priorities for preparation of ACRS reports (GEA/JTL/SD)

- 2) 8:35 - 10:00 A.M. RETRAN-3D Thermal-Hydraulic Transient Analysis Code (Open/Closed) (GBW/PAB)
 - 2.1) Remarks by the Subcommittee Chairman
 - 2.2) Briefing by and discussions with representatives of the Electric Power Research Institute (EPRI) and the NRC staff regarding the EPRI RETRAN-3D thermal-hydraulic transient analysis code, associated staff's Safety Evaluation Report, and resolution of issues previously raised by the ACRS.

[Note: A portion of this session may be closed to discuss EPRI proprietary information.]

- 10:00 - 10:15 A.M. *****BREAK*****

- 3) 10:15 - 11:45 A.M. Interim Review of the License Renewal Application for Arkansas Nuclear One, Unit 1 (Open) (MVB/GML/NFD/SD)
 - 3.1) Remarks by the Subcommittee Chairman
 - 3.2) Briefing by and discussions with representatives of the Entergy Operations, Inc. and the NRC staff regarding the license renewal application for Arkansas Nuclear One, Unit 1 and the associated staff's Safety Evaluation Report.

- 11:45 - 12:45 P.M. *****LUNCH*****

- 4) 12:45 - 2:15 P.M. Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (Open) (TSK/DAP/MME)
 - 4.1) Remarks by the Subcommittee Chairman
 - 4.2) Briefing by and discussions with representatives of the NRC staff regarding significant findings and recommendations of the final report on spent fuel pool accident risk at decommissioning plants, new developments, status of developing proposed options, and related matters.

Representatives of the nuclear industry will provide their views, as appropriate.

2:15 - 2:30 P.M. *BREAK*****

- 5) 2:30 - 3:45 P.M. Management Directive 6.4 Associated with the Revised Generic Issue Process (Open) (TSK/AS)
- 5.1) Remarks by the Subcommittee Chairman
 - 5.2) Briefing by and discussions with representatives of the NRC staff regarding Management Directive 6.4 related to the Revised Generic Issue process, results of the case study performed to determine the effectiveness of using the Management Directive to implement the revised Generic Issue process, and related matters.

3:45 - 4:00 P.M. *BREAK*****

- 6) 4:00 - 7:00 P.M. Proposed ACRS Reports (Open)
Discussion of proposed ACRS reports on:
- 6.1) NRC Safety Research Program (DAP/MME)
 - 6.2) Regulatory Effectiveness of the ATWS Rule (TSK/MWW)

FRIDAY, MARCH 2, 2001, CONFERENCE ROOM 2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 7) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (GEA/JTL/SD)
- 8) 8:35 - 9:45 A.M. British Nuclear Powered Submarine Incident (Closed) (GML/PAB)
- 8.1) Remarks by the Subcommittee Chairman
 - 8.2) Briefing by and discussions with representatives of the DOD/DOE Naval Reactors regarding the recent incident on the British Nuclear Powered Submarine (HMS TIRELESS).

Representatives of the NRC staff will provide their views, as appropriate.

[Note: This session will be closed to discuss information classified "Confidential - Restricted Data - Government Sensitive" .]

9:45 - 10:00 A.M. *BREAK*****

- 9) 10:00 - 11:30 A.M. Operating Event at V. C. Summer Nuclear Station (Open) (WJS/JDS/MTM)
- 9.1) Remarks by the Subcommittee Chairman
 - 9.2) Briefing by and discussions with representatives of the NRC staff regarding the October 7, 2000 incident at the V. C. Summer Nuclear Station, involving degraded reactor coolant system pressure boundary, findings and conclusions resulting from the staff's investigation of this event, and corrective actions taken by the licensee and industry organizations.

Representatives of the nuclear industry will provide their views, as appropriate.

- 10) 11:30 - 11:45 A.M. Trip Report (Open) (DAP/AS)
Dr. Powers and Mr. Singh will provide a trip report to the Committee on the Nuclear Energy Institute (NEI) Fire Protection Forum held in San Diego on February 5-7, 2001.
- 11:45 - 1:00 P.M. *****LUNCH*****
- 11) 1:00 - 1:30 P.M. Subcommittee Report (Open) (JDS/GEA/MWW)
Report by the Chairmen of the Plant Operations and Reliability and Probabilistic Risk Assessment Subcommittees regarding the South Texas Project Exemption Request that was discussed during a meeting on February 21, 2001.
- 12) 1:30 - 2:00 P.M. Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (GEA/JTL/JEL)
12.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.
12.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, organizational and personnel matters relating to the ACRS.
- 13) 2:00 - 2:15 P.M. Reconciliation of ACRS Comments and Recommendations (Open) (GEA, et al./SD, et al.)
Discussion of the responses from the NRC Executive Director for Operations to comments and recommendations included in recent ACRS reports and letters.
- 14) 2:15 - 3:00 P.M. Break and Preparation of Draft ACRS Reports
Cognizant ACRS members will prepare draft reports, as needed, for consideration by the full Committee.
- 15) 3:00 - 7:00 P.M. Proposed ACRS Reports (Open)
Discussion of proposed ACRS reports on:
15.1) NRC Safety Research Program (DAP/MME)
15.2) RETRAN-3D Thermal-Hydraulic Transient Analysis Code (GBW/PAB)
15.3) Interim Report on License Renewal Application for Arkansas Nuclear One, Unit 1 (MVB/GML/NFD/SD)
15.4) Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (TSK/DAP/MME)
15.5) Management Directive 6.4 Associated with the Revised Generic Issue Process (TSK/AS)
15.6) Regulatory Effectiveness of the ATWS Rule (TSK/MWW)

**SATURDAY, MARCH 3, 2001, CONFERENCE ROOM 2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

- 16) 8:30 - 12:30 P.M. Proposed ACRS Reports (Open)
(10:30-10:45 A.M.-BREAK) Continue discussion of proposed ACRS reports listed under Item 15.
- 17) 12:30 - 1:00 P.M. Miscellaneous (Open) (GEA/JTL/JEL)
Discussion of matters related to the conduct of Committee activities and matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

NOTE:

- **Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.**
- **Number of copies of the presentation materials to be provided to the ACRS - 35.**

APPENDIX V
LIST OF DOCUMENTS PROVIDED TO THE COMMITTEE
RD ACRS MEETING
, 2000

[Note: Some documents listed below may have been provided or prepared for Committee use only. These documents must be reviewed prior to release to the public.]

MEETING HANDOUTS

AGENDA
ITEM NO.

DOCUMENTS

- 1 Opening Remarks by the ACRS Chairman
 1. Items of Interest, dated February 1-3, 2001

- 2 Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project
 2. Treatment of Uncertainties in Pressurized Thermal Shock presentation by RES [Viewgraphs]

- 3 Siemens S-RELAP5 Appendix K Small-Break LOCA Code
 3. S-RELAP5 Staff Review presentation by R. Landry, NRR [Viewgraphs]
 4. Siemens PWR Appendix K SBLOCA Analysis presentation by J. Holm and J. Kelly from Siemens [Viewgraphs]
 5. Report from ACRS Consultant V. Schrock "Comments on Draft ACRS Letter on S-RELAP5" dated January 29, 2001 (ACRS Internal Use Only) [Handout #3-1]

- 4 Proposed ANS Standard on External-Events PRA

Verbal presentation by NRC staff and the American Nuclear Society

- 5 Reprioritization of Generic Safety Issue-152, "Design Basis for Valves that Might be Subjected to Significant Blowdown Loads"
 6. Closeout of Generic Safety Issue 152 Design Basis for Valves that Might be Subjected to Significant Blowdown Loads presentation by K. Karwoski, RES [Viewgraphs]

- 9 Regulatory Effectiveness of the ATWS Rule
 7. Regulatory Effectiveness of the Anticipated Transient Without Scram (ATWS) Rule presentation by B. Raughley, G. Lanik, RES

- 10 Overview of Mixed Oxide Fuel Fabrication Facility
 8. The NRC and Mixed Oxide Fuel presentation by T. Johnson, NMSS [Viewgraphs]

- 13 Future ACRS Activities/Report of the Planning and Procedures Subcommittee
 9. Future ACRS Activities [Handout No. 13.1]
 10. Final Draft Minutes of Planning and Procedures Subcommittee Meeting - January 31, 2001 [Handout #13.1]

- 14 Reconciliation of ACRS Comments and Recommendations
 11. Reconciliation of ACRS Comments and Recommendations [Handout #14]

MEETING NOTEBOOK CONTENTS

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DOCUMENTS

- 2 Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project
 1. Project Status Report - Discussion of PTS Rule Screening Criterion Reevaluation: Determination of Uncertainties (includes "ACRS Internal Use Only" Material)

- 3 Siemens Power Corporation S-RELAP5 SBLOCA Code
 2. Table of Contents
 3. Presentation Schedule
 4. Project Status Report, dated February 1, 2001
 5. Minutes of January 16-17, 2001 Thermal-Hydraulic Phenomena Subcommittee meeting, dated January 24, 2001 (internal committee use)
 6. NRR Safety Evaluation Report, PWR Small-Break LOCA Evaluation Model, S-RELAP5 Based
 7. Minutes of August 8-9, 2000 Thermal Hydraulic Phenomena Subcommittee meeting, dated September 1, 2000

- 4 Proposed ANS Standard on External-Events PRA
 8. Table of Contents
 9. Proposed Schedule
 10. Status Report, dated February 1, 2001
 11. Proposed American Nuclear Society External Events PRA Methodology Standard, dated December 25, 2000

- 5 Proposed Resolution of Generic Safety Issue 152, "Design Basis for Valves That Might Be Subjected to Significant Blowdown Loads"
 12. Table of Contents
 13. Proposed Schedule
 14. Status Report, dated February 1, 2001

- 9 Regulatory Effectiveness of the ATWS Rule
 15. Table of Contents
 16. Proposed Schedule
 17. Status Report, dated February 2, 2001
 18. Letter dated October 18, 2000, from F. Eltawila, RES, to D. Modeen, NEI, Subject: Draft Report, "Regulatory Effectiveness of the Anticipated Transient Without Scram Rule"

- 10 Overview of Mixed Fuel Fabrication Facility
 - 19. Table of Contents
 - 20. Proposed Schedule
 - 21. Status Report

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

FEBRUARY 1-3, 2001

Date(s)

FEBRUARY 1, 2001

Today's Date

NRC STAFF SIGN IN FOR ACRS MEETING

PLEASE PRINT

NAME	BADGE #	NRC ORGANIZATION
SHAH MALIK	B-7396	RES/DET/MEB
EDWARDS THAM	B7179	NRR/DSSA/SPSB
NATHAN SIM	B8130	RES/DRAA/PRAB
F. ELTAWILA	A6364	RES/DSAICE
N. Choksi	B6495	RES/DET/MEB
F. Cherny	B6477	RES/DET/MEB
Eric Thornsbury		
Eric Thornsbury	B8048	RES/DRAA/PRAB
WILLIAM R. JONES	B8399	RES/DET/MEB
Hugh Woods	B7313	RES/DRAA/PRAB
MARK KIRIL	B8678	RES/DET/MEB
Garth W. Pany	B8060	NRR/DSSA
JOHN FLACK	B6114	RES/SM SAB
RALPH LANDRY	B-6634	NRR/DSSA/SRXB
RALPH CARUSO	B-7988	NRR/SRXB
Jared Wermiel	A-6824	NRR/DSSA/SRXB
Jocelyn Mitchell	B6685	RES
Mohammed Shurubi	B-8538	NRR/
Foger Kenneth	B8039	RES/DET
J.S. Wyszog	B6290	NRR/DSSA/SPSB

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
479TH FULL COMMITTEE MEETING

FEBRUARY 1-3, 2001

FEBRUARY 1, 2001

Today's Date

ATTENDEES - PLEASE SIGN BELOW

PLEASE PRINT

NAME

AFFILIATION

Yung-Hsien Chang

UMD

Jerry S. Holm

Siemens

JOE M. KELLY

SIEMENS

Ali Mosleh

UMD

M.K. Ravindra

EQE International

Tatsuya Tamimami

Tokyo Electric

John W. Stettin

Stettin & Associates

Adrian Heymer

NEI

John Russell

CNRA

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

FEBRUARY 1-3, 2001

Date(s)

FEBRUARY 2, 2001

Today's Date

NRC STAFF SIGN IN FOR ACRS MEETING

PLEASE PRINT

NAME	BADGE #	NRC ORGANIZATION
<u>FAROUK ELTAWILA</u>	<u>A6364</u>	<u>RES/DSAR6</u>
<u>Donald Harrison</u>	<u>B 8744</u>	<u>NRR/SPSB</u>
<u>Jocelyn Mitchell</u>	<u>B 6685</u>	<u>RES</u>
<u>Jack Brandel</u>	<u>A6661</u>	<u>RES</u>
<u>TIM JOHNSON</u>	<u>A-7664</u>	<u>NMSS</u>
<u>Bill Greaves</u>	<u>B-7352</u>	<u>NMSS/FCSS/SPB</u>
<u>John Hull</u>	<u>B-6285</u>	<u>OGC</u>
<u>Erz Leeds</u>	<u>A-7634</u>	<u>NMSS</u>
<u>Charlotte Abrams</u>	<u>B-6004</u>	<u>NMSS</u>
<u>Tim Haeris</u>	<u>B-7843</u>	<u>NMSS</u>
<u>JENNIFER DAVIS</u>	<u>B-6563</u>	<u>NMSS</u>
<u>Robert Perra</u>	<u>A 4589</u>	<u>NMSS</u>
<u>WILKINS SMITH</u>	<u>A7584</u>	<u>NMSS</u>
<u>Rex Wescott</u>	<u>A 7528</u>	<u>NMSS</u>
<u>Sharon Steele</u>	<u>B8740</u>	<u>NMSS</u>
<u>RALPH CARLISO</u>	<u>B7988</u>	<u>NRR</u>
<u>CHANDU PATEL</u>	<u>B 6901</u>	<u>NRR</u>
<u>Undiw Shoup</u>	<u>B-8090</u>	<u>NRR</u>
<u>TIN MO</u>	<u>A-6537</u>	<u>NRC/RES.</u>

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
479TH FULL COMMITTEE MEETING

FEBRUARY 1-3, 2001

FEBRUARY 2, 2001

Today's Date

ATTENDEES - PLEASE SIGN BELOW

PLEASE PRINT

NAME

AFFILIATION

Peter Hastings

DCS

Tatsuya Tamiami

Tokyo Electric

Felipe Killar

NEI

Tom Clements

Nuclear Control Institute

Patrick Rhoads

US DOE

John Russett

CNWRA

WAYNE HENRY

DUKE ENERGY

Jenny Weil

McGraw-Hill

~~ETRE MO~~

~~ARC/RES~~

HERB FONTECILLA

DOMINION

Richard Bickers

McGraw-Hill

ITEMS OF INTEREST

479TH ACRS MEETING

FEBRUARY 1-3, 2001

**ITEMS OF INTEREST
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
479TH MEETING
FEBRUARY 1-3, 2001**

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- Remarks at the Global Spent Fuel Management Summit (Commissioner Merrifield) . . 9

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- NRC Cites NNECO for Violations at Millstone 2 23



NRC NEWS

UNITED STATES NUCLEAR REGULATORY COMMISSION

OFFICE OF PUBLIC AFFAIRS

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S-00-28

[[PDF Version \(70 KB\)](#)]

Responsible Openness: An Imperative for the U.S. Nuclear Regulatory Commission

**NEA Conference
Paris, France
Dr. Richard A. Meserve, Chairman
U.S. Nuclear Regulatory Commission
United States of America
November 29, 2000**

Good morning, ladies and gentlemen. I am pleased to have the opportunity to address this workshop on "Investing in Public Trust."

My purpose today is to describe why responsible openness is important for the processes of the U.S. Nuclear Regulatory Commission (NRC) and to explain what we are doing to achieve it. This workshop shows that many countries consider it important to keep the public informed about the work of their nuclear regulatory agencies. I am sure that we can all learn from each others' perspectives and experiences. I hope to contribute to this exchange and to learn from it.

Why Openness?

First, let me set the stage with a question: why openness? The regulation of the civilian uses of radioactive materials is obviously a highly technical activity, involving scientific analysis and engineering judgment that most members of the public at large cannot be expected to follow at the level of technical detail. It might be easy to conclude that, since most of the public does not understand, for example, conditional core damage frequency, special treatment requirements, or emergency core cooling systems, it is pointless to involve the public in the everyday intricacies of nuclear regulation. I think that such a conclusion is wrong.

In the United States and in most other countries, the operations of nuclear facilities are a controversial subject. There are segments of our population that are concerned about the risks -- real and imagined -- that the technology presents to the public health, safety and the environment. Others worry about the collective ability to safeguard nuclear materials so that untoward uses of them are avoided. And others are worried about the risks attendant to nuclear waste and the legacy that these materials present to future generations. Many of those holding strong views on such matters may not be technically knowledgeable and cannot engage with the regulatory agency at the level of engineering sophistication with which our staffs are most comfortable. Somehow, however, these concerns must be confronted.

I mean the words "must be confronted" quite literally. Although our regulatory decisions may have a veneer of technical detail, at core they usually implicate embedded social judgments about the acceptability of risk and the balance of costs and benefits. These social judgments are matters on which the public has a stake and on which the affected public is entitled to have its concerns addressed. There is thus a substantive imperative for the regulator to involve the public in its decision-making. Indeed, the public may on occasion bring to light issues that deserve careful attention that otherwise would not have been examined.

Equally important, there is a procedural imperative to make such licensing decisions through processes accessible to the public. In the absence of such transparency, skeptics who do not have access to the regulatory process cannot be blamed for suspicions that their concerns have not been considered. No matter how careful a job that the regulator may do, if the work is performed behind a veil of secrecy, the public will not have confidence that the result is fair, objective, honest, or in the public interest. There will always be the corrosive suspicion that decisions made outside the sight of the public serve to protect those favored by the decisions, to conceal dangers, or to cloak imprudent, unethical, or illegal acts.

There is a practical consequence of the failure to build public confidence in the validity of regulatory decisions: the invitation for intrusion by other institutions of government to "correct" the perceived inadequacies of regulatory decision-making. In the case of the United States, the situation may be aggravated by a philosophy of government that stems from the origins of our country.

As many of you know, the government of the United States is organized around a system of checks and balances, reflecting our Founding Fathers' mistrust of placing unrestrained power in the hands of any one governmental entity. The system was designed to create tensions among the branches of government. To the extent that the public believes that the decision-making by any branch is improper, it may seek correction elsewhere. Thus, the decisions of the Nuclear Regulatory Commission are subject to review in the courts, and our policy decisions may be examined and modified by the Congress. We invite exactly such intrusion on our decision-making if we do not demonstrate through open processes that our decisions are sound. Any other course invites concern by the public, thereby encouraging the public to seek redress in other branches of government, and breeds skepticism in those other branches as to the validity of our actions.

The dangers that attend the failure to heed the need for openness are reflected in the history of nuclear matters in the U.S. At one time the entirety of nuclear enterprise in the United States - both weapons development and commercial applications - was under the purview of the Atomic Energy Commission (AEC). In 1975, the AEC itself underwent a fission event, with the regulatory activities becoming the responsibility of the NRC and with the weapons-related activities eventually becoming the responsibility of the Department of Energy (DOE). Of course, the military-related activities of the AEC and then the DOE were shrouded in secrecy but, as time went on, the culture of secrecy in those agencies persisted even in matters that were distant from weapons.

Starting in the late 1980s, there have been slowly emerging revelations about past activities: involuntary human testing involving nuclear materials, environmental releases exposing civilians about which the affected populations were never told, and waste practices that were flatly inconsistent with sound stewardship. Many of these activities would not have been undertaken, or certainly would have been curtailed, if the public had been informed about them in a timely fashion. Moreover, the failure of DOE and its predecessors to be open with the public about these events has caused the agency to be viewed by many with distrust and suspicion. This climate has had a destructive effect on the confidence of the public in the decisions of DOE. And the intrusion on DOE's powers by other branches has occurred: many of DOE's activities are subject to litigation or are supervised by the courts and Congress has created an independent agency, the Defense Nuclear Facility Safety Board, to review and comment publicly on DOE's stewardship of nuclear activities. The current management of DOE has made great strides to improve the public trust through aggressive efforts at openness and public interaction, but nonetheless the effectiveness of the agency has no doubt been constrained by the past history of unjustified secrecy.

The bottom line is that all regulators need to build public confidence in regulatory programs and decisions. We can earn that confidence only by treating all views fairly and openly, by analyzing data competently, and by resolving issues judiciously. And the public cannot know that we are doing these things unless it has open access to our processes. We cannot expect everyone to agree with our decisions, but we can aspire to show that we have addressed every legitimate issue fairly and thoroughly. To build public confidence, we must practice responsible openness.

Risk-Informed Regulation and Economic Deregulation

Let me bring this discussion down to earth with a specific example. Although the primary objective of the NRC is to protect public health and safety, we have established certain other performance goals. One of these goals is the reduction of unnecessary regulatory burden. Based on four decades of experience with operating nuclear power reactors and on improved techniques of probabilistic risk assessment, we now recognize that some regulations imposed in the past may not serve their intended safety purpose. When many of our regulations were originally designed, we did not have much practical experience with commercial reactors, so we generally proceeded very cautiously, relying on conservative engineering judgment and defense in depth.

We have learned much in the intervening years, however, and now recognize that some of our regulatory requirements may not be necessary to provide adequate protection of public health and safety. Where that is the case, we should revise or eliminate those regulations, since they are not required to achieve our mission. The identification of such regulations is one aspect of the program to risk-inform the NRC's regulatory program. (Of course, insights about risk can also reveal shortcomings in the current regulatory system and these are also being addressed.)

At the same time that the NRC is using insights about risk to examine the regulatory program, the U.S. is experiencing a dramatic change in the economic conditions within which the nuclear electric power industry operates. Until recently, the rates that generators received for their service were regulated, state by state. Licensees could readily recover the costs of meeting safety requirements in the state-regulated rate base. Within the last year or two, however, many states have deregulated electricity prices and many more are expected to do so in the near future. The result is that nuclear electricity now must compete in an open market with other sources of electric power. The costs of our regulatory system now come directly off the economic bottom line, and affect the economic competitiveness of nuclear power.

Although the effort to risk-inform the regulatory system started long before the change in the economic

climate, the juxtaposition of the two activities can invite skepticism. How is the public to be assured that the changes in safety regulations that we adopt are not merely intended to promote the economic interests of the industry? As a regulator, the NRC does not promote nuclear power; that is the responsibility of the Department of Energy. However, this fact does not prevent the question from being asked. And the only way we can satisfy the skeptics is by fully revealing the substance of our efforts to revise our regulatory program so as to show that our actions are reasonable and appropriate. Without an open process, the public cannot be assured that our focus is indeed on health and safety, as it must be, and not on the financial interests of our licensees.

Let me mention one other demand for openness that arises from the current economic changes. The new regime of economic competitiveness holds the danger of creating an environment in which heightened concerns about nuclear power might fester if not addressed forthrightly. Some may fear, for example, that the new economic environment creates incentives for licensees to cut corners on safety in order to improve their competitive position. It is the responsibility of the regulator to assure that exactly such actions are not taking place. And it is equally the responsibility of the regulator to keep the public informed of our findings so that there can be an accurate factual foundation for the public's perceptions. Fortunately, our review to date has shown the improved economic performance and improved safety performance go hand-in-hand. The changed economic environment in fact may be providing increased incentives for safety because a safe plant is also one that is reliable. Regardless of the ultimate resolution of the tension or complementarity of safety and economic competitiveness, however, the regulator is responsible for assuring that the public is fully and accurately informed of licensee performance so that needless fears are avoided and appropriate pressures are placed on those licensees whose performance falls short.

Spent Fuel

Let me illustrate the immeasurable value of openness with another example: the challenge of regulating the management of spent fuel wastes. Everyone in this audience appreciates this challenge, whether the issue is on-site storage, off-site surface storage, or deep geological disposal. NRC's role is to license these activities in response to applications from operators. For one of these options, the proposed deep repository at Yucca Mountain, two other federal agencies are involved. The Environmental Protection Agency (EPA) will promulgate a standard to protect public health, and the Department of Energy (DOE) will, if the site is deemed suitable, apply for a license to construct and operate the repository. The NRC will decide whether to license the repository using technical and licensing criteria it has developed to implement EPA's standard.

Many of the citizens in the affected states are gravely concerned about the impacts of a repository. As a result, any decision about the management of nuclear wastes must be made in the cauldron of intense public controversy. Under these circumstances, it will be easy to stoke passions that a decision does not reflect a legitimate, forthright examination of the issues. In my view openness is the only way to combat corrosive suspicions that the decision has not been made on the basis of the technical merits. Openness may not be sufficient to assure acceptance of our decision, but complete transparency in decision-making is essential if there is to be any possibility of achieving a stable outcome.

Openness in Practice

I have tried thus far to provide an explanation for the importance of openness. Let me now turn to some of the ways in the which the NRC conducts its business in order to achieve openness.

First, the Commission operates under laws governing administrative procedures that promote government in the sunshine. For example, these laws require that we provide public access to the documents considered

in decision making. We thus maintain a Public Document Room in which public materials are made available. We are also trying to harness information technology so that these materials will be more readily available electronically, offering the prospect for timely and easy access throughout the world. This task has proven to be a formidable one, but I am hopeful that our systems will soon meet our expectations. Our administrative procedures also require the Commissioners to meet in public and to provide full explanations of their decisions for the public record. The public is encouraged to participate in our meetings.

Second, our staff routinely conducts both formal and informal public meetings in the field so that the public has opportunities to learn about proposed actions and to express views about the proposals and the resulting NRC decisions. Such meetings are held in the affected communities, often in the evening, so that all segments of the public can participate. These meetings are extraordinarily popular and usually result in important, mutually informative exchanges.

Current Initiatives

We are also undertaking several initiatives to enhance our openness. One of these is to provide formal training for both our managers and staff on the art of conducting public meetings. The ability to organize and conduct meetings that promote open, effective communications is not a natural one, but it is one that can be learned. Because public meetings often address controversial issues, our staff must be able to provide participants with clear and accurate information. Moreover, the staff must be mindful of something that my wife often tells me: half of communication is listening (or, at least, listening to her). And thus the staff must be trained to listen carefully and thoughtfully and to react responsively to the views and concerns of others. Our new training courses are aimed at reinforcing a cultural climate of openness and providing our staff with the skills to be responsible shepherds of honest open processes.

Another initiative is to develop explicit communications plans for important activities in our major programs, such as licensing, spent fuel storage, and inspection. The objective is to provide guidance to our staff who routinely work in the respective areas so their communications with the public are consistently thorough and complete. We want to avoid, for example, inadvertent omissions that could be misinterpreted as attempts to conceal information, thus needlessly creating suspicions. We have already used a communications plan to explain our response to the failure of a steam generator tube at the Indian Point 2 plant just north of New York City. The plan provided a useful framework to guide public discussion of the relevant issues and to facilitate public access to the ongoing decision-making process.

Another initiative is to redesign the NRC's website. We recognize that the Internet has become an important vehicle for making information widely available. The feedback we have received has impressed us with the need to upgrade and redesign our site so that it is more user friendly, is more easily navigated, and provides a richer variety of current mission-related information about the NRC's regulatory activities.

Conclusion

In summary, let me reiterate my view that responsible openness is an essential ingredient in the stew that is regulatory decision-making. As conscientious public servants, we cannot be successful if we are seen as being secretive. Openness is all the more important for decisions in highly technical areas, because otherwise the public has scant opportunity to understand the issues or to participate in a meaningful way. Openness is the spice that helps to make difficult decisions more palatable.

The NRC historically has had a good record in this regard, but we are nonetheless working to improve our interactions with the public because improvement is always possible. We want the public to continue to

have confidence that the NRC will carry out its mission to protect health and safety in the public interest, and we are investing in our staff and in programs to enhance that trust.

Trust, however, is a fragile commodity. Governmental organizations and their relations with the public they serve can be strengthened by trust -- or paralyzed by a lack of it. Responsible openness is the key to building and maintaining trust in regulatory programs.

Thank you for the opportunity to talk with you today. I look forward to our continuing discussions of this important topic.

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Statement of Commissioner Dicus Relating to Potassium Iodide (KI) Rulemaking in Response to Petitions for Rulemaking (Amendment to 10 CFR 50.47)

December 22, 2000

The opening paragraph of the Rational for the Commission Decision on potassium iodide (KI) defines the difficulty former Commissioners have had in reaching finality on this issue. Each, (including the current Commissioners), has realized the importance of the use of KI as an adjunct to evacuation and sheltering. We are in agreement to its use under these circumstances. I differ only on the proper way to implement a national KI policy. I appreciate and respect the views of my fellow Commissioners. I believe the Federal Register Notice should have included some additional information and discussion of these various issues. For that reason, I have chosen to provide the following comments.

Having previously had the responsibility for off-site emergency planning at Arkansas Nuclear One, the use of KI for the general population was considered, but rejected due to the utilization and effectiveness of other protective measures. Nevertheless, KI was provided and predistributed in areas for those individuals that could or would not be evacuated. These included: emergency workers; nursing home residents, critical care patients, and their care givers; and those incarcerated and the associated security staff. KI was placed in these locations. This was done as an extra precaution because these individuals could be expected to be in a contaminated environment for a prolonged period. The general population, however, was expected to be evacuated from this environment. They would also be protected from contaminated food.

Following the Chernobyl accident, Polish authorities provided KI to the population some days after the event. However foods, including milk, that might be contaminated with radioactive iodine or other radioactive materials were embargoed almost immediately. The combination of these actions resulted in minimal thyroid health impacts on children and adults in Poland. This was not the case in other

Chernobyl-impacted areas where neither protective measure was implemented in a timely manner. Thyroid health impacts in these areas were significant.

Due to the importance of embargoing contaminated food, I am disappointed that the Federal Register Notice (FRN) does not give at least a brief explanation of this important and effective emergency protective measure. In emergency exercises, off-site decision-making authorities can be evaluated (and often are) on their ability to make a decision about food embargos. Evaluations are also made on the timeliness of that decision.

One of the issues raised supporting state stockpiles is that unless KI is provided very quickly, it will not be effective. The experience in Poland suggests that if other protective measures are implemented in a timely fashion, it may not be necessary to supply KI immediately or within a few hours of the event. For chemical and biological agents, regional stockpiles of protective pharmaceuticals have been determined to be appropriate, and one presumes, that the logistics for rapid deployment of these pharmaceuticals have been established. In some cases, these protective pharmaceuticals must be administered quickly and in some cases there are few other protective measures that can be implemented. In light of the above, it appears to me that the argument that regional stockpiles of KI would be ineffective is neutralized. As a final comment, the new source term adopted by the NRC suggests that if radioactive iodine is released as the result of an event, it will be in the elemental form as Cesium iodide. As such, uptake by the body through inhalation will be minimal -- further underscoring that the primary pathway will be ingestion.

The current KI policy adopted by the Commission may result in a patchwork quilt of protection for the American public. Unless the CDC or another Federal Agency chooses to stockpile KI, there will be no Federal stockpile (regional or centrally located) for use anywhere in the country, should it be necessary. I believe this to be a questionable public health policy.

I believe that Federal Funding for a stockpile would better serve the public because States could fund their own stockpiles and a federal stockpile would serve as a prudent backup measure for States whose stockpile proves to be insufficient, or where a State has elected not to stockpile KI. Accordingly, I believe that funding a federal stockpile would be an effective use of Federal funds and would be more consistent with the allocation of responsibility between the Federal government and the States for all other emergency matters.

The Commission has chosen to place a disclaimer in the FRN addressing the NRC's liability regarding the use of KI. The disclaimer states in part that "...the NRC and any of its employees are not to be held responsible for any activity connected with transporting, storing, distributing, administering, using, or determining the proper doses of KI for adults or children." This disclaimer has been included for legal purposes presumably because a pharmaceutical is involved in this NRC action. It should be noted that the NRC has little or no responsibility for the actions listed in the disclaimer. It is my view that the disclaimer is not to be interpreted to mean that the NRC is involved in the decision-making authority of the State, and where appropriate, local governments. The decision to stockpile KI and the decision to recommend its use rests entirely with state and/or local decision-making authorities. The decision by a member of the public to follow a recommendation to take KI remains a voluntary action of that member of the public. The NRC is not involved in these decisions.

This decision regarding KI has been a difficult one and it has taken some time to come to finality on the issue. Going forward, it is important that the implementation of the policy is efficient and effectively provides an adjunct protective measure, as appropriate, for the American public.



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Challenges and Opportunities: Regulatory Perspective

**Global Spent Fuel Management Summit
Washington, DC
Commissioner Jeffrey S. Merrifield
US Nuclear Regulatory Commission
December 5, 2000**

Introduction

Good morning ladies and gentlemen. It is my pleasure to address this conference today with my thoughts on the important topic of spent fuel management. Today I will focus on three distinct areas. First, I will provide my views on the state of what has become a very dynamic nuclear industry in the United States. Second, I will discuss challenges and opportunities surrounding the management of high-level radioactive waste in the United States, and specifically, spent fuel from commercial power reactors. Finally, I will share my perspective on how I believe we must do a better job leveraging our international initiatives and enhancing international cooperation in the area of spent fuel management.

Industry Overview

As I have said on many occasions, I believe the outlook for nuclear power in the United States is arguably the brightest its been since the Three Mile Island accident. Competitive market forces have led to a resurgence of nuclear power by forcing dramatic improvements in the manner in which nuclear plants are managed and operated. Licensees have improved operator training, made significant process improvements, developed sound maintenance and corrective action programs, shortened refueling outages, and as a result, significantly increased both the safety and generation of power within the nuclear fleet. Plants are operating better than ever before, with forced outage rates at an all time low and capacity factors

at an all time high. By almost any measure, most of our licensees are doing a very good job of managing the business of nuclear power in a safe manner.

The dynamic state of the electric industry is also creating many challenges for the NRC. First, the consolidation of nuclear utilities through mergers, plant sales and the formation of multi-plant operating companies has resulted in an influx of license transfers. The PECO/Unicom merger, the acquisitions by Entergy, Amergen and Dominion, and the Nuclear Management Company formed by several midwest utilities, all reflect the financial importance being placed on large nuclear fleets by our licensees. In addition, projections indicate that the NRC will face a significant number of license renewal applications in the coming years. Earlier this year, the NRC renewed the Calvert Cliffs and Oconee licenses for another 20 years. We currently have under review the license renewal applications for the Hatch, ANO Unit 1, and Turkey Point plants. We expect to receive more than 20 applications for license renewal over the next 5 years. Based on my discussions with industry executives, I am hard-pressed to identify more than a handful of currently operating plants that may not seek to renew their licenses. Finally, I am sure you are aware that several utilities are exploring the option of building new nuclear plants in the United States. Joe Colvin, the President of the Nuclear Energy Institute, recently told a gathering in London that a new plant may be ordered in the United States within 5 years, but that conditions for doing so may be ready in as little as 2 years. In addition, commercial development of the pebble-bed technology by Eskom of South Africa with its reliance on new technology and non-traditional ways to accomplish defense-in-depth could significantly challenge the technical and licensing capabilities of the NRC. So, as you can see, the U.S. nuclear industry and the NRC face many challenges and opportunities; challenges I am confident we can overcome, opportunities I am confident we can seize.

Management of Spent Fuel

HIGH-LEVEL WASTE DISPOSAL

While industry performance and the outlook for nuclear power in the U.S. has never been better, one should not underestimate the challenges presented by the high-level waste disposal issue. Clearly, for currently operating plants as well as for potential new plants, the resolution of how to dispose of high-level waste remains a priority. At several of the 62 plants I have visited in the last two years, finding a solution to the problem of limited spent fuel pool capacity is a significant issue for top executives who are trying to reach a decision regarding whether to pursue license renewal. I doubt that many would disagree that the high-level waste disposal issue is a top tier concern in the minds of those assessing the merits of new plant construction.

As you know, last April, President Clinton vetoed high-level waste legislation sent to him by Congress. While it would be inappropriate for me to comment on the merits of that decision, I doubt that many would dispute that the nuclear industry is bearing the burden for the federal government's failure to provide a repository for high-level radioactive waste. However, let there be no doubt, the next President, fairly early in his tenure, will be faced with several major decisions associated with site selection for a high-level waste repository.

DOE is the lead federal agency for the selection and development of a proposed site for a high-level waste repository. The NRC is responsible for licensing the repository after determining whether DOE's proposed repository site and design comply with EPA's environmental standards and with the NRC's implementing regulations. Although no site has been selected, Congress has mandated that DOE focus its characterization efforts on one site, Yucca Mountain in Nevada.

I am proud to say that the NRC has met all of its commitments to date and stands ready to fulfill its role

associated with Yucca Mountain. The NRC's existing generic regulations for high-level radioactive waste disposal were developed in the mid-1980's and are found in 10 CFR Part 60. However, the NRC is in the process of revising its standards to apply specifically to the Yucca Mountain site and these standards will be located in a new 10 CFR Part 63 that the Commission should complete within the next month. As I am sure you are aware, there is a continuing debate between the NRC and the EPA regarding the appropriate environmental standards for protection of human health at Yucca Mountain. While I will not go into specifics of the differences between our two agencies, this remains an issue that divides us, and one that I expect will engender renewed attention by our new President.

CENTRALIZED INTERIM STORAGE

There has been considerable discussion, and even a few proposed legislative solutions, concerning the establishment of a centralized interim storage facility for spent fuel in the United States. Congressional action would be necessary for DOE to develop such a facility. The NRC official position, as communicated to Congress, is that centralized interim storage of spent fuel can be done safely and will allow economies of scale; but that the current storing of spent fuel at existing power reactor sites is also safe. Since the NRC would be responsible for licensing an interim storage facility, it would be inappropriate for me to take a position regarding if, or where, a storage facility should be constructed.

Absent a federal government proposal for an interim storage facility, private industry is actively pursuing some initiatives for centralized interim storage of its own. Currently, the NRC is reviewing an application from Private Fuel Storage to store spent fuel on land owned by the Skull Valley Band of Goshute Indians in Utah. The related licensing action is in the hearing process, and thus, I must demur from going into any detail on the technical or environmental issues at this time. However, I can say that the hearing on the technical issues was held last June and the hearing on the environmental issues is scheduled for mid-2001. With the current timeline, it would now appear that the NRC's Atomic Safety Licensing Board Panel could make its decision on this matter around the end of 2001 and, pending appeals, a final licensing decision could be issued by the middle of 2002. Waiting in the wings is another potential application from Nu Corp for a consolidated spent fuel storage facility in Wyoming, referred to as the Owl Creek Energy Project. The current projection for the Owl Creek license application is somewhat fluid; but the NRC is not currently expecting an application until January 2002, at the earliest. While I can't take a position on the merits of either proposal, I can say that I am committed to ensuring that these projects are reviewed by the NRC in a fair, prompt, thorough, and disciplined process.

I now turn to the main portion of my presentation, mainly casks used for storage and transportation of spent nuclear fuel. The NRC addresses storage and transport as separate regulatory functions. I will start my presentation addressing storage casks.

DRY CASK STORAGE

The NRC regulations in 10 CFR Part 72 authorize dry cask storage under a site specific license but also allow commercial power reactors the option of using a general license if they use certified casks listed in the NRC regulations. In the past, the NRC has been criticized for having a certification process that was inefficient, untimely, and unnecessarily burdensome. Over the last several years, my fellow Commissioners and I have demanded that the staff make significant internal procedural changes as well as some regulatory changes to improve the overall regulatory program for spent fuel casks. Today, technically sound casks are being certified in a reasonable, thorough, and timely manner and we appear to have a firm grasp on the immediate task of meeting licensee needs for the short term. This is a compliment to the hard work by the NRC staff and many active stakeholders over the last several years.

Despite our recent successes, this is no time to celebrate. I firmly believe that additional process improvements are essential. The challenge of having a sufficient number of certified casks is not over as the need for certified storage canisters will certainly grow further over the next twenty years. As of August 2000, there were approximately 200 loaded storage casks containing commercial fuel in the United States. A rough estimate is that, with license renewal, by the year 2010, there could potentially be the need for almost 1,000 loaded spent fuel storage casks. In theory, you could argue that all you need is one certified cask design. But the reality in our society is that this increase in demand for certified casks will result in an increase in the number of certification applications as private industry competes for available cask orders. The NRC responsibility is to ensure the public health and safety is maintained, no matter how many applications we receive. If we are to meet these challenges, it is absolutely essential that we make additional process and regulatory improvements, while at the same time continuing to achieve our mandate of protecting the public health, safety, and the environment. I will note that NRC's Office of Research, at the request of the Office of Nuclear Materials Safety and Safeguards, is currently evaluating the application of probabilistic risk assessment techniques to storage casks. Although this effort is just in its early stages, if successful, it should aid in making the Part 72 regulations more risk informed and allow the Certificates of Compliance to be less prescriptive. Quite frankly though, that is simply not enough. In my opinion we should also reassess the way we issue our Certificates of Compliance. While I believe that it is vital that we allow sufficient time for public input, I believe we must also consider new methodologies in approving these cask certifications so that sound regulatory decisions can be made in a more timely manner, and so vendors and licensees can make non-risk significant cask modifications without the need for formal NRC approval.

In addition, there are two significant technical areas that need to be addressed: specifically damaged, or unique fuel, and burnup credit. I expect significant progress to be made in the next year in resolving both of these technical concerns. To date, the focus by both the NRC and the industry has been on casks certified for storing only normal, undamaged fuel. The NRC purposely gave priority to certifying enough casks for "normal" spent fuel to address the short term crisis of a lack of sufficiently qualified casks that we faced just a few years ago. However, I believe that now we have made some headway, it is time to focus greater attention and additional resources on cask designs associated with handling damaged fuel and fuel with unique characteristics. It would be irresponsible for the NRC to not to tackle this problem promptly, aggressively, and thoroughly to address the emerging needs of the decommissioning community.

I also believe it is time to address the question of how much credit can be allowed for the burnup of the spent fuel in analyzing criticality concerns for casks involved in either transportation or storage. Our current regulatory guidance, which is based on the assumption that spent fuel has the same characteristics as new fuel, is designed to prevent achieving criticality as a result of placing too many new fuel rods too close together in a cask. The idea behind burnup credit is that some of the individual fuel rod's excess reactivity is used, i.e., burned, during the fission process in the reactor core. By conducting a more thorough analysis which considers credit for burnup, one should be able to place the spent fuel rods closer together and still meet our requirements that prevent a criticality. Therefore, allowing credit for the burnup of the fuel could allow more fuel to be safely packaged in one cask for either transportation or storage.

I have seen projections, perhaps overly optimistic, that indicate that with burnup credit, shipments by rail could be reduced by 25 percent and shipments by truck could be reduced by 50 percent. I do not know what, if any, actual reduction will take place in the number of casks. Nevertheless, resolving this issue could result in two significant outcomes. First, from a regulator's perspective, placing more fuel elements in each cask means that fewer casks will be shipped and therefore the overall risk to the general public may be lower because there will be fewer casks on our nation's highways and rails. As I will demonstrate later, the transportation of current casks is being accomplished safely. However, reducing the overall volume of cask shipments will further reduce the risk that a transportation accident with potentially serious

radiological consequences will occur. From the industry's perspective, fewer casks results in lower costs. As a Commissioner and as regulator, my primary responsibility is to protect public health, safety, and the environment. But this includes the responsibility to ensure that our regulations do not unnecessarily hinder industry initiatives designed to increase efficiencies of their operations or provide additional safety enhancements. The Commission has directed our staff to give a higher priority to the resolution of concerns associated with allowing burnup credit, and the staff has been actively engaged with industry and our international partners on this effort. Currently, the NRC allows some credit for burnup, but with some fairly severe restrictions. This month (December), the NRC Office of Research is scheduled to issue draft guidance for public comment which will reassess some of the current major NRC restrictions on burnup credit. I intend to closely monitor the staff's progress in this area, and it is my hope that we can work through these issues in an expeditious manner.

All of the NRC efforts to improve the regulatory process and address technical issues associated with dry cask storage will be for naught if industry fails to uphold its responsibilities in this area. Industry cannot afford to repeat its mistakes of the past. There have been entirely too many instances where casks have had design deficiencies, such as incompatible materials resulting in generation of hydrogen gas; others where the casks have been improperly maintained, such as inadequate weld repair documentation; or instances where casks were improperly loaded with fuel without adequate procedures in place to unload the cask. Until about a month ago, industry could have argued that poor performance was a thing of the past; however, in November, we learned that a cask at the Palisades plant in Michigan was improperly loaded with fuel that had not been in the spent fuel pool for the minimum required period of five years. Clearly, events such as this only serve to undermine public confidence in the industry and in the NRC; and, in light of efforts to receive credit for high burnup, are absolutely unacceptable. Industry must demonstrate more initiative to ensure casks are properly designed, constructed, maintained, and loaded with fuel, and simply cannot afford to repeat the mistakes of the past.

Do not get me wrong, I believe the vast majority of the nuclear cask industry is currently doing a good job managing their product. But when the number of loaded dry casks are projected to increase by a factor of five over the next ten years (i.e., 200 loaded casks in August 2000 and a projected 1,000 loaded casks in 2010), good performers must not become complacent and allow the quality of their product or procedures to decline to unacceptable levels. Those that cannot live by the highest standards have no business operating in this industry and, quite frankly, pose threats to even the best performers in the nuclear arena.

TRANSPORTATION

Now I will turn the discussion from casks used for storage and focus on casks used for transportation. The industry record to date for transportation in the United States of spent fuel has been very good. From 1979 to 1997 there were approximately 1,300 commercial shipments of spent fuel transported in the United States. Roughly 1,453 metric tons of spent fuel was shipped 850,000 miles during this time frame. However, there were only four transportation accidents involving loaded spent fuel casks through 1997. Of those four accidents, three were trucking accidents with loaded spent fuel casks, and one was a train accident with a cask loaded with the Three Mile Island core debris. Of these four accidents, only one cask (on a truck) suffered some damage only to its outer surface, but in no instance was radioactive material damaged or released. By any measure, this is very good performance both by the transportation industry and the transportation casks.

Although the history of transportation casks in the United States is a record of clear success, neither the industry nor NRC can rest on its laurels. One should not underestimate the critical role that public confidence will have on the future of the nuclear program. I fully expect that as the nation comes closer to a decision on whether or not a permanent high-level waste repository should be licensed at Yucca

Mountain, issues associated with the transportation of spent fuel will be a top public concern from a national perspective. Even with the past record of accomplishments, there is a valid concern being raised that all of the spent fuel shipments to date in the United States are only a very small fraction (3% or less) of the number of shipments that will need to be made once a final repository is licensed for spent fuel, no matter where the repository is located. When these shipments occur, both the industry and the NRC will need to be ever diligent to ensure that appropriate licensing standards are maintained; that casks are constructed, loaded, and maintained properly; and that transporters, i.e., truck drivers and train engineers, remain responsible for their actions. We cannot afford to lose confidence on the safety of spent fuel transportation because the costs associated with losing public confidence cannot be overstated.

As part of our effort to address Yucca Mountain issues, I strongly believe that the NRC and the industry need to do a better job communicating with the public and other stakeholders along proposed transportation routes to ensure we are adequately addressing their concerns. I take our public responsibility in this area very seriously, and I challenge both our staff as well as industry to be fully committed toward responsibly, thoroughly, and honestly answering their questions and addressing the concerns of the public who live and work along the proposed transportation routes. I assure you that shortcuts will only lead to time consuming problems for our agency and for the industry for many years to come.

Since this is an international conference, the final portion of my presentation will briefly touch on a few observations I have had as a result of my recent foreign visits.

International Involvement

The international management and regulation of nuclear materials is occurring in a very dynamic marketplace. For example, the reprocessing of spent fuel is becoming more common on an international basis even though there are significant nuclear non-proliferation issues to address. Both Russia and the United States are actively negotiating the down-blending of weapons grade nuclear stockpiles to produce mixed oxide fuel for commercial power reactors. Russia has recently announced that it will consider accepting spent fuel for disposal on an international basis and some countries are entertaining this as a method to address spent fuel management concerns. International shipments of spent nuclear fuel are occurring more frequently. Some countries are shutting down their nuclear programs, but these same countries have major corporations that want to remain active in the nuclear industry. Clearly, these are major challenges that face the industry, challenges that affect both technical concerns as well as public confidence on the international level.

To address these technical challenges, there are multiple research programs in progress. An area where I personally place a high priority is on leveraging our limited financial resources through increased international cooperation in research affecting the nuclear industry. Countries such as the United States, Sweden, Finland and others are actively sharing information on permanent nuclear waste disposal activities. In addition, there are internationally sponsored research efforts, such as the Halden Reactor in Norway, which I visited last July, where countries are pooling their resources on common research goals and reaping common research benefits. To date, France has been a leader in research on the use of mixed oxide fuel (MOX); and as time goes on more countries are getting involved in this effort. I have visited the MOX fuel production facilities in France and I have also observed and handled MOX fuel during a visit I made to Chalk River in Canada. It is clear to me that as we attempt to address the issues of plutonium disposition in the United States, potentially through the use of mixed oxide fuel, we will need to look to our international partners for insights and assistance. In addition, the Japanese are conducting extensive research on high burnup fuel, which is directly related to matters being evaluated by the NRC. These are just a few examples of areas where I believe that it is essential that international cooperation could result in significant benefits for each nation involved.

There are several areas where I believe the U.S. should continue or increase its efforts over the next several years within the international community.

- First, we should enhance the dialog between the U.S. and our international counterparts on spent fuel storage and disposal issues. We have much to learn from our counterparts on how to deal with these matters. Clearly, the technical issues and public concerns are similar, and how we address them should rely on common solutions. We simply must find a way to capitalize on the best practices in the international community so that we may forge consensus on international solutions.
- Second, as I have stated on many occasions, we must leverage our limited research budget and expand our cooperative efforts to share research with our international counterparts. For example, there is no reason why each country should have to reinvent the wheel on the safety issues associated with spent fuel cask designs. The fact remains that this technology is not extraordinarily complex and the differences between one fuel and another simply do not justify significant differences in how we regulate the casks.
- Third, we must work cooperatively with the IAEA and other international partners to foster a more efficient process for the design and licensing of new generations of dual purpose cask systems. As one would expect, a more efficient process should maintain the protection of the public health and safety as its highest priority, but it should also seek to reduce unnecessary burden and avoid unnecessary regulatory hindrances to innovation. The issue of cask safety is one that we could easily overstudy. We need the discipline and foresight to recognize when we have conducted enough research and to move forward with regulatory standards and make regulatory decisions with reasonable assurance that the public health, safety, and the environment will be protected.
- Fourth, we must capitalize on the inherent momentum of the information age to improve international cooperation and our ability to communicate effectively with our respective stakeholder groups. The fact is that when these casks make their way into interstate commerce, either by road or rail, it will result in a larger percentage of our public coming in close proximity to spent fuel casks. Although this is not in itself a health and safety concern, we must recognize the increased challenges to public confidence that this represents; and we must take appropriate steps to enhance the public's confidence that their regulatory bodies are being vigilant in protecting public health, safety, and the environment.

Closing:

In closing, I would like to reiterate that these are very dynamic times for the NRC and the nuclear industry associated with casks, and the future promises to be even more dynamic. As I have outlined, even with our current successes, there are still many challenges on the horizon. In order for the nuclear industry and the NRC to successfully meet these challenges and to seize these opportunities, our visions of the future must benefit from the lessons of the past. Communication of knowledge on an international level is expanding at an unprecedented rate and the nuclear community must keep pace with these advancements. In these dynamic times, cooperation on an international level, for all of the reasons I previously listed, is absolutely vital.

I want to thank you for giving me this opportunity to share some of my thoughts this morning. At this time, I'd be pleased to address any questions you may have.

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S-00-30

[[PDF Version \(45 KB\)](#)]

"The Changing Nuclear Workforce"

by

**The Honorable Greta Joy Dicus
Commissioner
U.S. Nuclear Regulatory Commission
Oak Ridge Women in Nuclear Chapter
Oak Ridge, Tennessee
November 30, 2000**

INTRODUCTION

I thought I would talk with you today about the changing nuclear workforce and some of the challenges that we have ahead of us. I hope to tie it all together by discussing how that workforce may affect the future of the nuclear industry, particularly in the area of research.

POTENTIAL NUCLEAR RESURGENCE PRESENTS ADDITIONAL WORKFORCE CHALLENGES

We are at a very exciting time for nuclear power in the world and in the United States. I believe that one day, in the not too distant future, there will be a resurgence in interest in nuclear. That day may be today. Acquisitions and mergers are occurring at a record pace and Wall Street and foreign investors are more bullish on nuclear power investment opportunities. For example, Exelon Corporation, the name of the company that resulted from the merger of PECO and Commonwealth Edison, has formed one of the largest

operators of nuclear power plants in the United States. Exelon is actively interested in emerging technology associated with the advanced Pebble Bed Modular Reactor and has made 10-15% investment in the project. They have began preliminary discussions with the NRC on the process for licensing a new plant in the United States.

A resurgence in nuclear power is not a certainty. It will be driven by economics. No US company is likely to invest in a new nuclear power plant unless they foresee the ability to return a profit to their investors. However, should a resurgence occur and take hold, attracting young college graduates to a career in nuclear-related fields should be easier.

But whether there is resurgence of nuclear power or not, the changing nuclear workforce provides enormous management challenges that must be addressed today. The current inflow of new talent does not equal the outflow of experienced workers. Even when we are able to attract talented young men and women, the lack of upward mobility or lack of variety in career paths may result in segments of the workforce moving outside the nuclear area. Maintaining and cultivating core competencies in nuclear-related areas is a key concern for the industry and the NRC.

RECENT NUCLEAR LABOR MARKET STUDIES

Annually, NRC and DOE contract with the Oak Ridge Institute for Science and Education to prepare labor market trends for nuclear engineers and health physicists. Anybody here work on that contract? The latest reports provide some important insights that I would like to share with you.

First for Nuclear Engineers, the current labor market continues to improve substantially since the mid-1990s. Starting salaries for nuclear engineers in the nuclear energy/nuclear weapons fields increased 6.0% for B.S. level graduates, 5.5% for M.S. level graduates, and 5.5% for Ph.D. level graduates between 1999 and 2000. According to the report, this was the third consecutive year that annual salary increases for new nuclear engineering graduates were larger than any of the annual increases experienced between 1991 and 1997.

However, the decreasing trend in the number of engineering degrees continued for the fifth consecutive year. Over the past five years, there has been almost a 50% decrease in the number of nuclear engineering degrees. Supply goes down.

But, the decline in the employment of nuclear engineers in the nuclear field that occurred for much of the 1990s appears to have stopped. A simple economic analysis of supply and demand yields not too startling results: namely that nuclear engineers are again in demand and finding employment in nuclear related areas. Do not get me wrong. The picture is better, but still unstable as utilities still face the future effects of deregulation.

For health physicists, in 1999 the total number of degrees earned in health physics had decrease of over one-third in just two years. Enrollments also decreased in a similar manner.

The continuing decreases in enrollments and degrees in the late 1990s resulted in just over 100 new graduates entering the labor supply annually. At the same time, employment stabilized or decreased only slightly in 1998 and 1999, providing approximately 100 job openings annually for new graduates during 1998 and 1999. Thus, after several years of somewhat excess supply of new graduates, the demand for and supply of new graduates now appears to be fairly balanced.

OUR MATURING WORKFORCE

With a tight labor market for nuclear engineers and a workforce with a large percent of personnel eligible to retire, the NRC is faced with some significant workforce challenges. I suspect that these challenges are not unique, and in fact, are shared with some other nuclear-related government agencies and with industry.

With appropriate attribution to my colleague, Chairman Meserve, I want to reiterate some points that he made during a recent speech at the Institute for Nuclear Power Operation Conference several weeks ago.

The ratio of NRC employees who are over 60 years of age to those under 30 is 6:1. The same ratio at NASA, for comparison, is 2:1. Moreover, seventeen percent of NRC's engineers are already eligible for retirement and another four percent of the current workforce of engineers will become eligible for retirement each year for the next few years. Twenty-five percent of the employees in the Office of Nuclear Regulatory Research and twenty percent of the employees in the Office of Nuclear Reactor Regulation are eligible for retirement today.

Despite our efforts to hire new engineers, we have experienced a net loss of engineers over the past five years. That loss is equivalent to roughly eight percent of our engineering workforce. The bottom line is that we are losing expertise and, along with it, valuable institutional knowledge.

The combination of these long-term trends raises a red flag: how will NRC be able to maintain its core technical competence into the future? We need to plan for turnover and retirements, as any employer would, but we also need to judge carefully what expertise we must have among our employees. The Chairman recently asked our Executive Director for Operations to begin the process of developing such a plan.

CHANGING WORKFORCE NEEDS TO ADAPT TO CHANGING ENVIRONMENT

Let me shift gears and talk about why it is essential for NRC to maintain core competencies. Simply stated, we need to be able to respond to emerging technology, deal with emerging issues, and deal effectively in the international environment. Our credibility as an effective competent regulator hinges on maintaining a strong technical expertise. We need to be flexible in meeting the demand for our technical expertise. A brief history of NRC research program provides useful insight on the breath of issues and technical expertise needed to deal with these issues.

The NRC has funded research on nuclear issues for all of its existence, but not always at the same level. In the early 1980's, the NRC's budget for the Office of Research peaked at over \$200 million. At the time, this research supported the development of the technical basis for many broad areas, including Three Mile Island items, severe accident phenomena, formulation of the NRC's Safety Goal and Severe Accident Policies, and modeling of thermal-hydraulic behavior. Many of these endeavors required the use of large scale experimental facilities. Subsequently, the focus of research shifted to issues such as the development and application of risk methods, revising the source term, aging research, and support of advanced reactor design reviews and certifications. However, this research has been less resource-intensive, and with no new plants being ordered in this country over the last two decades, the funding for research has gradually declined.

Today, as I look at where we are, I see that our research program still spans a wide variety of relevant technical issues. We categorize our research into two broad areas. The first is what we call Confirmatory Research, and it constitutes perhaps 80% of our budget. This area supports user needs requests from our front-line regulatory offices, and therefore focuses on current safety issues. This purpose of this type of research can generally be described as to remove unnecessary conservatism in our regulations and to

provide assurance that our regulatory judgements are valid. Examples of this in the reactor area includes risk-informing our regulations in 10 CFR Part 50, independently reviewing industry operating experience, ongoing research into structural and geological engineering issues, and radionuclide transport and health effects.

A second area of NRC research is called Anticipatory Research, and it constitutes the remaining 20% of our research budget. The purpose of this type of research is to anticipate future needs, and to provide the technical basis to support future regulatory actions for emerging safety issues. Examples of this type of research include addressing PRA limitations as the NRC transitions to a risk-informed regulatory process, development of risk-based performance indicators, assessing links between performance and plant safety, and deregulation and its impact on plant safety.

New technology, such as advanced instrumentation and controls, can certainly have an impact on plant safety. For example, advancement in computers and information technology are coming at a rapid pace today, but research is needed on the reliability of this technology before it can be widely applied to nuclear power plants. Advancements in fuel design and materials are an emerging area, particularly the use of high burnup and mixed oxide fuels. Finally, risk-informing our regulations will require research to establish a sound basis in both technical issues and probabilistic risk assessment (PRA) techniques. So you can see that using just these few examples, we need to have in-house or readily available expertise on advanced instrumentation and control, fuel design, and probabilistic risk analysis.

If we are to adapt our workforce to the changing environment, then I believe that we must reassess the way we do our research. As a regulatory agency, we must preserve our independence and maintain a broad perspective to fulfill our mission of maintaining safety. We do not have the resources to conduct extensive exploratory research. Long term research has a place, but many things today do not lend themselves to that. Instead, we must develop feedback mechanisms so that our programs can be continuously examined to ensure that the research is relevant. We must develop and refine our prioritization processes to ensure that our resources are being focused on the most significant issues. We must ensure that our research is linked to the needs of our stakeholders. In other words, our research programs must have a certain agility to respond to the environment. Where we may have had one person who was an expert in one area, today, we may ask that same person to be fungible and provide expertise in other related areas.

Our research programs must be timely and responsive to both internal and external stakeholders. Too many times I have seen a well-thought out and well-executed research project completed, but not really used because it was either not timely or not responsive to user needs, or both. I recognize that high quality research takes time, so the challenge is to focus our available resources in a way that ensures a quality product in a timely manner. One way to improve our programs is to adopt the approach the NRC has learned in responding to the changing environment: listening carefully to its stakeholders.

My vision of the NRC Office of Regulatory Research in the new millennium would be a center of excellence and source of expertise. This center would maintain a cadre of reactor safety specialists in various key areas, with independent and unbiased expertise across a broad spectrum of advanced nuclear technology, to provide the technical basis for robust and transparent regulatory decisions.

Finally, new and creative approaches to research will increasingly be used. Partnerships with industry, foreign organizations, and other government agencies will become more common. Our joint research with the European Union, and the recent Memorandum of Understanding with DOE on Cooperative Nuclear Safety Research are good examples of this. As the costs of large-scale experimentation rise, we will have an increased need to leverage the work of others, even while maintaining our necessary independence on regulatory matters. In other words, our expertise and workforce would be leveraged internationally.

CONCLUSION

So I hope you can see that the NRC and nuclear industry are at an exciting time. Excitement brings new challenges. A potential resurgence in the nuclear-industry may make the labor market tight. As recent trends show, the labor market is balanced but arguably already teetering on demand outpacing supply - - particularly for nuclear engineering expertise. Even if there isn't a resurgence, NRC is deeply concerned about the loss of experience and expertise as our workforce ages and retires and is taking steps to proactively address the issue. And finally, our workforce is ever changing in response to a changing environment. It will take smart management with foresight and a workforce that is technically agile to deal with the challenges of the future. I believe that we not only need to leverage our expertise internally, but internationally as well.

Again, thank you and I would be pleased to answer any questions.

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No. 00-186

December 22, 2000

NRC REVISES ITS REGULATIONS ON USE OF POTASSIUM IODIDE IN EMERGENCY RESPONSE

The Nuclear Regulatory Commission is revising a section of its emergency preparedness regulations to require that consideration be given to include potassium iodide (KI) as a protective measure for the general public to supplement sheltering and evacuation in the event of a severe nuclear power plant accident.

Reversing an earlier decision, the Commission has agreed to provide funding for a supply of KI for a State, or, in some cases, local governments designated by the State to request such funding, that choose to incorporate KI for the general public in their emergency plans. After funding the initial purchases of KI, the Commission may consider extending the program to fund stockpile replenishment, but has made no commitments in this regard. The NRC has set aside \$400,000 in fiscal year 2001 for this purpose and will be requesting similar funding in fiscal year 2002.

Potassium iodide, if taken in time, blocks the thyroid gland's uptake of radioactive iodine and thus would help prevent thyroid cancers and other thyroid diseases that might otherwise be caused by exposure to radioactive iodine that could be dispersed in a severe nuclear accident. Nuclear power plant emergency plans already provide for distribution of the drug to emergency workers and certain institutionalized populations, such as hospital patients within designated emergency planning zones.

The rule change would add this sentence to Part 50.47(b) (10) of Title 10, Code of Federal Regulations: "In developing this range of actions, consideration has been given to evacuation, sheltering, and as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate."

NRC is moving to amend this regulation as the result of a petition filed by Peter G. Crane, a retired NRC staff attorney who acted as a private citizen. The amendment should not be taken to imply that the NRC believes that the present generation of nuclear power plants is any less safe than previously thought. On the contrary, present indications are that nuclear power plant safety has been steadily improving. The Commission has found that KI can be a reasonable, prudent and inexpensive supplement to evacuation and sheltering for specific local conditions.

The Commission has directed the NRC staff to work with the Federal Emergency Management Agency (FEMA) to find "the most efficient and cost-effective way to fund the stockpiles," for those States, or in some cases, local governments that elect to stockpile KI for use by the general public as part of their emergency plans. FEMA is the lead agency for drafting a federal policy on use of KI for thyroid protection in a radiological emergency at commercial nuclear power plants. The Food and Drug Administration

(FDA) is the lead agency for the medical aspects of KI prophylaxis.

The rule change, which will be published shortly in the *Federal Register*, will be available on the NRC Homepage at www.nrc.gov/NRC/rule.html.

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No. I-00-83

December 7, 2000

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NRC CITES NNECO FOR VIOLATION AT MILLSTONE 2

The Nuclear Regulatory Commission staff has cited Northeast Nuclear Energy Company (NNECO) for a violation of NRC requirements at its Millstone Unit 2 nuclear power plant in Waterford Conn. The NRC has determined the violation is of low to moderate safety significance.

The finding at Millstone involved a turbine-driven auxiliary feedwater pump, one of three pumps that supplies water to the steam generators if the normal feedwater pumps are lost. The turbine-driven pump is designed to operate for events involving a loss of electrical power. NRC inspectors determined NNECO failed to take prompt and comprehensive corrective actions in August, after the pump exhibited erratic operation during a surveillance test. During the next test on September 20, operators determined that the pump was unable to perform its function. Further, it was determined that the pump failure in September was related to the problem identified in August, which was not corrected at that time. This failure has been characterized as "white" (of low to moderate safety significance) because of the pump's importance in mitigating plant events.

A regulatory conference was held on November 28 to provide NNECO officials an opportunity to present information to the NRC to enable the agency to reach a final determination of the significance of the inspection findings.

Under the NRC's new reactor oversight process, inspection findings are evaluated under a significance determination process and assigned a color that indicates safety significance. Findings with very low safety significance are labeled "green." "White" findings have low to moderate importance to safety and may require additional NRC inspection. Progressively more serious findings are labeled "yellow" and "red," and receive commensurately greater oversight. A more detailed explanation of the NRC's new reactor oversight process can be found on the NRC's website at: www.nrc.gov/NRR/OVERSIGHT/ROP/description.html.

NNECO has 30 days to respond to the notice of violation and 10 days to appeal the NRC's significance determination.

##



*United States
Nuclear Regulatory Commission*

Treatment of Uncertainties in Pressurized Thermal Shock

M. Mayfield, N. Siu

**Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission**

**Presentation to
Advisory Committee on Reactor Safeguards
February 1, 2001**

Introduction

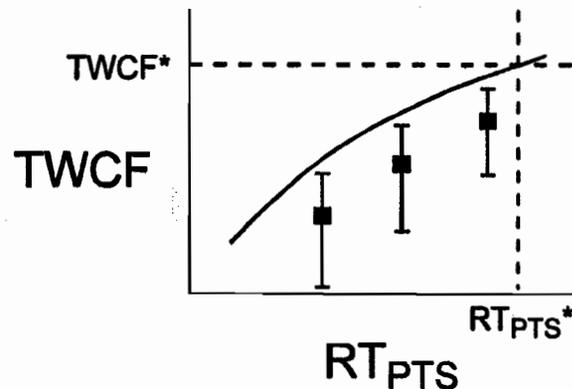
- **Project objective to develop technical basis for potential revision to PTS Rule 10 CFR 50.61 for PWR plants**
- **First major application of risk informed methodology to an adequate protection rule**
- **Evaluating 4 plants in an effort to develop generic approach**
 - **4 Plants: Oconee-1, Calvert Cliffs-1, Palisades, and Beaver Valley-1**
 - **No intention to do plant specific evaluation for PWR fleet**
 - **Use best available tools for analysis**
- **This is one of a continuing series of briefings to**
 - **Provide in-progress summaries in major areas**
 - **Solicit committee feedback**
 - **No letter is requested at this time.**
- **Key issue to be discussed today -- *treatment of uncertainties* in major areas**
- **Some of the comments from the January 18, 2001 Joint Subcommittee briefing are addressed today**

Outline

- **Objectives and conceptual approach**
- **Analysis overview**
- **Status: PRA, T/H, and PFM**
- **Draft PRA results**
- **T/H approach**
- **PFM approach**
- **Key issues and summary**

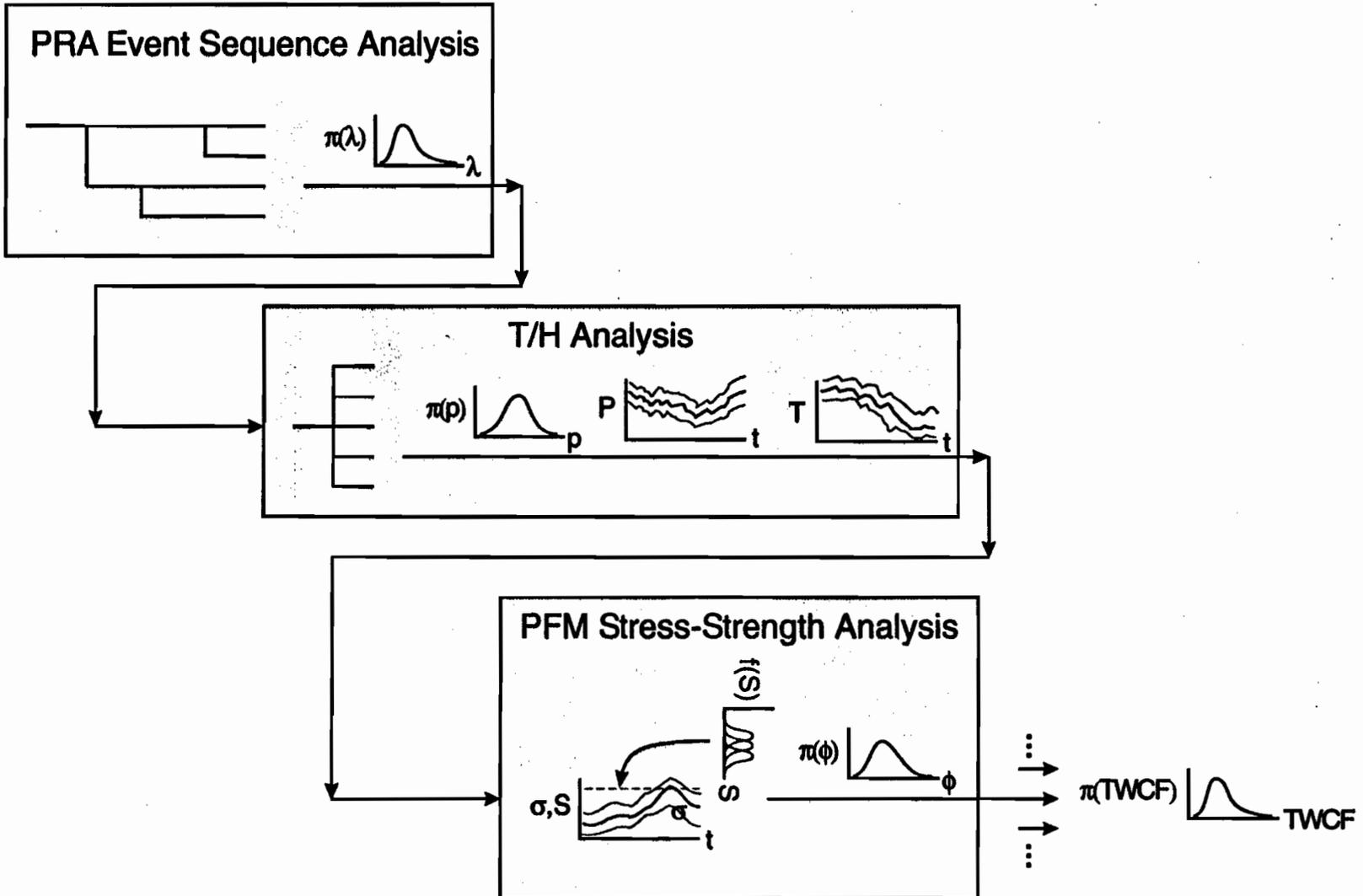
Objective and General Approach

- **Assess uncertainties in estimates of PTS risk**
- **Process supports**
 - **development of screening criterion, e.g.,**



- **development of technical basis for revising RG 1.154**
- **Analysis involves**
 - **categorization of sources of uncertainty**
 - **construction of aleatory model**
 - **propagation of epistemic uncertainties through aleatory model**

A Conceptual Model



Simplifications

- **Resource constraints:**
 - RELAP5 run times
 - Pre- and postprocessing requirements

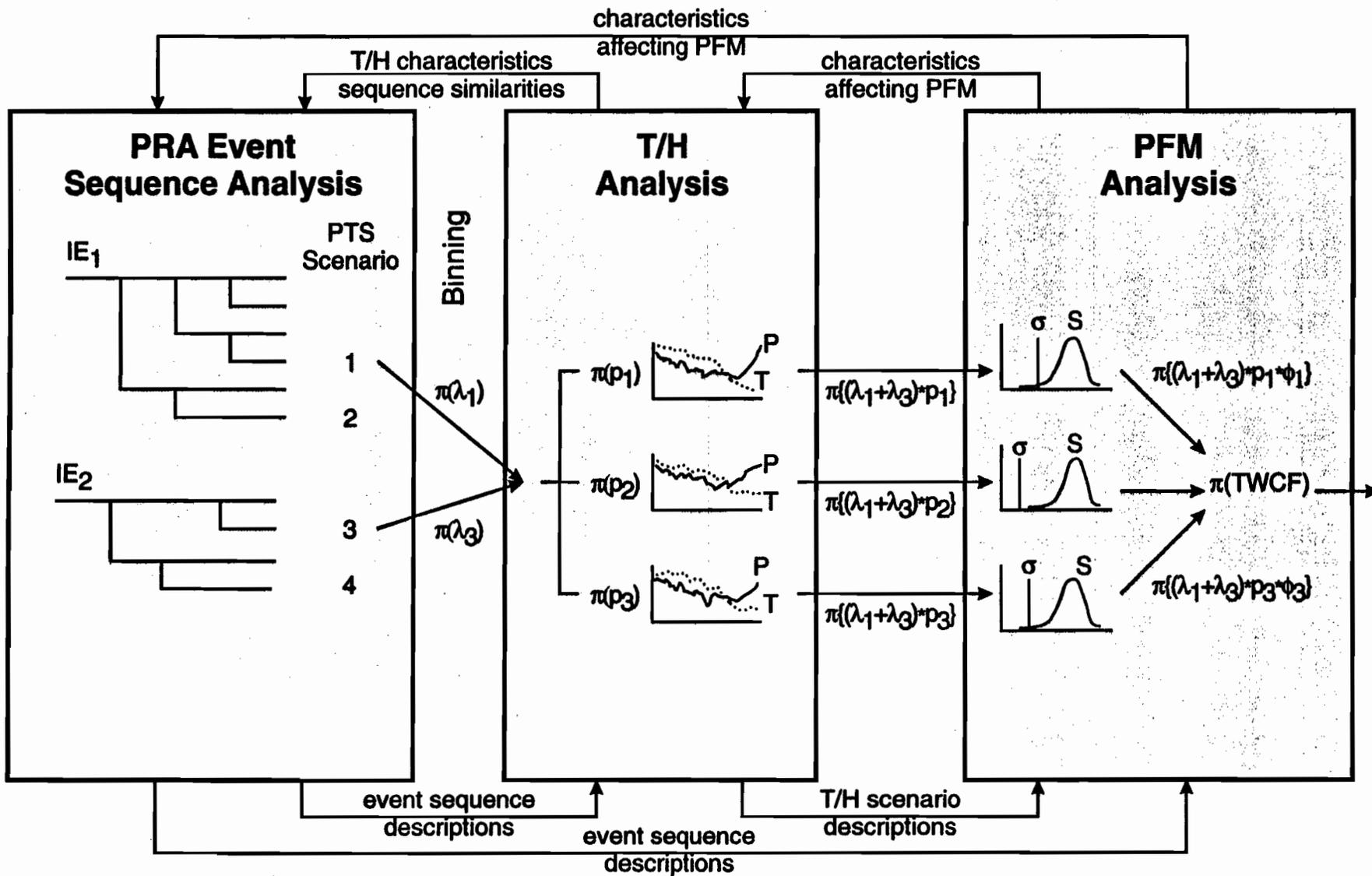
⇒ **Bin similar sequences**

- **Model uncertainties**
 - Formal methods under development
 - Limited data

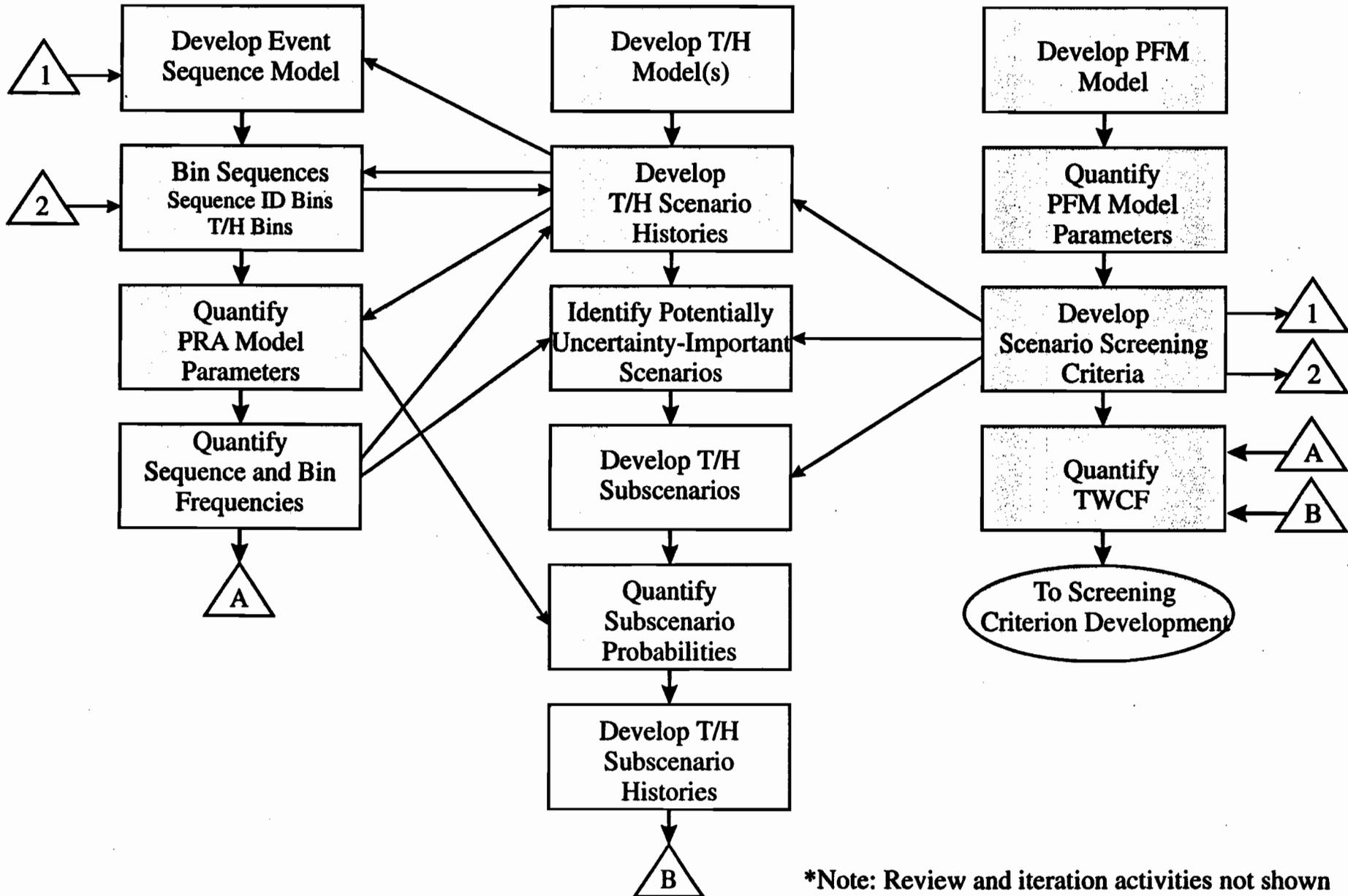
⇒ **Quantify parameter, boundary condition, and submodel uncertainties**

⇒ **Supplement with information from experiments and selected sensitivity studies**

Framework



Overall Analysis Process and Key Interactions*



*Note: Review and iteration activities not shown

Current Status: Treatment of Uncertainties

- **Aleatory model developed**
- **Model parameters categorized**
- **PRA event sequence analysis**
 - **distributions for scenario frequencies developed for Oconee scoping study**
 - **distributions to be revised as part of iteration process**
- **T/H analysis**
 - **have identified classes of scenarios where boundary condition uncertainties dominate model structure uncertainties**
 - **potentially important parameters identified**
 - **process for quantifying subscenario probabilities (split fractions) proposed**
 - **process to be demonstrated as part of Oconee analysis**

Current Status (cont.)

- **PFM analysis**
 - **distributions for most model parameters (e.g., flaw number and characteristics, fluence, chemistry) quantified**
 - **approach for treating uncertainties in fracture toughness and RT_{NDT} being developed**
 - **FAVOR undergoing modification**

Draft PRA Results Overview - Oconee 1

Description	T/H Run	Preliminary Estimates* Challenge Frequency (/yr)			P{TWC(S)}
		5th	Mean	95th	
SBLOCA (2"), HPI on full	3	1E-5	3E-5	7E-5	TBD
SBLOCA (2.8"), HPI on full	4	4E-8	3E-7	1E-6	TBD
Large MSLB, EFW feeding faulted SG, HPI on full	25	4E-5	9E-5	2E-4	TBD
Large MSLB, EFW feeding faulted SG, HPI throttled	27	9E-5	1E-4	1E-4	TBD
SBLOCA (1"), 2 MS-SRV stuck open, HPI on full, HZP	31	2E-11	9E-6	3E-5	TBD
Reactor trip, SRV stuck open, HPI on	34	2E-5	8E-5	2E-4	TBD

*Estimates will be revised following a review of the initial integrated analysis results

Example - Draft PRA Results Decomposition

- **Large main steam line break**
 - **9 top events modeling isolation, feedwater response, high pressure injection, reactor coolant pumps**
 - **multiple potentially challenging end states possible**
 - **a contributing sequence (frequency $\sim 5 \times 10^{-6}/\text{yr}$)**
 - Large steam line break**
 - Operators fail to isolate break**
 - Operators fail to isolate flow to faulted S/G**
 - Operators fail to throttle HPI flow**
- **Binned into T/H Run 25**
- **Issues to be addressed**
 - **binning of sequences**
 - **time frame for operator actions**
 - **dependencies**
 - **uncertainties**

Uncertainties in T/H Analysis

- **Identify key sources of uncertainty**
 - boundary conditions (e.g., timing of events, size of breaks)
 - models
- **Classify scenarios regarding relative importance of uncertainty sources**
 - single-phase
 - two-phase
- **For single-phase scenarios which appear to be important contributors to PTS risk**
 - use representative boundary condition variations to define subscenarios
 - quantify distributions for subscenario probabilities (split fractions)
 - identify appropriate T/H run or perform additional run
- **For two-phase scenarios, follow a similar approach and also investigate potentially dominant sources of model uncertainty**

RFM

Resistance

Initiation Toughness (K_{Ic}) at a Fixed Relative Temperature

$T - RT_{NDT(t)}$
Relative Temperature

T
Crack Tip Temp.

T/H

$RT_{NDT(t)}$
Transition Temp. after Irradiation

$RT_{NDT(u)}$
Transition Temp. Before Irradiation

ΔT_{30}
Transition Temperature Shift due to Irradiation

Conditional Probability of Crack Initiation

C

Driving Force

Applied K_I

Stress Intensity Factor Calc.

Vessel Design

Flaw Density

Flaw Size

P(t)

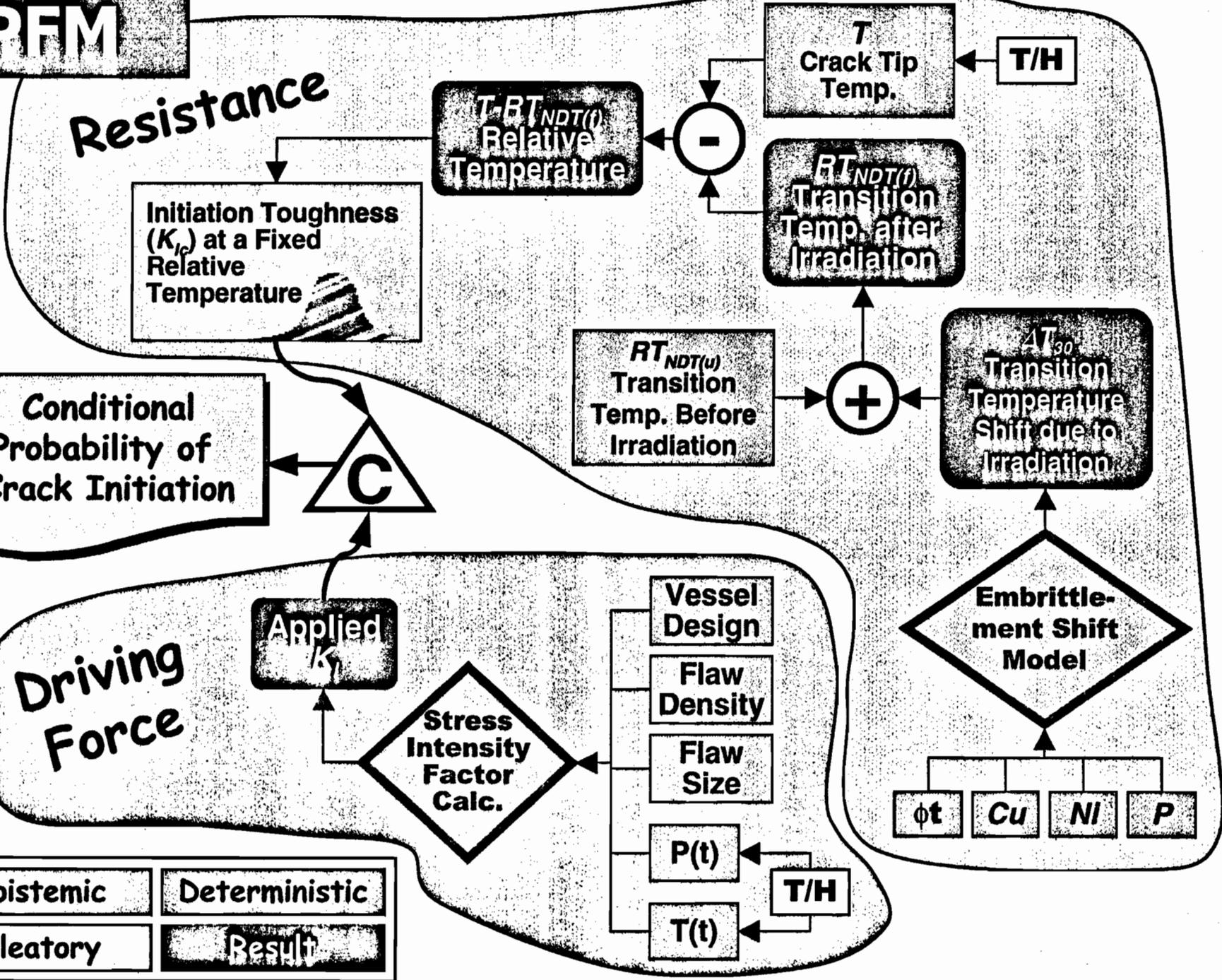
T(t)

T/H

Embrittlement Shift Model

ϕt Cu Ni P

Epistemic	Deterministic
Aleatory	Result



Key Issues

- **PRA event sequence analysis**
 - **uncertainties in success criteria (especially for human actions)**
 - **other uncertainties in human failure event probabilities**
- **T/H analysis**
 - **model uncertainties (2 ϕ scenarios)**
 - **parameter distributions**
- **PFM analysis**
 - **uncertainties in fracture toughness and irradiation shift**
 - **uncertainties in crack arrest**
- **Integrated analysis: uncertainties in binning process (especially “sequence identifier” -> T/H runs)**

Summary

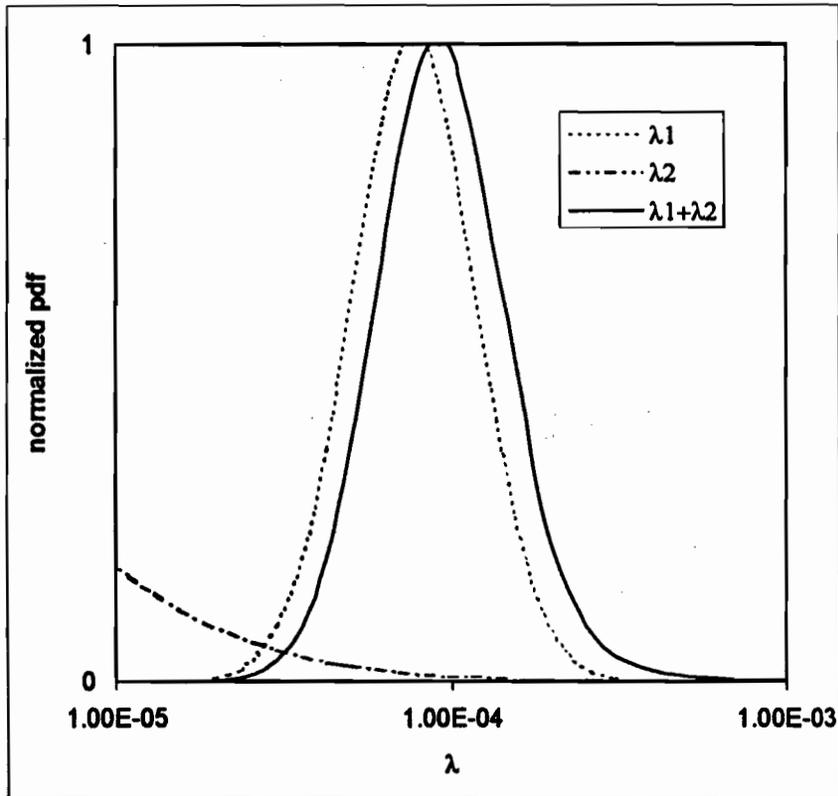
- **Analysis consistently treats uncertainties across different disciplines**
- **Approach quantifies most potentially important sources of uncertainty**
 - **model parameters, T/H boundary conditions and submodels**
 - **model structure uncertainties treated qualitatively**
 - **may need to refine models, depending on results of experiments and sensitivity analyses**
- **Approach will be documented in white paper update**
- **Work is in progress**
 - **currently iterating on initial results**
 - **scoping results expected later in February; full results in late Spring**
- **Approach may be useful in other risk-informed applications**

Backup Slides

**Treatment of Thermal Hydraulic Uncertainties in Pressurized
Thermal Shock**

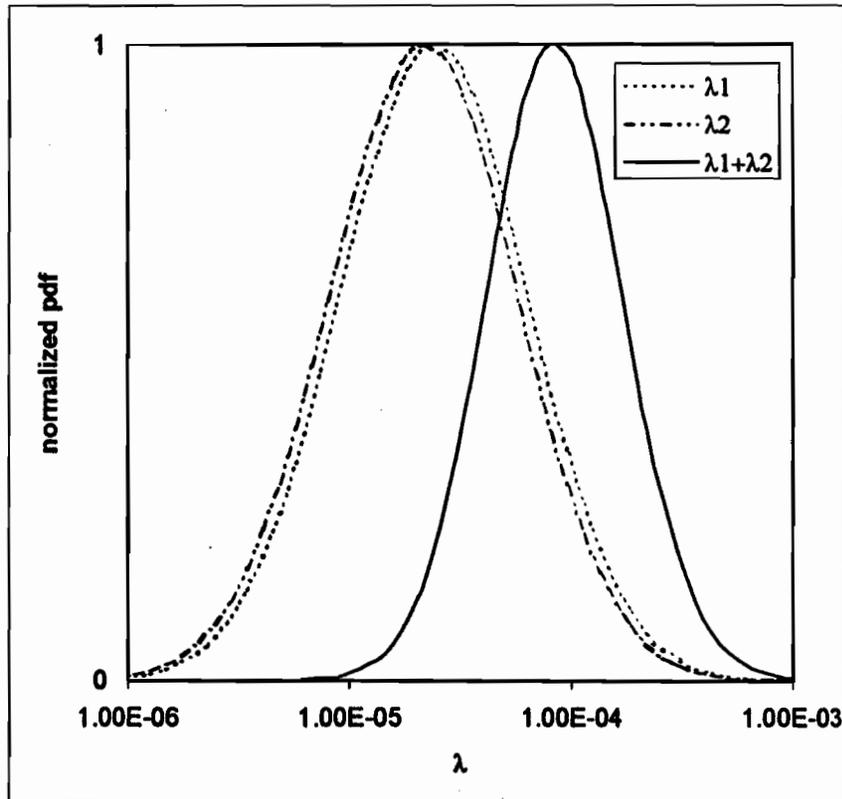
February 1, 2001

Dominant Effect of Dominant Sequences



	Mean	RF	5 th	95 th
λ_1	1.0E-4	2	4.6E-5	1.8E-4
λ_2	5.0E-5	20	4.8E-7	1.9E-4
$\lambda_1 + \lambda_2$	1.5E-4	2.3	5.5E-5	3.0E-4

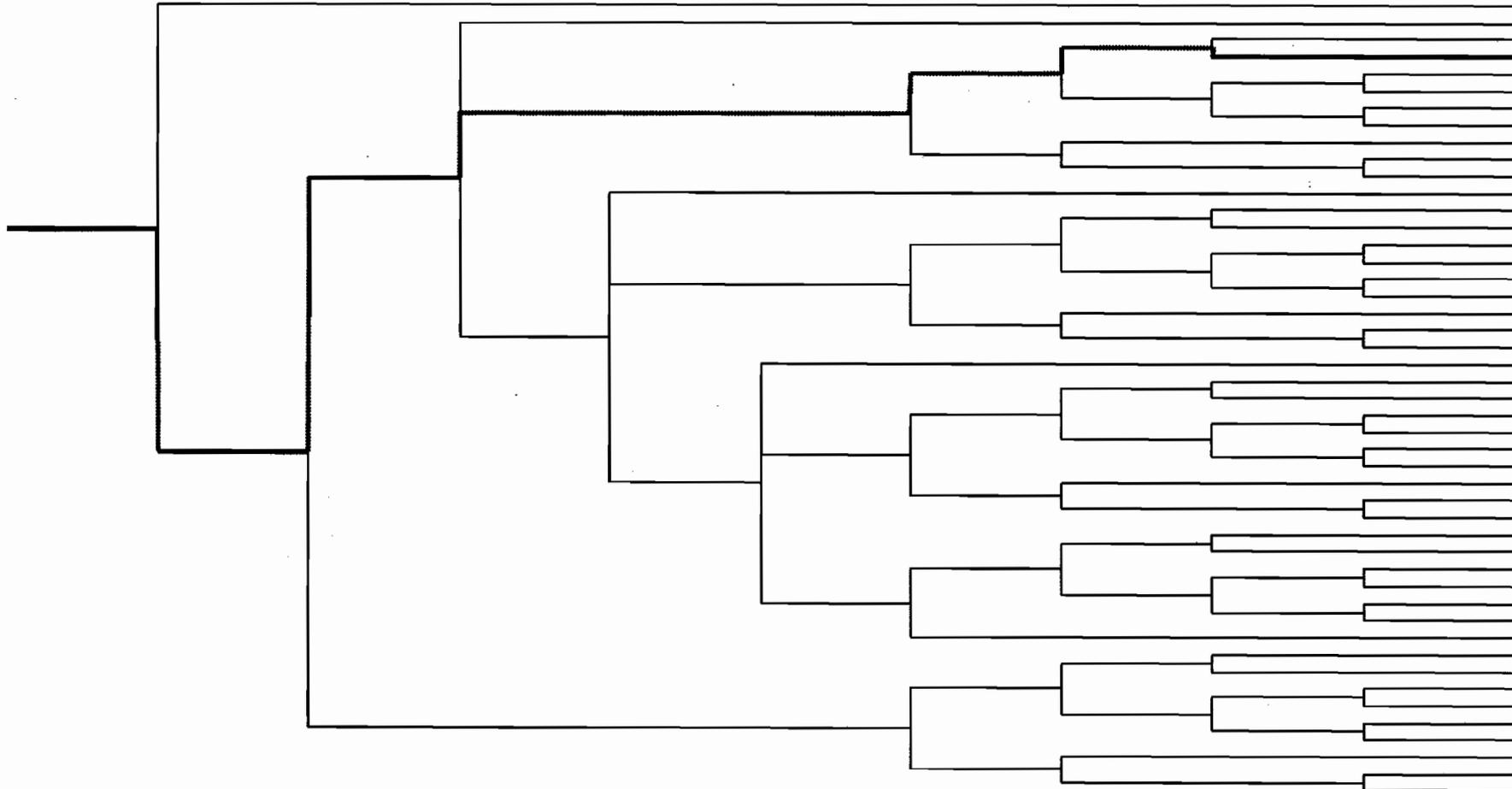
Narrowing Effect of Adding Sequences



	Mean	RF	5 th	95 th
λ_1	1.0E-4	5	1.2E-5	3.1E-4
λ_2	9.0E-5	5	1.1E-7	2.8E-4
$\lambda_1 + \lambda_2$	1.9E-4	3	4.4E-5	4.5E-4

MSLB Event Tree

Large Steam Line Break	Fail to Isolate SLB2	MFW Response to IE	EFW Response to MFW Trip	Fail to Recover from EFW-FTS	Condensate Booster Pumps Fail	HPI/F&B Response	RCP Trip (Loss of RCS Subcooling)	Fail to Throttle HPI Flow	Fail to Restart RCPs
------------------------	----------------------	--------------------	--------------------------	------------------------------	-------------------------------	------------------	-----------------------------------	---------------------------	----------------------

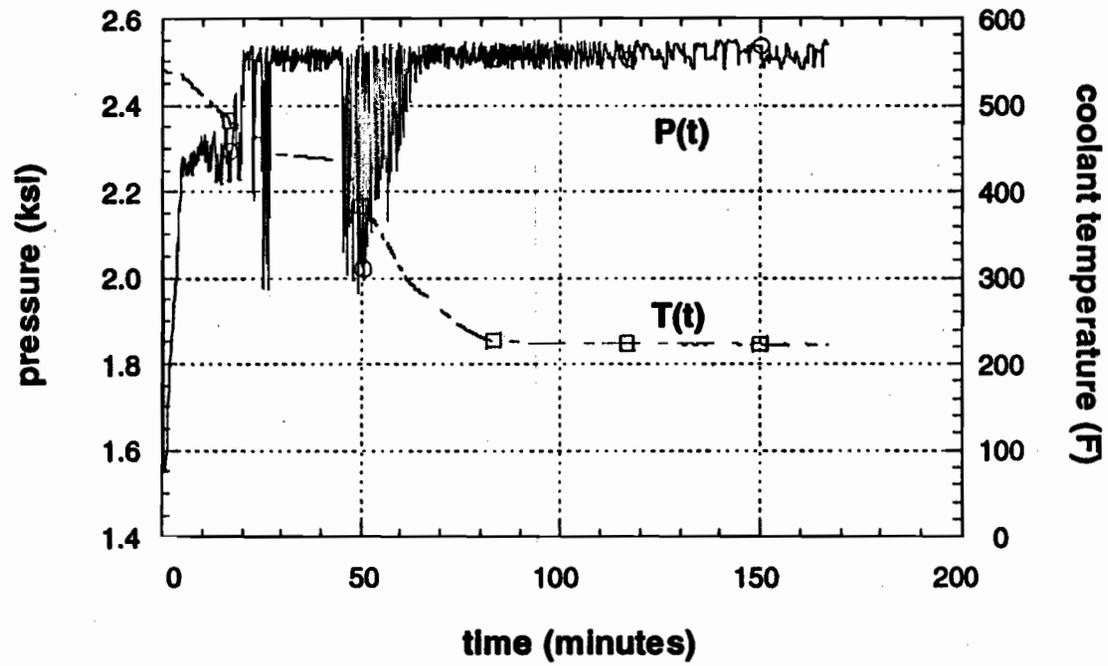


Description: T/H Run 25

- **Main Steam Line Break (severed main steam line at S/G-A outlet).**
- **Steam Line Break (SLB) Isolation circuit trips main feedwater (MFW) pumps, but turbine-driven emergency feedwater (EFW) pump is not tripped by the SLB isolation circuit. (At Oconee, the motor driven EFW pumps are not tripped by the SLB isolation circuit.)**
- **EFW system provides flow to faulted S/G (i.e., S/G-A) only. Flow controlled to maintain level in S/G. All heat removal is through faulted S/G, therefore no flow to intact S/G.**
- **High pressure injection (HPI) actuates at 21 seconds into transient.**
- **Control room operators do not throttle HPI flow.**

All other primary and secondary functions are assumed to be normal.

Thermal hydraulics input for Oconee transient case 25



PFM

Resistance

Arrest Toughness (K_{Ia}) at a Fixed Relative Temperature

$T - RT_{NDT(t)}$
Relative Temperature

T
Crack Tip Temp.

T/H

$RT_{NDT(t)}$
Transition Temp. after Irradiation

$RT_{NDT(u)}$
Transition Temp. Before Irradiation

ΔT_{30}
Transition Temperature Shift due to Irradiation

Embrittlement Shift Model

ϕt Cu Ni P

Conditional Probability of Vessel Failure

C

Driving Force

Applied K_I

Stress Intensity Factor Calc.

Vessel Design

Flaw Density

Flaw Size

$P(t)$

$T(t)$

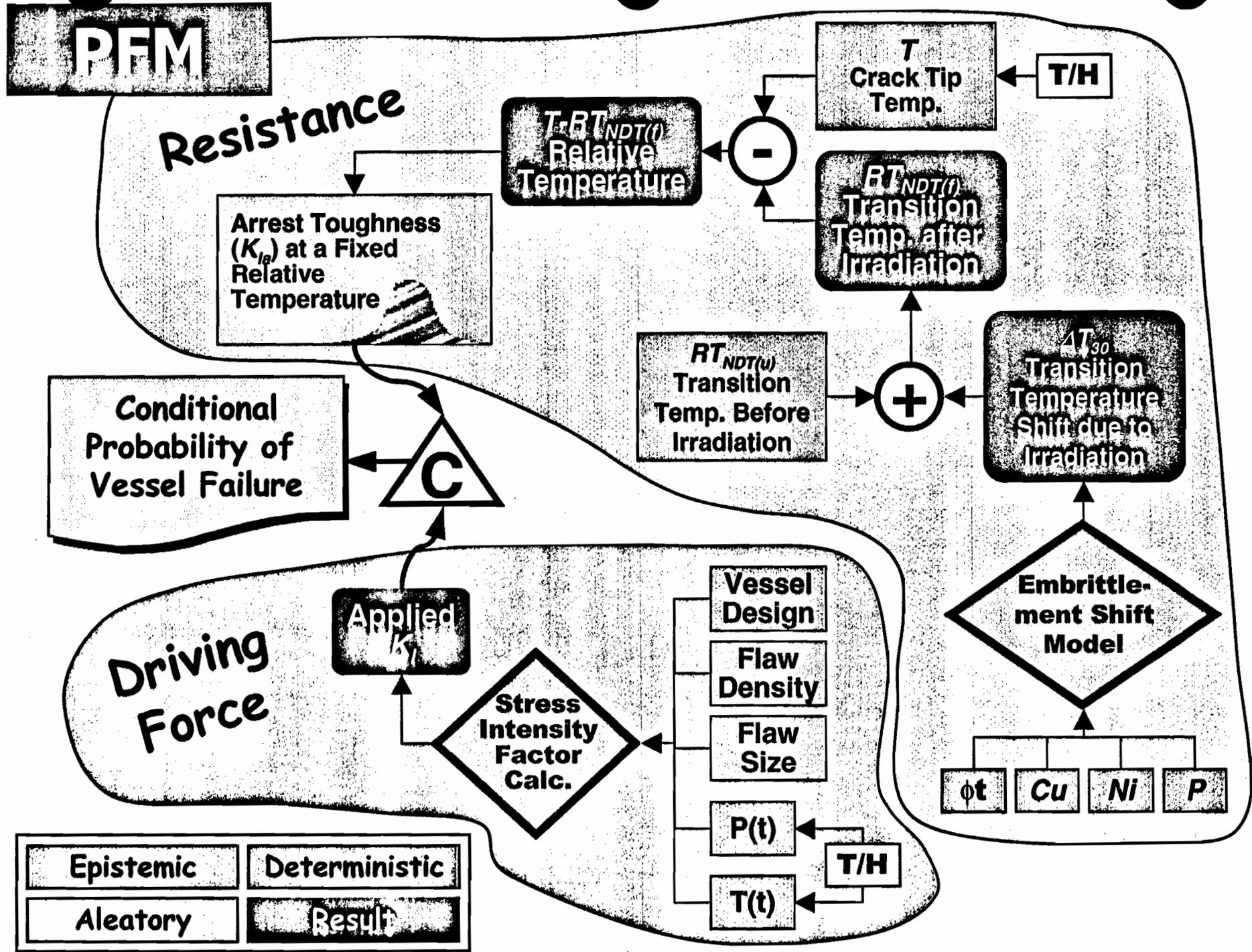
T/H

Epistemic

Deterministic

Aleatory

Result



Categorization of Key Parameters

<u>Variable/Parameter</u>	<u>Uncertainty Category</u>
initiating event frequencies	epistemic
component unavailabilities	epistemic
human failure event probabilities	epistemic
event occurrence times	aleatory*
flow areas	aleatory*
flow rates	aleatory*
fluid temperatures (feedwater, HPI)	aleatory*
decay heat	aleatory*
chemistry (Cu, Ni, P)	epistemic
neutron fluence	epistemic
flaw characteristics (density, size, location)	epistemic
K_{lc} scatter	aleatory*

*all aleatory models may have significant epistemic uncertainties

PFM

Resistance

Initiation Toughness (K_{I0}) at a Fixed Relative Temperature

$T-RT_{NDT(f)}$ Relative Temperature

$RT_{NDT(f)}$ Transition Temp. after Irradiation

T/H

Crack Tip Temp

ΔT_{30} Transition Temperature Shift due to Irradiation

Embrittlement Shift Model

σ σ_{max} σ_{min} P

Conditional Probability of Crack Initiation

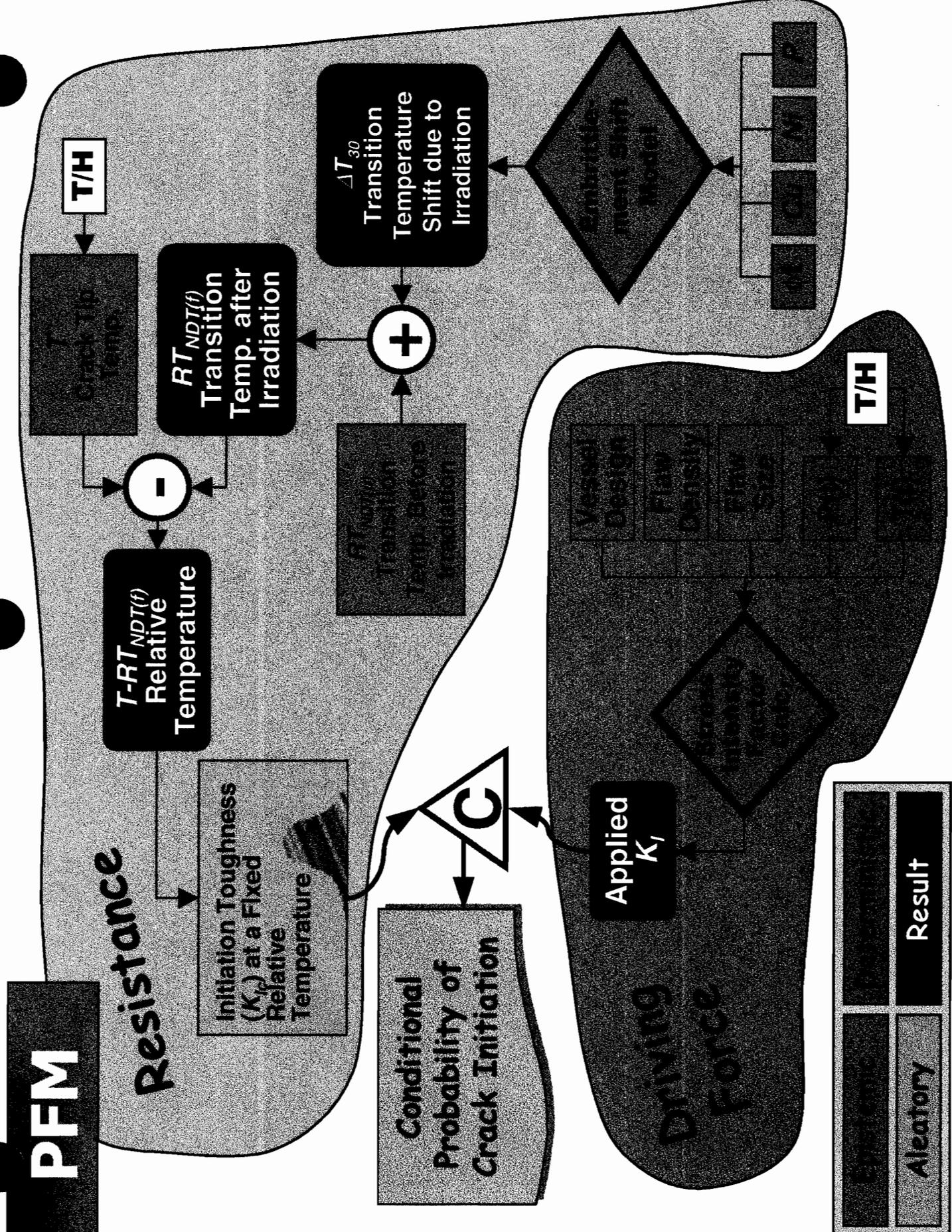
Applied K_I

Driving Force

Crack Tip Stress Intensity Factor

Systemic	Result
Alcatory	

T/H



**S-RELAP5
STAFF REVIEW**

**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
FEBRUARY 1, 2001**

**RALPH R. LANDRY
REACTOR SYSTEMS BRANCH
DIVISION OF SYSTEMS SAFETY AND ANALYSIS**

S-RELAP5 REVIEW STAFF EVALUATION

TOPICS COVERED

- **Milestones**
- **Code modifications**
- **Assessment**
- **Regulatory requirements**
- **Conclusions**

S-RELAP5 REVIEW STAFF EVALUATION

REGULATORY REQUIREMENTS

- **Modeling requirements of 10 CFR Part 50, Appendix K, such as Moody critical flow, have been incorporated**
- **Assessment conforming to the intent of NUREG-0737, Section II.K.3.30 has been performed**
- **Further assessment beyond that required, including an informal Phenomena Identification and Ranking Table, has been performed**
- **Sensitivity studies investigating the break spectrum, effect of time step size, loop seal model, pump model, radial flow form loss coefficients, and nodalization have shown the impact of each on the PCT to be less than 5°F**
- **The solution has been shown to be converged**

S-RELAP5 REVIEW STAFF EVALUATION

CONCLUSIONS

- **ANF-RELAP code (approved by the staff) has been modified to incorporate RODEX2, TOODEE2, and ICECON in a single, integrated code**
- **The code documentation supports the modifications made to the ANF-RELAP code, and the staff accepts those modifications, such as the numeric solution method, heat transfer correlations, assessment cases, and so on**
- **The staff has noted that errors occur in the documentation and that they will be corrected in the publication of the approved version of the code manuals**
- **The Siemens Power Corporation has been very responsive to the concerns expressed by the staff and has been very cooperative in the conduct of the S-RELAP5 review**
- **The staff finds the S-RELAP5 code acceptable for use in satisfying the requirements for analysis of the Small-Break LOCA event under the requirements of 10 CFR Part 50, Appendix K**

SIEMENS

Siemens PWR Appendix K SBLOCA Analysis

Presented by: Jerry Holm
Joe Kelly

Advisory Committee on Reactor Safeguards
February 1, 2001



12801
JANUARY 2001

SIEMENS

Agenda

- Introduction Jerry Holm
- S-RELAP5 Code Joe Kelly
 - Relationship to RELAP5
 - Summary of Siemens Enhancements
- Appendix K Small Break LOCA Methodology Joe Kelly
 - Summary of Methodology
 - Summary of Validation
- Conclusion Jerry Holm

12801
JANUARY 2001

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Methodology Vision

- **PWR Methodology Vision**
 - SBLOCA - Appendix K SBLOCA Using S-RELAP5 (under review)
 - LBLOCA - Realistic LBLOCA Methodology Using S-RELAP5 (submittal in 2001)
 - Non-LOCA - Non-LOCA Methodology Using S-RELAP5 (under review)
- **BWR Methodology Vision**
 - LBLOCA and SBLOCA - Appendix K Using S-RELAP5 (future development)
 - Non-LOCA - Non-LOCA Methodology Using S-RELAP5 (future development)

SIEMENS

SIEMENS

Information Provided to Support Review Process

- **Topical Report - PWR Appendix K SBLOCA Methodology**
- **Supporting Documentation**
 - Models & Correlations Manual
 - Programmer's Guide
 - Input Requirements Manual
 - Code Source and Executable
 - Sample Problem Input
- **Presentation to NRC**
- **Presentations to ACRS Thermal-Hydraulic Subcommittee**
- **Response to RAIs**

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S-RELAP5 Code for Appendix K SBLOCA Analysis

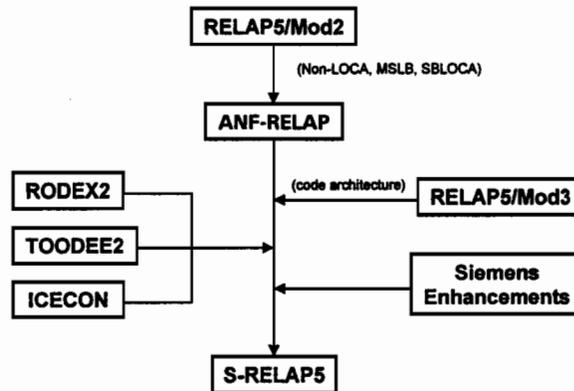
- Outline
 - S-RELAP5 T/H Code
 - Relationship to RELAP5
 - Summary of Siemens Enhancements
 - SBLOCA Appendix K Methodology
 - Methodology Overview
 - Validation Matrix
 - SBLOCA Example: BETHSY 9.1b (ISP-27)

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S-RELAP5 Code for Appendix K SBLOCA Analysis

- Relationship to RELAP5 Codes:



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JANUARY 1992

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S-RELAP5 Code for Appendix K SBLOCA Analysis

- **Summary of Siemens Enhancements:**
 - **Mass Conservation**
 - Improved numerics to minimize mass error during long-term transients
 - **Energy Conservation**
 - Reformulated energy equation to avoid error associated with flow across large pressure drop
 - **Momentum Conservation**
 - Implemented 2-D component to avoid flow anomalies associated with cross-flow junctions (e.g., reactor core)
 - **Constitutive Models**
 - Numerous upgrades (primarily for LBLOCA) and modifications to vertical stratification model that improve loop seal clearing behavior

SIEMENS

S-RELAP5 Code for Appendix K SBLOCA Analysis

- **Long-Term Mass Conservation**
 - Results from integral assessments and SBLOCA sample problem:

	Transient Time (sec.)	No. of Time Steps	Mass Error (%)
Semiscale	300	3.0×10^4	-1.76×10^{-4}
LOFT	1500	1.5×10^5	-8.22×10^{-4}
BETHSY	7690	1.3×10^6	1.66×10^{-3}
PWR Sample Problem	3800	3.6×10^5	-1.31×10^{-4}

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S-RELAP5 Code for Appendix K SBLOCA Analysis

- Methodology Overview
 - Siemens defines methodology as the combination of codes used and the application of those codes in the performance of the analysis
 - Methodology is encapsulated in an analysis guideline and quality assurance procedure that:
 - Specifies the plant model nodalization
 - Ensures Appendix K conservatisms are applied
 - Prescribes additional Siemens conservatisms to be applied
 - (e.g., loop seal modeling & diesel start time)
 - Constrains adherence to guidelines by analysts

SIEMENS
S-RELAP5

SIEMENS

S-RELAP5 Code for Appendix K SBLOCA Analysis

- SBLOCA Analysis
 - Four major factors affecting calculated PCT:
 - Determination of limiting single failure
 - Usually loss of diesel generator => only one HHSI available
 - Fuel Cycle
 - Limiting condition is normally EOC with top-skew power profile
 - Break Size
 - Spectrum performed to find limiting case where mass loss is greater than SI make-up and depressurization rate low enough to prolong transient => significant core uncover
 - Loop Seal Clearing
 - PCT affected by which loop and by how many loops clear

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S-RELAP5

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S-RELAP5 Code for Appendix K SBLOCA Analysis

- **S-RELAP5 Validation Matrix**
 - **General Matrix**
 - Selection of separate effects and integral effects tests performed and documented for every code version
 - **SBLOCA**
 - Integral and separate effects tests that is part of SBLOCA submittal
 - **Non-LOCA Transients**
 - Integral effects tests that are part of non-LOCA submittal
 - **Realistic LBLOCA**
 - Extensive PIRT based assessment matrix currently being performed

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S-RELAP5 Code for Appendix K SBLOCA Analysis

- **SBLOCA Validation Matrix**
 - **BETHSY Test 9.1b**
 - **Semiscale Test S-UT-8**
 - **LOFT LP-SB-03**
 - **UPTF Loop Seal Clearing**
 - **2-D Flow Tests**

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S-RELAP5 Code for Appendix K SBLOCA Analysis

- SBLOCA Validation Example:
 - BETHSY 9.1b (ISP-27)
 - BETHSY is a full-height, 1/100 scale model of a 3-loop PWR
 - Test 9.1b models a 2" break with no HHSI:
 - Deep core uncover and rod heat-up
 - S-RELAP5 Assessment
 - Input model follows proposed SBLOCA modeling guidelines,
 - Loop seals (broken & 1 intact) modeled so that #2 clears
 - Critical flow model => realistic estimate of break flow
 - 1-D core model
- Excellent comparison with data for core level and PCT

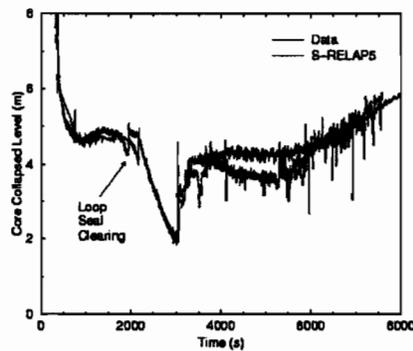
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S-RELAP5 Code for Appendix K SBLOCA Analysis

- BETHSY 9.1b
 - Core Collapsed Liquid Level Comparison



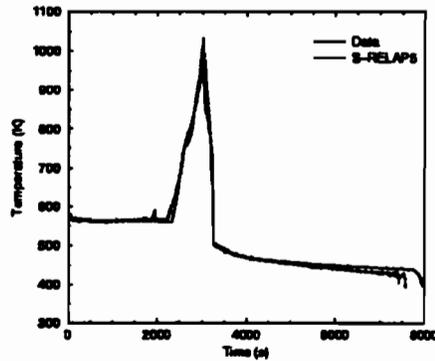
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S-RELAP5 Code for Appendix K SBLOCA Analysis

- BETHSY 9.1b
 - Maximum Clad Temperature Comparison



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S-RELAP5 Code for Appendix K SBLOCA Analysis

- Summary
 - Proposed Siemens SBLOCA methodology:
 - Replaces ANF-RELAP and TOODEE2 with S-RELAP5 thereby streamlining the analysis process, and
 - Improves loop seal clearing behavior
 - Results from PWR sample problem and sensitivity study show:
 - Proposed SBLOCA methodology is convergent and robust
 - SBLOCA assessments show S-RELAP5 captures the phenomena important to SBLOCA (loop seal clearing, core boil-off and recovery) with an acceptable level of accuracy
 - Therefore, the proposed S-RELAP5 based SBLOCA methodology is suitable for licensing analysis

SIEMENS

Conclusion

- SER provides Siemens ability to reference topical report in future licensing submittals without further NRC review
- SER has no additional conditions



ACRS MEETING HANDOUT

Meeting No. 479th	Agenda Item 3.0	Handout No.: 3-1
Title SIEMENS S-RELAP5 APPENDIX K SMALL-BREAK LOCA CODE		
Author: V. SCHROCK		
List of Documents Attached 1. Report from ACRS Consultant V. Schrock " Comments on Draft ACRS Letter on S-RELAP5" , dated January 29, 2001 - (ACRS Internal Use Only)		3
		From Staff Person P. BOEHNERT

ACRS INTERNAL USE ONLY MATERIAL ATTACHED

This report may contain proprietary or other information which should be protected from public disclosure. It should not be released until a review of the document has been completed.

To: Graham Wallis

From: Virgil Schrock

Date: January 29, 2001

Subject: Comments on Draft ACRS Letter on S-RELAP5

I am in general agreement with the draft letter, but I have reservations and concerns about the process being followed.

The SER addresses the approval of S-RELAP5 for use in Appendix K type analysis of SBLOCA only. It specifically refers to Siemens Power Corporation (SPC) report EMF-2328(P) which is not a stand alone document to describe the code. Siemens also provided for review four additional reports which collectively describe the code in a general way, i.e., a code which will also be used for best estimate analysis applications. There are a great many difficulties with the code as a best estimate tool. These have to do with many levels from the fundamental conservation equations and the constitutive equations to numerics, influence of nodding, and adequacy of assessment. I commented on a number of the problems in my report of July 1, 2000. The items revealed there are in my view a limited list and reflect a necessarily limited review of the technical issues. Other people have picked up on additional points. A thorough review will reveal additional problems. Some of my concerns have been reflected in the SER and in the draft ACRS letter. Others have not. It is unclear to me how a code that has yet to be thoroughly examined can be declared approved for a conservative analysis approach. It is not clear that fundamental flaws in basic analysis produce inherently conservative results. Are there no standards for documentation and content of conservative analysis codes? Conservatism is shown by assessment against integral system experimental data. But this approach leaves much doubt because it is limited in nature.

The SER makes the case that S-RELAP5 is derived from RELAP5 and implies that RELAP5 has had sufficient peer review to warrant looking only at differences in S-RELAP5. I don't think this a good argument. I agree with the concern expressed in the draft ACRS letter about the order of regulatory approval and the submittal of satisfactory documentation. I have seen examples of approvals with a caveat that errors in documents had to be fixed but where there was no apparent follow through to assure that final documentation was prepared and was satisfactory (and that it correctly reflects the actual code content). It would be preferable to make approval

contingent upon completion and review of final documentation. The SER appears to me to make a stronger case for the quality of S-RELAP5 than is justified. This may be meant a reward to SPC for their cooperative approach during the review process and thought to be all right because the "real and critical review" will rightly be done during the coming review of the best estimate version. I have never been a supporter of the unlimited use of Appendix K type licensing. What we are seeing here is a good example of how this approach can and will weaken the development of technically sound best estimate methodology.

The closing paragraph of the ACRS letter addresses a major problem, namely that industry management sees no long term benefit to be derived from adhering to high engineering standards in technical communications. This is seen as an unnecessary expense. The letter deals with this very nicely. If anything, the letter is overly tactful in dealing with this issue. It might be added that recent changes in the energy market have made nuclear the lowest in generation cost among the various options (according to Nuclear Energy Institute). The average cost quoted, 1.84 cents per kWh, is far below the current average and suggests that return of an expanding nuclear industry may be near. Now is an ideal time for the industry to make the investment in an improved technical basis for assessing nuclear safety.

**CLOSEOUT OF GENERIC SAFETY ISSUE 152
DESIGN BASIS FOR VALVES THAT MIGHT BE SUBJECTED
TO SIGNIFICANT BLOWDOWN LOADS**

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

**KENNETH KARWOSKI
Division of Engineering Technology
Office of Nuclear Regulatory Research
301-415-6933**

February 1, 2001

**SEEK ACRS ENDORSEMENT OF THE STAFF'S PROPOSAL TO
CLOSE THE ISSUE**

ORIGIN OF GENERIC SAFETY ISSUE (GSI) 152

GSI-152 was raised by the ACRS in 1989 during the review of activities related to GSI-87, "Failure of HPCI Steam Line Without Isolation"

GSI-87 dealt with the ability of the HPCI steam line isolation valves to isolate a postulated pipe break

GSI-87 was subsequently closed with Generic Letter (GL) 89-10, and its supplements

GL 89-10 focused on the ability of motor operated valves (MOVs) to operate consistent with their approved design basis

The focus of GSI-152 was the adequacy of the design basis for valves that might be subjected to significant blowdown loads (i.e., pipe breaks)

"the requirement for safety-related valves to move against high differential pressures and/or high flows experienced during a large downstream pipe break may not have been specified in the design bases"

GL 89-10

Testing done by the Office of Nuclear Regulatory Research for the closure of GSI-87 showed weaknesses in valve performance attributable both to motors and to valve mechanisms

GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance", did not address the adequacy of the design bases, only adequacy of valve performance in meeting the approved design bases

An examination of the design bases was included as part of GL 89-10 but the evaluation of the adequacy of the design bases was a separate issue, (i.e. GSI-152)

Industry sponsored research which confirmed the weaknesses identified in NRC testing

Licensees, reactor manufacturers, and industry groups developed "working groups" to address these weaknesses

GL 89-10 had 7 supplements spanning from 1989 to 1996

ADEQUACY OF DESIGN BASIS

Although GL 89-10 was focused on the ability of MOVs to operate as designed, the issue of adequacy of the design bases contained in GSI-152 was captured by industry initiatives, and confirmed during NRC inspections which included the reasonableness of the design bases

NRC inspections conducted to examine GL 89-10 programs also addressed the adequacy of design bases and whether they included the differential pressure associated with a large downstream break—the subject of GSI-152

A priority focus was on the high risk significant valves of HPCI, RCIC, and RWCU MOVs (GL 89-10 Supplement 3)

Lessons learned regarding valves other than MOVs were reported to the licensees by NRC and were voluntarily incorporated by the industry groups into their programs addressing all valve types

CLOSURE OF GSI-152

The ACRS Subcommittee on Mechanical Components was briefed on industry MOV activities and other MOV related items on October 5, 1993

The Subcommittee Chairman who had originally raised the concern stated he was satisfied the issue was adequately addressed and could be closed

RES confirmed the actions taken by licensees by reviewing historical documents including licensee documents submitted in response to GL 89-10, GL 89-10 inspection guidance, and GL 89-10 inspection reports

Based on the actions taken by industry in response to GL 89-10 and confirmed in NRC inspections, there is sufficient evidence to close GSI-152, and no further action is necessary

**REGULATORY EFFECTIVENESS OF THE
ANTICIPATED TRANSIENT WITHOUT SCRAM (ATWS) RULE**

BY
BILL RAUGHLEY
GEORGE LANIK

OFFICE OF NUCLEAR REGULATORY RESEARCH
DIVISION OF SYSTEMS ANALYSIS AND REGULATORY EFFECTIVENESS
REGULATORY EFFECTIVENESS ASSESSMENT AND HUMAN FACTORS BRANCH

BACKGROUND

- **Draft Report, “Regulatory Effectiveness of the ATWS Rule” for internal and external comment**
- **ATWS definition and effects**
 - Initiating event frequency
 - Reliability of the reactor protection system (RPS)
 - Reliability of ATWS mitigation systems
- **ATWS rule historical considerations**
 - Considerable uncertainty in frequency and consequences
 - BWR and PWR ATWS events
 - Technical basis and regulatory analysis
- **ATWS Rule 10 CFR 50.62 and Commission recommendations**
 - Modifications to improve capability to prevent and mitigate an ATWS
 - Reduce the number of automatic scrams and improve RPS reliability

ASSESSMENT

- **Regulatory Effectiveness**

- SBO assessment used as the template
- A regulation is effective if expectations are being achieved

- **Scope**

- Is the ATWS rule effective and if any areas need attention
- Plant specific problems not addressed

- **Method**

- Compared the expectations to the outcomes using objective measures in areas of risk, value-impact, modifications, and operating limits
- Expectations from NRC documents
- Outcomes from NRC PRA/IPE databases, LERs, NRC surveys, and NRC reliability studies

RESULTS

- **Hardware modifications and operating limitations implemented**

- All PWRs installed diverse means to trip turbine and initiate auxiliary feedwater
- CE and B&W PWRs installed a diverse scram system (DSS)
- Westinghouse low unfavorable exposure time (UET), no DSS
- BWRs installed diverse recirculation pump trip, alternate rod insertion circuitry, high capacity standby liquid control; upgrade EOPs

- **Mean frequency of automatic scram decreased**

- From 4 scrams per reactor year since 1983 to 0.5 since 1997 accounts for one order magnitude reduction in expected frequency of an ATWS

- **RPS reliability expectations met using data since 1984**

- Reactor trip breaker (RTB) failures persist along with industry efforts to address

- **Frequency of an unmitigated ATWS or $P(ATWS) < 1.0E-05$**

- **Costs less than expected due to fewer spurious scrams**

COMMENTS

- **Stakeholder Comments**

- Internal NRC comments
- External stakeholders including:
 - Union of Concerned Scientists
 - Westinghouse Owners Group
 - General Electric
 - CE Owners Group

- **More significant comments**

- risk approach too simplistic
- scram reduction not considered in value-impact outcome
- PWR ATWS peak pressure sensitivity to relief capacity important
- MTC/UET, steam generator tube issues
- fuel management issues need more emphasis
- operator action should have more credit

- **Each comment will be addressed**

CONCLUSIONS

- **ATWS rule was effective in installing modifications and reducing risk; and was implemented at reasonable cost.**
- **Uncertainties in RPS reliability and mitigative capability need to be fully considered in risk-informed regulatory changes.**

THE NRC AND MIXED OXIDE FUEL



ACRS Briefing
Tim Johnson
February 2, 2001

NRC's ROLE IN MOX

- Overview
- The Licensing Process
- NEPA
- Public Hearings
- Public Participation
- Issues
- Activities to Date / Schedule

AN OVERVIEW OF MIXED OXIDE FUEL AND THE NRC

A BRIEF HISTORY

- Agreement with Russia
- Reduce the spread of nuclear weapons

A BRIEF HISTORY

- DOE hybrid approach
 - ▶ Convert approximately 25 metric tons plutonium to MOX fuel;
 - ▶ Immobilize approximately 9 metric tons plutonium;
 - ▶ Fabricate the MOX fuel at Savannah River site;

- Contract to license, build and operate the MOX fuel plant -Duke Cogema Stone & Webster (DCS)

NRC Role in Regulating Mixed Oxide Fuel



Yellow = NRC regulated

Blue = DOE regulated

MOX FUEL FABRICATION PROCESS

Overview

- Aqueous polishing
 - ▶ Remove impurities
 - ▶ Based on process at La Hague in France
- Fuel fabrication
 - ▶ Mixing, blending, pelletizing, sintering, grinding, fuel rod / fuel bundle assembly
 - ▶ Based on process at MELOX in France

THE NRC LICENSING PROCESS

AREAS OF NRC REVIEW

- Fuel fabrication
- Transportation
- Reactors
- Spent fuel disposal

ACTIVITIES REQUIRING NRC APPROVAL

Fuel Facility

- Two-stage licensing process
 - ▶ Construction
 - ▶ Operation

CONSTRUCTION

Fuel Facility

- Content of construction application -10 CFR 70.22(f)
 - ▶ Site description
 - ▶ Safety analysis of the design bases
 - ▶ Quality assurance program
- Approval of construction application
 - ▶ 10 CFR 70.23(a)(7), 70.23(a)(8), 70.23(b)

OPERATION

Fuel Facility
10 CFR 70.22 and 70.65

- Safety analysis
- Safety equipment / operator actions
- Management measures
- Emergency plan
- Physical protection plan
- Material accounting plan

**NATIONAL ENVIRONMENTAL
POLICY ACT (NEPA)**

ENVIRONMENTAL IMPACT STATEMENT (EIS)

- Required for major federal actions

- Licensing the fuel fabrication facility pursuant to 10 CFR Part 51

DOE's EIS

Previous NEPA Work By DOE

- **DOE EIS for MOX**
- **Record of Decision**
- **Link to NRC EIS**

THE NEPA PROCESS

Receive Environmental Report



Issue Notice of Intent



Public
Input



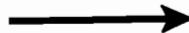
Initiate Scoping Process



Coordinate with
Federal/State agencies



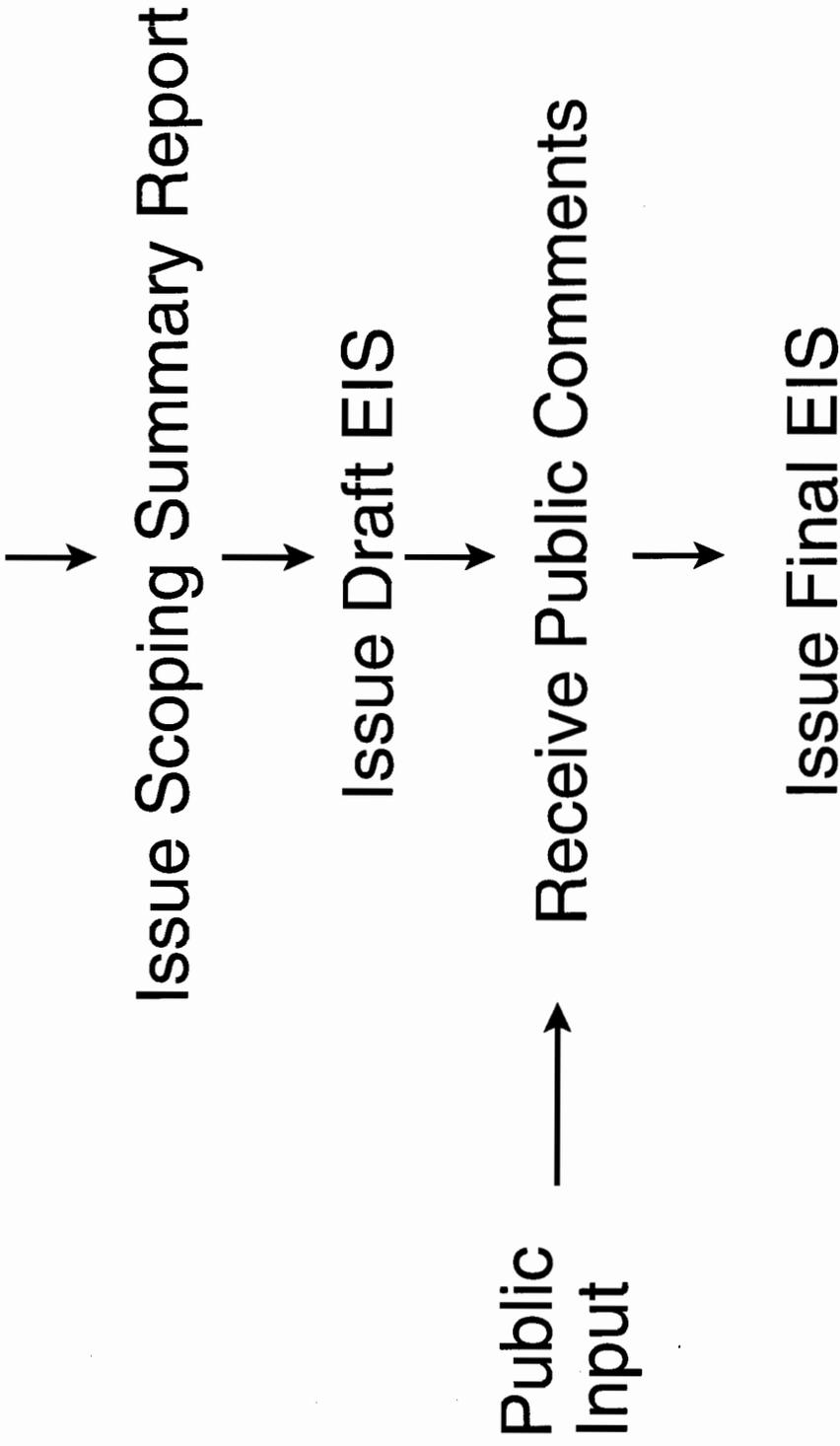
Public
Input



Receive Public Comments



THE NEPA PROCESS



HEARINGS

PUBLIC HEARINGS

- Two opportunities for hearing
 - ▶ Construction authorization stage
 - ▶ Operating approval stage

- 10 CFR Part 2, Subpart L- Informal Hearings

PUBLIC PARTICIPATION

PUBLIC PARTICIPATION

- **Communications plan completed in December 2000**
- **NEPA**
 - **Scoping meetings; public comments**
- **Opportunities for hearings**
- **Periodic public meetings**
- **MOX website**
 - **<http://www.nrc.gov/NRC/NMSS/MOX/index.html>**
- **MOX newsletter**
- **ADAMS**

ISSUES

- Technical issues
- Lead test assemblies
- DOE security-related MOU
- First application of revised Part 70
- Subpart L public hearings

ACTIVITIES TO DATE / SCHEDULE

ACTIVITIES TO DATE

- Standard Review Plan for MOX fuel facility (NUREG-1718) completed August 2000
- MOX website online October 2000
- Technical meetings
- Public meetings in South Carolina in July 2000

SCHEDULE

Fuel Facility

- Environmental report received 12/19/00
- Application for construction authorization fuel fabrication facility expected February 2001
- Start of construction of fuel fabrication facility assuming favorable SER scheduled in September 2002
- Operating license application fuel fabrication facility expected June 2002

SCHEDULE

Reactors

- Amendments for use of MOX lead test assemblies (LTAs) expected August 2001
- Irradiation of LTAs at McGuire scheduled to begin October 2003
- License amendment application to use MOX fuel (other than LTAs) in McGuire/Catawba reactors expected January 2004
- MOX fuel irradiation at McGuire/Catawba scheduled September 2007

**ANTICIPATED WORKLOAD
FEBRUARY 1-3, 2001**

LEAD MEMBER	BACKUP	ENGINEER	ISSUE	FULL COMM. REPORT	SUBC. MTG.	
					CHAIR.	MEMBER
Apostolakis	--	Markley	ANS Standard on External-Events PRA	Report	P&P 1/31	Joint M&M/THP 1/18 (A.M) Ret. 1/22-24/01
		Larkins	Meeting with the NRC Chairman Meserve			
Kress	--	Weston	Regulatory Effectiveness of the ATWS Rule	Report	--	P&P 1/31 THP 1/16-17 Joint M&M/THP 1/18 (A.M.) ACRS/ACNW Joint Sub. 1/19 Ret. 1/22-24/01
Leitch	--	Singh	Reprioritization of GSI-152, "Design Basis for Valves that might be subjected to significant Blowdown Loads"	Report	--	Ret. 1/22-24/01
Powers		El-Zeftawy	Research Report to the Commission	FINAL Report	--	Ret. 1/22-24/01
Shack	--	Boehnert/Markley	Treatment of Uncertainties in the Elements of the PTS Technical Basis Reevaluation Project	--	Joint M&M/THP 1/18 (A.M)	Ret. 1/22-24/01
Sieber	--	Singh	MOX Fuel Fabrication Facility- Overview	--	--	Ret. 1/22-24/01

**ANTICIPATED WORKLOAD
FEBRUARY 1-3, 2001**

LEAD MEMBER	BACKUP	ENGINEER	ISSUE	FULL COMM. REPORT	SUBC. MTG.	
					CHAIR.	MEMBER
Wallis	-	Boehnert	Siemens S-RELAP5 Appendix K Small-Break LOCA Code	Report	THP 1/16-17	Joint M&M/THP 1/18 (A.M) Ret. 1/22-24/01

ANTICIPATED WORKLOAD
March 1-3, 2001

LEAD MEMBER	BACKUP	ENGINEER	ISSUE	FULL COMM. REPORT	SUBC. MTG.	
					CHAIR.	MEMBER
Bonaca	Leitch	Dudley/Duraiswamy	ANO, Unit 1 License Renewal Application	Interim Report (Tentative)	PLR 2/22	PO/RPRA 2/21 P&P 2/28-10 AM
Kress	--	Singh	Management Directive 6.4 & related handbook associated with the revised Generic Issue Process	Report	--	THP 2/20 PO/RPRA 2/21 PLR 2/22
		El-Zeftawy	Spent Fuel Pool Accident Risk at Decommissioning nuclear plants	--		P&P 2/28-10 AM
Shack	Sieber	Markley	Degraded RCS pressure boundary event at V.C. Summer plant	--	--	PO/RPRA 2/21 PLR 2/22
Sieber	--	Boehnert	British Nuclear Powered Submarine Incident (CLASSIFIED)	--	PO/RPRA 2/21	--
Wallis	--	Boehnert	RETRAN-3D Transient Analysis Code	Report	THP 2/20	--

ANTICIPATED WORKLOAD
April 5-7, 2001

LEAD MEMBER	BACKUP	ENGINEER	ISSUE	FULL COMM. REPORT	SUBC. MTG.	
					CHAIR.	MEMBER
Apostolakis	--	Markley	Risk-Based Performance Indicators	Report	RPRAM&M/THP 3/16 P&P 4/4	--
Bonaca	Leitch	Dudley	Hatch License Renewal Applicaton/SERs on Selected BWRVIP Documents	Interim Report	PLR 3/27-28	RPRAM&M/THP 3/16 P&P 4/4
	Leitch	Dudley	Proposed Final License Renewal Documents (SRP, Reg. Guide, & GALL)	Report	--	PLR 3/27-28
Powers	--	El-Zeftawy	High Burn-up & Mox Fuel Issues	Report	RF 4/4	RPRAM&M/THP 3/16
Shack	Wallis	Markley	Risk-Informing 10 CFR 50.46 (Drs. Shack & Wallis should discuss with the staff & develop a plan)	--	--	RPRAM&M/THP 3/16 PLR 3/27-28
Sieber	Apostolakis	Weston	South Texas Project Exemption Request	Report	--	RPRAM&M/THP 3/16
Wallis	--	Boehnert	EPRI Report on Waterhammer Issues	Report	THP 3/15	RPRAM&M/THP 3/16
	Kress	Boehnert/El-Zeftawy	Thermal-Hydraulic Issues Associated with AP1000	Report	--	THP 3/15 RPRAM&M/THP 3/16 P&P 4/4 RF 4/4

II. ITEMS REQUIRING COMMITTEE ACTION

1. Thermal-Hydraulic Issues Associated with the AP1000 Design (Open)
(GBW/TSK/PAB/MME) ESTIMATED TIME: 1 ½ hours.

Purpose: Determine a course of action.

Requested by the NRC staff [J. Wilson, NRR]. During its September 2000 meeting, the Committee reviewed the results of the staff's pre-application (Phase 1) review of the Westinghouse Electric Company's proposed AP1000 design and provided report to the NRC Chairman dated September 14, 2000. In that report, the Committee recommended:

- The PRA should include uncertainty distribution on core damage frequency, conditional containment failure probability, and large, early release frequency;
- The seismic analysis should not be left solely to the COL applicant and should be included in the PRA using a representative site;
- The applicant's results from the codes NOTRUMP, WCOBRA/TRAC, LOFTRAN, and WGOthic for the design basis accidents should be accompanied by uncertainty assessments;
- The staff should obtain and exercise the above codes to assist its independent evaluation and validation of these codes. Westinghouse and the staff did not agree with all of the above ACRS recommendations.

The staff is in the process of performing the pre-application (Phase 2) review of the AP1000 design and expects to complete it in the fall of 2001. In this phase, the staff is evaluating the issues identified in Phase 1.

Recently, Westinghouse and NRR staff representatives held a meeting to discuss Westinghouse's planned approach for addressing issues associated with application of AP600 test and analysis programs to the AP1000 design. NRR suggested that Westinghouse brief the ACRS regarding this matter and obtain Committee comment. Discussions among NRR, Westinghouse, and the cognizant ACRS Member (G. Wallis) have resulted in scheduling a meeting of the T/H Phenomena Subcommittee on March 15, 2001, with ACRS review expected during the April meeting.

The Planning and Procedures Subcommittee recommends that Dr. Wallis propose a course of action.

2. DOD/DOE Naval Reactors Brief on British Nuclear Powered Submarine Incident
(Closed - Classified Briefing) (GML/PAB) ESTIMATED TIME: 1 hour

Purpose: Determine a Course of Action

Briefing requested by the ACRS [A. Adams, NRR]. A couple of months ago, a British nuclear powered submarine (HMS TIRELESS) experienced an operational incident while on patrol. The incident involved the reactor coolant system and resulted in shut down of the plant and the need for the boat to diesel into port at Gibraltar. Press reports made reference to a "near-core-meltdown" event. In truth, this event never approached that significance.

Recently, senior representatives of the NRC staff were briefed on the particulars of this event by representatives of Naval Reactors. Inquiries by P. Boehner regarding this matter have led to an offer from Naval Reactors to brief the ACRS on this event. Dr. Apostolakis, ACRS Chairman, has suggested that a briefing on this matter be scheduled for the March ACRS meeting.

The Planning and Procedures Subcommittee recommends that this briefing be scheduled for the March ACRS meeting and that Mr. Leitch provide his views.

3. Pebble Bed Modular (PBM) Reactor Design (Open)(TSK/MME) ESTIMATED TIME: 1 ½ hours

Purpose: Determine a Course of Action

Review requested by the ACRS. During the ACRS retreat, January 22-24, 2001, the Committee decided to schedule a meeting of the Advanced Reactors Subcommittee on June 5, 2001, to discuss the status of NRC and industry activities related to future reactor designs such as the pebble bed modular reactor design. Since safety and licensing are major considerations for any future designs, it would be most efficient, timely, and in the national interest for the NRC to prepare for licensing future designs by having early interactions with the designers and developers as encouraged by the Commission's Policy Statement on Advanced Reactors. Risk insights will become critical to the efficiency and effectiveness of the interactions and the process as a whole.

To accommodate risk insights, the Office of Nuclear Regulatory Research (RES) is considering a top-down risk-related framework that could be useful in guiding both the applicant and the regulator through the process. Currently, RES is discussing the technology and the potential for Exelon's requesting the NRC review of the PBM reactor design.

The Planning and Procedures Subcommittee recommends that Dr. Kress propose a course of action concerning the need for a briefing to the ACRS on this matter at the June ACRS meeting.

January 30, 2001

MEMORANDUM TO: John T. Larkins, Executive Director
Advisory Committee on Reactor Safeguards
Advisory Committee on Nuclear Waste

FROM: John W. Craig /RA/
Assistant for Operations
Office of the Executive Director for Operations

SUBJECT: PROPOSED AGENDA ITEMS FOR THE ACRS AND THE ACNW
MEETINGS

Attached is a list of proposed agenda items for the ACRS (February 2001 - May 2001) and the ACNW (February 2001 - May 2001). This list was compiled based upon information received from (1) NRR, NMSS, RES, and IRO in response to the EDO request for the monthly update of proposed agenda items, and (2) the ACRS/ACNW staffs at a meeting held on January 25, 2001 with the OEDO, NRR, and NMSS ACRS/ACNW coordinators [OEDO, I. Schoenfeld; NRR, M.G. Crutchley; and NMSS, R.H. Turtill].

A copy of the Work Items Tracking System (WITS) list for March 2001 - June 2001 is also attached. This list includes a projection of office originated Commission papers that may be of interest to the ACRS/ACNW. Please provide timely feedback on your interest for briefings on particular items identified from the projected Commission papers that were not planned for formal review or information briefings but that are of interest to the Committees.

Attachments: As stated

DISTRIBUTION

Office Directors-NRR, NMSS, RES, STP, IRO
WTravers ACRS File
FMiraglia EDO R/F
CPaperiello AO R/F original PNorry
KKerr, STP (O-3H20)
SNesmith, RES (T-10D5)
EOkleson, RES (T-10D5)
MCase, NRR (O-5E13)
MCrutchley, NRR (O-5E13)
RTurtill, NMSS (T-7J8)
MVirgilio, NMSS (T-8A23)
CSiegel, IRO (T-4D18)
SMeador, ACRS (T-2E26)
CPoland, NMSS (T-8A23) JMitchell, RES (O-9F31)
ISchoenfeld, OEDO PAnderson, OEDO Document: ACRS-ACNWagendas-PAA.wpd

OEDO	DEDE/OEDO	DEDR/OEDO	AO/OEDO
ISchoenfeld:paa	CPaperiello	FMiraglia	JWCraig
01/30/01	01/30/01	01/30/01	01/30/01

**PROPOSED AGENDA FOR
ACRS MEETINGS
(February 2001 -May 2001)**

ACRS MEETING ---- FEBRUARY 1-3, 2001				
Item #	Title/Issue	Purpose	Priority	Documents
1	Effectiveness of the ATWS Rule	Review and Comment	Medium	Draft ATWS report provided to ACRS in late September 2000.
	Contact: W. Raughley, DSARE/RES			
2	Reprioritization of GSI-152, Valves Subject to Blowdown Loads	Review and Comment	High	Documents provided in January.
	Contact: O. Gormley, DET/RES			
3	Siemens S-RELAP5 Appendix K Small-Break LOCA Code	Review and Comment	High	SER on Code provided in December.
	Contact: R. Caruso/R.Landry, DSSA/NRR			
4	Overview of Licensing of Mixed Oxide Fuel Fabrication Facility	Information Briefing	Low	None.
	Contact: A. Persinko, FCSS/NMSS			
5	Treatment of Uncertainty in Elements of the PTS Reevaluation Project	Review and Comment	High	Review documents provided 1/4/01.
	Contact: S. Malik, DET/RES			

ACRS MEETING ---- MARCH 1-3, 2001				
Item #	Title/Issue	Purpose	Priority	Documents

1	ANO-1 License Renewal	Review and Comment	Medium	SER with open items to be provided in January.
	Contact: S. Hoffman, DRIP/NRR			
2	VC Summer Reactor System "A" Hot Leg Crack	Information Briefing	Medium	All documents are currently available at www.nrc.gov/NRC/REACTORS/SUMMER/index.htm
	Contact: E. Benner, DRIP/NRR			
3	Status of MD 6.4, "Generic Issues Program"	Review and Comment	Medium	None
	Contact: H. Vandermolen, DSARE/RES			
4	EPRI RETRAN-3D Code	Review and Comment	Medium	SER on Code provided in December
	Contact: R. Caruso/R. Landry, DSSA/NRR			
5	Spent Fuel Pool Accident at Decommissioning Nuclear Power Plants	Information Briefing	Low	None
	Contact: C. Carpenter/D. Matthews, DRIP/NRR			
6	Draft Final SER for the South Texas Project Exemption Request to Exclude Certain Components from the Scope of Special Treatment Requirements Required by Regulations	Review and Comment	High	STP responses to open and confirmatory items from the draft SER. 1/15/01 response provided to ACRS via e-mail on 1/16/01. 1/18 and 1/24 responses provided to ACRS via e-mail on 1/25/01.
	Contact: J. Nakoski, DLPM/NRR			

ACRS MEETING — APRIL 5-7, 2001

Item #	Title/Issue	Purpose	Priority	Documents
1	Hatch License Renewal and BWRVIP Documents	Review and Comment	Medium	SER with open items to be provided by 2/8/01.
	Contact: S. Hoffman, DRIP/NRR			
2	SERs on BWR Vessel and Internal Project (BWRVIP)	Review and Comment	High	SE's have been continuously provided.
	Contacts: T. Sullivan, G. Carpenter, B. Bateman DE/NRR; S. Hoffman, DRIP/NRR			

3	License Renewal Implementation Documents	Review and Comment	High	Final SRP, GALL Report, RG, and NEI 95-10 to be provided by 3/16/01.
	Contact: S. Lee, DRIP/NRR			
4	Waterhammer Issues	Review and Comment	High	EPRI interim report submitted to NRC for review on 12/20/00. Copies provided to ACRS
	Contact: J. Tatum, DSSA/NRR			
5	Overview of the Pre-Application (Phase2) Review of the AP-1000 Design	Information Briefing	Medium	WCAP-15612 (Plant Description), dated 12/12/00 and WCAP-15613 (Scaling Assessment) expected in Feb. '01.
	Contact: J. Wilson, DRIP/NRR			

6	Proposed Framework for Risk-Informing the Technical Requirements of 10CFR Part 50 and Proposed Revisions to 10CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Power Reactors	Review and Comment		
	Contact: M. Drouin, DRAA/RES			

ACRS MEETING — MAY 10-12, 2001				
Item #	Title/Issue	Purpose	Priority	Documents
1	Risk-Based Performance Indicators	Review and Comment	High	ACRS received the draft report on the results of Phase 1 development of risk-based indicators on October 16, 2000.
	Contact: S. Mays, DRAA/RES			
2	Proposed Update to 10CFR Part 52	Review and Comment	Medium	Draft rule will be provided 30 days prior to meeting.
	Contact: J. Wilson, DRIP/NRR			
3	TRACG Best-Estimate Thermal-Hydraulic Code	Review and Comment	Medium	Draft SER to be provided by 4/5/01.
	Contact: R. Caruso, DSSA/NRR			

ACRS MEETING HANDOUT

G Drive:PP

Meeting No. 479th	Agenda Item 13	Handout No: 13.1
--	-------------------------------------	---------------------------------------

Title **MINUTES OF PLANNING & PROCEDURES
SUBCOMMITTEE MEETING - JANUARY 31,
2001**

Authors **JOHN T. LARKINS**

List of Documents Attached

13

- Instructions to Preparer**
1. Punch holes
 2. Paginate attachments
 3. Place copy in file box

From Staff Person

JOHN T. LARKINS

MINUTES OF THE
PLANNING AND PROCEDURES SUBCOMMITTEE MEETING
WEDNESDAY, JANUARY 31, 2001

The ACRS Subcommittee on Planning and Procedures held a meeting January 31, 2001, in Room 2 B1, Two White Flint North Building, Rockville, Maryland. The purpose of the meeting was to discuss matters related to the conduct of ACRS business. The meeting was convened at 10:00 a.m. and adjourned at 12:15 p.m.

ATTENDEES

G. Apostolakis, Chairman
M. Bonaca
T. Kress

ACRS STAFF

J. T. Larkins
J. Lyons
R. P. Savio
S. Duraiswamy
S. Meador
B. J. White
J. Gallo

NRC STAFF

I. Schoenfeld

DISCUSSION

- 1) Review of the Member Assignments and Priorities for ACRS Reports and Letters for the February ACRS Meeting

Member assignments and priorities for ACRS reports and letters for the February ACRS meeting are included in a separate handout. Reports and letters that would benefit from additional consideration at a future ACRS meeting were discussed.

RECOMMENDATION

The Subcommittee recommends the following:

- The assignments and priorities for the February 2001 ACRS meeting should be as shown in the handout.

- To the extent practicable, cognizant Subcommittee Chairmen should prepare draft ACRS reports on topics assigned to them in advance and distribute them to the members for comments prior to the full Committee meeting. If it is not feasible, the draft reports should be completed Friday before the full Committee meeting and sent to the members.

2) Anticipated Workload for ACRS Members

The anticipated workload of the ACRS members through April 2001 is included in a separate handout. The objectives are to:

- Review the reasons for the scheduling of each activity and the expected work product and to make changes, as appropriate
- Manage the members' workload for these meetings
- Plan and schedule items for ACRS discussion of topical and emerging issues

During this session, the Subcommittee discussed and developed recommendations on the items that require Committee decision, which are included in Section II of the Future Activities list.

RECOMMENDATION

The Subcommittee recommends the following:

- The Committee should consider the Subcommittee's recommendations on the items listed in Section II of the Future Activities list.
- Dr. Shack should take the lead in reviewing the issue of risk-informing 10 CFR 50.46 and Dr. Wallis should provide assistance to Dr. Shack. Drs. Shack and Wallis should meet with the NRC staff and develop a plan, including the number of Subcommittee and full Committee meetings needed to complete this review along with a proposed schedule for these meetings. The Planning and Procedures Subcommittee will discuss the plan for reviewing risk-informing 10 CFR 50.46 during its February 28 meeting and submit to the full Committee for discussion at the March 2001 meeting.
- If an item was discussed at a Subcommittee meeting and if the Subcommittee was not satisfied with the discussion due to various factors (e.g., unfocused presentation, poor quality documents, and incomplete documentation), the Subcommittee Chairman should inform the staff and others at the end of the Subcommittee meeting that there is no need for a presentation at the full Committee meeting at this time. The Subcommittee Chairman should identify specific issues that should be dealt with prior to bringing that matter to the full Committee for review. The Subcommittee Chairman should provide a brief report to the full Committee.

3) ACRS Action Plan for CY 2001

During the December 2000 ACRS meeting, the Committee approved the ACRS Action Plan for CY 2001. The Action Plan has been sent to all Commissioners. It will be published in February 2001.

RECOMMENDATION

The Subcommittee recommends that the ACRS Executive Director keep the Committee informed of any feedback from the Commissioners.

4) Assignments for Reviewing the Safety Evaluation Report (SER) Associated with ANO, Unit 1 License Renewal Application

The ACRS is scheduled to review the ANO, Unit 1 license renewal application and the associated staff SER during the March 2001 ACRS meeting. Depending on the significance of the open issues, the Committee will issue an interim report. The ACRS Subcommittee on Plant License Renewal plans to hold a meeting on February 22, 2001 to review this matter. Proposed assignments for reviewing various chapters of the staff SER are attached (pp. 1-9). Copies of the staff SER will be sent to the members as soon as possible.

RECOMMENDATION

The Subcommittee recommends that members review the SER chapters and/or sections assigned to them and provide comments to Dr. Bonaca by February 19, 2001. Comments and issues raised by the members should be discussed at the February 22, 2001 Plant License Renewal Subcommittee meeting.

5) Assignments for Reviewing Selected Reports of the Boiling Water Reactor Vessel Internals Project (BWRVIP) Reports Associated with Hatch License Renewal and License Renewal Guidance Documents

The Committee is scheduled to review the license renewal application for Edwin I. Hatch Nuclear Plant and the associated staff SER during its April meeting. The Plant License Renewal Subcommittee plans to review this matter during its meeting on March 28, 2001. The Subcommittee also plans to review selected BWRVIP reports pertinent to the Hatch license renewal application and the proposed final revisions to license renewal guidance documents (SRP, GALL, and Regulatory Guide) on March 27, 2001.

A list of BWRVIP documents for review and the ACRS member assignments for reviewing these documents will be provided during the March meeting. Assignments for reviewing the license renewal guidance documents will also be provided at the March meeting. The selected BWRVIP documents, associated staff safety evaluation, and the proposed final license renewal guidance documents will be sent to the members when they become available. Dr. Bonaca will provide his views regarding the need for consultant support to review certain BWRVIP documents.

RECOMMENDATION

The Subcommittee recommends the following:

- The members should review the BWRVIP documents and sections of the proposed final license renewal guidance documents which will be assigned to them and provide comments to Dr. Bonaca prior to the March 27, 2001 Subcommittee meeting. Any issues identified by the reviewers should be discussed during the Subcommittee meeting.
- Dr. Bonaca should identify those reports for which consultant support is needed. He should also recommend names of individuals who could be used as consultants.

6) Potential Candidates for ACRS Membership

The members are scheduled to interview four candidates during the February 2001 ACRS meeting for potential membership on the ACRS. The ACRS Member Candidate Screening Panel plans to send a slate of candidates to the Commission subsequent to completing the interviews.

RECOMMENDATION

The Subcommittee recommends that the members provide feedback to the ACRS Executive Director on these candidates during the February ACRS meeting.

7) ACRS/ACNW Joint Subcommittee Meeting

The ACRS/ACNW Joint Subcommittee held a meeting on January 19, 2001 to discuss the proposed Standard Review Plan for evaluating integrated safety assessments (ISAs), application of ISAs to the MOX fuel fabrication facility, BWXT Naval fuels facility, and other matters related to risk-informing regulation in NMSS regulations. Dr. Kress, ACRS member of Joint Subcommittee, will provide a report to the Committee on the results of the January 19, 2001 meeting.

RECOMMENDATION

The Subcommittee recommends that Dr. Kress provide a report to the Committee on the results of the Joint Subcommittee meeting, follow-up matters resulting from this meeting, and the anticipated outcome.

8) Commitments Resulting From the ACRS Retreat

The Committee held a retreat on January 22-24, 2001 to discuss various matters, including ACRS self assessment, stakeholders' comments on ACRS performance, selected key ACRS products, and other issues pertinent to ACRS operation. A list of commitments resulting from the retreat is included in the Attachment (pp. 10-14). The Subcommittee discussed Item 4, which identifies specific issues to be addressed by

ACRS in CY 2001, such as: design margins, risk-informing Appendices A and B of 10 CFR Part 50, adequacy of regulatory analyses, AP 1000, new generation reactors, and Revised Reactor Oversight Process.

RECOMMENDATION

The Subcommittee's recommendations on this specific issue are included in the attachment (pp. 10-14). The Subcommittee will continue its discussion of other commitments resulting from the retreat during its February 28, 2001 meeting and make recommendations to the full Committee.

9) Pay Increase for Members

On January 22, 2001, we submitted a request to the Commission for a salary increase for ACRS members, consistent with the recently approved pay increase for Executive Level IV employees.

10) ACRS Member 130-Day Limit

Based on the number of days worked that members claimed through the first quarter of this fiscal year, it is projected that many members will exceed the 130-day limit on special government employees by fiscal year's end. Members are reminded that exceeding the 130-day limit may trigger additional conflict of interest restrictions that could potentially impact their ability to work on certain contracts.

RECOMMENDATION

The Subcommittee recommends that the members who have been notified by Carol Harris should take steps to ensure that they do not exceed the 130-day limit. Mr. Szabo, OGC, should be invited to respond to Members' questions on this matter and other related issues during the March ACRS meeting.

11) ACRS Member Hotel Reservations for CY 2001 Full Committee Meetings

In the past, we have reserved hotel rooms for members to attend full Committee meetings for the entire calendar year as soon as practicable after the full Committee approved the meeting calendar. Due to a policy change, the Residence Inn in Bethesda will not accept reservations at the government rate more than three months in advance. If we wait until then to secure lodging, our ability to reserve convenient lodging for the members (i.e., everyone in the same hotel in the Bethesda/Rockville area) may be significantly impacted.

RECOMMENDATION

The Subcommittee recommends that the staff reserve rooms for the Members at the government rate at the Rockville Doubletree Hotel (or an alternate hotel if the Members suggest one) for the April through December 2001 full Committee meetings.

12) Member IssuesTravel Request

Dr. Uhrig has requested to attend the OECD Enlarged Halden Reactor Project Programme Group Meeting, in Lillhammer, Norway, March 11-16, 2001 (p. 6).

He will present a paper dealing with the automatic identification of plant transients using artificial intelligence-based technology.

RECOMMENDATION

The Subcommittee recommends that the Committee approve Dr. Uhrig's request to attend the OECD meeting.

13) Miscellaneous

The Subcommittee discussed the amount of time spent by the engineers in preparing the Subcommittee meeting minutes and suggested that the ACRS management take steps to enhance process for preparing the minutes.

The ACRS management plans to review the existing process and modify it, as needed, to minimize the time involved in preparing minutes and maximize the time for the engineers to perform a technical review of the documents prior to the Subcommittee and/or full Committee meetings.

PROPOSED ASSIGNMENTS FOR REVIEWING STAFF SER ASSOCIATED
WITH ANO, UNIT ! LICENSE RENEWAL

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Commitments from CY99and CY00 ACRS Self Assessment

1) Modify ACRS/ACNW Operating Plan in accordance with new NRC planning initiatives, draft FY2000-2005 Strategic Plan, and FY2001 Performance Plan, with incorporation of self assessment information and metrics. (Larkins/ Savio/ Gallo)

ACTIONS: A new Operating Plan is being developed as planned and is due to the Commission on 5/31/2001. Mag Weston and Sam Duraiswamy have developed a ACRS Action Plan which, as will the existing ACNW Action Plan, be incorporated into the content of the new Operating Plan. The current plan is to provide six month updates.

2) Develop action plan that will identify and allocate resources for ACRS and ACNW review of selected decommissioning issues. (Larkins/Savio/Larson)

ACTIONS: An action plan has been developed that identifies the decommissioning issues, schedules, ACRS, ACNW and Joint ACRS/ACNW Subcommittee assignments, and a general approach to the reviews. This information was has been provided to the Commission as per a request from their staff. Activities are being incorporated into ACRS (and ACNW) Future Activities scheduling using existing process. Priorities (ie, resource allocation were there is the expected competition with other activities) will be broadly addressed in the ACRS Action Plan and specifically in the Planning and Procedures Subcommittee process. The ACRS work on the SFP accidents analysis report falls in this category.

3) Maintain awareness of need to preserve independence, re. early involvement in the development of NRC staff positions. (P&P Subcommittee oversight)

ACTIONS: The Planning and Procedures Subcommittee has been doing this in its monthly meetings. No issues have been identified that could not be resolved by routine Subcommittee deliberation. This is an issue where there is likely to continue to be different stakeholder views as to how the ACRS should conduct its business.

4) Return to a mode of operation that will afford more in-depth review of issues when warranted. (P&P Subcommittee oversight)

ACTIONS: The Planning and Procedures has and will continue to address this issue in its monthly meetings. **Discussions related to new ACRS initiatives and key technical areas in which ACRS can focus its efforts were discussed during the January 2001 ACRS retreat. Areas identified that the ACRS will address in CY2001 are:**

- a) design margins (report by A. Cronenburg)
- b) 10CFR appendices A and B (report by J. Sorenson)
- c) adequacy of analysis used to support regulatory decisions (ie, when is a bounding analysis adequate, when will the existing knowledge base support a

- regulatory decision, when are experiments needed)--- to be addressed on a case by case basis and in the ACRS advice on particular regulatory decisions
- d) continue to define information needed for ACRS concurrence with the proposed AP 1000 design certification
 - e) information needed for the licensing of new generation reactors
 - f) response to the 3/2/2000 SRM on the Revised Reactor Oversight Process (Pis and SDP)

The Subcommittee discussed these commitments during the February 2001 Planning and Procedures Subcommittee meeting and recommended the following actions:

- 1) Dr Bonaca will meet with Dr Cronenburg to further develop the scope and approach to Dr Cronenburg's report on design margins.
- 2) Dr Powers and Dr Apostolakis will meet with Mr. Sorenson to further develop the scope and approach to Mr Sorenson's report on 10 CFR Appendices A and B
- 3) The ACRS staff will present an action plan for the proposed ACRS workshop on the safety needs for Generation 4 reactors (currently planned for the afternoon (1:00pm) of June 4 and June 5, 2001) to the Subcommittee during its March meeting. Reactor types, possible participants, and discussion of the use of a risk-based licensing approach and licensing by test will be addressed in the action plan (GA/JTL/RPS/MME)
- 4) The ACRS staff will present an action plan to the Subcommittee during its March meeting for ACRS development of an response to the 3/2/2000 SRM on the Revised Reactor Oversight Process. (JTL/RPS)
- 5) Recruitment for a Fellow, with consideration for being brought onboard early in FY 2002, will be initiated.(JTL/CAH)
- 6) Use of the ACRS/ACNW web site as part of an effort to provide additional visibility in the international community will be explored and a proposal presented tp the Subcommittee during its March meeting. (JTL/RPS)

5) Look for more opportunities to increase involvement in important technical issues and minimize involvement in routine matters such as rules and regulatory guides addressing routine technical or process issues. The examples of important technical issues given in the CY99 self assessment SECY were:

- a) risk-informed initiatives for improving regulation (10 CFR Part 50, pressurized thermal shock, and decommissioning)
- b) future NRC research needs
- c) risk-based performance indicators
- d) PRA quality standards
- e) human performance
- f) digital I&C
- g) transient and accident analyses code certification
- h) emerging uses of mixed-oxide and high-burnup fuels

To conserve resources ACRS would end its review efforts when technical issues have been satisfactorily resolved and staff is addressing implementation. (P&P Subcommittee prioritization and scheduling of ACRS activities)

ACTIONS:

The Planning and Procedures Subcommittee will continue to address this issue in its monthly meetings. All of the examples of important technical issues identified in the CY99 self

assessment SECY have been addressed in CY2000 ACRS activities. **Additional technical issues identified in the January 2001 ACRS retreat and not addressed in other parts of this commitments list are:**

- a) **ACRS review of the proposed MOX Fuel Fabrication Facility**
- b) **power uprates**
- c) **improvements in transient and accident analysis codes to support RI regulation and the AP 1000 review**
- d) **regulatory coherence**
- e) **impact of deregulation and burden reduction on operational safety and adequate protection**

ACRS workload is expected to be high in the foreseeable future and will have to continue to be closely managed by the Planning and Procedures Subcommittee. ACRS will at times find itself pressed by schedule constraints. ACRS will focus on necessary work product quality when reviewing complex issues and will when necessary sacrifice timelessness when it is necessary to do so to produce necessary product quality. Planning will be used to minimize impact on NRC staff and Commission schedules.

6) Systematically assess how ACRS, as a Commission-level advisory committee, can add value to an issue prior to agreeing to reviewing the issue. (P&P Subcommittee oversight of proposed ACRS activities, with increased use of identified review objectives and action plans providing an assessment of resource use)

ACTIONS: An ACRS Action Plan has been developed. The P&P Subcommittee has been culling and prioritizing proposed ACRS activities in its monthly reviews. The Chairman and Vice Chairman have been meeting with and communicating with individual Commissioners to obtain their input.

7) Test and refine streamlined process for ACRS review of license renewal application. (Plant License Renewal Subcommittee)

ACTIONS: A process has been developed and discussed with the Committee and will be refined taking into account the experience gained in the ANO 1 and Hatch reviews.

8) Take actions to maintain and improve ACRS awareness of plant operations issues. (Larkins, Savio, and Plant Operations Subcommittee)

ACTIONS: The ACRS continues to have plant operating events briefings and to make a annual visit to a Region office and a operating plant. The ACRS met with a representative of UCS during the September 2000 and October 2000 ACRS meetings to discuss a recent UCS report on the impact of the current increased focus on the use of PRA on the safety of plant operations. The ACRS meet with NEI representatives and discussed issues of mutual interest (risk-informing 10CFR Part 50, license renewal, decommissioning, and the revised reactor oversight process) during the October 2000 ACRS meeting. The issues of mutual interest to be discussed were selected by NEI from a longer list provided by the ACRS/ACNW office and were identified by NEI as being the four main elements of NEI's program of regulatory reform.

The ACRS will continue to meet with NEI representatives about once a year to discuss issues of mutual interest. NEI and other non-NRC stakeholders will be invited to present their views at ACRS meetings as needed. ACRS members and staff will attend industry sponsored meetings and workshops to obtain additional insights into stakeholder views on plant operations issues as resources permit. The Chairman of the Plant Operations Subcommittee will provide recommendations as to plant operations events and experience to be discussed by the ACRS.

9) Solicit and address feedback on how annual research report can be made more useful to Commission and staff. (Safety Research Subcommittee)

ACTIONS: This was done and the feedback was used to structure the current annual ACRS review of NRC-sponsored research. **The process for and resources allocated to this annual review will be accessed after completing and receiving feedback on the CY2001 ACRS research report.**

10) Maintain and improve current communications with Commissioners and senior NRC management. (P&P Subcommittee)

ACTIONS: The ACRS Chairman and Vice Chairman will continue to meet with individual Commissioners, the EDO, the Deputy EDOs, and office directors. These individuals will be invited to ACRS meetings to discuss issues of mutual interest as needed.

11) Consider the use of ACRS member task groups instead of established subcommittees to address particular issues before the ACRS. (P&P Subcommittee)

ACTION: The Planning and Procedures Subcommittee will address in the assignment of the ACRS member responsibility for emerging work.

12) Address issues of member preparation, focus on regulatory issues, and efficient conduct of ACRS and ACRS subcommittee discussion. (ACRS Chairman/ ACRS subcommittee chairmen/ Larkins/ Savio)

ACTION: The actions to address these issues will be:

a) Process and deadlines specified in the new ACRS/EDO MOU for the delivery of documents needed for a ACRS review will be enforced.

b) ACRS members participating in subcommittee meetings will reserve the necessary time to prepare for the subcommittee discussions.

c) Staff presenters at subcommittee meetings will be instructed to clearly outline what they believe is the regulatory issue that needs to be addressed, their proposed approach, why they believe that it is adequate, and how their presentations will support this belief.

d) When issues are brought to the ACRS for review, the responsible subcommittee chairmen will continue to provide a introduction that outlines the issues the issues to be addressed by the Committee, the relevant regulatory issues, and issues related to the NRC staff's proposed approach. All ACRS members should

at a minimum read the ACRS staff's status report and review any material in the ACRS briefing book necessary for them to participate efficiently in the ACRS discussions.

e) The ACRS members responsible for particular Committee or subcommittee discussions will continue to assist in and lead discussions in a manner that is conducive to the efficient resolution of the issues.

f) The ACRS staff will provide regular feedback to the responsible staff and the EDO coordinator as to the effectiveness of specific NRC staff presentations. The ACRS staff will at this time collect feedback from these individuals.

13) Address issue of NRC staff sometimes not knowing how to respond to "embedded" recommendations. (ACRS Chairman/ Larkins/ Savio)

ACTION: The NRC staff will be told to contact ACRS/ACNW management when there is a question. ACRS/ACNW management will, in consultation with the ACRS Chairman, resolve the staff's questions.

14) ACRS members should attend ASME quality standard peer review group meetings.

ACTION: Arrangements will be made for ACRS member and staff attendance subject to the availability of resources and members time.

15) Address issues associated with the uniqueness of the ACRS review of the MOX Fuel Fabrication Facility. (Larkins/ Savio)

ACTION: Development an action plan for this review after the staff briefing at the February ACRS meeting.