



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

February 1, 2005

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

Dear Chairman Diaz:

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

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

REPORT:

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

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

LETTERS:

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

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

MEMORANDUM:

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

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

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HIGHLIGHTS OF KEY ISSUES

1. Expert Elicitation on Large-Break LOCA Frequencies

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

Committee Action:

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

2. Proposed Rule for Risk-Informing 10 CFR 50.46

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

Committee Action:

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

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

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

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

Committee Action

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

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

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

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

Committee Action

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

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

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

Committee Action:

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

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

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

Committee Action

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

7. Election of ACRS Officers for CY 2005

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

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

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

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

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

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

OTHER RELATED ACTIVITIES OF THE COMMITTEE

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

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

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

- Regulatory Policies and Practices Subcommittee - November 16, 2004

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

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

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

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

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

- Planning and Procedures - December 1, 2004

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

LIST OF MATTERS FOR THE ATTENTION OF THE EDO

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

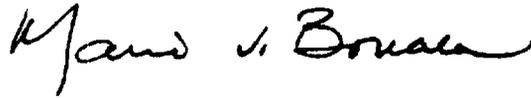
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PROPOSED SCHEDULE FOR THE 519th ACRS MEETING

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

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

Sincerely,

A handwritten signature in black ink that reads "Mario V. Bonaca". The signature is written in a cursive style with a large initial 'M' and a long, sweeping underline.

Mario V. Bonaca
Chairman



Date Issued: 2/8/2005
Date Certified: 2/16/2005

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REPORT:

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

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

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

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

MEMORANDUM:

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

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

APPENDICES

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

CERTIFIED

MINUTES OF THE 518th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
DECEMBER 2-4, 2004
ROCKVILLE, MARYLAND

The 518th meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on December 2-4, 2004. Notice of this meeting was published in the *Federal Register* on November 24, 2004 (65 FR 68411) (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 is available in the NRC's Public Document Room at One White Flint North, Room 1F-19, 11555 Rockville Pike, Rockville, Maryland. Copies of the transcript are available for purchase from Neal R. Gross and Co., Inc. 1323 Rhode Island Avenue, NW, Washington, DC 20005. Transcripts are also available at no cost to download from, or review on, the Internet at <http://www.nrc.gov/ACRS/ACNW>.

ATTENDEES

ACRS Members: ACRS Members: Dr. Mario V. Bonaca (Chairman), Dr. Graham B. Wallis (Vice Chairman), Mr. Stephen L. Rosen, (Member-at-Large), Dr. George E. Apostolakis, Dr. F. Peter Ford, Dr. Thomas S. Kress, Dr. Dana A. Powers, Dr. Victor H. Ransom, Dr. William J. Shack, and Mr. John D. Sieber. 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. Mario V. Bonaca, 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. Expert Elicitation on Large-Break LOCA Frequencies (Open)

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

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

Committee Action

The Committee issued a report to the NRC Chairman on December 10, 2004, recommending that the draft NUREG Report be revised prior to being issued for public comment. The Committee identified several issues that should be addressed. The Committee felt that the Report was a work in progress and is not ready for public comment.

III. Proposed Rule for Risk-Informing 10 CFR 50.46 (Open)

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

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

Committee Action

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

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

[Note: Dr. Hossein Nourbakhsh was the Designated Federal Official for this portion of the meeting.]

The Office of Nuclear Regulatory Research (RES) initiated a project in 1999 to develop a technical basis for a potential revision to the Pressurized Thermal Shock (PTS) screening criteria in 10 CFR 50.61. Two central features of the research approach were a focus on the use of more realistic models and an explicit treatment of uncertainties. The Committee has previously reviewed the methodology and the initial results of the PTS Technical Basis Reevaluation Project. The staff concurred with the ACRS recommendation in its report of February 21, 2003, that supported plans for an external peer review of the technical work. RES solicited a panel of experts to perform independent review of the technical basis report, and all supporting documentation that comprises the basis for its recommended revisions to the PTS rule. The staff has also concurred, in most part, with the Committee recommendation in its report of February 21, 2004, that the draft technical basis report needs substantial revision to describe more clearly the basic phenomena, issues, approaches, and conclusions. However, the topical report, NUREG-1809, "Thermal Hydraulic Evaluations of Pressurized Thermal Shock", has not yet been completed. During the November 2-4, 2004 ACRS meeting, the Committee met with representatives of the NRC and its contractors to discuss the staff's development of a technical basis for a potential revision to the Pressurized Thermal Shock (PTS) screening criteria in 10 CFR 50.61. The Subcommittees on Materials and Metallurgy, Thermal Hydraulic Phenomena, and Reliability and Probabilistic Risk Assessment reviewed this issue during a meeting on November 30, - December 1, 2004. The staff also described their responses to peer review comments in the areas of thermal hydraulics, probabilistic risk assessment, and probabilistic fracture mechanics.

Committee Action

The Committee Plans to further discuss the technical basis for potential revision of the pressurized thermal shock (PTS) screening criteria in the PTS rule during the February 10-12, 2005 ACRS meeting.

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

[Note: Dr. Medhat El-Zeftawy was the Designated Federal Official for this portion of the meeting.]

Dr. Thomas Kress, Chairman of Future Plant Designs Subcommittee, stated that the purpose of this meeting is to hear a briefing by and hold discussions with the NRC staff

regarding the **DRAFT** Commission Paper on the staff's proposed regulatory structure for new plant licensing and update on policy issues related to new plant licensing.

Ms. Mary Drouin, NRC Office of Nuclear Regulatory Research (RES), stated that RES has developed a **DRAFT** Framework document. The objective of this document is to develop and implement a risk-informed regulatory structure for licensing of future reactors. To meet this objective, four tasks are proposed:

- Development of a technology-neutral framework for the regulatory structure,
- Formulation of proposed content of technology-neutral requirements,
- Development of guidance for applying the framework on a technology-specific basis, and
- Formulation of technology-specific Regulatory Guides.

The RES staff believes that to meet the above objectives, the guidance and criteria need to address safety philosophy, safety objectives, risk objectives, design, construction, operation, and treatment of uncertainties.

The new framework would help ensure that a structured and systematic approach will instill uniformity and consistency in the licensing and regulation of advanced reactors, particularly when addressing the unique design and operational aspects of these reactors.

In addition, the framework for current LWRs has evolved without the benefit of insights from PRA and severe accident research. The NRC staff is proposing a structured approach for a regulatory structure for future generation reactors that provides guidance on how to use PRA results and insights to help ensure the safety by focusing the regulations on where the risk is most likely while maintaining basic safety principles such as defense-in-depth and safety margin.

RES is proposing two complementary approaches to be integrated in the framework document. These approaches are "Protective Strategies", and "Risk Objectives and Design/Construction/Operation Objectives". The Protective Strategies approach is based on a top-down, hierarchical approach that starts with a desired outcome, identifies performance goals to achieve this outcome, and then identifies specific objectives and information needs to meet each performance goal.

The framework document identifies four protective strategies: Barrier Integrity, Limit Initiating Event Frequencies, Protective Systems, and Accident Management. The Barrier Integrity objective is to ensure that there are adequate barriers to protect the public from accidental radionuclide releases. The Limit Initiating Event Frequency objective is to limit the frequency of events that can upset plant stability and challenge critical safety functions, during all plant operating states (full power, shutdown, transitional). The Protective Systems objective is to ensure that the systems that mitigate initiating events are adequately designed, and perform adequately, in terms of reliability and capability, to satisfy the design assumptions regarding accident prevention and mitigation during all states of reactor operation. The Accident Management objective is to ensure that adequate protection of the public health and safety in the event of a radiological emergency can be achieved should radionuclide penetrate the barriers designed to contain them.

The Risk Objectives and Design/Construction/Operation objectives approach sets frequency limits on the possible consequences of accidents to ensure that the NRC's safety goals are met. It also provides accident mitigation criteria (including environmental protection), probabilistic criteria for the selection of events which must be considered in the design and which constitute "design basis accidents", and probabilistic criteria for the safety classification of systems, structures and components.

In order to demonstrate compliance of future reactors with the safety goals, a 3-region approach (Acceptable region, Tolerable region, and Unacceptable region) to risk acceptance is developed and defined. Conceptually, the staff expects that future reactors should fall in the acceptable region with only a small chance that the risk extends into the tolerable region and essentially zero chance that it reaches the unacceptable region. Currently, operating reactors may fall in the tolerable region.

RES staff expects that the technology-neutral regulatory requirements for future reactors will strive to reduce the risk to the acceptable region, that is, regulations will be written to achieve the safety goal level of safety. This achievement will provide margin to adequate protection to account for uncertainties associated with new designs and technologies as well as to help implement the Commission's expectations for safety of the advanced reactors.

The staff is developing a regulatory structure with four major parts: 1) a technology-neutral framework, 2) a set of technology-neutral requirements, 3) a technology-specific framework, and 4) technology-specific regulatory guides. Part 1 of the Regulatory Structure is **Work in Progress**. Work has not been initiated on the other three parts.

The staff has developed a DRAFT Commission paper to provide :

- an update to the Commission on the staff's effort regarding a "Regulatory Structure for New Plant Licensing,"
- an update to the Commission on incorporation of the four policy issues, previously approved by the Commission, into the proposed regulatory structure for new plant licensing,
- the staff proposed positions on the two policy issues pertaining to integrated risk of modular reactors and containment versus confinement, and
- an update on new policy issues for Commission information.

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

Currently, the policy issues for new plant licensing include the following:

1. Definition of defense-in-depth
2. Use of a probabilistic approach to establish the licensing basis
3. Use of scenario-specific source terms for licensing decisions
4. Revision of the emergency planning zone
5. Integrated risk
6. Containment functional performance requirements and criteria
7. Level of safety
8. Physical protection
9. Selective implementation

The staff plans to issue shortly after this draft Commission paper, a working draft of the framework to start engaging the stakeholders. Currently, the staff is not asking for Commission approval of proposed staff's positions on the policy issues. The staff plans to provide recommendations for Commission approval on all of the policy issues associated with implementing the technology-neutral framework for new plant licensing by December 2005. These issues will include integrated risk, containment performance standards, and level of safety. In addition, the staff will provide for Commission approval a definition for defense-in-depth to be incorporated into the Commission's PRA Policy Statement.

Committee Action

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

VI. Reliability and Probabilistic Risk Assessment Subcommittee Report

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

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

Committee Action:

This was a status briefing. No action was taken by the Committee on this matter at this time.

VII. Plant License Renewal Subcommittee Report

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

The Chairman of the Plant License Renewal Subcommittee provided a report to the Committee summarizing the results of the December 1, 2004, subcommittee meeting with the NRC staff and representatives of Entergy Operations, Inc. (Entergy) to review and discuss the NRC's Draft Safety Evaluation Report (SER) related to the License Renewal Application for Arkansas Nuclear One Unit 2 (ANO2). The current operating license expires on July 17, 2018. The applicant has requested approval for continued operation for a period of 20 years beyond the current license expiration date.

ANO2 is a Combustion Engineering pressurized water reactor unit with a dry ambient containment. ANO2 began initial operations in 1978 and has a capacity of 3026 MWt or 1023 MWe. In 2002, a power uprate of 7.5% increased capacity by 210 MWe. In 2000 the steam generators were replaced.

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ANO2 is the second plant to be reviewed with a new process that uses on-site audits to verify consistency with the Generic Aging Lessons Learned Report. There are no open items or confirmatory items associated with this application. All structures, systems, and components within scope of license renewal and subject to an aging management review have been identified and there is reasonable assurance that activities during the period of extended operation will be conducted in accordance with the current licensing basis. The Draft SER listed 3 license conditions and concluded that the applicant has met the requirements for license renewal.

Committee Action

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

VIII. Election of ACRS Officers for CY2005

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

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

IX. 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/EDO Commitments

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

The Committee discussed the response from the NRC Executive Director for Operations (EDO) to ACRS comments and recommendations included in recent ACRS reports:

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

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

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

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

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

The Committee heard a report from the ACRS Chairman and the Executive Director, ACRS, regarding the Planning and Procedures Subcommittee meeting held on December 1, 2004. The following items were discussed:

Review of the Member Assignments and Priorities for ACRS Reports and Letters for the December ACRS meeting

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

Anticipated Workload for ACRS Members

The anticipated workload for ACRS members through March 2005 were addressed. The objectives were:

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

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

Expanded Meeting of the Planning and Procedures Subcommittee

An expanded meeting of the Planning and Procedures Subcommittee is scheduled to be held on January 27-28, 2005, in the ACRS conference room, to discuss certain process and regulatory issues. During the November ACRS meeting, the Committee decided on the topics for this meeting. A proposed schedule for this meeting was discussed.

Conflict-of-Interest Issues

In order to keep the members' files on conflict-of-interest up-to-date the members should keep the ACRS Office informed of any new contracts either with the NRC or industry, including performing work as a subcontractor for a company who has the main contract with the NRC or industry. In the past, the members were reminded every six months to identify new contracts. In the future, this process will be reinstated.

Final 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components, for Nuclear Power Reactors"

The Committee reviewed the draft final version of 10 CFR 50.69 during its June 2004 meeting and issued a report to the Commission dated June 15, 2004, recommending issuance of the final rule. The final rule was issued on November 15, 2004. The Commission has made some changes to the rule prior to issuance. As suggested by Dr. Bonaca, Mr. Snodderly prepared a summary of the changes made to 10 CFR 50.69 subsequent to the Committee's review in June 2004. A copy of the line-in/line-out version of the changes made to the rule will be distributed to the members.

Member Issue

Dr. Apostolakis has suggested that the Planning and Procedures Subcommittee discuss whether ACRS should get involved in the OECD/NEA Seminar on Emergency Zoning Around Nuclear Power Plants. The seminar is scheduled for the end of April or beginning of May 2005, and it will last for 2-days in the Netherlands.

518th ACRS Meeting
December 2-4, 2004

C. Future Meeting Agenda

Appendix IV summarizes the proposed items endorsed by the Committee for the 519th ACRS Meeting which will be held on February 10-12, 2005.

The 518th ACRS meeting was adjourned at 1:30 p.m. on December 4, 2004.



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

February 8, 2005

MEMORANDUM TO: ACRS Members

FROM: Sherry Meador *Sherry*
 Technical Secretary

SUBJECT: PROPOSED MINUTES OF THE 518th MEETING OF THE
 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS -
 DECEMBER 2-4, 2004

Enclosed are the proposed minutes of the 518th 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, which will be distributed within six (6) working days from the date of this memorandum.

Attachment:
As stated



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

February 16, 2005

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

FROM: Mario V. Bonaca
Chairman *Mario V. Bonaca*

SUBJECT: CERTIFIED MINUTES OF THE 518th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
(ACRS), DECEMBER 2-4, 2004

I certify that based on my review of the minutes from the 518th 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.

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 (ACRS) will hold a meeting on December 2- 4, 2004, 11545 Rockville Pike, Rockville, Maryland. The date of this meeting was previously published in the **Federal Register** on Monday, November 21, 2003 (68 FR 65743).

Thursday, December 2, 2004, Conference Room T- 2B3, Two White Flint North, Rockville, Maryland

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.: Expert Elicitation on Large-Break LOCA Frequencies (Open)- The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the draft predecisional NUREG- XXX, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," and the conclusions and recommendations of the Expert Elicitation Panel.

10:15 a.m.- 11:45 a.m.: Proposed Rule for Risk-Informing 10 CFR 50.46 (Open)- The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the proposed rule for risk-informing 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors."

12:45 p.m.- 2:45 p.m.: Technical Basis for Potential Revision of the Pressurized Thermal Shock (PTS) Screening Criteria in the PTS Rule (Open)- The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the technical basis for potential revision of the PTS screening criteria in the PTS rule.

3 p.m.- 4:30 p.m.: Preparation of ACRS Reports (Open)- The Committee will discuss proposed ACRS reports on matters considered during this meeting.

4:45 p.m.- 7 p.m.: Safeguards and Security Matters (Closed)- The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding safeguards and security matters.

Friday, December 3, 2004, Conference Room T- 2B3, Two White Flint North, Rockville, Maryland

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.- 9 a.m.: Peer Review Comments on the Technical Basis for Revising the PTS Screening Criteria (Open)- The Committee will hold discussions with the Chairman of the Peer Review Panel, as needed, regarding the Panel's comments on the technical basis for potential revision of the PTS screening criteria.

9 a.m.- 10:30 a.m.: Draft Commission Paper on Technology Neutral Framework for Future Plant Licensing-Policy Issues (Open)- The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding the draft Commission Paper on "Regulatory Structure for New Plant Licensing, Part 1: Technology Neutral Framework-Policy Issues."

10:45 a.m.- 11 a.m.: Subcommittee Report (Open)- The Committee will hear a report by the Chairman of the ACRS Subcommittee on Reliability and Probabilistic Risk Assessment regarding the status of development of the draft NUREG document on Treatment of Uncertainties.

11 a.m.- 11:15 a.m.: Subcommittee Report (Open)- The Committee will hear a report by the Chairman of the ACRS Subcommittee on Plant License Renewal regarding interim review of the license renewal application for the Arkansas Nuclear One, Unit 2 Nuclear Power Plant.

11:15 a.m.- 11:45 a.m.: Election of ACRS Officers for CY 2005 (Open)- The Committee will elect Chairman and Vice Chairman for the ACRS and Member-at-Large for the Planning and Procedures Subcommittee for CY 2005.

1:45 p.m.- 2:45 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, including anticipated workload and member assignments.

2:45 p.m.- 3 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.

3:15 p.m.- 7 p.m.: Preparation of ACRS Reports (Open/Closed)- The Committee will discuss proposed ACRS reports.

Saturday, December 4, 2004, Conference Room T- 2B3, Two White Flint North, Rockville, Maryland

8:30 a.m.- 12:30 p.m.: Preparation of ACRS Reports (Open/Closed)- 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 5, 2004 (69 FR 59620). In accordance with those 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. Persons desiring to make oral statements should notify the Cognizant ACRS staff named below 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 the Cognizant ACRS staff 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 the Cognizant ACRS staff if such rescheduling would result in major inconvenience.

In accordance with Subsection 10(d) Pub. L. 92- 463, I have determined that it is necessary to close portions of this meeting noted above to discuss and protect information classified as national security information and safeguards information pursuant to 5 U.S.C. 552b(c)(1) and (3).

Further information regarding topics to be discussed, whether the meeting has been canceled or rescheduled, as

well as the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefor can be obtained by contacting Mr. Sam Duraiswamy, Cognizant ACRS staff (301- 415- 7364), between 7:30 a.m. and 4:15 p.m., e.t.

ACRS meeting agenda, meeting transcripts, and letter reports are available through the NRC Public Document Room at pdrc@nrc.gov, or by calling the PDR at 1- 800- 397- 4209, or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS) which is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> or <http://www.nrc.gov/reading-rm/doc-collections/> (ACRS & ACNW Mtg schedules/agendas).

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., e.t., 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 and facilities that they use to establish the videoteleconferencing link. The availability of videoteleconferencing services is not guaranteed.

The ACRS meeting dates for Calendar Year 2005 are provided below:

ACRS meeting No.	Meeting dates
.....	January 2005 (No meeting).
519	February 10-12, 2005.
520	March 3-5, 2005.
521	April 7-9, 2005.
522	May 5-7, 2005.
523	June 1-3, 2005.
524	July 6-8, 2005.
.....	August 2005 (No meeting).
525	September 8-10, 2005.
526	October 6-8, 2005.
527	November 3-5, 2005.
528	December 8-10, 2005.

Dated: November 18, 2004.

Andrew L. Bates,

Advisory Committee Management Officer.
[FR Doc. 04- 26005 Filed 11- 23- 04; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

Notice of Opportunity To Comment on Model Safety Evaluation on Technical Specification Improvement To Modify Requirements Regarding the Addition of LCO 3.0.8 on the Inoperability of Snubbers Using the Consolidated Line Item Improvement Process

AGENCY: Nuclear Regulatory Commission.

ACTION: Request for comment.

SUMMARY: Notice is hereby given that the staff of the Nuclear Regulatory Commission (NRC) has prepared a model safety evaluation (SE) relating to the impact of inoperable non-technical specification snubbers on supported systems in technical specifications (TS). The NRC staff has also prepared a model no-significant-hazards-consideration (NSHC) determination relating to this matter. The purpose of these models is to permit the NRC to efficiently process amendments that propose to add an LCO 3.0.8 that provides a delay time for entering a supported system TS when the inoperability is due solely to an inoperable snubber, if risk is assessed and managed. Licensees of nuclear power reactors to which the models apply could then request amendments, confirming the applicability of the SE and NSHC determination to their reactors. The NRC staff is requesting comment on the model SE and model NSHC determination prior to announcing their availability for referencing in license amendment applications.

DATES: The comment period expires December 27, 2004. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received on or before this date.

ADDRESSES: Comments may be submitted either electronically or via U.S. mail. Submit written comments to Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mail Stop: T-6 D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Hand deliver comments to: 11545 Rockville Pike, Rockville, Maryland, between 7:45 a.m. and 4:15 p.m. on Federal workdays. Copies of comments received may be examined at the NRC's Public Document Room, 11555 Rockville Pike (Room O- 1F21), Rockville, Maryland. Comments may be submitted by electronic mail to CLIIP@nrc.gov.

FOR FURTHER INFORMATION CONTACT: Tom Boyce, Mail Stop: O- 12H4, Division of Inspection Program Management, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555- 0001, telephone 301- 415- 0184.

SUPPLEMENTARY INFORMATION:

Background

Regulatory Issue Summary 2000- 06, "Consolidated Line Item Improvement Process for Adopting Standard Technical Specification Changes for Power Reactors," was issued on March 20, 2000. The consolidated line item improvement process (CLIIP) is intended to improve the efficiency of NRC licensing processes by processing proposed changes to the standard technical specifications (STS) in a manner that supports subsequent license amendment applications. The CLIIP includes an opportunity for the public to comment on a proposed change to the STS after a preliminary assessment by the NRC staff and a finding that the change will likely be offered for adoption by licensees. This notice solicits comment on a proposed change that allows a delay time for entering a supported system TS when the inoperability is due solely to an inoperable snubber, if risk is assessed and managed. The CLIIP directs the NRC staff to evaluate any comments received for a proposed change to the STS and to either reconsider the change or announce the availability of the change for adoption by licensees. Licensees opting to apply for this TS change are responsible for reviewing the staff's evaluation, referencing the applicable technical justifications, and providing any necessary plant-specific information. Each amendment application made in response to the notice of availability will be processed and noticed in accordance with applicable rules and NRC procedures.

This notice involves the addition of LCO 3.0.8 to the TS which provides a delay time for entering a supported system TS when the inoperability is due solely to an inoperable snubber, if risk is assessed and managed. This change was proposed for incorporation into the standard technical specifications by the owners groups participants in the Technical Specification Task Force (TSTF) and is designated TSTF- 372. TSTF- 372 can be viewed on the NRC's Web page at <http://www.nrc.gov/reactors/operating/licensing/techspecs.html>.

Applicability

This proposal to modify technical specification requirements by the



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

November 17, 2004

SCHEDULE AND OUTLINE FOR DISCUSSION
518th ACRS MEETING
DECEMBER 2-4, 2004

THURSDAY, DECEMBER 2, 2004, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND

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

- 2) 8:35 - ^{10:40}~~10:00~~ A.M. Expert Elicitation on Large-Break LOCA Frequencies (Open)
(GEA/MRS)
2.1) Remarks by the Cognizant Subcommittee Chairman
2.2) Briefing by and discussions with representatives of the
NRC staff regarding draft predecisional NUREG-XXX,
"Estimating Loss-of-Coolant Accident (LOCA) Frequencies
Through the Elicitation Process," and the conclusions and
recommendations of the Expert Elicitation Panel.

Representatives of the nuclear industry and members of the public
may provide their views, as appropriate.

- ^{10:40 - 10:50}
10:00 - 10:15 A.M. ***BREAK***
- 3) ^{10:05 - 1:00}
~~10:15 - 11:45~~ A.M. Proposed Rule for Risk-Informing 10 CFR 50.46 (Open) (WJS/MRS)
3.1) Remarks by the Cognizant Subcommittee Chairman
3.2) Briefing by and discussions with representatives of the NRC
staff regarding the proposed rule for risk-informing 10 CFR
50.46, "Acceptance Criteria for Emergency Core Cooling
Systems for Light-Water Nuclear Power Reactors."

Representatives of the nuclear industry and members of the public
may provide their views, as appropriate.

- ^{1:00 - 1:45}
11:45 - 12:45 P.M. ***LUNCH***
- 4) ^{1:45 - 3:30}
~~12:45 - 2:45~~ P.M. Technical Basis for Potential Revision of the Pressurized Thermal
Shock (PTS) Screening Criteria in the PTS Rule (Open)
(WJS/HPN/CS)
4.1) Remarks by the Cognizant Subcommittee Chairman
4.2) Briefing by and discussions with representatives of the NRC
staff regarding the technical basis for potential revision of the
PTS screening criteria in the PTS rule.

Representatives of the nuclear industry and members of the public
may provide their views, as appropriate.

- 5) ^{3:30-3:45}
~~3:00~~ - 4:30 P.M. Preparation of ACRS Reports (Open)
Discussion of proposed ACRS reports on:
- 5.1) Expert Elicitation on Large-Break LOCA Frequencies (GEA/MRS)
 - 5.2) Proposed Rule for Risk-Informing 10 CFR 50.46 (WJS/MRS)
 - 5.3) Technical Basis for Potential Revision of the PTS Screening Criteria (WJS/HPN/CS)

4:30 - 4:45 P.M. *BREAK*****

- 6) 4:45 - 7:00 P.M. Safeguards and Security Matters (Closed) (MVB/RPS/RKM)
Discussion of Safeguards and Security matters.

[NOTE: This session will be closed to protect information classified as national security information and safeguards information pursuant to 5 U.S.C. 552b(c)(1) and (3).]

FRIDAY, DECEMBER 3, 2004, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 7) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (MVB/JTL/SD)
- 8) 8:35 - 9:00 A.M. Peer Review Comments on the Technical Basis for Revising the PTS Screening Criteria (Open) (WJS/HPN/CS)
- 8.1) Remarks by the Cognizant Subcommittee Chairman
 - 8.2) Briefing by and discussions with the Chairman of the Peer Review Panel, as needed, regarding the Panel's comments on the technical basis for potential revision of the PTS screening criteria.
- 9) 9:00 - 10:30 A.M. Draft Commission Paper on Technology Neutral Framework for Future Plant Licensing - Policy Issues (Open) (TSK/MME)
- 9.1) Remarks by the Cognizant Subcommittee Chairman
 - 9.2) Briefing by and discussions with representatives of the NRC staff regarding the draft Commission Paper on "Regulatory Structure for New Plant Licensing, Part 1: Technology Neutral Framework - Policy Issues."

Representatives of the nuclear industry and members of the public may provide their views, as appropriate.

10:30 - 10:45 A.M. *BREAK*****

- 10) 10:45 - 11:00 A.M. Subcommittee Report (Open) (GEA/MRS)
Report by the Chairman of the ACRS Subcommittee on Reliability and Probabilistic Risk Assessment regarding the status of development of the draft NUREG document on Treatment of Uncertainties.

- 11) 11:00 - 11:15 A.M. Subcommittee Report (Open) (MVB/CS)
Report by the Chairman of the ACRS Subcommittee on Plant License Renewal regarding interim review of the license renewal application for the Arkansas Nuclear One, Unit 2 Nuclear Power Plant.
- 12) 11:15 - 11:45 A.M. Election of ACRS Officers for CY 2005 (Open) (MVB/JTL/SD)
The Committee will elect Chairman and Vice Chairman for the ACRS and Member-at-Large for the Planning and Procedures Subcommittee for CY 2005.
- 11:45 - 1:45 P.M. *****LUNCH*****
- 13) 1:45 - ^{3:45}~~2:45~~ P.M. Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (MVB/JTL/SD)
- 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, including anticipated workload and member assignments.
- 14) 2:45 - 3:00 P.M. Reconciliation of ACRS Comments and Recommendations (Open) (MVB, 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.
- 3:00 - 3:15 P.M. *****BREAK*****
- 15) 3:15 - 7:00 P.M. Preparation of ACRS Reports (Open/Closed)
Discussion of the proposed ACRS reports on:
- 8:30-9:04 15.1) Expert Elicitation on Large-Break LOCA Frequencies (GEA/MRS)
- 4:00-5:30 15.2) Proposed Rule for Risk-Informing 10 CFR 50.46 (WJS/MRS)
- 15.3) Technical Basis for Potential Revision of the PTS Screening Criteria (WJS/HPN/CS)
- 15.4) Technology Neutral Framework for Future Plant Licensing - Policy Issues (Tentative) (TSK/MME)
- ~~15.5) Safeguards and Security Matters (Tentative) (Closed) (MVB/RPS/RKM)~~

SATURDAY, DECEMBER 4, 2004, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 16) 8:30 - 12:30 P.M. Preparation of ACRS Reports (Open/Closed)
Continue discussion of proposed ACRS reports listed under Item 15.
- 17) 12:30 - 1:00 P.M. Miscellaneous (Open) (MVB/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.**
- **Thirty-Five (35) hard copies and (1) electronic copy of the presentation materials should be provided to the ACRS.**

APPENDIX III: MEETING ATTENDEES

518TH ACRS MEETING
DECEMBER 2-4, 2004

NRC STAFF (12/2/2004)

S. Dinsmore, NRR	M. Koval, NRR
A. Salomon, RES	B. Jasinski, NRR
J. Wermiel, NRR	B. Richter, NRR
Y. Orecheva, NRR	S. Malik, RES
A. Hiser, RES	R. Woods, RES
G. Bagchi, NRR	D. Lew, RES
J. Calvo, NRR	M. Junge, RES
J. Beall, OCM/EXM	M. Mitchell, NRR
C. Ader, RES	M. Kirk, RES

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

P. Bailey, ICF Consulting
W. Hamon, STPNOC/WOG
B. Bishop, Westinghouse
C. Brinkman, Westinghouse
B. Bradley, NEI
B. Hdies, CEG
R. Gamble, Sartrex Corp.
B. Arcieri, ISL
D. Whitehead, SNL
S. Dolley, McGraw-Hill
T. Dickson, ORNL

NTC STAFF (12/3/2004)

J. Wilson, NRR	S. Rubin, RES
M. Drouin, RES	T. King, RES
M. Stutzke, NRR	
G. Parry, NRR	
D. Lew, RES	
C. Carpenter, OCM	
M. Tschiltz, NRR	
C. Ader, RES	

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

C. Farrell, NEI
S. Mazurkiewicz, AREUA
S. Newberry, ISL



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

APPENDIX IV

January 31, 2005

REVISED
SCHEDULE AND OUTLINE FOR DISCUSSION
519th ACRS MEETING
FEBRUARY 10-11, 2005

**THURSDAY, FEBRUARY 10, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

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

2) 8:35 - 12:00 Noon Power Uprate for Waterford Nuclear Plant (Open) (GBW/RC)
(10:00-10:15 A.M. BREAK) 2.1) Remarks by the Cognizant Subcommittee Chairman
2.2) Briefing by and discussions with representatives of the NRC staff and Entergy Operations, Inc. regarding Entergy's license amendment request for an 8% increase in thermal power for the Waterford Nuclear Plant and the related NRC staff's Safety Evaluation Report.

12:00 - 1:00 P.M. ***LUNCH***

3) 1:00 - 4:00 P.M. Mixed Oxide (MOX) Fuel Fabrication Facility (Open) (DAP/MWW)
(2:30-2:45 P.M. BREAK) 3.1) Remarks by the Cognizant Subcommittee Chairman
3.2) Briefing by and discussions with representatives of the NRC staff regarding the draft Safety Evaluation Report related to the construction authorization request to construct a MOX Fuel Fabrication Facility at the Department of Energy's Savannah River site.

4:00 - 4:15 P.M. ***BREAK***

4) 4:15 - 6:30 P.M. Preparation of ACRS Reports (Open)
Discussion of proposed ACRS reports on:
4.1) Waterford Power Uprate (GBW/RC)
4.2) Construction Authorization Application for the MOX Fuel Fabrication Facility (DAP/MWW)

**FRIDAY, FEBRUARY 11, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

5) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (GBW/JTL/SD)

6) 8:35 - 8:50 A.M. Subcommittee Report (Open) (MVB/CS)
Report by the Chairman of the ACRS Subcommittee on Plant License Renewal regarding interim review of the license renewal application for the D.C. Cook Nuclear Plant.

- 7) 8:50 - 10:00 A.M. Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (GBW/JTL/SD)
 7.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.
 7.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.
- 10:00 - 10:15 A.M. ***BREAK*****
- 8) 10:15 - 11:15 A.M. Assessment of the Quality of the Selected NRC Research Projects (Open) (DAP/HPN/SD)
 Report by the Chairman of the Safety Research Program Subcommittee regarding the plan, schedule, and assignments for assessing the quality of selected NRC research projects.
- 9) 11:15 - 11:30 A.M. Reconciliation of ACRS Comments and Recommendations (Open) (GBW, 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.
- 11:30 - 12:30 P.M. ***LUNCH*****
- 10) 12:30 - 6:00 P.M. Preparation of ACRS Reports (Open)
 Discussion of the proposed ACRS reports on:
 10.1) Waterford Power Uprate (GBW/RC)
 10.2) Construction Authorization Application for the MOX Fuel Fabrication Facility (DAP/MWW)
- 11) 6:00 - 6:30 P.M. Miscellaneous (Open) (GBW/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.**
- **Thirty-Five (35) hard copies and (1) electronic copy of the presentation materials should be provided to the ACRS.**

APPENDIX V
LIST OF DOCUMENTS PROVIDED TO THE COMMITTEE
518TH ACRS MEETING
DECEMBER 2-4, 2004

[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 | <u>Opening Remarks by the ACRS Chairman</u>
1. Items of Interest, dated December 2-4, 2004 |
| 2 | <u>Expert Elicitation on Large-Break LOCA Frequencies</u>
2. Selection of Transition Break Size for 10 CFR 50.46 Revision presentation by NRR and RES [Viewgraphs] |
| 3 | <u>Proposed Rule for Risk-Informing 10 CFR 50.46</u>
4. Tracking the Cumulative Change in Risk presentation by S. Dinsmore, NRR [Viewgraphs]
5. Regulatory Analysis for 10 CFR 50.46 Proposed Rule presentation by NRR [Viewgraphs] |
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 5. Staff Requirements Memorandum dated July 1, 2004, from Annette L. Vietti-Cook, SECY, NRC, to Luis A. Reyes, EDO, NRC, Subject: Staff Requirements SECY-04-0037, "Issues Related to Proposed Rulemaking to Risk-Inform Requirements Related to Large Break Loss-of-Coolant Accident (LOCA) Break Size and Plans for Rulemaking on LOCA with Coincident Loss-of-Offsite Power"

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS AND SECURITY
518TH FULL COMMITTEE MEETING

DECEMBER 2-4, 2004

DECEMBER 2, 2004
Today's Date

NRC STAFF PLEASE SIGN IN FOR ACRS MEETING
PLEASE PRINT

<u>NAME</u>	<u>NRC ORGANIZATION</u>
Stephen Vinsmore	NRR/DSSA
Arthur Salomon	RES/DRAA/PRAB
Jared Wermiel	NRR/DSSA/SRXB
Yuri Orzechuk	NRR/DSSA/SRXB
Aiken Hiser	RES/DET/MEB
GOUTAM BAGCHI	NRR/DE/EMEB
Jesse Calvo	NRR/DE/EEIB
J BEALL	OCM/EXM
Charles Ader	RES/DRAA
Mark Koval	NRA/DSSA
Bob Jasnoch	NRR/OP
BRIAN RICHTER	NRR/DRIF
SHAH MALIK	RES/DET/MEB
Roy Woods	RES/DRAA/PRAB
David Lew	RES/DRAA/PRAB
Mike Jung	RES/DRAA/PRAB
Matthew A. Mitchell	NRR/DE/EMCO
MARIC KIRK	NRC/RES/DET/MEB

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS AND SECURITY
518TH FULL COMMITTEE MEETING

DECEMBER 2-4, 2004

DECEMBER 3, 2004

Today's Date

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PLEASE PRINT

NAME

NRC ORGANIZATION

JERRY WILSON

NRR / DRIP

Mary Toriumi

RES / PRAA

MARTY STUTZKE

NRR / DSSA / SPSB

GARETH PERRY

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Charles Ader

RES / DRAA

Stuart Rubini

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Tom King

RES

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS AND SECURITY

518th FULL COMMITTEE MEETING
DECEMBER 2-4, 2004

December 3, 2004
Today's Date

ATTENDEES PLEASE SIGN IN BELOW
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NAME

AFFILIATION

CLIFTON FARRELL

NEI

Stephen Mazurkiewicz

AREVA

Scott Nowberry

ISL

ITEMS OF INTEREST

518th ACRS MEETING

DECEMBER 2-4, 2004

**ITEMS OF INTEREST
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
518th MEETING
December 2-4, 2004, 2004**

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November 22, 2004

MEMORANDUM TO: Luis A. Reyes
Executive Director for Operations

FROM: Annette L. Vietti-Cook, Secretary *IRA by Andrew L. Bates
Acting Forl*

SUBJECT: STAFF REQUIREMENTS - SECY-04-0200 - A RISK-INFORMED
APPROACH TO DEFINING THE DESIGN BASIS TORNADO
FOR NEW REACTOR LICENSING

The Commission has approved "Option 1" to proceed with updating NUREG/CR-4461, "Tornado Climatology of the Contiguous United States." The staff should expeditiously complete the update of NUREG/CR-4461, report the results to the Commission, and present the Commission with a plan for updating the affected guidance documents. The staff should promptly notify the Commission if the inconsistencies in NRC regulatory guidance documents concerning design basis maximum tornado wind speeds cannot be resolved within the scope of Option 1.

The Commission has disapproved proceeding with "Option 2" because the inconsistencies in NRC regulatory guidance documents concerning design basis maximum tornado wind speeds are expected to be resolved with "Option 1."

cc: Chairman Diaz
Commissioner McGaffigan
Commissioner Merrifield
DOC
OGC
CFO
OCA
OPA
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR

IN RESPONSE, PLEASE
REFER TO: M041108AB

November 17, 2004

MEMORANDUM TO: Luis A. Reyes
Executive Director for Operations

FROM: Annette L. Vietti-Cook, Secretary */RA/*

SUBJECT: STAFF REQUIREMENTS - BRIEFING ON PLANT AGING AND
MATERIALS DEGRADATION, 9:00 A.M./1:30 P.M., MONDAY,
NOVEMBER 8, 2004, COMMISSIONERS' CONFERENCE ROOM, ONE
WHITE FLINT NORTH, ROCKVILLE, MARYLAND (OPEN TO PUBLIC
ATTENDANCE)

In the morning session, the Commission was briefed by representatives of the nuclear power industry and the Nuclear Energy Institute (NEI) on the industry's initiatives in the management of materials issues. In the afternoon, NRC staff briefed the Commission on its reactor oversight and research programs that address materials degradation issues.

The staff's goal should continue to be a proactive program to predict future degradation and initiate regulatory action where appropriate. The staff should continue developing cooperative, integrated research programs that set priorities in a risk-informed manner. The staff should continue to pursue collaborative and complementary research programs with industry and foreign entities in order to benefit from their work and share the results of our work in the area of materials degradation. To the extent allowed (e.g., 10 CFR 2.390), the staff should conduct these activities consistent with the Agency's strategic goal to ensure openness in our regulatory process.

The industry and NRC staff should provide a briefing in approximately one year, to update the Commission on the status of their efforts to address materials degradation, including any regulatory action taken in response to items identified in the industry's materials issue programs. This briefing should also address how industry's mandatory and needed implementation categories are to be treated in regulatory space. Before the next briefing, the staff should provide the Commission with information copies of the draft reports on its implementation of the Phenomena Identification and Ranking Table (PIRT) program and its assessment of the safety significance of various forms of materials degradation.



NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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No. S-04-019

**Chairman Nils J. Diaz
U.S. Nuclear Regulatory Commission**

at the

American Nuclear Society's Winter Meeting

**November 15, 2004
Washington, D.C.**

**LEADERSHIP TOWARD A PROGRESSIVE,
INTEGRATED NUCLEAR COMMUNITY
GOING FORWARD TOGETHER**

Thank you. I am honored to be here with such a distinguished group of speakers. I appreciate the perspective Don Johnson just provided and I am personally looking forward to the interesting perspective that will be brought forward by my other fellow panelists. Personally, it is always a pleasure for me to participate in the American Nuclear Society meetings.

I will be presenting today my individual views, which do not necessarily represent the views of the Commission. I will limit my discussion to a regulatory perspective on, "Leadership Toward a Progressive, Integrated Nuclear Community." I will start with the bottom line: for the utilization of nuclear technology to advance to a new level of performance in the 21st century, nuclear regulation needs to be better, more predictable, more useable, more consistent across borders and more risk-informed. Using the theme of this conference, leadership by nuclear regulators should contribute to a progressive, more integrated nuclear regulatory community. In fact, nuclear regulation needs to be better managed to better serve individual countries as well as international needs. Nuclear regulation is a complex techno-legal construct that requires constant examination and management, even apart from sociopolitical issues.

At the NRC, our recently updated Strategic Plan for Fiscal Years 2004-2009 includes the agency's strategic objective of enabling the use and management of radioactive materials and

nuclear fuels for beneficial civilian purposes in a manner that protects public health and safety and the environment, promotes the security of our nation, and provides for regulatory actions that are open, effective, efficient, realistic, and timely. That is quite a mouthful, but I believe it embodies what we as regulators have been doing and are committed to continue to do in the 21st century. The revised NRC strategic plan is based on five goals: safety, security, openness, effectiveness and management. I have frequently emphasized safety, security, openness and effectiveness. Today, I want to focus on the role that excellence in management, specifically with regard to the management of nuclear licensing and regulation, plays in the management of safety.

The NRC strives for management excellence in carrying out all of its regulatory responsibilities. This goal includes strategies for the management of safety, human capital, financial performance, expanded electronic government, budget and performance integration, and external and internal communications. Key attributes of excellence in management are enhanced accountability, connectivity, communications and timeliness. In this regard, the regulator/licensee interface is key to the management of safety, and therefore, requires excellence in management by both the regulator and the industry.

At this point, I will venture to say that there are more striking differences in the global regulation of nuclear power than in the technology and operation of the nuclear power plants themselves. I value the distinct contribution that each nuclear regulator makes to safety within each country's framework; however, I believe that more convergence on the regulatory framework and its tools would enhance predictability and decisionmaking. Going forward, four key areas requiring expertise and excellence in regulatory management, and which contain elements amenable to international collaboration, are: license renewal (also called plant life extension or periodic safety review), power uprates, unplanned extended shutdowns, and new reactor design certification. On the first two, I believe most everyone will agree that the nuclear power plant license renewals and power uprates which satisfy safety requirements contribute to the energy supply, economic stability and well-being of nations. For this purpose the improvement of regulatory programs and tools for both license renewals and power uprates are amenable to bilateral or even multilateral exchanges. The third key issue I mentioned was unplanned extended shutdowns. I gave a talk earlier this month at the Institute of Nuclear Power Operations (INPO) Chief Executive Officer (CEO) meeting on the issue of management of extended shutdowns. This is also a very important issue, for which the management of the regulator/industry interface and many of the regulatory treatment options is amenable to integrated international analysis, aiding each country's decision making. For more information on this topic, you can find this talk at the NRC web site at www.nrc.gov.

I have frequently expressed my conviction that national licensing and regulatory authorities should remain strong and fully responsible for making their countries' regulatory decisions; however, there are key parts of regulations that are amenable to "internationalization." I believe that safety will be better served when certified designs can be accepted across borders as a commodity, fully respecting property rights and the licensing responsibility of regulatory authorities. Therefore, I am convinced that regulators should seek to develop the tools needed to certify new reactor designs, as well as to certify the related research programs used to validate these designs, using bilateral or multilateral agreements. The bottom line is that safety and regulatory decisions would be facilitated globally.

For example, design certifications completed by the NRC can be reviewed and adopted by other regulators thereby utilizing a broad range of expertise, research results and other resources. For future design certification efforts, international regulators can, at the front end, join the projects and

participate in the efforts for both the safety reviews and the related technical and research activities that support the certification. The concept of consortia for these applications might sound strange, but it should become a 21st century reality. I am not advocating international licensing; licensing should remain each country's responsibility. I am advocating certifying reactor designs in a manner that should greatly enhance the regulator's management - in each country - of the relevant licensing and regulatory activities. A more detailed discussion of this topic is included in my remarks at the 2004 Nuclear Safety Research Conference (it can also be found on the NRC web site at www.nrc.gov).

Let me summarize my thoughts. Regulators are required by their countries to demonstrate excellence in the management of safety and there is much to be done to better share experiences, regulatory programs and tools, including design certification, across borders. I see opportunities for enhanced international cooperation among regulators to articulate and document regulatory decisions that are technical in nature. I see significant opportunities for improved connectivity among the regulators to ensure that different regulatory initiatives complement each other, minimizing duplication of effort. I see significant opportunities in improving communications among regulators by sharing expertise, know-how, analytical capabilities, as well as data generated from research efforts to permit greater consistency worldwide. I see opportunity for improvement in the area of timeliness as well, so safety issues can be promptly identified and resolved. We are entrusted with the responsibility to ensure safety in discharging our licensing and regulatory responsibilities; we are all in a path to do it better because we know better.

In conclusion, the future contribution of nuclear power generation to the global energy mix and to environmental stewardship depends on a variety of factors. The global regulatory environment is one of the significant factors affecting nuclear power in the 21st century. It is clear to me that regulatory activities need to keep pace with the changes in the nuclear industry and that regulations need to be maintained in step with the technological developments of the 21st century. There is no doubt that the nuclear industry will be profoundly influenced by international regulatory developments and we must be ready to effectively manage them.



NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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No. S-04-018

Chairman Nils J. Diaz
U.S. Nuclear Regulatory Commission

at the

Institute of Nuclear Power Operations (INPO)
25th Annual CEO Conference

November 3-4, 2004
Atlanta, Georgia

EXCELLENCE IN SAFETY MANAGEMENT
(Ensuring the Assurance of Adequate Protection
and Enhancing Public Confidence)

It is my distinct pleasure to address the 25th INPO CEO Conference. The Nuclear Regulatory Commission recognizes the important role INPO plays in helping the nuclear industry strengthen and sustain the focus on nuclear safety and improved plant performance. I will be presenting my individual views, which do not necessarily represent the views of the Commission, unless I state otherwise.

I have considered several good topics to discuss with you today. For example, I could talk about security: nuclear power plants in the USA are as secure as they should be, and the NRC continues to work with the industry to add further assurance to the safety strategies for event mitigation. I could also talk about safety and security, or new reactor licensing, or cross-border design certification, or regulatory predictability, or implementation of risk-informed and performance-based practices, or the new NRC Strategic Plan, or materials degradation.

In fact, I could go on and on, use up my time and never get beyond a very solid laundry list of issues. That would be nice. However, realizing it is late in the afternoon and it is November 3, 2004, I am going to pass by those issues. You may have guessed right: I am not going to miss the opportunity to add something to your plate. And INPO, unknowingly, gave me the solution, with their emphasis on excellence; excellence is a word normally outside the regulatory lexicon.

I am going to talk to you about excellence in safety management, its importance to ensuring the assurance of adequate protection and to increasing public confidence. Furthermore, I am going to focus on a very specific area of utmost concern for the NRC and for the industry: the management of events, of shutdowns and of extended shutdowns.

The discussion that preceded my talk certainly laid out the foundation for the issues I will be addressing. I cannot imagine a better introduction for my talk than what you experienced this afternoon (a discussion of the TMI-2 accident and its aftermath).

Let me begin with the regulator's role and the industry's role in continuing to "provide adequate protection" of public health and safety, a phrase you surely recognize comes from the Atomic Energy Act, enacted in 1954. The regulatory structure for commercial nuclear power was then established, and the Atomic Energy Commission was charged in part with regulating the civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety and to promote the common defense and security. Since the early days of commercial nuclear power, there have been many discussions on what constitutes "adequate protection." The framework for adequate protection is provided by the body of NRC regulations and requirements. Of course, the actual implementation of these requirements is primarily the job of the industry, with NRC oversight.

The protection of public health and safety is obviously a priority for the NRC; I believe it is a priority for the industry as well. In a sense, both the industry and the NRC have the mission to provide the oversight and management to ensure the assurance of adequate protection. I am not creating a tongue twister. I am trying to peel away any ambiguity about the ultimate responsibility and accountability for the assurance of adequate protection: it belongs to the nuclear industry management and the NRC management. The daily activities of the workers at nuclear plants should be conducted in a manner that assures adequate protection in the operation of facilities and the use of nuclear materials; the daily activities of the NRC staff should also assure adequate protection by implementing the licensing and regulatory functions of the agency. Yet, the best assurance of safety clearly requires excellence in management by both NRC and the industry managers, from top to bottom. They remain key in ensuring the assurance of adequate protection.

I mentioned earlier the NRC's new Strategic Plan. It is based on five goals: safety, security, openness, effectiveness and management. Two weeks ago at the Fall NRC's Senior Manager's Meeting, I only focused on one goal: excellence in management of the agency's activities across the board, with enhanced accountability, connectivity, communications and timeliness. In reviewing the NRC's and the industry's management performance, I became convinced that events, shutdowns and extended shutdowns, need additional management attention; a better, more effective, more risk-informed and performance-based management. I am going to be very specific.

I see the need for improved safety management and overall management of shutdowns, and especially of events and extended shutdowns. I see the need for effectively managing the regulator/licensee interface during events and extended shutdowns. I see the need for better informing the public and stakeholders of what is happening in the safety management of events and/or extended shutdowns. I see the need to converge on the resolution of safety issues, first and foremost, in a manner that demonstrates the NRC's and the licensee's full cognition of regulatory requirements, expectations, and timely solutions. And I see the need to communicate the resolution in each of these areas in clear and unambiguous terms, so people and stakeholders know what the situation is and what to expect.

Excellence in management is key to early convergence on safety issue resolution and the implementation of the solutions.

At this point, I will take a few minutes to discuss with you one perspective on the existing data on nuclear power plant events, shutdowns and extended shutdowns by reviewing the distribution of extended shutdowns during the last 25 years, beginning after TMI and therefore not including the shutdown of TMI-2. Figure 1 shows Unplanned Shutdowns that lasted for more than six (6) months. You may be a bit surprised by the fact that there have been at least 140 unplanned shutdowns lasting six months or longer since 1979. Excluded are some plants that permanently shutdown for economic or political reasons, in our judgment. Also excluded are routine shutdowns for planned maintenance or modifications, regardless of the length of the shutdown. Figure 1 correlates with the well-known data showing the increase in the capacity factor of the nuclear fleet that began in the mid-eighties, as well as with improvements in the safety performance indicators.

The peaks are reasonably correlated with identifiable events or regulatory initiatives. The increases from 1980 to 1985 were mainly the result of material degradation problems and the post-TMI action plans. It is well documented that materials degradation has always been an issue; some are old mechanisms of degradation and some are new. Shutdowns from 1986 to 1995 were mainly due to material degradation problems and design issues. The increase in the number of shutdowns in 1996 and 1997 corresponds to the issue of design basis and licensing basis resolution and documentation, as shown by the problems at Millstone and D.C. Cook, as well as management issues such as deficiencies in the corrective action program. I will dare to say that in the mid-nineties the regulatory interface was not well managed. Please keep in mind that there are other causal factors, which I am not addressing, that contributed to the length of the extended shutdowns. However, I still believe that pertinent conclusions can be drawn from the data.

Figure 2 shows those shutdowns that lasted for more than a year, a subset of Figure 1. There are 52 extended shutdown cases on Figure 2. Figures 1 and 2 confirm that both sets of extended shutdowns (longer than six and 12 months) have occurred in recent times with reduced frequency. Since 1998 there has only been one plant shutdown lasting longer than 12 months, and that was the 2002 Davis-Besse shutdown, which started as a serious materials degradation problem, and was compounded by the ECCS, sump and High Pressure Injection problems, and by management issues.

There is, of course, much good news here, especially since 1998, and there is no doubt that most of you should be congratulated for the very significant improvement made in your overall safety and management performance. I also believe the NRC made sound improvements in its regulatory approach to assure effective safety oversight. But there is more to discuss.

Figure 3 shows that the "over 6 months" and the "over 12 months" shutdowns are well correlated; the "over 6 months" data includes the "over 12 months" shutdowns. One fact is that the shutdowns of longer than 12 months dominate the 1993 and 1996 peaks. The 1979-1998 twenty-year average of shutdowns was about seven for longer than six months and about 2.5 for longer than 12 months. Since then, the number went down significantly, and stayed down.

Figure 4 presents a more complete picture; it shows the duration of each extended shutdown since 1996. For example, in 1999 there were five plants in extended unplanned outages, although no plant entered an extended outage in that year. Another way to look at this aspect of the issue is seen on

Figure 5, which shows total months of extended unplanned shutdowns per year. There were approximately 418 unplanned shutdown months (or 35 reactor shutdown years) from 1996 through 2004. It is not until 1999, or even 2001, that a very significant reduction was maintained.

A brief analysis of the 52 unplanned shutdowns since 1979 lasting longer than a year reveals a set of reappearing causes. One could group the causal factors as shown in Table 1:

TABLE 1

APPARENT CAUSE	No. of Shutdowns Longer than One yr	Shutdowns Avg. length (months)
Design basis or licensing basis	18	38
Material degradation	15	16.5
Management issues	12	25
Equipment failures	7	19

I would like to point out that, based on the numbers in Table 1, issues relating to “design basis or licensing basis” contributed to about 50 percent of the total industry-wide shutdown time (for shutdowns since 1979 lasting longer than a year). If you add “management issues” to these, the combination contributed almost three quarters of the total industry-wide shutdown time.

I believe I should at this point highlight some of the reasons why I decided to bring this issue out into the limelight again. Of course, it is TMI’s and INPO’s 25th Anniversary. But that is not it. First, I am convinced that the NRC and the industry have the know-how and opportunity today to deal with this now. A good time to do this is while there is no crisis. Also, the new security regime has been established, and license renewals are proceeding to extend plant life. Second, excellent management will support license renewal, power uprates, and other regulatory activities. Excellence in management is also needed to accommodate the fact that plants are now running longer between outages. Furthermore, we know that extended shutdowns are not necessarily related to the original reason for the shutdown and that excellent management could have, and should have, contributed to earlier resolution. Third, I am concerned that many of the good senior managers who have experienced extended shutdowns, have faded, or are about to fade, from the action. I am talking about both the industry and the NRC. While you and we have great talent in our respective pipelines, many do not have the scars. We owe new managers a good program to define better how to manage a potential crisis, including dealing effectively with the regulatory interface. Pipes, tubes, and equipment will weaken, and some will break, and there will be human failures. Management is about being ready.

Furthermore, at the beginning of my remarks, I mentioned the importance of safety management for increasing public confidence. I have often been asked why so many people are concerned with the safety of nuclear power plants when no member of the public has been injured by an event or accident. Well, I believe that unplanned shutdowns, especially extended shutdowns, contribute to these concerns.

They raise questions among members of the public about safety management and management practices. Excellence in management is strongly coupled with public confidence.

It has been said that the NRC has unnecessarily contributed to the number and length of extended shutdowns. I will neither dispute it nor confirm it. I am sure that we can all do better at fulfilling expectations for the management of the safety issues. It is fair to say that the NRC concentrates significant efforts on what we perceive as poor performance. The tools and policies we had in the past were not as effective as those we have today in discriminating between the truly significant safety issues and other conditions. Under our current policy, we keep safety issues as the focus of our attention, and the ROP is a prime example of a good tool. For some of the extended shutdowns, I believe that licensee management did not fully appreciate the regulatory implications of the situation. That made the NRC's job harder and demanded much more attention.

For the oversight of shutdown nuclear power plants with performance problems, the NRC has a well-documented process, found in the NRC Inspection Manual, Chapter 0350. The process involves establishing an NRC Oversight Panel, which then develops a Process Plan and a Restart Checklist. Obviously, a well-defined Restart Checklist is crucial for licensees to understand what corrective actions are needed prior to plant restart. I believe there may be opportunities for improvement in this process.

Please note that I have frequently emphasized corrective actions. I am convinced that there is no way to overstate the importance of an effective and timely Corrective Action Program. I am speaking not only about the industry: in fact, I believe there is a need for a Corrective Action Program for the NRC.

I have said little about refueling outages and planned shutdowns. I am sure we all agree that shutdowns should be well-managed and "pay me now or pay me later" has real meaning; therefore, the gold standard is not about how short they are but about how they contribute to long-term safety and reliability.

The NRC's obligation to protect the public can be fulfilled in a number of ways. I believe the public, the NRC, and the industry benefit most when the industry uncovers and fixes the problems. This applies to both plant-specific and generic concerns. While I expect excellence in safety management for the NRC and the licensees, how to achieve it at the power plants is the prerogative of the licensees. However, if there is a lack of understanding of regulatory matters, or lack of commitment to correct deficiencies, problems grow and complications develop, and the NRC would necessarily intervene. I am convinced that good two-way communications and fair and equitable treatment by the regulator can go a long way toward resolving these issues; it does, however, require a licensee commitment to safety. I am committed to fair and equitable treatment across the spectrum of regulatory issues.

Without a doubt much progress has been made over the last 10 years, and it is clear that the industry has significantly improved the performance of nuclear plants, and most of the events, shutdowns and extended shutdowns are now better managed. INPO has contributed to this improvement. I also believe the NRC has improved its oversight and management of regulatory issues. I sincerely hope the progress continues and reaches the point where extended shutdowns become part of the history of nuclear power and not part of the future. To improve their treatments of events and unplanned shutdowns, the industry and the NRC need to do even better. Just as a new Reactor Oversight Program was developed with the strong collaboration of the industry and other stakeholders, I believe

we can do much good by finding ways and taking steps to enhance the 0350 process and better address event and shutdown safety management. Excellence in management has broad applicability; I am taking one bite. Such efforts are needed to reduce the factors leading to or contributing to events or extended shutdowns, to resolve the issues that appear at the interfaces, to demonstrate excellence in management during a shutdown, and to implement the lessons learned throughout the industry, all in a timely manner. Proceeding on this path of enhancing the NRC's and the industry's management of safety will contribute to ensuring the assurance of adequate protection and to increasing public confidence.

Thank you for the opportunity to share my views with you.

Inside NRC

Volume 26 / Number 24 / November 29, 2004

Two new commissioners expected; Diaz chairmanship nears end

An unusual deal struck last week between the White House and Senate Minority Leader-elect Harry Reid (DNev.) will put two new commissioners at the agency in January and terminate Nils Diaz' chairmanship at the end of June.

Gregory Jaczko, Reid's science policy adviser, and retired Navy Vice Adm. Albert Konetzni Jr. will be installed as recess appointees for two-year terms under the agreement.

Jaczko, who was formally nominated Feb. 12 by President George W. Bush for the NRC post, cannot be renominated after the two-year term ends, according to a Nov. 21 statement issued by Senate Energy & Natural Resources Committee Chairman Pete Domenici (R-N.M.). But a spokeswoman for Reid said there is no such term-limit condition and that Reid is committed to ensuring that Jaczko serves out the remainder of the term for that NRC seat, which ends June 30, 2008. She said Domenici and other Republican leaders were not a part of the deal that Reid worked out privately with administration officials.

Domenici did not indicate in his prepared statement that there was any restriction on renominating Konetzni, whose name was forwarded to the Senate for consideration on Nov. 16 (Nucleonics Week, 18 Nov., 1).

The agreement was brokered Nov. 20 in the final hours of a lame-duck session to break an impasse on pending presidential nominees. But the compromise reached between the White House and Reid is not legally binding and is nothing more than a "gentlemen's agreement," as one observer put it. Sixteen senators had signed a letter Nov. 20 to Senate Majority Leader Bill Frist (R-Tenn.), saying they refused to confirm Jaczko by unanimous consent—a fast-track process typically used for noncontroversial candidates—without a hearing.

"While our position is certainly not politically expedient, we place too much importance on the role of the Nuclear Regulatory Commission to let that happen," they wrote. The signers were 15 Republicans—Domenici, Larry Craig (Idaho), George Voinovich (Ohio), James Inhofe (Okla.), Lisa Murkowski (Alaska), John Cornyn (Texas), Sam Brownback (Kan.), Craig Thomas (Wyo.), Lamar Alexander (Tenn.), George Allen (Va.), Rick Santorum (Pa.), Jeff Sessions (Ala.), Saxby Chambliss (Ga.), Peter Fitzgerald (Ill.), and Lindsey Graham (S.C.)—and one Democrat—Zell Miller (Ga.).

Domenici and Reid issued statements calling the arrangement an acceptable resolution. Recess appointments are not usually announced in advance. In this case, a date for the appointments was not publicized, but it is likely Bush will submit Konetzni's and Jaczko's names sometime between Jan. 7 and Jan. 19, when Congress is not in session. Reid spokeswoman Tessa Hafen said Jaczko would start immediately after he was appointed.

Konetzni awaits details

Konetzni said in Nov. 22 telephone interview from his home in Georgia that he had not been briefed on the specifics of his appointment and was waiting to learn more from the White House. He said he had not discussed with administration officials whether he would be named chairman. Many political observers, however, believe Bush will tap Konetzni to be the next chairman.

Industry officials were reportedly willing to sink Konetzni's nomination in order to also kill Jaczko's candidacy. It was rumored that Konetzni had asked at least once for the White House to withdraw his papers from the background check. But Konetzni denied that he had requested his

name be pulled from consideration. In fact, he said he did little either to promote or halt his nomination.

"I didn't ask for this," he said, but added that his 38-year background in the nuclear Navy would provide him with the training for the job. "I've got the technical background" and "good people skills," he said.

Konetzni was deputy and chief of staff for the U.S.

Atlantic Fleet when he retired in mid-July. His previous position, between May 1998 and May 2001, was commander of the U.S. Pacific Fleet's submarine force. After graduating from the U.S. Naval Academy in 1966, Konetzni attended Naval Submarine School and then was trained in naval nuclear power systems. He held numerous command and senior positions over the years, earning him the moniker "Big Al, the sailor's pal." Konetzni joked last week that it was not a nickname that he gave himself.

After learning that the deal between the White House and congressional leaders would make him a commissioner for two years instead of the expected four-year term, Konetzni said he would have to consider how that would affect his family's future. "My wife and I will sit down and look at the pros and cons," he said.

There is nothing to prevent the White House from resubmitting Konetzni's nomination at any time. Nor is there any indication that the administration doesn't anticipate that Konetzni would serve out the remainder of the term ending in June 2009. Although he has not yet sorted out the particulars of the NRC job, Konetzni said he was pleased to be named to the position. "I look forward to serving," he said, if he decides to take the position.

End of an era

Diaz was unavailable for comment last week, but his chief of staff, Richard Croteau, said Nov. 22 that he was unsure of his boss' plans after June. Last week's agreement calls for a switch in agency heads in July. Croteau also said he did not know whether Diaz had certain priorities that he would focus on before his tenure as chairman ends. He said Diaz has operated over the past year and a half by pushing through "as much as he can."

But one Nuclear Energy Institute source said that the industry has begun compiling a list of issues that it would like resolved while the current commission is still together. Among those issues are programmatic Itaac—short for inspections, tests, analyses, and acceptance criteria. Commissioner

Edward McGaffigan, whose second term ends June 30, has strongly supported the industry's position on this issue. Industry is particularly concerned that Jaczko will use a "pocket veto" to delay commission decisions, including adjudicatory ones if Diaz leaves and the White House is slow to nominate replacements for vacant commission slots. NRC rules require a quorum of three commissioners, and Jaczko could choose not to vote on issues in which he strongly objects to the positions of the other two commissioners.

Industry officials have repeatedly voiced concerns about Jaczko's ability to be impartial. Since joining Reid's staff in 2001, Jaczko has spoken out against the high-level waste repository planned at Yucca Mountain, Nev. The agreement reached last week, according to Domenici, would bar Jaczko from participating in any commission decision on repository-related matters during his first year at NRC. But that was a pledge Jaczko voluntarily offered when he was nominated by Bush, Reid's spokeswoman said (INRC, 3 May, 1).

Some raised questions about how that would affect key Yucca Mountain decisions. They wondered whether Jaczko's recusal promise would stymie the commission from making any decisions on Yucca Mountain after June 30, assuming both Diaz and McGaffigan depart and there were only two commissioners—less than a quorum—to vote on high-level waste issues.

Jaczko and Konetzni will also need time "to get their feet under them," especially on adjudicatory matters, said one NRC source. A lot will depend on how quickly Konetzni can master the issues. For months after he gets here, "he'll be drinking from a fire hose" as he tries to absorb a vast amount of information, the source said.

Another key to the stability of the commission depends on the staffers that Jaczko hires. By tradition, a commissioner typically fills most or all of his staff positions from inside the agency. But there is nothing to stop Jaczko from hiring outside nuclear critics such as David Lochbaum and Edwin Lyman of the Union of Concerned Scientists or James Riccio of Greenpeace, the NRC source said. Those moves would, in the opinion of this source, be "disastrous" and lead to "enormous conflicts." The upshot, though, would be that Jaczko would "isolate himself and his staff" from decision-making at NRC, another source said.

One industry source said that if Jaczko tries to be an obstructionist, the White House would likely move quickly to fill the vacant seats on the commission.

But even under the best of circumstances for the industry —Jaczko is a reasonable critic and Konezni is a quick learner and a strong chairman—the commission in the coming years will be different. And the industry has been told, by senior NRC officials, that it had better prepare for a period of some instability after the “golden era” that it has enjoyed from having three two-term commissioners serving simultaneously. Another industry worry is that Jaczko will provide an unwelcome communication link to his former boss, Rep. Edward Markey (D-Mass.), an ardent antinuclear critic. After receiving a doctorate in physics from the University of Wisconsin-Madison in 1999, Jaczko worked for a year for Markey as a congressional science fellow.

Reid brushed aside suggestions that Jaczko would not be objective, saying in a Nov. 21 statement that Jaczko’s scientific background would aid him in making decisions on nuclear safety and public health. Reid said Jaczko would “put the welfare of the American public above everything else.” Jaczko, who turned 34 in October, would be the second youngest commissioner to serve. Former commissioner James Asselstine was not quite 34 when he came to the agency in May 1982, and James Curtiss was 34 years and 10 months when he was sworn in as commissioner in October 1988.

The NRC has not had all five commission slots filled since former chairman Richard Meserve left the agency in March 2003. Commissioner Greta Dicus departed three months later at the end of her second term, and the commission has since been operating with only three political appointees.

—*Jenny Weil and Michael Knapik, Washington*

Inside NRC

Volume 26 / Number 24 / November 29, 2004

NRC escapes deep spending cuts; budget grows by \$44-million

Congress approved last week NRC's fiscal 2005 budget request almost in its entirety, slicing only about \$1-million as part of a 0.83% across-the-board cut that affected nearly every federal agency.

The House and Senate agreed Nov. 20 to an NRC operating budget of \$670.2-million, of which about \$128.4-million would be appropriated. The remaining \$541.1-million will be recovered from fees assessed to licensees regulated by NRC.

The agency's FY-04 budget was about \$626.1-million, but NRC's authority to collect user fees dropped from 92% to 90% of its projected costs for FY-05.

NRC's budget was rolled into an \$821.9-billion omnibus spending bill because legislators were unable to complete action on 13 individual FY-05 appropriation bills by the start of the new fiscal year, which began Oct. 1. The measure was expected to be sent last week to President George W. Bush for his signature. The NRC, like other agencies, has been operating for the past seven weeks at last year's budget levels.

Congress agreed to appropriate about \$69-million from the Nuclear Waste Fund to cover high-level waste activities and about \$59-million from the general U.S. Treasury. NRC's net appropriations will be about \$47-million more than in FY-04.

In a report accompanying the bill, appropriators directed NRC to implement findings of a National Academy of Sciences (NAS) study on spent fuel storage at commercial reactors.

The report said the NAS study "found a number of areas in which the NRC could improve its modeling of the risks to spent fuel storage and the mitigation of such risks."

The conferees said NRC should “take the necessary steps to improve its analyses, including the preparation of site-specific models, and to work with the utilities to ensure timely application of this information to mitigate risks.”

The NAS report was finished in late June, but an unclassified summary is not expected to be released until next month (Inside NRC, 28 June, 1).—**Jenny Weil, Washington**

Inside NRC

Volume 26 / Number 24 / November 29, 2004

Final 50.69 rule released, but some implementation issues remain

After a long and tortuous journey, NRC published Nov. 22 a final rule that risk-informs the agency's special treatment requirements for structures, systems, and components (SSC) in nuclear power plants.

The voluntary rule—10 CFR 50.69—offers utilities the promise of significant cost savings in procuring safety-related parts judged to be of low safety significance after a robust categorization process. One industry estimate suggested that a dual-unit reactor site might be able to save as much as \$2.3-million a year.

The final 50.69 rule had its origins in the mid-1990s in an industry initiative to come up with a graded quality assurance alternative to existing requirements in 10 CFR Part 50, Appendix B.

Industry representatives have indicated that there are still some “make or break” implementation issues that need to get resolved before most utilities move to adopt the rule. Among other things, the Nuclear Energy Institute (NEI) is unhappy that the statement of considerations (SOC)—the explanation of the final rule—still contains too many “musts,” according to an NEI source. (The final rule language uses the word “must” about 12 times, but the section-by-section analysis of the rule uses the word “must” about 48 times.) The use of “must” so often in the SOC

was "inappropriate," said one NEI source. This just adds "an element of uncertainty" to how NRC will interpret the rule language, and it won't help ensure regulatory stability, he said.

NEI hopes to resolve most of the implementation issues during discussions with agency staffers about NRC regulatory guide 1.201. That reg guide provides the agency's position on NEI guidance for categorizing SSCs (NEI 00-04). NEI is hoping to get a "clean endorsement" by NRC, according to NEI's Biff Bradley, who talked about the 50.69 rule at the recent American Nuclear Society (ANS) conference in Washington, D.C. But there is not yet agreement between the industry and NRC over a key issue of how common cause failures and known degradation mechanisms are to be handled during the categorization process. A meeting on this topic is expected to be held sometime in mid-December.

The industry hopes other implementation issues will be addressed by 50.69 license amendments to be submitted by two pilot plants next year—Dominion's Surry and Wolf Creek Nuclear Operating Corp.'s Wolf Creek. But NRC staff reviews of those submittals are unlikely to be completed before fourth quarter 2005, and most other licensees are expected to wait until those reviews are completed before filing their own license amendments to adopt 50.69, industry and NRC sources agree.

NRC and the industry will also be watching to see if STP Nuclear Operating Co. moves to adopt the new 50.69 rule to replace the exemption of certain NRC special treatment requirements that STP received in 2001.

Getting NRC to buy into the industry's position that its categorization guidance already satisfies NRC concerns, however, may prove to be difficult. Three NRC staffers who had filed differing professional views on an earlier version of 50.69 but who had agreed with a final rule that was forwarded to the commission in June (Secy 04-109), now say that the final rule as amended by the commission in October (INRC, 18 Oct., 1) "raises more serious safety concerns than the proposed rule that was issued for public comment in May 2003."

In an internal memorandum obtained by Inside NRC, Office of Nuclear Reactor Regulation (NRR) staffers Tom Scarbrough, David Fischer, and John Fair said they disagreed with a key change made by Chairman Nils Diaz and Commissioner Jeffrey Merrifield to the staff's final rule proposal.

That change simplified language referring to the treatment of low safety-significant SSCs to require that licensees “ensure, with reasonable confidence,” that those SSCs (classified as risk-informed safety class-3, or RISC-3, SSCs), remain capable of performing their safety-related functions. The three NRR staffers said that this change “will allow licensees to define reasonable confidence as negligible confidence (as suggested by one licensee during discussions with the staff) in the capability of RISC-3 SSCs to perform their safety-related functions (such as low pressure emergency core cooling, containment spray, and containment isolation).”

The NRR dissenters also said that they believe that the monitoring required by the final rule “is not sufficient to ensure that the risk associated with the elimination of the special treatment requirements is maintained acceptably small”; that the final rule “eliminates all documentation requirements for RISC-3 SSCs”; and that licensees will now be able to procure and install “most safety-related SSCs and to rely on those SSCs to perform their safety functions without any controls or procedures, without qualified installation personnel (such as welders), and without any requirements to perform periodic maintenance on that equipment.”

Scarborough, Fischer, and Fair in their Nov. 9 memorandum had asked the commission to re-issue the rule for public comment in light of the significant changes made in the final rule. That suggestion, however, was obviously rejected.

Savings could be significant

In a presentation Nov. 16 at the ANS conference, Thomas Hook, supervisor of probabilistic risk assessment at Dominion, estimated that savings from categorizing 12 systems at a dual-unit site under the new 50.69 rule could be about \$2.3-million a year. Of that amount, about 58% comes from being able to procure less expensive parts. For instance, a safety-related 36-inch butterfly valve costs about \$36,000, according to a chart that Hook prepared. The cost of a commercial-grade valve is about \$9,500, Hook’s chart indicated.

Other savings as a result of the relaxed requirements on RISC-3 components come in the areas of quality assurance, record-keeping, equipment qualification, and testing, Hook indicated.

He also said that the pilot license amendment submittal for Surry, now scheduled for June 2005, would involve the categorization of SSCs in the chemical and volume control

system. Dominion had also been planning to categorize SSCs in the component cooling water system, but that was postponed "due to resources constraints."

—*Michael Knapik, Washington*

Inside NRC

Volume 26 / Number 24 / November 29, 2004

Regulators urged to focus on utility corporate organization

Regulators and safety experts attending an IAEA-sponsored meeting in China last month were advised by some participants to pay more attention to utility corporate management and organizational behavior as increasing commercial pressures in the nuclear power industry challenge safety oversight.

The Oct. 18-22 international conference on "Topical Issues in Nuclear Installation Safety" held in Beijing was organized by the IAEA and hosted by the China Atomic Energy Authority and National Nuclear Safety Administration (NNSA), China's regulatory body.

William Cavanaugh, chairman of the World Association of Nuclear Operators (WANO), said at the start of the meeting that, in the aftermath of consolidation of utility management in the U.S. and other developed countries, "many CEOs don't know anything about nuclear energy. They come from a business environment. They are financially astute, but they don't share" a background in nuclear engineering or safety issues more typical of personnel further down in the management organization. "There is a basic conflict" between "short-term results" sought by corporate management and "the long-term perspectives about nuclear energy benefits," Cavanaugh said.

Richard Taylor, an executive at British Nuclear Fuels plc (BNFL), said that "financial gurus are often in charge (of nuclear-generating utilities) these days. They don't know about nuclear safety, and we have to find a way to get the information to them." Some participants pointed out the Beijing meeting was largely attended by regulators and safety consultants and that, with the exception of a small group of Electricite de France (EDF) executives, utility corporate management was absent from the meeting. Attendees said, however, that it was unlikely utility CEOs would have the time to attend conferences like the one in Beijing.

Studies on severe accidents that have occurred outside the nuclear power industry strongly suggest that changes in an organization's culture as a result of deregulation and management consolidation could be a breeding ground for a disaster, Taylor said. In the U.S., for example, the "corporate culture" at the National Aeronautics & Space Administration before the 2003 Columbia space shuttle explosion fostered a "good news culture," Taylor said. "If something was unsafe, you had to prove it [to top management], there was pressure to take shortcuts, and a fear of failure was considered psychologically unhealthy."

A similar environment was noticed in an evaluation of rail accidents in the U.K. from 1991 through 1999 that caused 31 deaths. "There was immense pressure from privatization on contractors to make runs on time, and a clear conflict with safety goals in nearly all of these cases," Taylor said. An investigation of the 1988 explosion of the Piper Alpha gas drilling platform in the North Sea, he said, "showed that safety principles were espoused, but they weren't effectively being practiced, and this at a time when there was also commercial pressure on the organization" responsible for operations.

"There is a lot of congruence," Taylor said, "between the organizational background of these (non-nuclear) events and the nuclear ones" that were cited at the Beijing meeting as wake-up calls for safety vigilance in advanced nuclear countries. Incidents cited that have occurred in the nuclear industry include non-conservative decisions at the Philippsburg and Brunsbuttel LWRs in Germany; the Tokaimura criticality accident, the Mihama-3 turbine-side pipe rupture, and widespread coverups of BWR core internals inspection reports in Japan; a fuel failure at the Paks PWR station in Hungary; and the failure to detect significant pressure vessel degradation at the Davis-Besse reactor in the U.S.

Among other parallels, Taylor found a "deterioration of competence and financial pressure on contractors when organizations undergo major changes," and a situation where "no one is challenging" top-down management organization. Judith Melin, head of the Swedish Nuclear Power Inspectorate (SKI), said that where utility management is "increasingly relying on contractors, there is suspicion that utility employees aren't capable of doing the work." But "more and more low-priced contractors" are only one of a long string of problems stemming from growing commercial pressure that now challenge regulators as utilities "hunt for cheap kilowatts," said Dana Drabova, head of the State Office of Nuclear Safety (SUJB) in the Czech

Republic. She offered a list, compiled by an internal working group at the Nuclear Energy Agency (NEA) of the OECD: a “decoupling” of owners and business managers from technical managers at both the top of the utility organization and at the nuclear power plants themselves; lack of sufficient funding for radwaste management; growing job-related stress on workers; excessive overtime; lower quality work, related to reduced expertise; reduced safety margins as a result of both higher fuel burnups and power upratings; reduced equipment reliability related to reduced time for preventive maintenance; less expertise at vendors; diffusion of design continuity and loss of the design basis; less cooperation from operator organizations; less safety research; a more aggressive attitude by operators against regulators; and a classification of more and more information as “market significant” or “proprietary.”

“In a market environment, all the information is market sensitive,” Drabova asserted. “Information flow is reduced, and nobody wants to share it.”

Linda Keen, head of the Canadian Nuclear Safety Commission (CNSC), told conference-goers that she had come away from meetings she organized with top utility management “asking questions about the role of (utility) boards of directors in safety oversight.”

“Does the board have access to regulators as part of its responsibility for assuring reliability?” she asked. NEA head Luis Echavarri likewise queried the role of corporate shareholders. “Are they only interested in the bottom line?”

Taylor and U.K. regulators at the meeting suggested that CEOs would become more aware of the importance of nuclear safety if they were more aware of the high costs associated with something going wrong. The total cost of forced inspection outages at all 17 of Tokyo Electric Power Co.’s (Tepco) BWRs, according to some Japanese accounts, ran as high as (U.S.)\$800-million over 18 months following revelations that Tepco personnel covered up inspection reports. “Do (CEOs) understand these risks?” Keen asked. During some of Keen’s previous meetings with top utility executives, it was revealed that in some cases “the (CEO) was not aware there was a problem at the company,” she recalled. “You don’t know what you don’t know.”

In Germany, laws and regulations have been modified as deregulation and utility consolidation moved forward during the last five years, assigning a designated executive at each operating company who would be legally responsible

for compliance with safety rules. Making that organizational change hasn't been a panacea. Officials from the Federal Ministry of Environment & Nuclear Safety (BMU), Germany's regulator, confirmed in Beijing last month that BMU is conducting a thorough probe into the corporate culture at utility Energie Baden-Wuerttemberg (EnBW), Germany's third-biggest generator, related to a series of forced and acrimonious personnel management changes at its LWRs since 2002, which occurred during a period of acute financial pressure on executives.

One expert, Graeme Thomas of the U.K.'s Nuclear Installations Inspectorate (NII), was unfazed by concerns voiced in Beijing about alleged growing economics-based aggressiveness by utility management vis-a-vis safety oversight bodies. "In response to any such behavior," Thomas told Drabova, "I would first suggest persuasion." If that failed, he said, "then there's enforcement." Vadym Gryshchenko, head of Ukraine's State Nuclear Regulatory Committee, appeared to agree. "I wanted the plant managers at Chernobyl and Khmel'nitsky replaced," he told the group. Gryshchenko said he had asked for the personnel changes but that no action was taken. "It had to be forced," he said.—*Mark Hibbs, Beijing*

Pebble bed nuke project flawed - author

By Melanie Gosling

Eskom's pebble bed nuclear project was "steeped in secrecy and deception" in the same way that South Africa's nuclear industry had been shrouded in secrecy under the apartheid regime.

This was said on Wednesday by David Fig, an independent environmental analyst, who launched his book Uranium Road in Cape Town this week.

The book examines South Africa's past and present nuclear industry.

"The latest scandal in South Africa's nuclear industry is the government handing over another R500-million to the pebble bed modular reactor (PBMR) project this month without any public debate or policy discussion. Why are public funds going to something which is shrouded in secrecy? Why are decisions being taken behind closed doors?" Fig asked.

So far about R1-billion has been spent on the pebble bed modular reactor

So far about R1-billion has been spent on the pebble bed modular reactor (PBMR) and it is estimated that it will cost another R11-bn to complete.

If this demonstration model, to be built at Koeberg, is successful, Eskom plans to build others at sites around the country and also to export them.

Fig said: "The injustice is that it was said that the PBMR project would not be viable without foreign funding. Now that no foreign investors have come to the table, they are expecting the taxpayers to foot the bill. This needs to be fought by the environmental lobby in the same way that the Treatment Action Campaign fought and shifted government policy."

Eskom had failed to release to the public the results of a feasibility study it commissioned from a number of international experts in 2002.

It refused to do so on the grounds of commercial confidentiality. This was probably because it had raised questions on marketing, design and cost that "Eskom may have found uncomfortable".

Fig, who has a doctorate in international political economy, says in Uranium Road that analysis had shown that the potential for marketing a large number of PBMRs was very uncertain.

Most developed countries were not investing in nuclear energy. The few countries that were, mainly in Asia, were more likely to opt for the established pressurised water reactions rather than the unproven PBMR design, or to invest in their own national industries.

"The PBMR will produce a greater volume of waste per unit of energy than the two nuclear reactors already do at Koeberg," Fig said.

All the high level radioactive waste from Koeberg is stored on site as there is nowhere this can be disposed of.

Fig said a DA Powers of the United States Nuclear Regulatory Commission's committee on nuclear safeguards had said in 2001 that the PBMR was seriously flawed as the "chaotic and unpredictable movements of the fuel balls inside the reactor vessel were a prescription for core instability". - Environment Writer.

- This article was originally published on page 4 of The Cape Times on November 04, 2004

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The State.com

on Tue, Nov. 23, 2004

Congress approves MOX funding, but no money for new national lab

Associated Press

AIKEN, S.C. - A congressional spending bill recently approved and awaiting President Bush's signature includes \$300 million for a facility that would convert weapons-grade plutonium into fuel for commercial nuclear power plants.

But funds for the newly designated Savannah River National Laboratory were not restored in the final spending bill.

Construction of the mixed-oxide, or MOX, fuel facility at the Savannah River Site has been delayed. It was expected to begin last spring.

According to the United States and Russian agreement to get rid of 68 metric tons of plutonium, the programs must run parallel and DOE officials have said there have been delays in Russia, which wants the United States to assume plant liability in their country.

Members of Congress wrote in the bill they were disappointed a solution for liability was not negotiated.

Sen. Lindsey Graham, R-S.C., expressed optimism in a statement.

"The Bush administration understands how important it is we get this project moving so we can take this material off the market and terrorists cannot get their hands on it," he said.

Site also will receive about \$1.15 billion for cleanup and operations, including about \$162 million to accelerate the cleanup, removal and storage of about 37 million gallons of high-level waste in 49 underground tanks.

A decision on the modern pit facility, a \$4 billion plant that would make plutonium triggers for nuclear weapons, will not be made until fiscal year 2005.

Information from: The Augusta Chronicle, <http://www.augustachronicle.com/>

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Officials: Better communication might have prevented nuclear plant mishap

By GEOFF MULVIHILL
Associated Press Writer

November 19, 2004, 5:05 PM EST

LOWER ALLOWAYS CREEK, N.J. -- A break in a steam pipe that caused the shutdown of the Hope Creek nuclear plant last month might have been prevented had the plant's operators and engineers communicated better, the top executive at the plant said.

Hope Creek, one of three nuclear plants run by PSEG Nuclear on Salem County's Artificial Island, was shut down on Oct. 10 after the pipe ruptured, causing radiation levels to rise briefly in an area normally off-limits to plant workers.

The plant had been scheduled to be shut down for routine refueling and maintenance a few weeks later. It's now unclear when it will be restarted, said Chris Bakken, chief nuclear officer for PSEG Nuclear.

The company's original diagnosis of the problem turned out to be wrong, Bakken said Friday. Originally it was thought that a hanger holding the pipe in place was not properly connected to a structural beam above. But Bakken said the company has since determined that the hanger was only part of the problem.

The main cause, he said, was an open valve on the pipe that eventually caused it to crack.

By Sept. 14, plant operators noticed through remote monitoring that the valve was starting to open and asked company engineers whether it could cause a problem, Bakken said.

Arthur Bready, who manages plant operators, said the explanation from engineers led the operators to believe the situation would not cause serious problems.

"We had the right question asked by our operators and the wrong answer from our engineers, which led to an inappropriate management decision," Bakken said.

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Selection of Transition Break Size for 10 CFR 50.46 Revision

**Charles Hammer
NRR**

**Robert L. Tregoning
Lee Abramson
RES**

**Advisory Committee on Reactor Safeguards
December 2, 2004**



Presentation Objectives

- Provide overview of elicitation scope, results, and uncertainty.

- Describe approach for selecting transition break size (TBS).
 - Use elicitation passive-system LOCA frequencies as a starting point.
 - Consider uncertainty and variability in elicitation results.
 - Incorporate adjustments to account for other LOCA frequency contributions.



Elicitation Objectives and Scope

- Develop generic BWR and PWR piping and non-piping passive system LOCA frequency distributions as function of break size and operating time.
 - LOCAs which initiate in unisolable portion of reactor coolant system.
 - LOCAs related to passive component aging, tempered by mitigation measures.
 - Small, medium, and large-break LOCAs examined. Large break category further subdivided to consider LOCA sizes up to complete break of largest RCS piping.
 - Time frames considered: 25 years (current day), 40 years (end of original license), and 60 years (end of life extension).
- Primary focus: frequencies associated with normal operating loads and expected transients.
- Assume that no significant changes will occur in the plant operating profiles.



Other LOCA Risk Contributors

- LOCA frequency contributions occur from other events that were beyond the scope of the elicitation.

- Active system LOCAs.
 - Stuck-open valves.
 - Pump seal LOCAs.

- Seismically-induced LOCAs.

- Other rare event loading LOCAs.
 - Rare water hammer events.
 - Heavy load drops from overhead cranes.

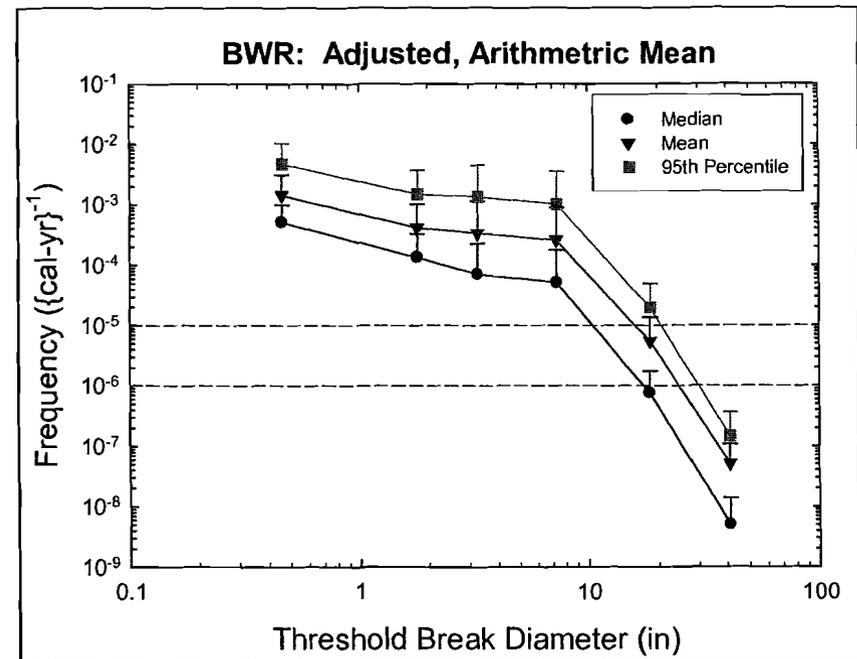
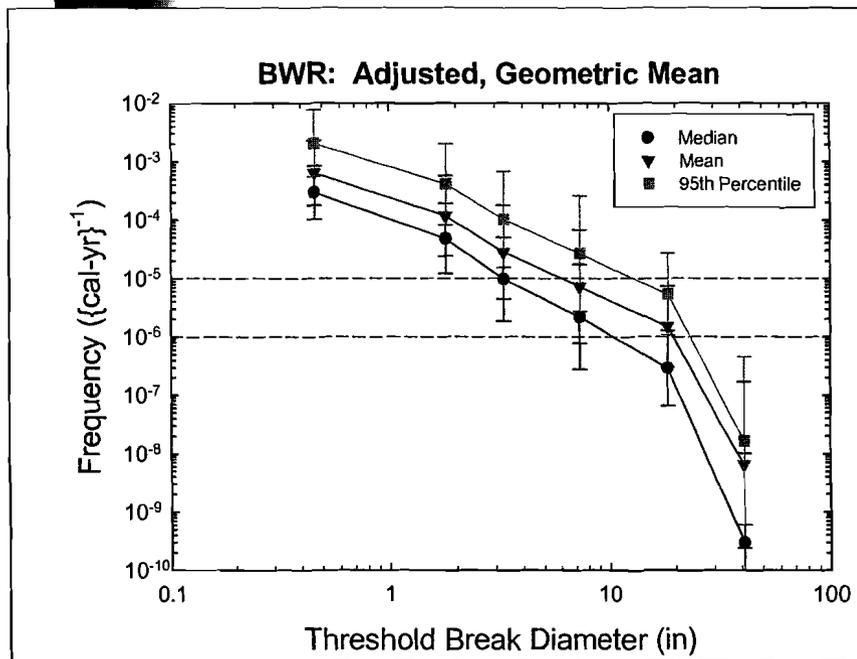


Elicitation Results

- Baseline results developed with measures of both individual uncertainty and group variability.
- Sensitivity analyses conducted in five broad areas.
 - Effect of distribution shape on mean.
 - **Overconfidence adjustment.**
 - Correlation structure of panelist responses.
 - **Aggregating expert opinion.**
 - Panel diversity measurement.
- Baseline results modified by important sensitivity analyses for TBS selection.
 - Results modified to incorporate overconfidence adjustment.
 - Geometric mean aggregation and mixture distribution used to provide range of elicitation results which capture process uncertainty.



Total LOCA Frequencies: BWR Current Day Estimates

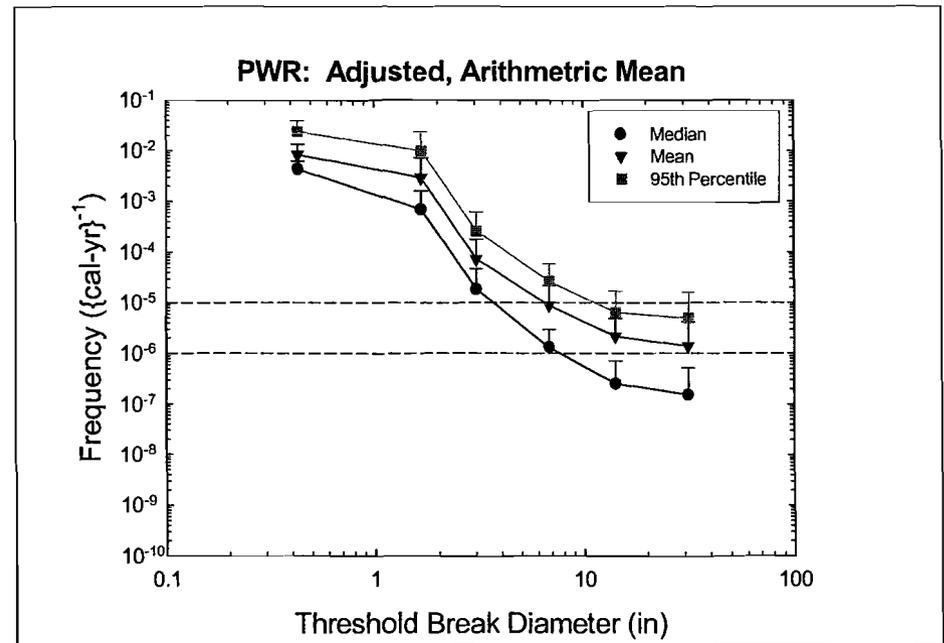
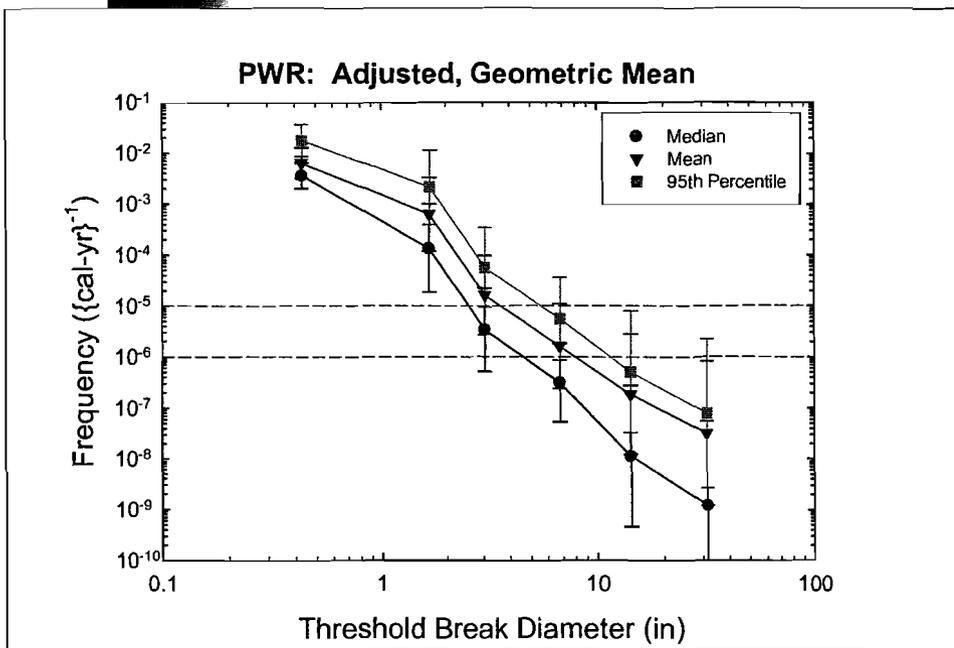


Elicitation Results: BWR Break Size @ 1×10^{-5} ($\{\text{cal-yr}\}^{-1}$)

Aggregation	Mean	Mean with 95% Conf.	95 th Per.	95 th Per. with 95% Conf.
Geometric Mean	6	16	13	22
Arithmetic Mean	16	19	21	24
Mixture Distribution	16		20	



Total LOCA Frequencies: PWR Current Day Estimates



Elicitation Results: PWR Break Size @ 1×10^{-5} (cal-yr⁻¹)

Aggregation	Mean	Mean with 95% Conf.	95 th Per.	95 th Per. with 95% Conf.
Geometric Mean	4	7	6	14
Arithmetic Mean	7	10	11	31
Mixture Distribution	7		10	



Selection of TBS

- Use Expert Elicitation results as a starting point.
- There is a range of pipe sizes which correlate to pipe break frequency of $1E-5$ /cal-yr.
- Selection should accommodate various uncertainties.
- There are other considerations which could impact the TBS selection.
 - Active LOCAs.
 - Load-generated LOCAs.
- Actual plant piping design and operating experience should be considered in final selection.



Other Considerations Not Addressed by Expert Elicitation

- Active LOCAs.
 - Stuck-open valves, failure of seals and gaskets.
 - Generally result in small-break LOCAs.
 - Higher frequency than pipe break LOCAs.
 - Limited in size by the size of associated pipe.
 - Not larger than largest attached pipe to main loop.

- Dropped heavy loads.
 - Studied in NUREGs-0612 and -1774 and in GSI-186.
 - LOCA frequency contribution not significant.
 - Most lifts made during shutdown conditions.
 - Fewer and lighter loads lifted during power operation.



Other Considerations Not Addressed by Expert Elicitation (cont)

- Seismically-induced LOCAs.
 - Seismic events at $1E-5$ /cal-yr are large magnitude.
 - Some plant sites may have higher failure frequencies especially with piping degradation.
 - Undegraded piping not expected to have significant effect on failure frequency.
 - For small flaw sizes, undegraded and degraded failure probabilities are similar.
 - For worst case flaw sizes, unacceptable increase in failure probabilities.
 - Confirmatory studies are ongoing and to be published.
 - Guidance to be provided by the staff in RG.
 - Licensees need to ensure inspection plans are adequate such that no breaks larger than TBS expected.



Other considerations Not Addressed by Expert Elicitation (cont)

- Water hammer.
 - No water hammers expected during normal operation.
 - Condensation-induced water hammer following SBLOCA (NUREG/CR-3895).
 - Narrow range of SBLOCAs (plant-specific) requiring level drop and higher pressures believed to be low probability.
 - Licensees need to ensure plants are not susceptible to damaging water hammer.
 - Screening criteria to be provided by the staff in RG.



Preliminary TBS Selection and Consideration of Actual Piping

- Certain piping is more susceptible within their size range.
 - Pressurizer surge lines in PWRs (thermal fatigue).
 - Feedwater lines in BWRs (flow accelerated corrosion).
- Preliminary TBS values of 14" for PWRs and 20" for BWRs.
 - Includes necessary adjustments for uncertainties.
 - Includes pipes of most concern.
- These sizes are also similar to the sizes of the largest pipes attached to the main loop piping.
 - Pressurizer surge line in PWRs.
 - RHR suction line and feedwater line in BWRs.
 - Actual sizes do vary somewhat among plants.
- The next larger size pipes are the large main coolant loop piping.
 - Hot and cold legs in PWRs.
 - Recirculation and main steam piping in BWRs.



TBS Selection

- TBS is selected as the size of the largest pipe attached to the main coolant loop.
 - For PWRs, based on the size of the largest pipe attached to the cold or hot leg main loop piping.
 - For BWRs, based on the size of the largest pipe in either of the RHR or Feedwater systems inside primary containment.
 - Next larger pipes are significantly less likely to break.
 - Accommodates uncertainties and provides regulatory stability.

- TBS is actually defined in the proposed rule as twice the cross-sectional flow areas of these size pipes.



Future Plant Modifications and TBS Adjustments

- Expert elicitation did not consider power uprate conditions in estimates of break frequencies.
 - Recent operating experience indicates higher rates of degradation are possible.
 - Licensees need to explain why future uprate conditions do not significantly increase break frequencies.

- The staff will continue to assess pipe break frequencies and update as necessary.

- However, because significant uncertainties are accommodated, staff does not expect to have to adjust TBS in future.



TBS Selection Summary

- Elicitation results used as starting point for TBS selection.
 - Consider individual uncertainty, panel variability, and process sensitivity.
 - Determine break size at 1×10^{-5} /cal-yr associated with different elicitation metrics.
- Other considerations not evaluated in the elicitation were incorporated to adjust TBS.
- The final TBS selections are risk-informed, accommodate attached piping of most concern, and promote regulatory stability.

Tracking the Cumulative Change in Risk

Stephen Dinsmore
Probabilistic Safety Assessment Branch – NRR
Advisory Committee on Reactor Safeguards
December 2, 2004

Issues Identified by ACRS for Additional Clarification

- The Rule Requires the Licensee to Estimate and Track the Cumulative Impact on Risk of all Changes Related to Redefinition of LBLOCA
- The Rule Prohibits Combining the Risk Impact of Unrelated Changes with Changes Related to Redefinition of LBLOCA in the Cumulative Impact
 - A Related Change is any Change Enabled by the New Rule and not Permitted by the Current Rule

Cumulative Change in Risk

- The Proposed Rule Requires the Combination of the Risk Impacts of Related Changes Made at Different Times
 - Compare the Total Change in Risk from all Related Changes to the Acceptance Guidelines
 - The same concept is utilized in all current risk-informed applications since they provide for measurement and control of cumulative risk from related changes
- Change in Risk - Initial and the Final Risk Must be Estimated Using an Updated PRA
 - (the current facility configuration excluding all related changes)
 - » Compared to
 - (the current facility configuration including all related changes)

Justification for Tracking Cumulative Change in Risk

- There may be a Wide Variety and Large Number of Changes that are Enabled by the Rule
- The Combined Impact of the Changes Enabled by the New Rule should not Result in an Inordinate Increase in Risk or Create New Vulnerabilities
- Consistent with RG 1.174 and Numerous Risk-Informed Applications
- Requirement on Processing and Tracking Changes Precisely Defined Because this is a Rule

Cumulative Change in Risk – Original Applications

- RG 1.174 - the cumulative impact from all risk-informed changes should be available when necessary
 - Cumulative impact of previous changes should be submitted when acceptance guidelines are approached
- RG 1.175: Inservice Testing
 - The cumulative impact of all RI-IST program changes (initial approval plus later changes) should comply with the acceptance guidelines
- 50.69 Categorization
 - If the categorization of SSC's is done at different times, the sensitivity study should consider the potential cumulative impact of all SSCs categorized
 - The results of the risk sensitivity study must be confirmed to still be acceptable following each revision or update of the PRA to ensure that the categorization process is maintained valid

Cumulative Changes in Risk – Rulemaking

- 50.46a Proposed Implementation
 - Must Estimate and Track Cumulative Change in Risk from all Related Changes
 - Changes that Cause the Cumulative Risk Increase to Exceed Sufficiently Small will not be Permitted
 - If the Cumulative Increase Exceeds the Sufficiently Small Guidelines Following PRA Updates the Licensee must take “appropriate action”

Combined Change Requests

- Changes Unrelated to LB LOCA Redefinition Will not be Allowed to Directly Offset Risk Increases from Changes Related to LB LOCA
- If Direct offset was Allowed
 - The Change in Risk - Initial and the Final Risk Must be Estimated Using an Updated PRA would become
 - (the current facility configuration excluding all related and **“selected” unrelated** changes)
 - » Compared to
 - (the current facility configuration including all related and **“selected” unrelated** changes)

Justification for Not Allowing Combined Change Requests

- All Changes at the Facility that Impact the Risk Profile of the Plant may also Indirectly Impact the Risk of the 50.46 Changes – this Impact is Always Included in PRA Updates and the Cumulative Change in Risk Estimate
- There may be a Wide Variety and Large Number of Changes that are Enabled by the Rule
- RG 1.174 Cautions that Staff should not Allow Risk tradeoffs in Combined Change Request that could Create Significant Sequences or Vulnerabilities
- Rule would Require Criteria to Specify what must be Combined and what can not Combined – Significant Challenge to Develop Appropriate Criteria in Rule Language that Provides the Necessary Confidence that such Vulnerabilities are not Created.
- CCR would only be Necessary if the Risk Increase Exceeds the Significantly Small Guidelines and the Staff Believes that many Changes could be Made without Challenging these Guidelines

Combined Change Request Rulemaking

- 50.46a Proposed Implementation
 - Unrelated Changes may not be Combined with Related Changes in the Cumulative Risk Impact
 - However, there may be Situations where a New Plant Improvement Results in a very Desirable Safety Enhancement
 - Licensee could make an Exemption Request using 50.12(a)(2)(iv)
The exemption would result in benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption

Regulatory Analysis for 10 CFR 50.46 Proposed Rule

ACRS Briefing
December 2, 2004

Brian Thomas, NRR Financial and Regulatory Analysis Section
U.S. Nuclear Regulatory Commission

10 CFR 50.46 Regulatory Analysis (Redefinition of Large Break LOCA)

- Enabling rule (licensees may voluntarily choose this rule in lieu of current ECCS requirements)
- Licensees can change aspects of facility design and operations
- Intent is to enable flexibility in design and operations; rule can also contribute to improving safety

10 CFR 50.46 Regulatory Analysis

Examples -

Operational Enhancements Identified by Industry

- More power uprates
- Relaxation of emergency diesel generator start times
- Improved fuel management
- Changes in number of accumulators
- Potential for load removal in load sequencing of electrical equipment

10 CFR 50.46 Regulatory Analysis

- Some design and operational benefits are not quantifiable at this time
- Safety benefits will vary on a plant-specific basis (no specifics on what licensees will do)

Regulatory Analysis Approach

- Builds on WOG submittals from 2000 and 2004
 - PWRs to benefit from uprates and EDG tech spec changes
- Uses scenario approach for bounding uncertainty
 - Due to different levels of participation by PWRs and different degrees of possible power uprates
- Assumes all 69 PWRs will obtain license renewals

Quantified Benefits

Value of Increased Power from Uprates

Plus

Labor and Materials Savings from Reduced Scope of EDG Maintenance (mechanical work on EDGs)

Plus

Replacement Power Savings from Reduced Outage Time for EDG Maintenance (cost of replacement power)

Bottom Line

- Although many potential operational benefits – including safety – cannot be quantified, the rule can be justified based on the quantifiable benefits and costs
- The net present value of the proposed rule is positive, regardless of discount rate or scenario, and is estimated at \$700 million to about \$13 billion
- For any given discount rate, the economic value to society increases as more plants undertake greater uprates facilitated by the rule



Background

Selected Tables

Net Present Value in 2004 in millions of 2004\$
Annual Discount Rate = 7%

Quantitative Attributes		Present Value Estimates (Millions of 2004\$)		
		Scenario 1	Scenario 2	Scenario 3
Power Upgrading Benefits		\$1,151	\$3,108	\$8,633
EDG Benefits		\$237	\$213	\$178
Licensee Costs	Capital Costs	(\$185)	(\$500)	(\$2,493)
	Initial Licensing Costs	(\$120)	(\$108)	(\$91)
	Recurring Monitoring/PRA Costs	(\$353)	(\$317)	(\$266)
NRC Costs	Initial Regulatory Costs	(\$21)	(\$24)	(\$29)
	Deferred/Recurring Regulatory Costs	(\$11)	(\$10)	(\$9)
Overall Net Present Value		\$697	\$2,362	\$5,923

Note: Totals are subject to round-off error

Net Present Value in 2004 in millions of 2004\$
Annual Discount Rate = 3%

Quantitative Attributes		Present Value Estimates (Millions of 2004\$)		
		Scenario 1	Scenario 2	Scenario 3
Power Uprating Benefits		\$2,148	\$5,801	\$16,113
EDG Benefits		\$429	\$386	\$321
Licensee Costs	Capital Costs	(\$215)	(\$582)	(\$2,900)
	Initial Licensing Costs	(\$128)	(\$115)	(\$97)
	Recurring Monitoring/PRA Costs	(\$682)	(\$613)	(\$514)
NRC Costs	Initial Regulatory Costs	(\$25)	(\$28)	(\$34)
	Deferred/Recurring Regulatory Costs	(\$23)	(\$21)	(\$18)
Overall Net Present Value		\$1,504	\$4,829	\$12,871

Note: Totals are subject to round-off error

Power Uprate and EDG Scenarios

Scenario	Participation	# Plants	Degree of Power Uprate
1	100%	69	1%
2	90%	62	3%
3	75%	52	10%

Note: Scenario 3 may even be conservative

Summary of Estimated 50.46a Direct Application Costs to Licensee (2004\$)

Best estimate of the cost of implementing the proposed rule

Activity	Burden	Estimated Cost
ECCS Re-Analysis based on new TBS (pipe break size)	2,500 hours	\$392,500
Describe Proposed Change	700 hours	\$109,900
Engineering Analyses	2,500 hours	\$392,500
Develop Monitoring Plan	850 hours	\$133,450
Synthesize Proposal	540 hours	\$84,780
License Amendment Process	384 hours	\$60,288
Upfront Total		\$1,173,418
PRA Updates (Reevaluations)	400 hours @ 3 years	\$62,800 @ 3 years
Implement Monitoring	1,150 hours/year	\$180,500/year

Summary of Estimated 50.46a Costs to NRC (2004\$)

	Review Submission	Process License Amendment
Scenario 1	1,248 hours x \$88/hour = \$109,800 per application	200 hours x \$88/hour = \$17,600 per application
Scenario 2	2,340 hours x \$88/hour = \$205,900 per application	200 hours x \$88/hour = \$17,600 per application
Scenario 3	5,070 hours x \$88/hour = \$446,200 per application	200 hours x \$88/hour = \$17,600 per application

Note: Review hours increase as level of power uprates increases

Estimated NRC Costs (2004\$)

- Prepare Reg. Guide(s) - \$402K
- Review Submissions and Process License Amendments over three years (3% discount rate)
 - Scenario 1 \$24.2 million (all 69 units)
 - Scenario 2 \$27.0 million (62 units)
 - Scenario 3 \$33.7 million (52 units)
- Review PRA Updates - 200 hours per review
- Review LOCA Frequencies - \$2.4 million (10-year review)

Technical Basis to Support Revision of the PTS Rule (10CFR50.61)

→ *Project Overview*



Mark EricksonKirk

Materials Engineering Branch

**Donnie Whitehead, Nathan Siu,
Mike Junge**

*Probabilistic Risk Assessment Branch,
Sandia National Laboratories*

David Bessette, Bill Arcieri

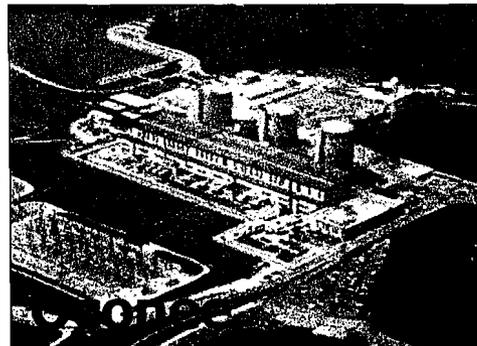
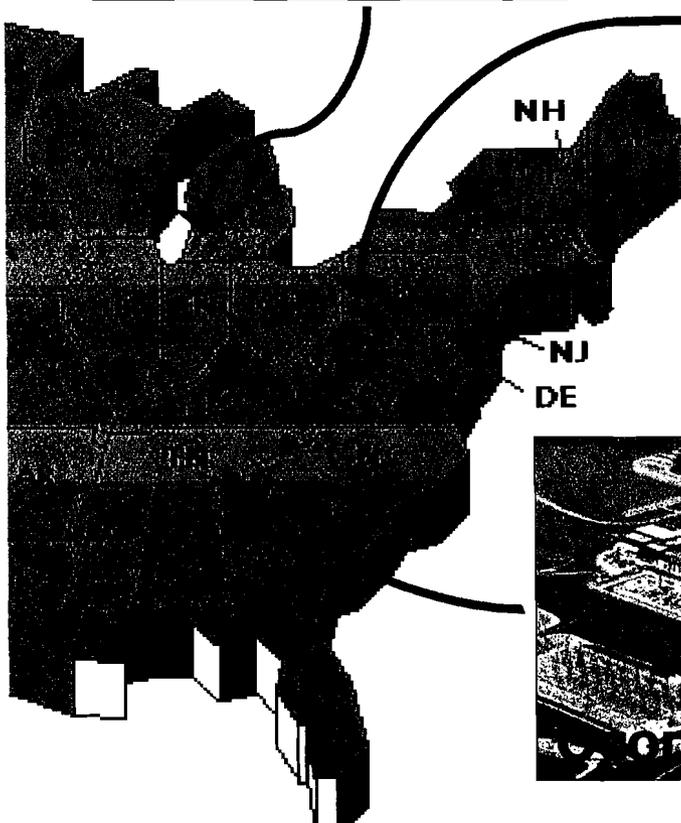
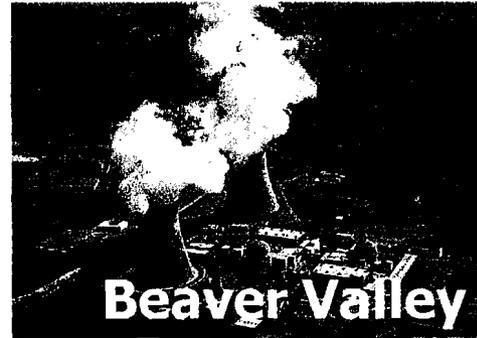
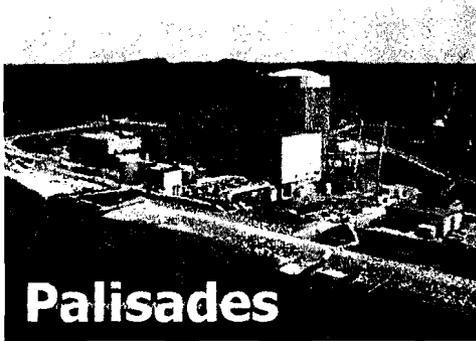
*Safety Margins and Systems Analysis Branch,
Integrated Systems Laboratory*

ACRS Briefing
NRC Headquarters • Rockville, MD • 2nd December 2004

Overview

- **Scope of analysis performed**
- **Factors that contribute most significantly to vessel failure probability**
 - **Material factors**
 - **Transient classes**
- **Generalization of findings to PWRs *in general***
- **Proposed RT-based screening limits consistent with RG1.174 guidance on LERF**
- **Comparison of operating PWRs with these screening limits**
- **Conservatisms / non-conservatisms that underlie screening limits**

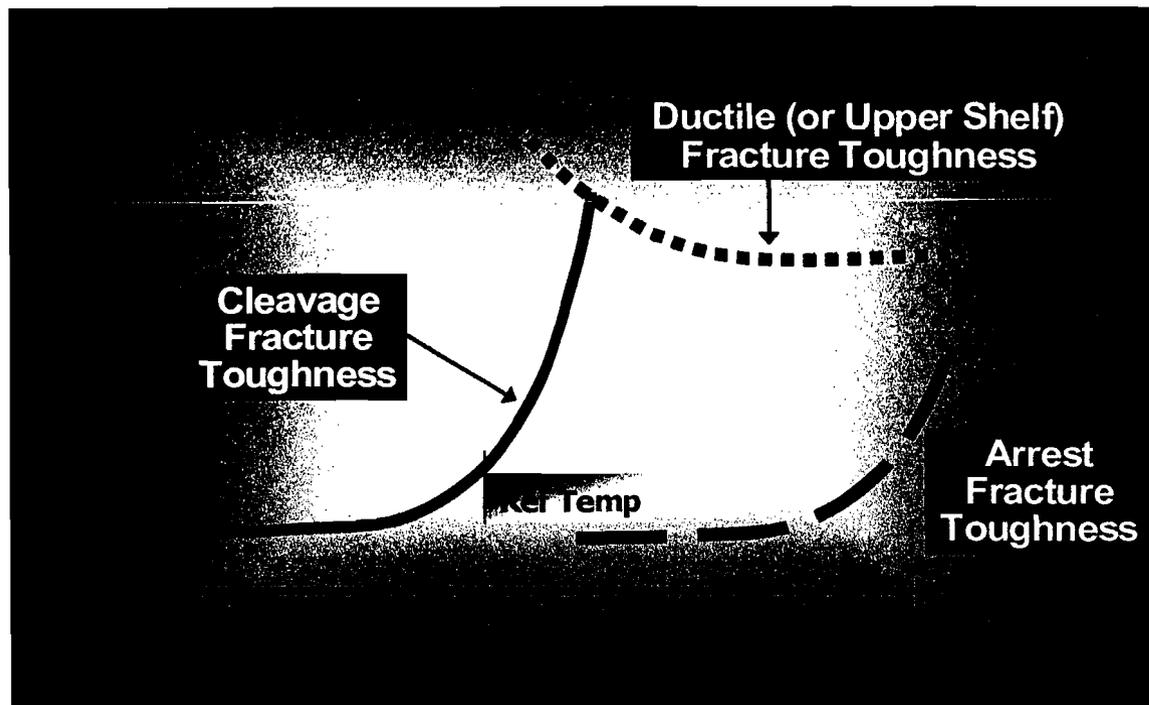
Scope of Analysis



- **All PWR manufacturers**
 - 1 Westinghouse
 - 1 CE
 - 1 B&W
- **1 plant from original (1980s) PTS study**
- **2 plants very close to the current PTS screening criteria**
- **Generalization to all PWRs**
- **TWCF criteria consistent with RG 1.174 guidance on LERF**

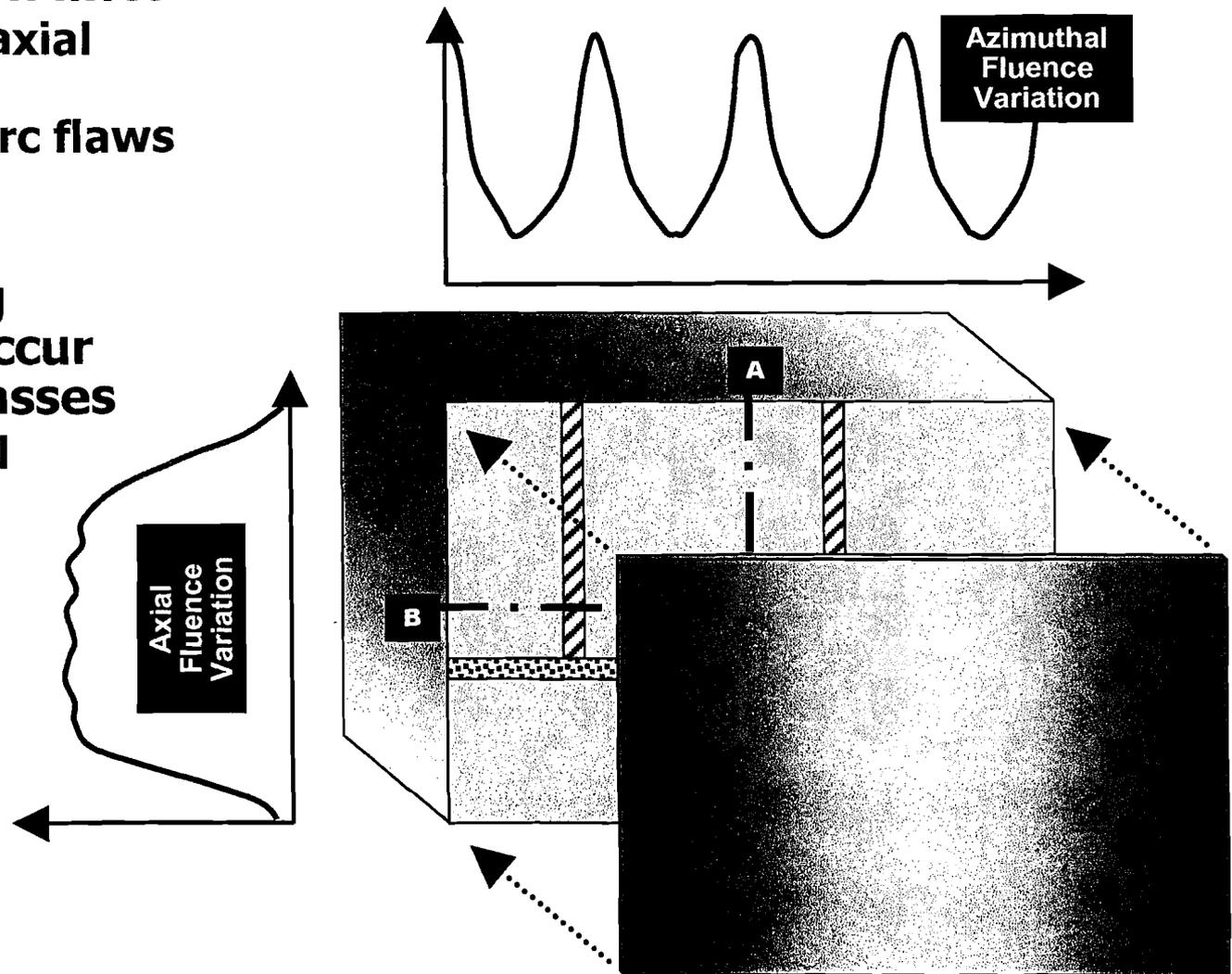
Material Factors Controlling Vessel Failure

- To correlate / predict vessel failure the toughness properties at the flaw location need to be known
- A reference temperature (RT) characterizes all of the toughness properties of interest
- So flaw locations are needed to determine the reference temperature(s) that control the vessel failure probability



Locations of Simulated Flaws

- **Embedded weld flaws follow weld fusion lines**
 - Axial welds → axial flaws only
 - Circ welds → circ flaws only
- **Surface breaking cladding flaws occur between weld passes**
 - Circumferential
- **Plate flaws have no preferred orientation**



Flaw Location Specific Reference Temperatures ...

... are needed to characterize accurately toughness properties at the different flaw locations

$$RT_{MAX} = \text{MAX} \left\{ \left(RT_{NBDT(7A)}^{plate} + \Delta T_{30}^{plate}(\phi_{7A}) \right), \left(RT_{NBDT(7B)}^{circ\ weld} + \Delta T_{30}^{circ\ weld}(\phi_{7B}) \right) \right\}$$

$$RT_{max}^i = \frac{\sum_{i=1}^{n_{axial}} RT_{max}^{axial}}{\sum_{i=1}^{n_{axial}} 1}$$

Failure of axial weld flaws controlled by axial weld or plate toughness properties & by the fluence along the axial weld fusion lines

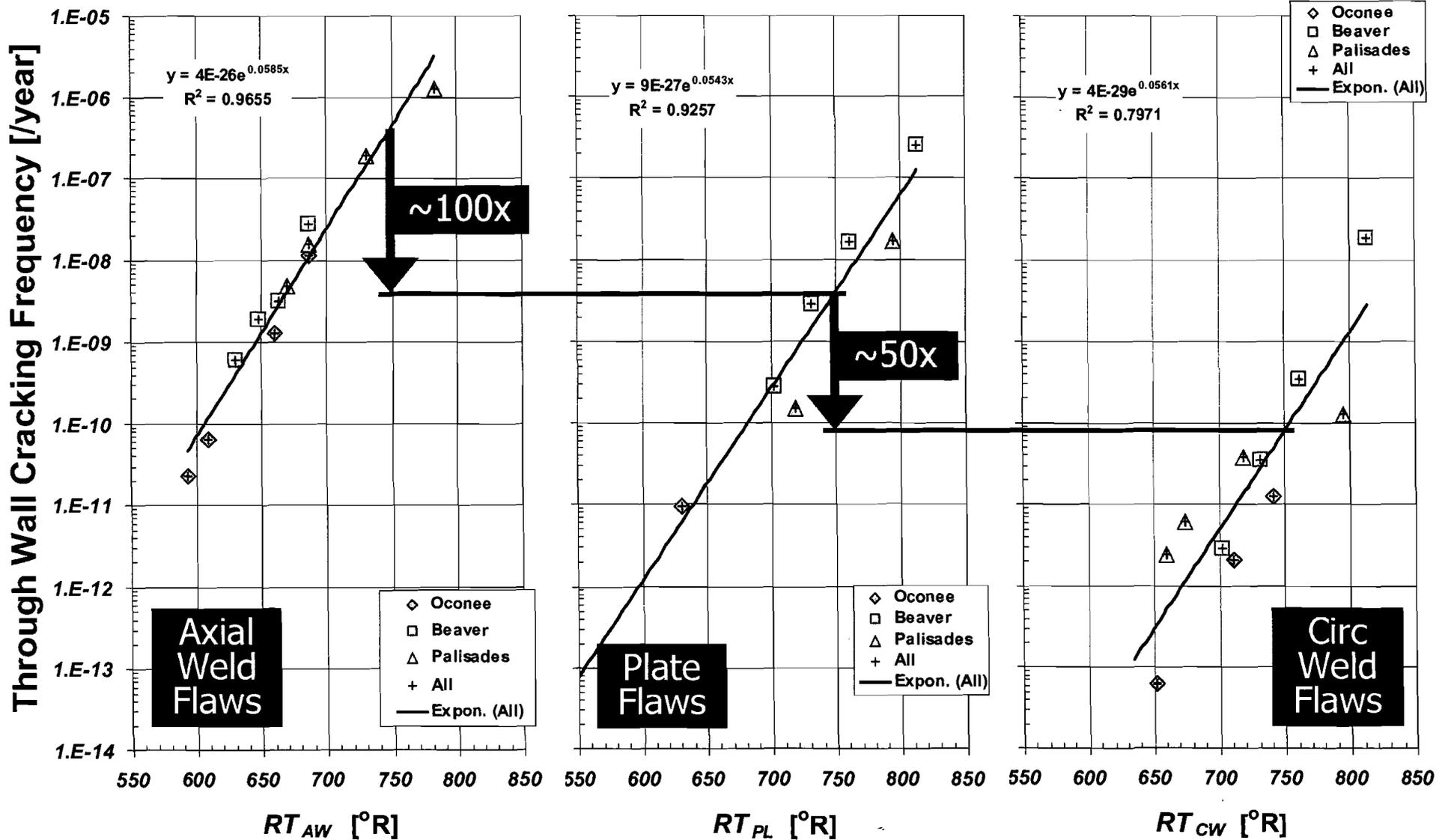
Failure of circ weld flaws controlled by circ weld or plate toughness properties & by the peak fluence in the vessel

$$RT_{circ} = \text{MAX} \left\{ \text{MAX}_{i=1}^{n_{axial}} \left(RT_{NBDT(7A)}^{plate} + \Delta T_{30}^{plate}(\phi_{7A}) \right), \text{MAX}_{j=1}^{n_{circ}} \left(RT_{NBDT(7B)}^{circ\ weld} + \Delta T_{30}^{circ\ weld}(\phi_{7B}) \right) \right\}$$

Failure of axial flaws controlled by plate toughness properties & by the peak fluence in the vessel

$$RT_{axial} = \text{MAX}_{i=1}^{n_{axial}} \left(RT_{NBDT(7A)}^{plate} + \Delta T_{30}^{plate}(\phi_{7A}) \right)$$

Materials Factors Controlling Vessel Failure

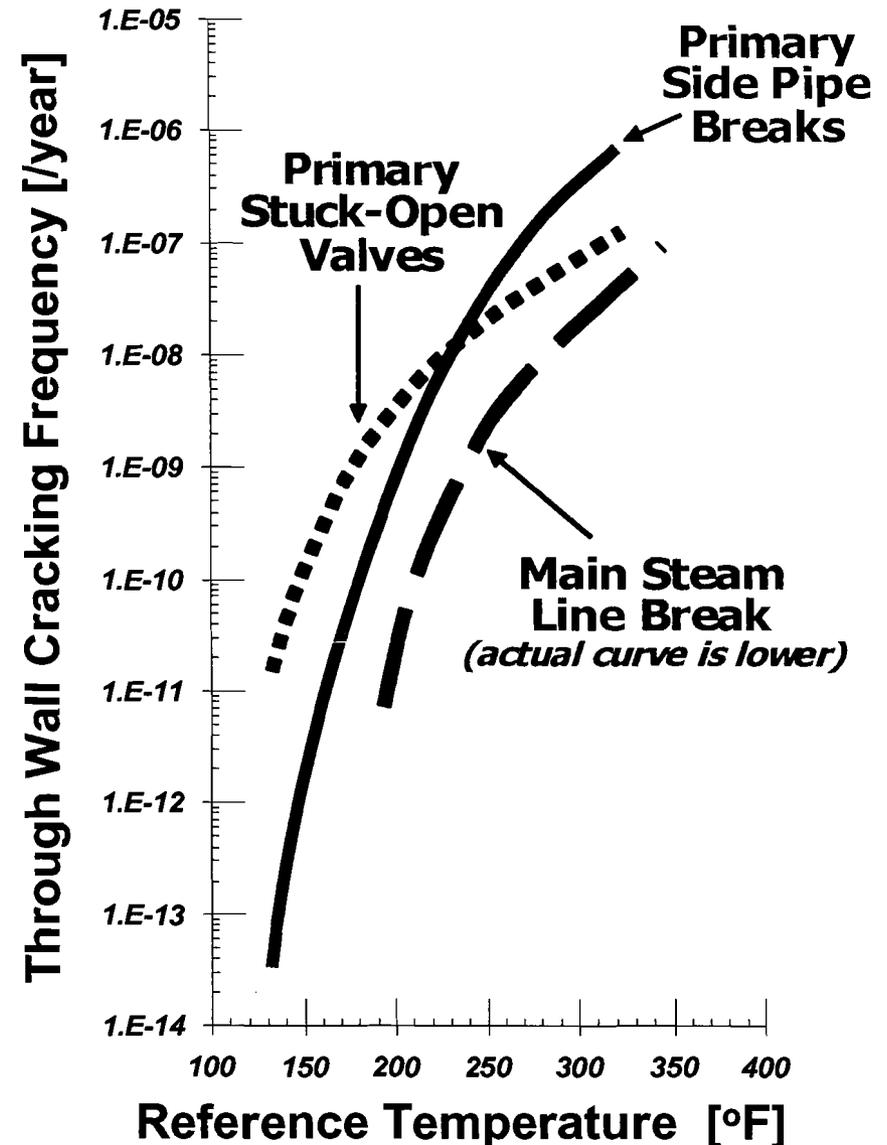


Transient Classes Controlling Vessel Failure

- **Primary side failures dominate risk (75% or more)**
 - **Low embrittlement:** stuck open valves that later re-close
 - **Higher embrittlement:** medium & large diameter pipe breaks

- **Secondary side failures**
 - main steam line breaks
 - stuck open valves

of much smaller consequence, & only at extremely high embrittlement levels



Transient Classes Controlling Failure

- **Secondary side breaks much less damaging than primary side**
 - Initial cooling rate similar, scales with break size
 - Minimum temperature much higher for secondary breaks (212°F) than for primary breaks (40°F)

- **Operator action “credits” have small influence on overall results**
 - Pipe break: no operator actions possible
 - Stuck-open valves (primary circuit): Only very rapid action has any effect

Findings applicable to PWRs *in general*

- **The transients that contribute the most to TWCF have \approx occurrence rate and \approx severity across plants**
- **Operator actions, though modeled, do not influence significantly the calculated TWCF**
- **Similarity of PWR designs**
- **Calculational models robust to credible changes**
- **Conservatisms intentionally left in model**
- **Equivocations**
 - **Forgings prone to sub-clad cracking at high embrittlement levels**
 - **Thick vessels**

TWCF Estimation Based on TWCF vs. RT Correlations

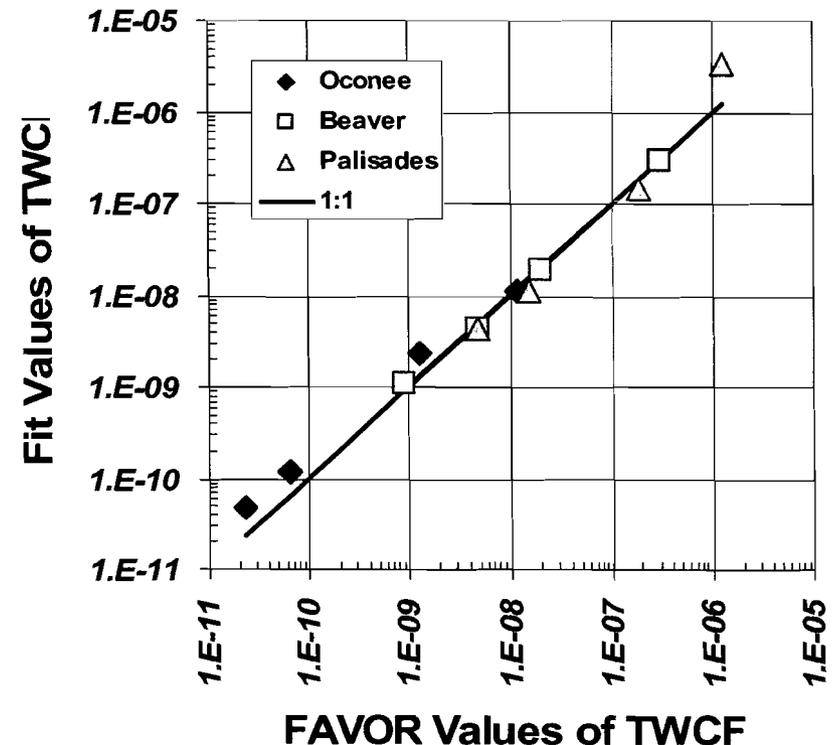
$$TWCF_{TOTAL} = TWCF_{AXIAL-WELD} + \alpha_{PL} \cdot TWCF_{PLATE} + TWCF_{CIRC-WELD}$$

$$TWCF_{AXIAL-WELD} = 4 \times 10^{-26} \cdot \exp\{0.0585 \cdot (RT_{AW} + 459.69)\}$$

$$\alpha_{PL} = 2 \quad TWCF_{PLATE} = 9 \times 10^{-27} \cdot \exp\{0.0543 \cdot (RT_{PL} + 459.69)\}$$

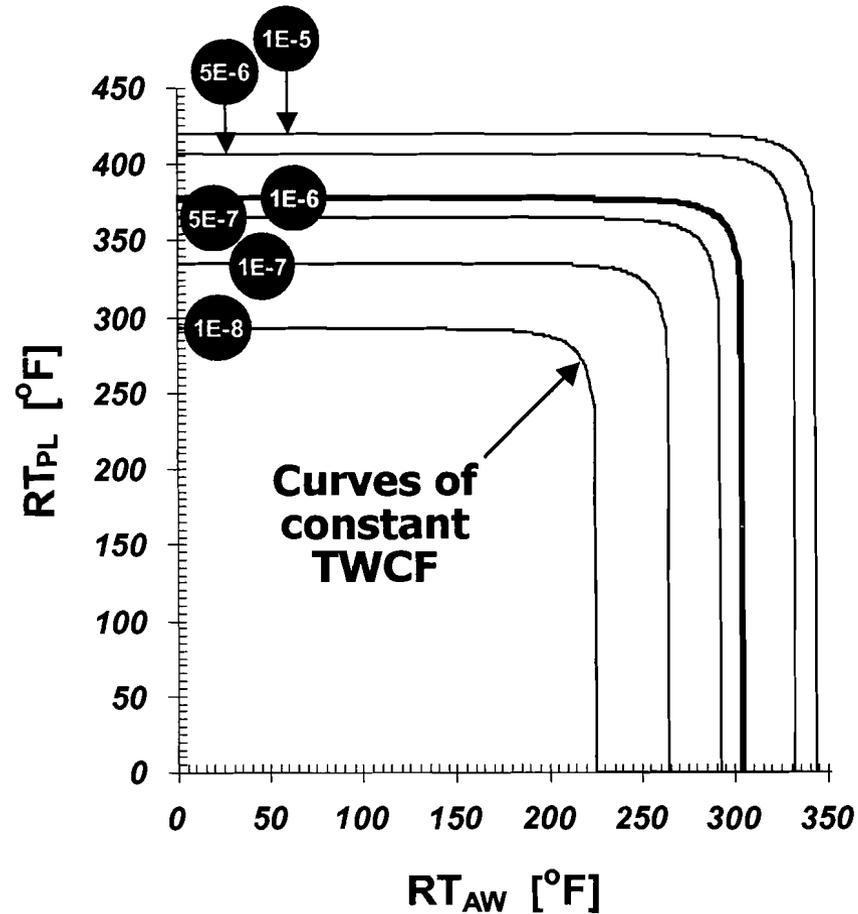
$$TWCF_{CIRC-WELD} = 4 \times 10^{-29} \cdot \exp\{0.0561 \cdot (RT_{CW} + 459.69)\}$$

- TWCF due to plate flaws multiplied by 2 to prevent under-estimation of Beaver Valley**
- Setting $TWCF_{TOTAL} = 1E-6$ permits derivation of RT-based screening limits consistent with LERF limit**

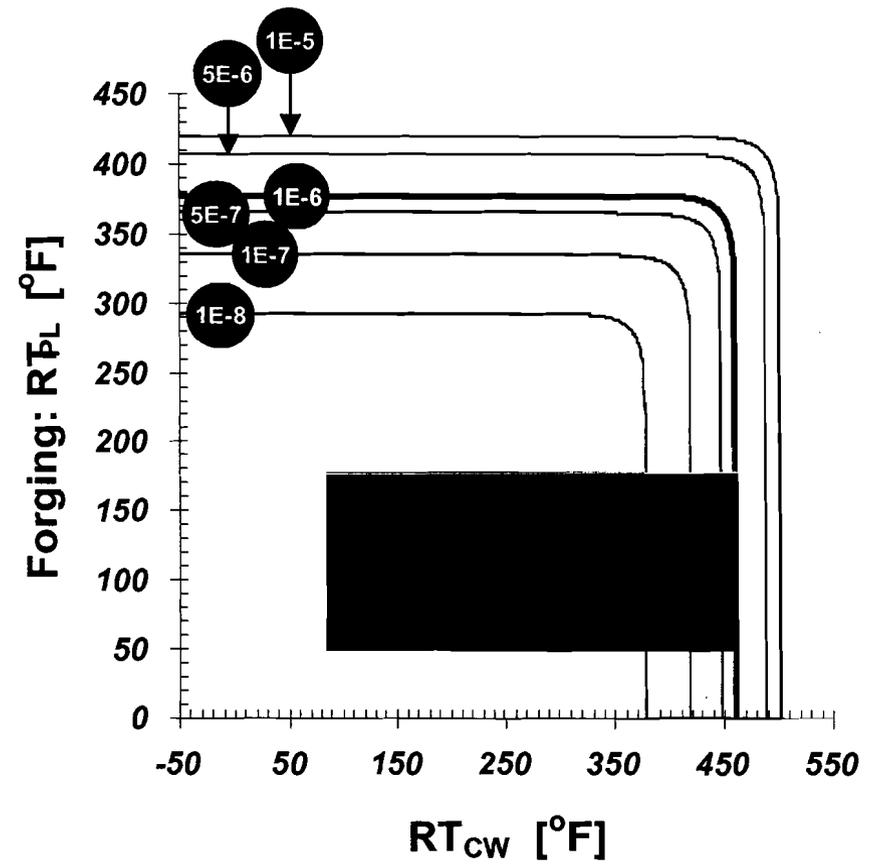


Proposed PTS Screening Limits

Plate Welded Plants

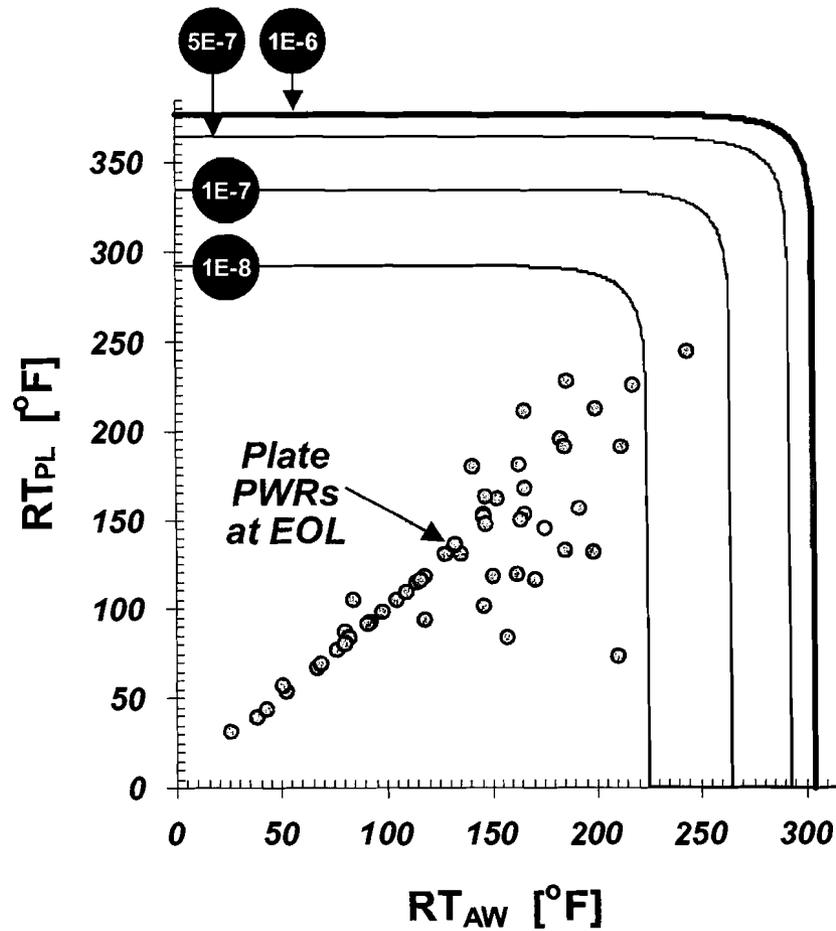


Forging Plants

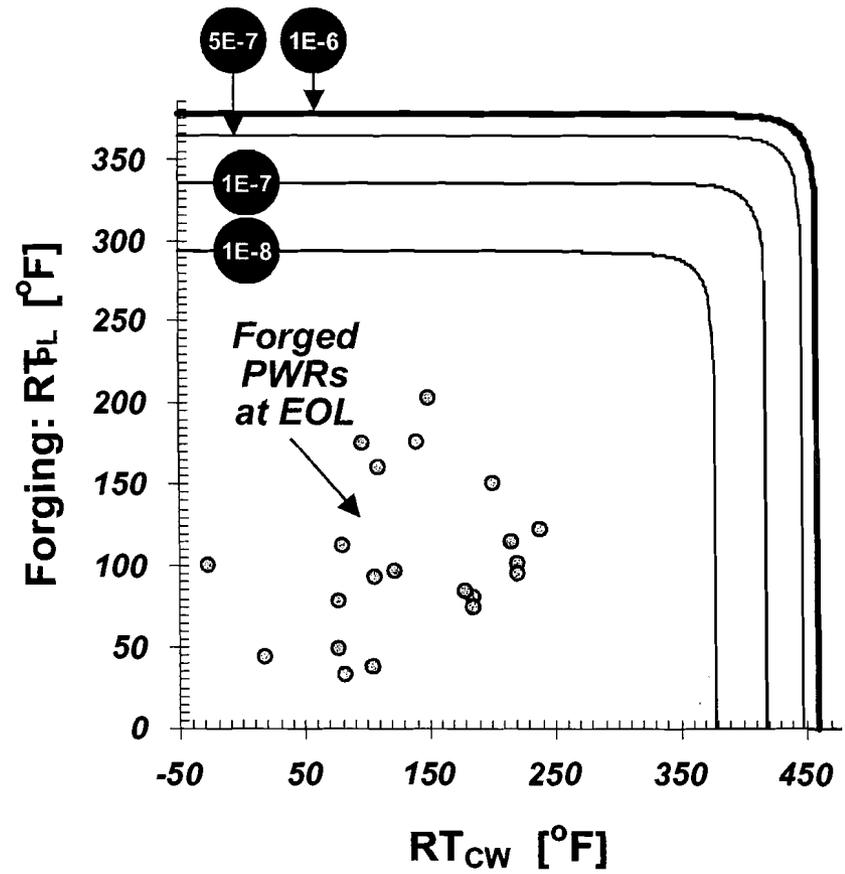


Assessment of U.S. PWRs at EOL Relative to Proposed PTS Screening Limits

Plate Welded Plants

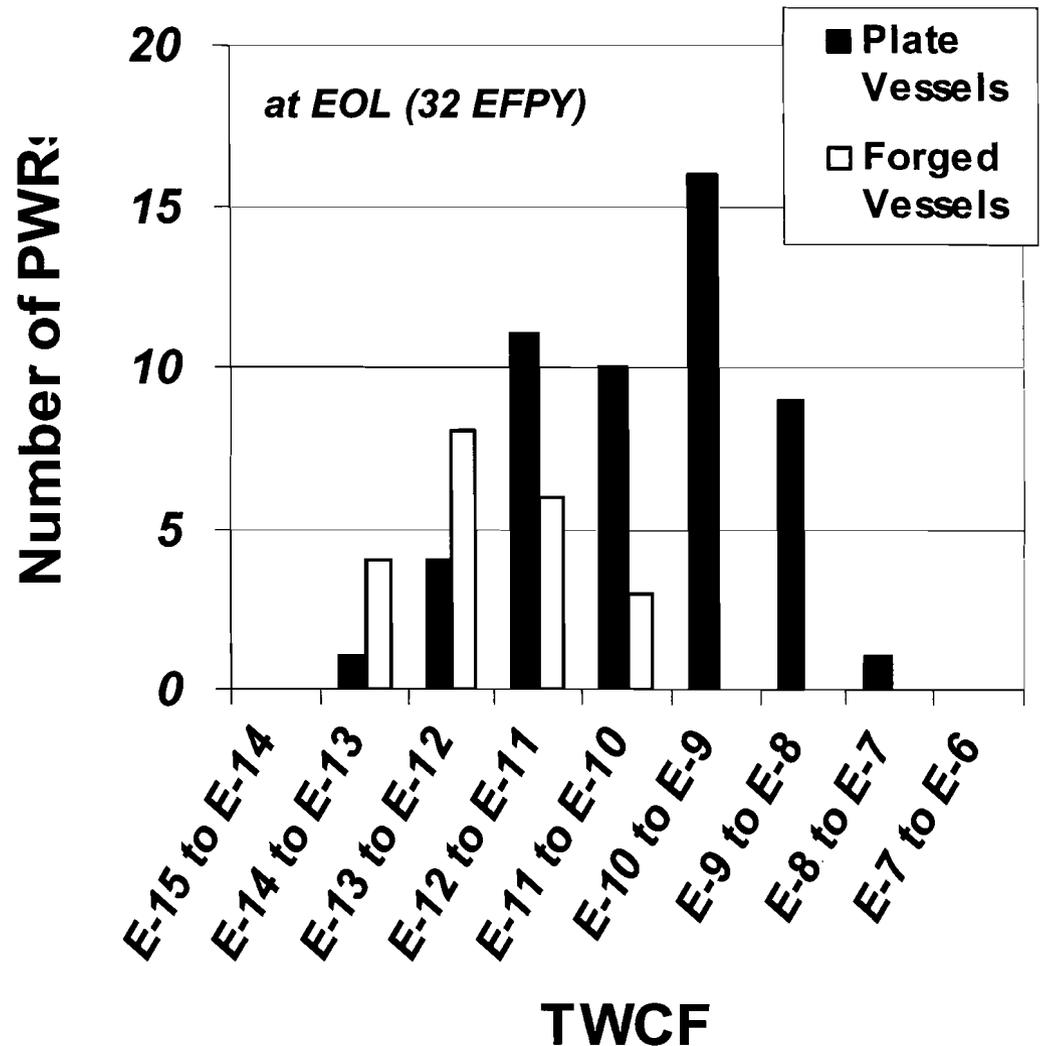


Forging Plants



Proposed PTS Screening Limits & Current Plant Status

- **Plant status**
 - PWRs all an order of magnitude away (or more) from 1E-6 LERF limit
 - At least 60°F (& usually much more) separates any PWR from the proposed screening limit at EOL (compare with <1°F per current regs.)
 - Plants move 10-20°F closer to screening limits at EOLE



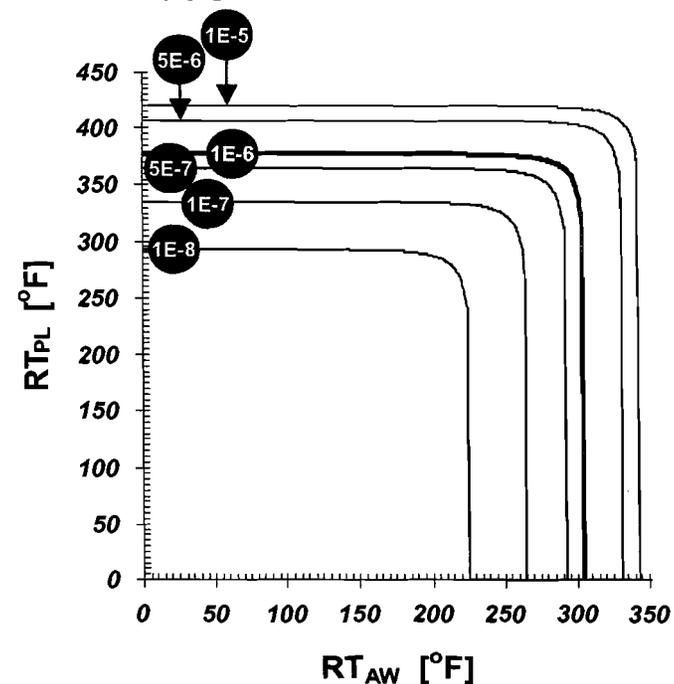
Uncertainties that Underlie Proposed PTS Screening Limits

Conservatism

- Vessel failure always leads to LERF
- Conservative binning to account for lack of knowledge
- MSLB min temperatures $\sim 40^\circ\text{F}$ too cold
- SO-2 transients conservatively modeled
- Infinite length axial flaw propagation assumed
- Full circumferential crack propagation assumed
- Material variability / uncertainty over-estimated (both chemistry and un-irradiated toughness)
- Neutron attenuation function
- Systematically conservative assumptions made in developing flaw model (e.g., all defects characterized as flaws, etc.)
- Initiation / arrest interdependency model
- Model of RT shift due to embrittlement
- Increasing embrittlement by increasing EFPY

Non-Conservatism

- Plume effects, if present, have been ignored
- External events ignored
- Heat transfer model
- Through-wall chemistry layering
- Air oxidation



PRA Response to Draft Final Peer Review Comments

Donnie W. Whitehead

12/02/04

**Sandia National Labs
505-844-2632
dwwhite@sandia.gov**

Dr. Murley Comment

- **Comment**

The assumption that SRV opening size is uniformly distributed seems intuitively wrong.

- **Response**

Initial response is to agree that we should not make this assumption.

Additional investigation to be performed.

Backup Slide

A sensitivity analysis to determine the importance of this assumption was performed (set the basic events that represent the SRV opening size to 1.0).

Total TWCF estimates (at 60 EFPY) increased.

- **Oconee: Factor of 1.5**
8.4E-10/5.5E-10 (sensitivity/original)
- **Beaver Valley: Factor of 1.4**
9.9E-9/7.0E-9

Should not affect the overall conclusion (i.e., sufficient technical basis exists for rule modification).

Pressurized Thermal Shock Technical Basis for Rule Revision

PTS Thermal Hydraulic Analysis

David E. Bessette

December 2, 2004

518th. ACRS Meeting

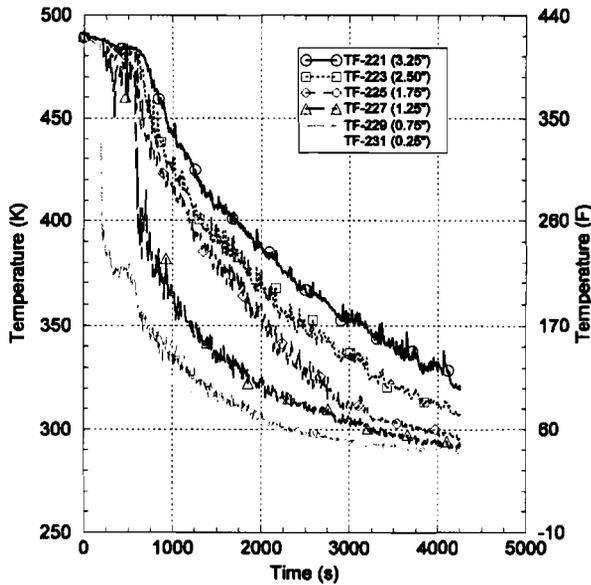
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Main Peer Review Group Comments

1. Most parameters in PIRT are system boundary conditions rather than physical models. (e.g break size, ECCS flow, etc.)
2. Effect of thermal stratification and mixing in the cold leg and downcomer from ECCS injection (adequacy of 1-dimensional code)
3. Uncertainty in downcomer fluid to wall heat transfer coefficient and its impact on conditional probability of vessel failure (CPF).

TH-2

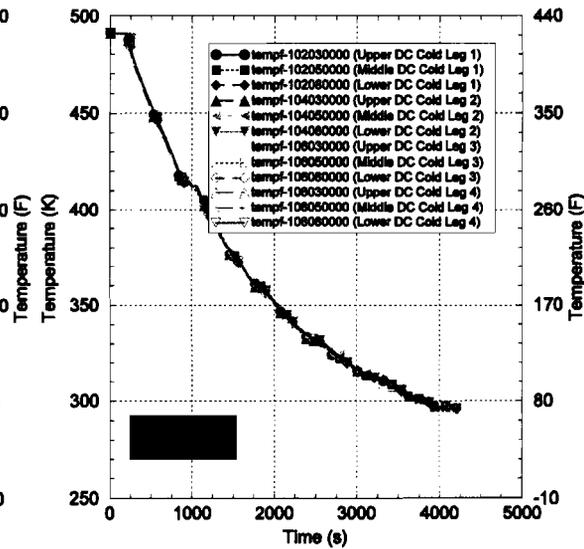
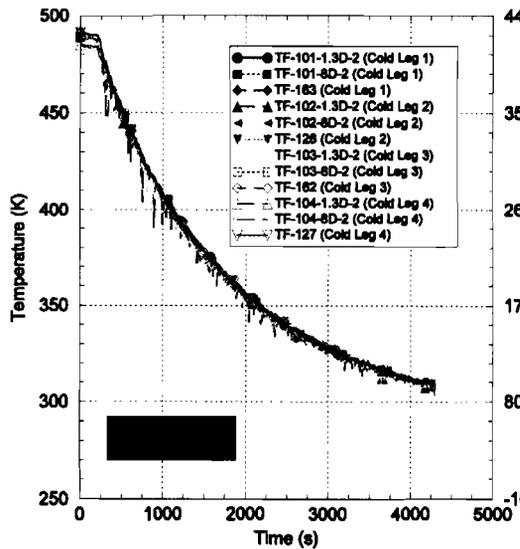
Cold Leg Thermal Stratification APEX-CE-05



- 50 to 150 K [90 - 270°F] thermal stratification seen in the two instrumented cold legs.
- ECCS injection temperature is 285 K [54°F].
- Maximum possible thermal stratification is 200 K [360 °F]

TH-5

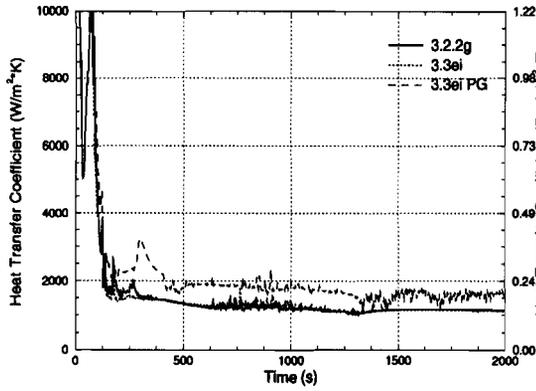
Axial Downcomer Temperature Variation APEX-CE-05



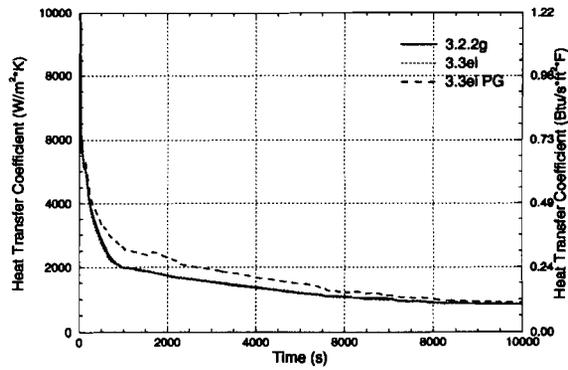
- Fluid temperatures at 0, 1.3 and 8 cold leg diameters axially along each cold leg centerline.
- No evidence of plumes based on the above temperature data

TH-6

Comparison of Heat Transfer Models



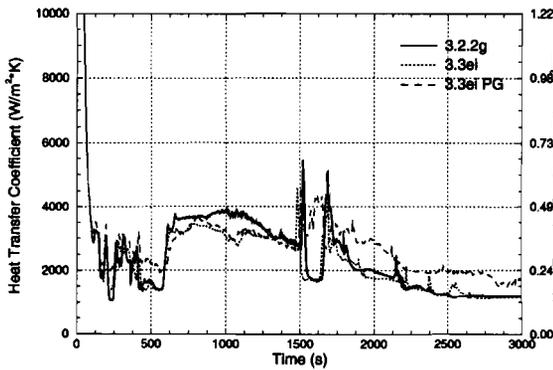
16-inch Hot Leg Break



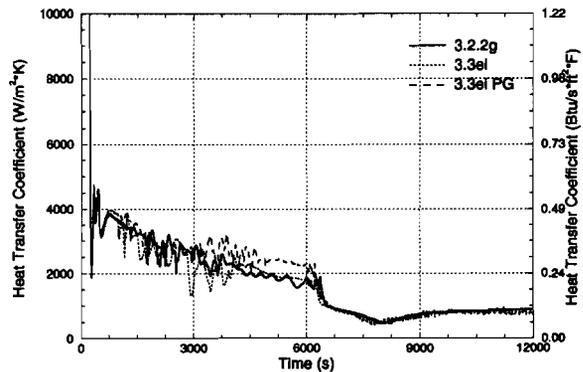
Main Steam Line Break

TH-9

Comparison of Heat Transfer Models



4 inch Surge Line Break



Stuck-open Primary SRV

Overall, Petukhov-Catton predicts HTC to be 20% higher than the default RELAP5 models.

Sensitivity study on risk-dominant Palisades transients showed a factor of 3 increase in CPF.

TH-10

Conclusions

- RELAP5 predicts pressure and temperature adequately for the PTS analysis.
- Experimental data show large thermal stratification in the cold legs, but nearly uniform downcomer temperature distribution.
- Sensitivity of CPF to heat transfer coefficient uncertainty small compared to the boundary condition variation within a PRA bin.

Technical Basis to Support Revision
of the PTS Rule (10CFR50.61)
→ *PFM Review Comments, Appendix B*



Mark EricksonKirk
Materials Engineering Branch

ACRS Briefing
NRC Headquarters • Rockville, MD • 2nd December 2004

VG 1

Comment Categories

- **Comments that led to model changes**
- **New (final) comments from reviewers**

VG 2

Final Comments

(VanWalle)

■ Summary

- *"The newly proposed PTS-methodology is worked out well and has a logical and acceptable pattern ... The methodology is very well established, explained, and documented in NUREG-1806 ... The reviewer recommends that ... the PFM procedure as implemented in FAVOR 04.1 shall be used in the overall approach of the PTS methodology."*

■ Remaining issues

- Not sampling correlation uncertainties for embrittlement relationships and Charpy to toughness conversions
- Difficulty in mathematically representing "mixed" uncertainties.

■ Recommends

- Continued in-service inspection to substantiate applicability of flaw distribution to all PWRs
- Over time, the direct use of fracture toughness measurements made on surveillance specimens instead of correlative approach.
- Continued / further validation of crack arrest models.

VG 5

Final Comments

(Murley)

■ General summary

- *"The NRC RES staff is to be congratulated for producing the breadth and quality of world class PTS research represented by this material ... While I have some issues & concerns {regarding the PRA, TH, & PFM}" analysis, these concerns do not rise to the level that would seriously challenge the logic of the overall approach or the general validity of the PRA, TH or PFM calculational methods."*

VG 6





Presented to:
Advisory Committee on Reactor Safeguards

Presented by:
Mary Drouin, Tom King, Stuart Rubin
US Nuclear Regulatory Commission

December 3, 2004



PURPOSE OF MEETING



- ◆ Brief Committee on SECY paper and status of work

2



SECY PAPER – SUMMARY

- ◆ Staff's effort regarding the framework
- ◆ Policy issues and how they are addressed in the framework
- ◆ Proposed schedule for completion

3



REGULATORY STRUCTURE (Four Major Parts)

- ◆ Technology-neutral framework
- ◆ Set of technology-neutral requirements
- ◆ Technology-specific framework
- ◆ Technology-specific regulatory guides

4

FRAMEWORK STATUS

- ◆ To date, sufficient work been completed to demonstrate the feasibility of developing a technology-neutral framework
- ◆ Public indication of general agreement with the need for a framework and the conceptual bases
- ◆ Staff issuing *working draft* of framework to engage stakeholder input
- ◆ Major workshop scheduled, tentative date of March 14/15, 2005

5

FRAMEWORK

- ◆ Hierarchal structure that blends deterministic and probabilistic criteria
- ◆ Criteria and guidelines developed for
 - Safety philosophy
 - Protective strategies
 - Risk objectives
 - Design/construction/operation objectives
 - Treatment of uncertainties
 - Process for defining scope of requirements
- ◆ Policy and technical issues associated with development and implementation of each of the above

6



POLICY ISSUES

- ◆ Definition of defense-in-depth
- ◆ Use of probabilistic approach to establish the licensing basis
- ◆ Use of scenario-specific source terms for licensing decisions
- ◆ Revision of the emergency planning zone
- ◆ Integrated risk
- ◆ Containment functional performance requirements and criteria
- ◆ Level of safety
- ◆ Physical protection
- ◆ Selective implementation

7



DEFENSE-IN-DEPTH

- ◆ Commission approved the staff recommendation for development of a description of defense-in-depth that would be incorporated into a policy statement
- ◆ Approach in framework has four main elements
 - Defines objectives
 - Defines principles
 - Develops a model
 - Develops process for implementation
- ◆ Staff plans to develop a proposed revision to the Commission's PRA Policy Statement to incorporate a definition on defense-in-depth

8

LICENSING BASIS

- ◆ Commission approved the use of probabilistic criteria for identification of events that need to be considered in the design, for safety classification of SSCs, and to replace the single failure criterion (SFC)
- ◆ Approach in framework
 - Replaces SFC with event sequences from PRA
 - Approach in framework incorporates a flexible, performance-based approach for establishing scenario-specific source terms
 - Defines event sequence categories by frequency
 - Classifies SSCs based on risk importance
- ◆ Expected that licensees will need to maintain a “living” PRA

9

SCENARIO-SPECIFIC SOURCE TERMS

- ◆ Commission approved the use of scenario-specific source terms provided there is sufficient understanding of fission product behavior, plant conditions and performance
- ◆ Key features include:
 - Scenarios selected from design-specific PRA
 - ST calculations based on verified analytical codess
 - STs for compliance be 95% confidence level values
 - ST for Emergency preparedness be mean values
 - ST for licensing decisions reflect timing, form and magnitude
- ◆ Applicant to develop the technical basis

10

EMERGENCY PLANNING ZONE

- ◆ Commission approved the staff proposal that no change to emergency preparedness requirements is needed in the near term.
- ◆ Commission also approved, for the longer term, the staff developing guidelines for assessing proposed changes to emergency preparedness requirements as part of the work to develop a description of defense-in-depth.
- ◆ Conceptual approach in the framework ensures a baseline emergency preparedness capability, regardless of reactor technology or design, and to expand this baseline where necessary to accommodate the need for more rapid implementation.
 - Requires that all applicants develop and maintain a plan for offsite protective measures.

11

INTEGRATED RISK

- ◆ Commission asked the staff to provide further details on the options for, and associated impacts of, requiring that modular reactor designs account for the integrated risk posed by multiple reactors.
- ◆ ACRS raised additional issues:
 - recommended that the Commission's Quantitative Health Objectives apply to the site as a whole (not being limited to modular reactors).
 - Presented an alternative view that "a CDF goal should depend on the total number of reactors nationwide (not the number on a site).
- ◆ The staff does not consider the issue of integrated risk for non-modular reactors to be a near term issue requiring Commission direction.
- ◆ The staff plans, however, to solicit comment on this issue, including the views expressed by the ACRS and report the results in the next status paper.

12

INTEGRATED RISK (cont'd)

Staff's proposed position

- ◆ integrated risk from multiple reactor modules would be considered in risk-informed licensing decisions as follows:
 - taking into consideration the integrated effect of risk when assessing accident prevention for modular reactor designs, independent of reactor power level, and
 - taking into consideration the integrated effect of risk when assessing accident mitigation for modular reactor designs in a fashion that allows for consideration of the effect of reactor power level

13

CONTAINMENT

- ◆ Commission asked the staff to develop performance requirements and criteria working closely with industry experts (e.g., designers, Electric Power Research Institute, etc.) and other stakeholders regarding options in this area, taking into account such features as core, fuel, and cooling systems design.
- ◆ Commission also stated that the staff should pursue the development of functional performance standards and then submit options and recommendations to the Commission on this important policy decision

14

CONTAINMENT (cont'd)

Staff Approach:

- ◆ Identify the functions for containment; e.g.
 - Reduce radionuclide releases to the environs
- ◆ Define technology-neutral performance requirements for each function; e.g.,
 - The containment must be adequate to reduce radionuclide releases to the environs to ensure that doses do not exceed the dose criteria for the selected events in the event categories.
- ◆ Use criteria based on framework to determine the options; e.g.,
 - Meets overall plant risk criteria
- ◆ Establish metrics and evaluate each option; e.g.,
 - Does the option provide flexibility to the designer?

15

CONTAINMENT (cont'd)

Options:

- 1) For the events selected for the event categories, reduce radionuclide releases to the environs adequately to meet the onsite and offsite radionuclide dose acceptance criteria.
- 2) (1) plus include within the design-basis category, selected credible events having the potential for high consequence source terms.
- 3) (2) and have the capability to establish controlled leakage and release of the delayed accident source term radionuclides.
- 4) (2) and be essentially leak tight against the release of prompt and delayed accident source term radionuclides.

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CONTAINMENT (cont'd)

Proposed Position: Option 3

- ♦ Would require that the containment have an independent capability to reduce delayed radionuclide releases to the environment independent of other radionuclide transport barriers associated with the fuel, core and reactor coolant pressure boundary.
- ♦ Is consistent with the Commission's defense-in-depth philosophy which provides that safety functions (e.g., control of fission product release) should not depend on a single element of design, construction, maintenance or operation.

Issue Resolution: Will establish a key element of defense-in-depth.

17

LEVEL OF SAFETY

- ♦ Commission approved the staff's recommendation on implementation of the Commission's expectations for enhanced safety in future non-light-water reactors.
- ♦ A process similar to that used in the certification of the two evolutionary LWRs (ABWR and System 80+) and the advanced LWR (AP-600) was approved by the Commission.
- ♦ Approach in the framework is to adopt a safety philosophy which will define a level of safety that will meet the expectation of enhanced safety
 - staff proposes that the technology-neutral requirements be written to achieve the level of safety defined by the Safety Goal Policy Quantitative Health Objectives.

18



PHYSICAL PROTECTION

- ◆ The staff has deferred it in this paper.
- ◆ The issue is being carefully coordinated with RES, NRR (Program Directorate on New, Research and Test Reactors), and NSIR.
- ◆ Currently, NRR is developing a position paper (with RES support) for Commission consideration on this issue.
- ◆ It is the staff's intent to implement the direction the Commission provides in response to this issue.

19



SELECTIVE IMPLEMENTATION

- ◆ In SECY-04-0157, selective implementation was raised as a potentially new policy issue.
- ◆ Staff's intent to develop a technology-neutral framework and requirements for new plant licensing on an integrated basis which would make selective implementation not practical.
- ◆ In identifying selective implementation as a policy issue, it was not meant to preclude the exemption process.
- ◆ Since the exemption process will be a part of this regulatory structure, this issue is no longer considered to be a policy issue.

20

PROPOSED FRAMEWORK SCHEDULE

- ◆ Early January 2005: Issue working draft to public to engage stakeholder input
- ◆ March 14&15, 2005: Public workshop to discuss in detail the policy and technical issues in the framework
 - ACRS members attend workshop
- ◆ April 2005: Meeting with ACRS subcommittee
- ◆ June 2005: Finalize staff position on policy issues and provide recommendations to Commission
- ◆ June 2005: Meet with ACRS full committee
- ◆ December 2005: Issue final draft of framework for public review and comment
- ◆ April 2006: Meeting with ACRS subcommittee
- ◆ June 2006: Issue framework for use

21

PUBLIC WORKSHOP

- ◆ Discuss in detail the technical and policy issues associated with both development and implementation of the framework
- ◆ Federal register notice announcing availability of the framework also includes lists of topics to be discussed at workshop

22



PUBLIC WORKSHOP (cont'd)

Example topics:

- ◆ A technology-neutral framework desirable?
- ◆ Developed as an independent alternative to licensing under 10CFR 50?
- ◆ Appropriate to use the Commission's Safety Goal QHOs as the level of safety for new plants?
- ◆ Meeting a frequency/consequence curve the appropriate way to achieve enhanced safety?
- ◆ Should consideration of integrated risk be applied to all reactors on a site, accounted for nationwide?
- ◆ Defense-in-depth model appropriate?
- ◆ What PRA scope and quality should be required?

INTERNAL USE ONLY

SUMMARY MINUTES OF THE ACRS PLANNING AND PROCEDURES SUBCOMMITTEE MEETING December 3, 2004

The ACRS Subcommittee on Planning and Procedures held a meeting on December 3, 2004, in Room T-2B3, 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 11:30 a.m. and adjourned at 12:40 p.m.

ATTENDEES

M. Bonaca
G. Wallis
S. Rosen

ACRS Staff

J. T. Larkins
S. Duraiswamy
J. Gallo
M. Snodderly
M. Sykes
M. El-Zeftawy
C. Santos
J. Flack
S. Meador
M. Afshar-Tous
R. Caruso
M. Weston

1) Review of the Member Assignments and Priorities for ACRS Reports and Letters for the December ACRS meeting

Member assignments and priorities for ACRS reports and letters for the December ACRS meeting are attached (pp. 4-6). Reports and letters that would benefit from additional consideration at a future ACRS meeting were discussed.

RECOMMENDATION

The Subcommittee recommends that the assignments and priorities for the December ACRS meeting be as shown in the attachment (pp. 4-6).

2) Anticipated Workload for ACRS Members

The anticipated workload for ACRS members through March 2005 is attached (pp. 4-6). 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 also discussed and developed recommendations on items that require Committee decision (pp. 7-8).

RECOMMENDATION

The Subcommittee recommends that the members provide comments on the anticipated workload. Changes will be made, as appropriate.

3) Expanded Meeting of the Planning and Procedures Subcommittee

An expanded meeting of the Planning and Procedures Subcommittee is scheduled to be held on January 27-28, 2005, at the ACRS conference room, to discuss certain process and regulatory issues. During the November ACRS meeting, the Committee decided on the topics for this meeting. A proposed schedule for this meeting is attached (pp. 9-10). Detailed issues associated with extended power uprates are also attached (pp. 11-16).

RECOMMENDATION

The Subcommittee recommends that the members provide feedback on the proposed schedule as well as on the assignments.

4) Conflict-of-Interest Issues

In order to keep the members' files on conflict-of-interest up-to-date, the members should keep the ACRS Office informed of their new contracts either with the NRC or industry, including performing work as a subcontractor for a company who has the main contract with the NRC or industry. We used to remind the members every six months to identify any new contracts. We plan to reinstate that process in January 2005.

RECOMMENDATION

The Subcommittee recommends that the members keep the ACRS Office informed of any new contracts that may have impact on their conflict-of-interest status.

5) Final 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components, for Nuclear Power Reactors"

The Committee reviewed the draft final version of 10 CFR 50.69 during its June 2004 meeting and issued a report to the Commission dated June 15, 2004, recommending issuance of the final rule. The final rule was issued on November 15, 2004. The Commission has made some changes to the rule prior to issuance. As suggested by

Dr. Bonaca, Mr. Snodderly has prepared a summary of the changes made to 10 CFR 50.69 subsequent to the Committee's review in June 2004 (pp. 17). A copy of the line-in/line-out version of the changes made to the rule will be distributed to the members during the meeting.

RECOMMENDATION

The Subcommittee recommends that this item be scheduled for discussion at the expanded meeting of the Planning and Procedures Subcommittee on January 27-28, 2005.

6) Member Issue

OECD/NEA Seminar on Emergency Zoning Around Nuclear Power Plants, end of April or beginning of May 2005, 2-day seminar, Netherlands (pp. 18). Dr. Apostolakis suggests that the Planning and Procedures Subcommittee discuss whether ACRS should get involved in this seminar.

RECOMMENDATION

The Subcommittee recommends that the Committee seek additional information on this Seminar from Dr. Apostolakis and decide whether a member should attend this Seminar (subject to the availability of travel funds).

ANTICIPATED WORKLOAD DECEMBER 2-4, 2004

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Apostolakis	Shack	Snodderly	Draft Final NUREG Documenting the Expert Elicitation on LBLOCA Frequencies	A	To support staff schedule	—
	—	Snodderly	Subcommittee Report - Status of the Development of Draft NUREG on Treatment of Uncertainties - Subc. Mtg 11/16/04	—	—	—
Bonaca	—	Savio/Major	Safeguards and Security Matters	B	To provide Committee's views	—
		Santos	Subcommittee Report - Interim Review of the Arkansas Unit 2 License Renewal Application - Subc. Mtg. 12/1/04	—	—	—
Kress	—	El-Zeftawy	Draft Commission Paper on "Regulatory Structure for New Plant Licensing, Part 1: Technology Neutral Framework - Policy Issues"	—	—	—
Shack	Apostolakis/ Wallis	Nourbakhsh/Santos	Technical Basis for Potential Revision of the PTS Screening Criteria in the PTS Rule	—	—	—
	—	Snodderly	Proposed Rule for Risk-Informing 10 CFR 50.46	A	To support staff schedule	—

ANTICIPATED WORKLOAD FEBRUARY 10-12, 2005

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Chairman	—	Larkins/Duraiswamy	Follow-up Matters Resulting from the Expanded Planning and Procedures Subcommittee Meeting Held on January 27-28, 2005	—	—	—
Bonaca	—	Savio/Major Santos	Safeguard and Security Matters (TENTATIVE) Subcommittee Report - D.C. Cook License Renewal Application - Subc. Mtg. Feb. 9, 2005	B —	To provide Committee's views —	— —
Kress	—	EI-Zeftawy	Draft Final 10 CFR Part 52 [TENTATIVE]	A	To support staff schedule	—
Powers	Wallis	Weston	MOX Fuel Fabrication Facility - Construction Authorization SER	A	To support staff schedule	—
Shack	Apostolakis/ Wallis	Nourbakhsh/Santos	Technical Basis for Potential Revision of the PTS Screening Criteria in the PTS Rule	A	To support staff schedule	—
Sieber	—	Snodderly	Digital I&C Research Plan	B	To provide Committee's views	—
Wallis	—	Caruso Caruso	Waterford Power Uprate Integrated Chemical Effects Test Results (GSI-191) [TENTATIVE]	A —	To support staff schedule —	— —

ANTICIPATED WORKLOAD MARCH 3-5, 2005

LEAD MEMBER	BACKUP	LEAD ENGINEER/ BACKUP	ISSUE	PRIORITY	BASIS FOR REPORT PRIORITY	AVAIL. OF DRAFTS
Chairman	All Members	Larkins	Preparation for Meeting with the NRC Commissioners - Scheduled for April 7, 2005	—	—	—
Apostolakis	—	Snodderly	Draft Final Reg. Guide 1.200, Endorsing ANS External Events Standard	A	To support staff Schedule	—
Bonaca	—	Santos/Duraiswamy	Proposed Update to Generic License Renewal Guidance Documents	—	—	—
		Savio/Major	Safeguard and Security Matters (TENTATIVE)	—	—	—
Kress	—	El-Zeftawy	Draft Safety Evaluation Report Related to North Anna Early Site Permit Application	A	To support staff schedule	—
Powers	Wallis	Caruso/Nourbakhsh	Status Report - Assessment of the Quality of the NRC Research Project on Thermal-Hydraulic Experiments	—	—	—
Sieber	—	Nourbakhsh	Technical Basis for Resolving GSI-80, "Pipe Break Effects on Control Rod Drive Hydraulic Lines in the Drywells of BWR Mark I and II Containments" (TENTATIVE)	A	To support staff schedule	—
Wallis	—	Caruso	Vermont Yankee Power Uprate (TENTATIVE)	A	To support staff schedule	—

ACRS Items Requiring Committee Action

1 **Status of the Accident Sequence Precursor (ASP) Program and the Development of Standardized Plant Analysis Risk (SPAR) Models**

Member:

Engineer:

Estimated Time:

Purpose: Determine a Course of Action

Priority: Medium

Requested by: RES Pat O'Reilly, RES

SECY-04-0210, "Status of the Accident Sequence Precursor (ASP) Program and the Development of Standardized Plant Analysis Risk (SPAR) Models," was issued to inform the Commission of the status of the Accident Sequence Precursor (ASP) Program, provide the annual quantitative ASP results, and provide the status of the development of the Standardized Plant Analysis Risk (SPAR) models. Dr. Larkins requested that ACRS staff contact Pat O'Reilly, RES, about a possible information briefing. Dr. O'Reilly said that he was willing to support such a briefing but requested that ACRS identify specific topics the Committee was most interested in from SECY-04-0210. During this reporting period, the staff screened and reviewed more than 700 licensee event reports (LERs) from FY 2001-2004 to identify potential precursors. Of the 148 events selected for analysis, the staff completed 119 analyses, rejecting 79 as not meeting the precursor threshold and identifying 40 precursors. With the exception of the ongoing analyses of the condition discovered at the Davis-Besse Nuclear Power Station and the cracks in the control rod drive mechanism (CRDM) housings at several plants, the staff has completed ASP analyses for all events that occurred in FYs 2000-2002. The analyses of FY 2003 events are also nearing completion, and the analyses of FY 2004 events have begun. Attachment 2 to this paper summarizes the final and preliminary precursor analyses, and provides a list of events involving CRDM cracking.

The Planning and Procedures Subcommittee recommends that Members Apostolakis, Denning, and Seiber review SECY-04-0210 and recommend topics for a March Full Committee information briefing.

2 **Generic Letter 2004-01 "Requirements for Steam Generator Tube Inspections"** (Open)

Member: Peter Ford

Engineer: Cayetano Santos

Estimated Time: 1 hr

Purpose: Review & Comment

Priority: High

Requested by: NRR Maitri Banerjee

GL 2004-01 was issued on August 30, 2004, requesting information that will enable the staff to determine whether steam generator (SG) tube inspection programs comply with existing requirements.

Specifically, the GL will do the following:

- (1) advise addressees that the staff's interpretation of TS requirements in conjunction with 10 CFR Part 50 Appendix B raises questions as to whether some SG inspection practices ensure compliance with requirements,
- (2) request that addressees describe their SG tube inspections and assess whether these inspections ensure compliance with TS requirements in conjunction with 10 CFR Part 50 Appendix B,
- (3) request that addressees who are not in compliance propose plans for coming into compliance with these requirements, and,
- (4) request that addressees submit a structural and leakage integrity safety assessment that addresses any differences between their inspection practices and the staff's position regarding SG tube inspection requirements.

The staff did not provide an opportunity to the ACRS to review this GL prior to issuance.

On November 5, 2004, Drs. Shack and Ford met informally with the staff. Drs. Shack and Ford recommend that the Committee not review GL 2004-01 because it is a compliance issue.

December 3, 2004

**PROPOSED
SCHEDULE AND OUTLINE FOR DISCUSSION
ACRS SUBCOMMITTEE MEETING ON PLANNING AND PROCEDURES
JANUARY 27-28, 2005**

**THURSDAY, JANUARY 27, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

- 1) 8:30 - 8:40 A.M. Opening Remarks by the Subcommittee Chairman (**Open**)
(/JTL)
 - 1.1) Objectives of the meeting
 - 1.2) Anticipated goals and outcomes

- 2) 8:40 - 9:10 A.M. Reviewing fewer issues and spending more time on each (**Open**)
(MVB/SD)

- 3) 9:10 - 9:40 A.M. Documenting some ACRS members' concerns regarding the quality
of science and engineering that goes into regulations and regulatory
process (**Open**) (DAP/SD)

- 4) 9:40 - 10:10 A.M. Role of Cognizant Subcommittee Chairman during Full Committee
meetings (**Open**) (MVB/SD)

- 10:10 - 10:30 A.M. *****BREAK*****

- 5) 10:30 - 11:00 A.M. Informal meetings with the NRC staff (**Open**) (GBW/SD)

- 6) 11:00 - 11:45 A.M. Planning for the next Quadripartite Meeting (**Open**) (JTL/MA/SD)

- 11:45 - 1:00 P.M. *****LUNCH*****

- 7) 1:00 - 2:00 P.M. How should requests for containment overpressure credit be
reviewed and what sorts of standards should be applied to determine
whether to allow the credit, and how much credit should be granted?
(**Open**) (GBW/RC)

- 8) 2:00 - 3:00 P.M. In evaluating the containment overpressure credit issue, should risk-
informed (probabilistic) considerations (which would allow relaxation
of existing criteria) be allowed/Included, when they are excluded
elsewhere on the power uprate process? (**Open**) (TSK/RC)

- 3:00 - 3:15 P.M. *****BREAK*****

- 9) 3:15 - 4:15 P.M. How should the uncertainties associated the calculations used to support containment overpressure credit applications be dealt with? should probabilistic or deterministic methods be encouraged? **(Open)** (GEA/MRS)
- 4:15 - 4:30 P.M. *****BREAK*****
- 10) 4:30 - 5:30 P.M. Should a facility be examined in more depth than would otherwise occur, when a power uprate request includes a request for containment over pressure credit? **(Open)** (JDS/MWW)
- 11) 5:30 - 6:30 P.M. Has the evolution of the staff position on containment overpressure credit been properly assessed by the staff and by the ACRS, with regard to the compact on defense-in-depth, and on other aspects of the design of the containment and accident mitigation features (policy change)? **(Open)** (WJS/HPN)
- 6:30 P.M. *****RECESS*****

FRIDAY, JANUARY 28, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 12) 8:30 - 8:40 A.M. Opening Remarks by the Subcommittee Chairman **(Open)** (/JTL)
- 13) 8:40 - 9:30 A.M. Why should a relaxation of margins be granted, when the recent expert elicitation report for the 10 CFR 50.46 rulemaking process clearly states that operational changes, such as extended power uprates, may significantly increase overall LOCA probabilities? **(Open)** (MVB/MME)
- 14) 9:30 - 11:45 A.M. Strategy for dealing with the Safety Culture Issue **(Open)**
(10:30-10:45 A.M. BREAK) (GEA/SLR/JHF)
- 15) 11:45 - 12:45 P.M. Changes to Final 10 CFR 50.69 (WJS/MRS)
- 16) 12:45 - 1:00 P.M. Summary of Commitments/Follow-Up Items (/JTL/SD)
- 1:00 P.M. **ADJOURN**

ACRS Retreat
Issue for Consideration
Containment Overpressure Credit

Background

Power uprates have the possibility to alter the relationship between containment and ECCS performance, by making ECCS performance more dependent on successful containment functioning. E.g., some uprates require additional containment overpressure credit to ensure ECCS pump NPSH, and may require operators to maintain containment pressure in a fashion that they have not previously been trained to do.

In addition, the staff position on granting containment overpressure has changed over the past 35 years. In RG 1.1, containment overpressure credit was not allowed. The latest revision to RG 1.82, Rev 3, which was reviewed by the ACRS, states that credit may be granted for plants "...for which the design cannot be practicably altered..." This guidance is not precise, because it does not define "practicably altered".

Over the past 5 years, the staff has granted more and more overpressure credit, especially for power uprates in BWRs, because licensees are reluctant to change their ECCS pumps, and therefore "the design cannot be practicably altered."

The ACRS is on the record as having changed its position on containment overpressure, having stated at one point that

"allowing some level of containment overpressure is not an acceptable corrective action because adequate overpressure may not be present when needed. In particular, it may not be available during shutdown and containment bypass accidents." (June 17, 1997)

Six months later, the ACRS reconsidered, and concluded:

"As a result of further review of this issue, we now concur with the NRC staff position that selectively granting credit for small amounts of overpressure for a few cases[emphasis added] may be justified. We recommend that instead of using qualitative arguments and restricting attention to a limited range of accident sequences, the decisionmaking process should consider the time variation of NPSH for a broad range of accident sequences such as typically found in a probabilistic risk assessment." And

"The margins in NPSH afforded by the DBA approach constitute a level of defense in depth. Allowing more credit for containment overpressure reduces defense in depth. The staff's justification for this was that the consequences of losing NPSH would not be catastrophic, i.e., the particular pumps at issue would not suffer damage and the discharge flow rates would remain sufficiently high. We believe that the evidence to support these assertions needs to be identified

as a part of the decisionmaking process."(December 1997)

The ACRS did not explicitly consider the portion of the latest revision to RG 1.82, Rev 3, which allowed containment overpressure credit.

In applying for approval of containment overpressure credit, licensees frequently use PRA arguments to demonstrate that risk from the uprate is minor, and that granting overpressure credit is reasonable. Licensees and the staff have presented only limited portions of the PRA to support these positions, and there are some concerns that they have not appropriately modeled all of the consequences of the uprates, including especially new interactions and dependencies between containment performance and ECCS performance, which may not have been modeled or considered before the uprate.

Summary of Issues for Consideration

1. How should requests for containment overpressure credit be reviewed, and what sorts of standards should be applied to determine whether to allow the credit, and how much credit should be granted?(G. Wallis)
2. In evaluating this issue, should risk-informed (probabilistic) considerations (which would allow relaxation of existing criteria) be allowed/included, when they are excluded elsewhere in the power uprate process? (T. Kress)
3. How should the uncertainties associated with the calculations used to support containment overpressure credit applications be dealt with? Should probabilistic or deterministic methods be encouraged? (G. Apostolakis)
4. Should a facility be examined in more depth than would otherwise occur, when a power uprate request includes a request for containment overpressure credit? What aspects of the design should be considered?(J. Sieber)
5. Has the evolution of the staff position on containment overpressure credit been properly assessed by the staff and by the ACRS, with regard to its impact on defense-in-depth, and on other aspects of the design of the containment and accident mitigation features?(W. Shack)
6. Why should a relaxation of margins be granted, when the expert elicitation report for the recent 50.46 rulemaking process clearly states that operational changes, such as extended power uprates, may significantly increase overall LOCA probabilities? (M. Bonaca)
(Policy Change) ?

Specific Policy Questions

7. Has the change to the staff position on overpressure credit been properly considered and accepted by the ACRS? Was the public given sufficient notice of this change, and did sufficient public dialogue occur to ensure that the views of all affected stakeholders were heard?
8. When is containment overpressure credit "necessary"?
9. When can a plant not be "practicably altered"?
10. Does granting containment overpressure credit "link" the performance of the containment and the ECCS to create a common-mode failure situation which did not exist before the application for the uprate and the request for overpressure credit?
11. Does this sort of linkage violate the "defense-in-depth" principle?"
12. Should PRAs performed in support of uprates be complete, and include potential new dependencies and interactions created by the uprate?
13. What should be the relationship between "defense-in-depth" and the PRA in supporting the uprate request? Should the definition of "defense-in-depth" be reconsidered or redefined to accommodate new dependencies and interactions created by the uprate?
14. What is the role of maintaining "sufficient" safety margins in the context of a risk-informed power uprate? What are the appropriate metrics for evaluating the safety margins, and how much margin is "sufficient"?
15. When a licensee requests a change such as containment overpressure credit, should it be considered to be such a significant change that its approval needs to reopen consideration of other technical aspects of containment performance, such as seismic design, qualification of the penetrations, and other upgrades to current licensing standards?
16. How much should the plant be upgraded to current licensing standards when it applies for a power uprate? How much "cherry-picking" of new requirements or burden reduction opportunities be allowed?
17. Should there be a limit on the amount of containment overpressure that is granted?
18. Does granting containment overpressure credit, which places operators under some pressure to maintain containment pressure within a varying band for a period of time, violate the TMI Lessons Learned that operators should not be required to perform actions with conflicting goals?

Specific Technical Issues

1. Should uprate plants that request containment overpressure credit be required to assume that containment pressure-retention function fails, as part of their new design basis?
2. Should such plants as described above also be required to assume some other single failure besides containment failure? If so, why? Also, if so, then why not assume containment failure for other sequences?
3. How should the staff determine whether these licensees should be required to change their ECCS pumps to provide the needed NPSH margin?
4. Is there sufficient uncertainty in various aspects of calculating NPSH that the margin provided by containment overpressure should not be surrendered when there is no need to do so, and when the design can be practicably altered to avoid it?
5. In the calculations of success paths for the analyses supporting PRAs related to power uprates, should nominal or bounding input values be used?
6. Is the risk evaluation methodology that is used to support uprate requests sufficiently developed to account for uncertainties?
7. Should there be limits on the amount of overpressure credited? If so, how much, or for how long during the scenario?
8. Should containment overpressure credit be allowed for non-LOCA scenarios, such as SBO or ATWS?
9. What sort of operator training is needed to allow overpressure credit?
10. What sort of containment/penetration testing should be required to ensure that the containment is able to maintain the requested overpressure value for the requested amount of time?
11. Might it be possible to deal with this issue in a "reality space" as opposed to "design basis space", by performing, for a complete spectrum of LOCA sizes (a la PRA), three sets of uncertainty analyses:
 - A. An uncertainty distribution on the quantity and type of debris that reaches the screen and uncertainty in the consequent head loss versus flow for the various LOCAs.
 - B. An uncertainty distribution on the calculated containment pressure caused by the various LOCAs.
 - C. An uncertainty distribution on the required NPSH for the particular pumps at the station in question.
 - D. Convoluting A, B, and C will result in a probability of loss of NPSH for

any LOCA size.

- E. Develop a criterion on what is an acceptable probability for (D) above.
 - F. This approach would require enough data and analyses to make the requisite uncertainty analyses. For the acceptance criterion on the resulting probability, we could view this as a late containment failure and use the LOCA frequencies developed by the expert elicitation and see if the late containment large release frequency meets a new safety goal that we would have to come up with that would be consistent with the current safety goals.
12. Alternatively to 11, stay strictly in "design basis space". Calculate containment overpressure, screen blockage, loss of NPSH, and required NPSH for the DBA LOCAs in a demonstrably conservative way to see if there results an acceptable NPSH for the various DBA LOCAs. Either of these approaches could be time-dependent.

Memorandum to: Mario Bonaca, Chairman
Planning and Procedures Subcommittee, ACRS

From: Mike Snodderly
Senior Staff Engineer, ACRS

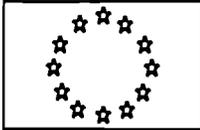
Subject: Changes to Draft Final 10 CFR 50.69 Since ACRS Review in June 2004

The NRC staff provided the Commission the draft final 10 CFR 50.69 in SECY-04-0109 dated June 30, 2004. The Commission subsequently approved the final rule subject to the changes documented in an SRM dated October 7, 2004. The following is a summary of the Commission's changes based on my review of the revised Statement of Considerations (SOC).

From Page 14 of the SOC, the Commission revised the rule to adopt a more performance-based approach that provides licensees and applicants greater flexibility in establishing RISC-3 (safety-related, low safety significant functions) treatment consistent with the low safety significance of RISC-3 SSCs. Accordingly, the Commission has removed the more prescriptive requirements regarding RISC-3 treatment activities and adopted rule language that focuses on the performance requirements for RISC-3 SSCs.

From Page 22 of the SOC, the final rule requirements require that licensees and applicants ensure with reasonable confidence that RISC-3 SSCs remain capable of performing their safety-related functions under design basis conditions. With respect to design changes, as noted in several places in the notice for the final rule, § 50.69 is not changing design basis functional requirements and § 50.59 remains applicable to all changes to non-special treatment aspects of RISC-3 SSCs. The Commission believes that a performance-based requirement will allow licensees who choose to implement § 50.69 to have greater flexibility to implement treatment that they have determined is needed, commensurate with the safety significance of the SSCs in order to ensure with reasonable confidence that RISC-3 safety-related functional capability is maintained. Reasonable confidence is defined on Page 115 of the SOC. By "reasonable confidence", the Commission means that the licensee or applicant is required to provide a "reasonable confidence" level with regard to maintaining the capability of RISC-3 safety-related functions. As indicated previously in this notice, "reasonable confidence" is a level of confidence that is both less than that associated with RISC-1 SSCs (safety-related, safety significant functions) which are subject to all the special treatment requirements, and consistent with their individual low safety significance. The term "ensure" is intended to convey the Commission's determination that the licensee is under a legally-binding regulatory requirement to provide the requisite "reasonable confidence."

From Page 39 of the SOC, RISC-3 components no longer have surveillance requirements. They are still required to be inspected, tested and covered by a corrective action program.



EUROPEAN COMMISSION

JOINT RESEARCH CENTRE
Institute for Energy
Nuclear Safety Unit
Probabilistic Risk and Availability Assessment of Energy Systems

**Subj.: EC/JRC - OECD/NEA Seminar on Emergency Zoning around
Nuclear Power Plants**

Petten, 29 November 2004

Dear Colleague,

Plant-specific Probabilistic Safety Assessment (PSA) can provide together with other information resources relevant information for strategic planning purposes in the area of emergency zoning (risk zones) around a Nuclear Power Plant (NPP), as well as information to the public on the geographical component of plant risk.

Not least due to the close relation of this issue to security and civil protection, there is currently discussion within the nuclear safety community whether or not PSA technology in its current state (Levels 2 & 3) is mature enough to be used to address the issues of levels of NPP emergency classification, concept of risk / emergency zones, relevant acceptance risk criteria, information to the public in the event of radiological emergency, and public evacuation and sheltering.

For this reason, both the European Commission's Joint Research Centre (EC/JRC) and the Nuclear Energy Agency of the Organization for Economical Cooperation and Development (OECD/NEA) intend to organize in spring 2005 a seminar with the aim to help relevant stakeholders on both national and international levels to decide on the relevance of this issue and on related research and development needs.

Relevant stakeholders would be representatives from regulatory authorities, utilities, civil protection institutions as well as PSA users and developers from Europe and international. We could imagine that presentations of practical application examples from Netherlands, the UK, Japan, USA and possibly South Africa would be quite informative and instructive for a wider audience.

With this letter you are kindly invited to inform us on your personal view on the above subject. The main question is, if incorporation of risk informed support into NPP emergency planning is currently a relevant enough topic to be treated by a technical seminar with a view of international harmonisation or if the topic is somewhat premature at this stage.

The tentative dates currently being considered are for 2 days during either end of April or beginning of May 2005 at JRC's Institute for Energy in Petten / Netherlands.

We kindly ask you to send us your responses by not later than 10 December 2004, so that we could distribute official invitations in January 2005.

Yours sincerely,

C. Kirchsteiger (EC-JRC),

B. Kaufer (OECD-NEA),

E. Lazo (OECD-NEA)

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