

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

March 31, 2005

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

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT - 520th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, March 3-5, 2005 AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 520th meeting, March 3-5, 2005, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letters, and memorandum:

REPORTS:

Reports to Nils J. Diaz, Chairman, NRC, from Graham B. Wallis, Chairman, ACRS:

- Revised Draft NUREG Report "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," dated March 11, 2005
- Proposed Rulemaking to Modify 10 CFR 50.46, "Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements," dated March 14, 2005

LETTERS:

Letters to Luis A. Reyes, Executive Director for Operations, NRC, from Graham B. Wallis, Chairman, ACRS:

- Interim Letter: Draft Safety Evaluation Report on North Anna Early Site Permit Application, dated March 11, 2005
- Pressurized Thermal Shock (PTS) Reevaluation Project: Technical Basis for Revision of the PTS Screening Criterion in the PTS Rule, dated March 11, 2005

MEMORANDUM:

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

• Proposed Generic Letter 2005-XX, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated March 8, 2005

HIGHLIGHTS OF KEY ISSUES

1. Revised Draft NUREG on Expert Elicitation on Large-Break LOCA Frequencies

The Committee met with representatives of the NRC staff to review the revised draft NUREG Report, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process." The expert elicitation produced several distributions to assist in the determination of an appropriate alternative break size. This alternative break size is part of a draft proposed rulemaking to modify the requirements addressing large-break LOCAs.

Committee Action

The Committee issued a report to the NRC Chairman on March 11, 2005, recommending that the revised draft NUREG Report be issued for public comment. The Committee commented on the appropriate choice of a composite distribution.

2. Proposed Rulemaking Package for Risk-Informing 10 CFR 50.46

The Committee met with the NRC staff, the Nuclear Energy Institute, and the Westinghouse Owners Group to review the proposed rulemaking, "Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements," to modify 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors." The Committee previously reviewed a draft version of a proposed rule during the 518th meeting on December 2-4, 2004 and issued a letter on December 17, 2004. The current proposed rule uses the initiating event frequencies from the expert elicitation process and other relevant information to guide the determination of an appropriate alternative break size. The transition break size in the current version of the rule is equivalent to a single-ended rupture of the largest pipe attached to the reactor coolant system rather than the double-ended rupture in the earlier version. A representative of the Westinghouse Owners Group discussed efforts under way to quantify possible safety benefits from a smaller transition break size. He said the Westinghouse Owners Group hoped the results of the quantification would be available during the proposed rule's public comment period. NEI said that the proposed rule should increase focus on safety-significant matters. NEI stated that the proposed rule should be issued so that stakeholders may engage in the process.

Committee Action

The Committee issued a report to the NRC Chairman on March 14, 2005, recommending that the proposed rule for risk-informing 10 CFR 50.46 be released for public comment. The Committee commented on consideration of late containment failure, whether certain acceptance criteria in Regulatory Guide (RG) 1.174 need to be codified in the rule, and the importance of associated regulatory guidance.

3. Draft Safety Evaluation Report Related to North Anna Early Site Permit Application

The Committee heard presentations by and held discussions with representatives of the NRC staff and Dominion Nuclear North Anna, LLC (Dominion) regarding the staff's Draft Safety Evaluation Report (DSER) and Dominion's application related to North Anna early site permit

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(ESP). The Committee is conducting such effort to fulfill the requirement of 10 CFR 52.23, which states that the ACRS shall report on those portions of an ESP application that concern safety.

Dominion has submitted a first-of-a-kind application for ESP, and seeks to locate up to two nuclear power units, each with a thermal power of up to 4300 Megawatts, wholly within the existing North Anna Power Station (NAPS) site. This site was previously approved for four units, but only two units (3-loop Westinghouse pressurized water reactors) were constructed and operated.

Dominion's application included a description and a safety assessment of the site, as required by 10 CFR 52.17. The DSER summarizes the results of the staff's technical evaluation of the suitability of the proposed site for a nuclear power plant(s) falling within a plant parameter envelope (PPE) that Dominion specified in its application.

The proposed North Anna site will have reactors founded on hard rock with seismically induced accelerations that extend to frequencies in excess of 10 Hz. Some generic issues arose during the staff's review of the application, including Dominion's concept for emergency planning, the approach for determining safe shutdown earthquake, and the design/site interface. Currently, most of the open items in the DSER are considered resolved. However, the staff has identified 18 permit conditions and 19 site-related combined license action items that it will recommend that the Commission impose should an ESP be issued to the applicant.

Committee Action

The Committee issued an interim letter to the NRC Executive Director for Operations on March 11, 2005, stating that the staff is preparing a quality safety evaluation of a first-of-a-kind application for an ESP. The Committee sees a promising start to the first application of the ESP process both on the part of Dominion and the staff. The Committee looks forward to examining the final version of the staff's Safety Evaluation Report, and will work with the staff in the development of lessons learned from the review of this and subsequent ESP applications.

4. <u>Technical Basis for Potential Revision of the Pressurized Thermal Shock (PTS)</u> <u>Screening Criterion in the PTS Rule</u>

The Committee met with representatives of the NRC to discuss the staff's development of a technical basis for revision of the PTS screening criterion in the PTS Rule (10 CFR 50.61). This matter was also discussed during a joint meeting of the ACRS Subcommittees on Thermal-Hydraulic Phenomena, Materials and Metallurgy, and Reliability and Probabilistic Risk Assessment (PRA) on November 30-December 1, 2004, and at the ACRS meeting of December 2, 2004. The focus of the current meeting was on NUREG-1809, "Thermal Hydraulic Evaluation of Pressurized Thermal Shock," which documents the applicability of RELAP5 for PTS applications.

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Committee Action

The Committee issued a letter to Executive Director for Operations, concluding that the PTS Reevaluation Project has developed a comprehensive technical basis for analyzing the susceptibility of reactor pressure vessels to PTS and to support rulemaking to revise the current PTS Rule. The Committee also concluded that the external peer review of the technical work was valuable, and that the staff response to the criticisms and questions raised by the peer review panel has strengthened the technical basis. The Committee recommended that NUREG-1809 be substantially revised. The Committee would like to review the final version of this NUREG.

5. <u>Proposed Revisions to Generic License Renewal Guidance Documents/Scoping Review</u> <u>Process for BOP Systems</u>

The Committee met with representatives of the NRC staff to discuss proposed updates to generic license renewal guidance documents and the scoping review process for balance of plant (BOP) systems. The staff is revising NUREG-1800 (Standard Review Plan for License Renewal Applications for Nuclear Power Plants), NUREG-1801 (Generic Aging Lessons Learned Report), and RG 1.188 (Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses). These documents were issued for public comment on January 31, 2005. The revised versions will be published on September 30, 2005. NUREG-1801 was updated to incorporate approved past precedents, interim staff guidance, and lessons learned from previous reviews. A definitions chapter was also added for materials, environments, and aging mechanisms. Changes to NUREG-1800 reflect the changes to NUREG-1801 and incorporate the new audit process for reviewing aging management programs. The proposed revision to RG 1.188 endorses NEI 95-10 Revision 5 (Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule) with exceptions. These exceptions are related to alternative scoping of non-safety-related piping and supports and the use of short term exposure to leakage in determining the need for aging management. The staff also described a two-tier process for the scoping review of BOP systems. The Tier-1 review applies screening criteria to identify systems for a more detailed Tier-2 review. The screening criteria consider risk significance, operating experience, and previous review experience. This new process was applied to Brunswick and 15 of 39 BOP systems were selected for the Tier-1 review. This new process will focus the review on more important systems and conserve limited staff resources.

Committee Action

This briefing was for information only. No committee action was necessary. The Committee plans to review the draft final versions of these documents after reconciliation of public comments.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

• The Committee considered the EDO's February 1, 2005, response to the ACRS letter of December 10, 2004 concerning the Committee's review of the proposed staff Safety Evaluation (SE) related to the Nuclear Energy Institute (NEI) guidance report

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"Pressurized Water Reactor Sump Performance Evaluation Methodology." Following its initial review of this matter in October, 2004, the Committee had responded with a second letter to the EDO on 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 will alert the responsible national standards organizations about technical shortcomings in one of their guidance documents. Overall, however, the Committee continued to believe that both the SE 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. The Committee did not consider the EDO's response to be acceptable.

The EDO's February 1, 2005 response acknowledged the Committee's concerns, and expressed the view that the staff continues to take steps to address them. The staff is conducting ongoing confirmatory work on the NUREG/CR-6224 head loss correlation, and downstream and chemical effects are also being evaluated. The staff will provide the results of these studies to the Committee as they become available.

The Committee determined that it will continue to discuss this issue with the staff, as individual licensee responses are received in the fall of 2005, and as new information arises from the ongoing research efforts. The Committee looks forward to reviewing future refinements to the guidance documentation by both the staff and the industry.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from February 10, 2005 through March 2, 2005, the following Subcommittee meetings were held:

Early Site Permits Subcommittee - March 2, 2005

The Subcommittee reviewed Draft Safety Evaluation Report for the North Anna early site permit application, the application itself, and the applicant's proposed plant parameter envelope information.

<u>Planning and Procedures</u> - March 2, 2005

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 draft final version of the NUREG Report, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," after resolution of public comments.

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- The Committee plans to review the draft final rulemaking, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," to modify 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," after resolution of public comments. The Committee plans to review the associated regulatory guide prior to its being issued for public comment.
- The Committee plans to review the draft final version of Generic Letter 2005-XX, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," after reconciliation of public comments.
- The Committee plans to review the final version of the staff's Final Safety Evaluation Report related to Dominion application for an early site permit.
- The Committee plans to work with the staff in the development of "lessons learned" from the review of Dominion application and the next few applications for early site permits.
- The Committee would like to review the final version of NUREG-1809, "Thermal-Hydraulic Evaluation of Pressurized Thermal Shock."
- The Committee plans to review the draft final revisions to the Generic License Renewal Guidance documents after reconciliation of public comments.
- The Committee plans to review future refinements to the NEI guidance document and results of the ongoing research efforts related to the resolution of GSI-191.

PROPOSED SCHEDULE FOR THE 521th ACRS MEETING

The Committee agreed to consider the following topics during the 521th ACRS meeting, to be held on April 7-9, 2005:

- Final Review of the License Renewal Application for Joseph M. Farley Nuclear Plant, Units 1 and 2
- NUREG-1792, "Good Practices for Implementing Human Reliability Analysis"
- Meeting with the NRC Commissioners to discuss items of mutual interest.
- Accident Sequence Precursor Program and Development of SPAR Models

Sincerely,

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Graham B. Wallis Chairman



Date Issued: 3/24/05 Date Certified: 4/1/05

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- III. Proposed Rulemaking Package for Risk-Informing 10 CFR 50.46 (Open)
- IV. <u>Draft Safety Evaluation Report Related to North Anna Early Site Permit</u> <u>Application</u> (Open)
- V. <u>Technical Basis for Potential Revision of the Pressurized Thermal Shock</u> (PTS) Screening Criteria in the PTS Rule (Open)
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REPORTS:

The following reports to Nils J. Diaz, Chairman, NRC, from Graham B. Wallis, Chairman, ACRS:

- Revised Draft NUREG on Estimating Loss-of-Coolant Accident (LOCA) Frequencies through the Elicitation Process dated March 11, 2005
- Draft Proposed Rule for Risk-Informing 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors" dated March 14, 2005

LETTERS:

The following letters to Luis A. Reyes, Executive Director for Operations, NRC, from Graham B. Wallis, Chairman, ACRS:

- Interim Letter-Draft Safety Evaluation Report Related to North Anna Early Site Permit Application dated March 11, 2005
- Pressurized Thermal Shock (PTS) Reevaluation Project: Technical Basis for Potential Revision to PTS Screening Criteria dated March 11, 2005

MEMORANDA:

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

Proposed Generic Letter 2005-XX, "Grid Reliability and the Impact on Risk Plant and the Operability of Offsite Power" dated March 8, 2005

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



MINUTES OF THE 520th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS March 3-5, 2005 ROCKVILLE, MARYLAND

The 520th meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on March 3-5, 2005. Notice of this meeting was published in the *Federal Register* on February 23, 2005 (70 FR 8857) (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 <u>http://www.nrc.gov/ACRS/ACNW</u>.

ATTENDEES

ACRS Members: ACRS Members: Dr. Graham B. Wallis (Chairman), Dr. William J. Shack (Vice Chairman), Mr. John D. Sieber, (Member-at-Large), Dr. George E. Apostolakis, Dr. Mario V. Bonaca, Dr. Richard S. Denning, Dr. F. Peter Ford, Dr. Thomas S. Kress, Dr. Dana A. Powers, and Dr. Victor H. Ransom. Mr. Stephen L. Rosen did not attend this meeting. For a list of other attendees, see Appendix III.

I. <u>Chairman's Report</u> (Open)

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

Dr. Graham B. Wallis, Committee Chairman, convened the meeting at 8:34 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. Revised Draft NUREG on 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 revised draft NUREG Report, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process." The expert elicitation produced several distributions to assist in the determination of



an appropriate alternative break size. This alternative break size is part of a draft proposed rulemaking to modify the requirements addressing large-break LOCAs.

Committee Action

The Committee issued a report to the NRC Chairman on March 11, 2005, recommending that the revised draft NUREG Report be issued for public comment. The Committee commented on the appropriate choice of a composite distribution.

III. Proposed Rulemaking Package 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, and the Westinghouse Owners Group to review the proposed rule for a voluntary alternative to 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors." The Committee previously reviewed a draft version of a proposed rule during the 518th meeting on December 2-4, 2004 and issued a letter on December 17, 2004. The proposed rule is 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 report to the NRC Chairman on March 14, 2005, recommending that the proposed rule for risk-informing 10 CFR 50.46 be released for public comment. The Committee commented on consideration of late containment failure, whether certain acceptance criteria in RG 1.174 need to be codified in the rule, and the importance of associated regulatory guidance.

IV. Draft Safety Evaluation Report Related to North Anna Early Site Permit Application (Open)

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

Dr. Dana A. Powers, Chairman of the early site permits Subcommittee, stated that the purpose of this session is to hear presentations by and hold discussions with representatives of the NRC staff and Dominion Nuclear North Anna, LLC (Dominion) regarding the staff's draft safety evaluation report (DSER) and Dominion's application related to North Anna early site permit (ESP). The Committee is conducting such effort to fulfill the requirement of 10 CFR 52.23, which requires that the ACRS shall report on those portions of an ESP application that concern safety.



Mr. Eugene S. Grecheck, Vice-President-Nuclear Support Services/Dominion, stated that on September 25, 2003, Dominion submitted its application (Revision 0) to the NRC for an early site permit. Subsequently the application has been revised to respond to the request of additional information from the NRC. Currently, Revision 3 - September 2004, is the version from which the NRC staff has written its draft safety evaluation report (DSER).

Dominion has submitted a first-of-a-kind application for ESP, and seeks to locate up to two nuclear power units, each with a thermal power of up to 4300 Mega-watt, wholly within the existing North Anna Power Station (NAPS) site. The North Anna site is located near Lake Anna in Louisa County, Virginia, approximately 40 miles north-northwest of Richmond, Virginia. This site was previously approved for four units, but only two units (3-loop Westinghouse pressurized water reactors) were constructed and in operation.

Mr. Michael Scott, NRC staff, stated that Dominion's application included a description and a safety assessment of the site, as required by 10 CFR 52.17. The staff's review was guided by the Review Standard (RS-002), "Processing Applications for Early Site Permits", developed by the staff and approved by the Commission on May 3, 2004. The DSER summarizes the results of the staff's technical evaluation of the suitability of the proposed site for a nuclear power plant(s) falling within a plant parameter envelope (PPE) that Dominion specified in its application. The current regulations of 10 CFR Part 52 and 10 CFR Part 100 that apply to an ESP do not require that an ESP applicant provide specific design information.

In the process of performing the review of Dominion's ESP application, the staff has identified several generic issues. One issue is associated with "major features" of emergency plans. Another issue involves seismic analyses. Dominion has initially submitted application that contained a new "performance-based" methodology for determining the Safe Shutdown Earthquake (SSE) ground motion for the site. The staff had not previously reviewed this methodology and informed the applicant that the choice of this method could result in a delay in completion of the staff's seismic review of the ESP application. Subsequently, Dominion elected to rely on the staff approved methodology in the regulatory guide and revised its application accordingly.

The proposed North Anna site will have reactors founded on hard rock with seismically induced accelerations that extend to frequencies in excess of 10 Hz. Dominion seeks a 20-year ESP. Some generic issues arose during the staff's review of the application include Dominion's concept for emergency planning, approach for determining safe shutdown earthquake, and design/site interface. Currently, most of the open items in the DSER are considered resolved. However, the staff has identified 18 permit conditions and 19 site-related combined license action items that it will recommend the Commission impose should an ESP be issued to the applicant.

The Site Safety Analysis Report (SSAR) of the ESP application, Dominion provided a list of postulated design parameters in the form of PPE. The applicant stated that the PPE approach provides sufficient design details to support the NRC's review of the ESP application, while



recognizing that new reactor technologies, not envisioned at the time Dominion submitted its ESP application, may become available in the future. Dominion states that the PPE is intended to bound multiple reactor designs. Dominion also states that the actual reactor design selected would be reviewed at the combined license (COL) stage to ensure that the design fits within the PPE. The PPE references the following designs:

- ACR-700 (Atomic Energy of Canada, Ltd.)
- Advanced Boiling Water Reactor (General Electric)
- AP1000 (Westinghouse)
- Economic and Simplified Boiling Water Reactor (General Electric)
- Gas Turbine Modular Helium Reactor (General Atomics)
- International Reactor Innovative and Secure (IRIS) Project (Consortium led by Westinghouse)
- Pebble Bed Modular Reactor (PBMR (Pty) Ltd.)



The DSER summarizes the staff's technical evaluation of the North Anna ESP site. The DSER focused on the following matters:

- population density and land use characteristics of the site environs including seismology, meteorology, geology, and hydrology.
- potential hazards to a nuclear power plant(s) that might be constructed on the ESP site posed by man made facilities and activities, transportation accidents, and the existing nuclear power plants.
- potential capability of the site to support the construction and operation of a nuclear power plant(s) with design parameters falling within those specified in the applicant's PPE.
- suitability of the site for development of adequate physical security plans and measures.



- proposed major features for an emergency plan.
- quality assurance measures applied to the information submitted by the applicant.
- the acceptability of the applicant's proposed exclusion area and low population zone (LPZ) under the dose consequence evaluation factors of 10 CFR 50.34(a)(1).

The applicant (Chapter 15, Accident Analysis-SSAR) analyzed and provided the radiological consequences of design-basis accidents (DBAs) to demonstrate that new nuclear units could be sited at the proposed ESP site without undue risk to the health and safety of the public. The applicant, however, did not identify a particular reactor design to be considered for the proposed ESP site. Instead, the applicant developed a set of reactor DBA source term parameters using surrogate reactor characteristics.

In selecting DBAs for dose consequence analyses, the applicant focused on two light-water reactors, the certified ABWR and the AP1000 designs, to serve as surrogates. Using source terms developed from these two designs, the applicant performed radiological consequence analyses for the following DBAs:

- PWR main steamline break
- PWR feedwater system pipe break
- locked rotor accident
- reactor coolant pump shaft break
- PWR rod ejection accident
- BWR control rod drop accident
- failure of small lines carrying primary coolant outside containment
- PWR steam generator tube failure
- BWR main steamline break
- PWR and BWR LOCAs
- fuel handling accident

The applicant calculated site-specific DBA doses by first obtaining DBA dose information from the ABWR and AP1000 design control documents (DCDs), then calculated site-specific χ/Q values using onsite meteorological information. The applicant, then multiplied the doses from



the two designs by the ratio of the site-specific χ/Q values to the assumed χ/Q values from the DCDs. The applicant cited Regulatory Guide (RG 1.183), "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors"- issued July 2000, as the applicable NRC regulations. The NRC staff finds the applicant's site-specific χ/Q values and dose consequence evaluation methodology to be acceptable. In addition, the staff concludes that the proposed distances to the exclusion area boundary (EAB) and the LPZ outer boundary of the proposed ESP site, in conjunction with the fission product release rates to the environment provided by the applicant as PPE values, to be adequate.

Committee Action

The Committee issued an interim letter to the NRC Executive Director for Operations on March 11, 2005, stating that the staff is preparing a quality safety evaluation of a first-of-a-kind application for an ESP. The Committee sees a promising start to the first application of the ESP process both on the part of Dominion and the staff. The Committee looks forward to examining the final version of the staff's safety evaluation report, and will work with the staff in the development of lessons learned from the review of this and next ESP applications.

V. <u>Technical Basis for Revision of the Pressurized Thermal Shock (PTS) Screening</u> <u>Criterion in the PTS Rule</u> (Open)

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

The Committee met with representatives of the NRC to discuss the staff's development of a technical basis for revision of the Pressurized Thermal Shock (PTS) screening criterion in the PTS Rule (10 CFR 50.61). This matter was also discussed during a joint meeting of ACRS Thermal-Hydraulic Phenomena, Materials and Metallurgy, and Reliability and Probabilistic Risk Assessment (PRA) Subcommittees on November 30-December 1, 2004, and at the ACRS meeting of December 2, 2004. The focus of the current meeting was on NUREG-1809, "Thermal Hydraulic Evaluation of Pressurized Thermal Shock," which documents the applicability of RELAP5 for PTS applications.

Committee Action

The Committee issued a letter to Executive Director of Operation concluding that the PTS Reevaluation Project has developed a comprehensive technical basis for analyzing the susceptibility of reactor pressure vessels to PTS and to support rulemaking to revise the current PTS Rule. The Committee also concluded that the external peer review of the technical work was valuable, and the staff response to the criticisms and questions raised by the peer review panel has strengthened the technical basis. The Committee recommended that NUREG-1809 should be substantially revised.



VI. <u>Proposed Revisions to Generic License Renewal Guidance Documents/Scoping Review</u> <u>Process for BOP Systems</u> (Open)

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

The Committee met with representatives of NRR to discuss proposed updates to generic license renewal guidance documents and the scoping review process for balance of plant (BOP) systems.

Mr. Dozier, NRR, described the schedule for updating NUREG-1800 (Standard Review Plan for License Renewal Applications for Nuclear Power Plants), NUREG-1801 (Generic Aging Lessons Learned Report), and RG 1.188 (Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses). These documents were issued for public comment on January 31, 2005. A draft technical bases document providing justification for these changes was posted on the NRC web page on February 7, 2005. The revised documents and a public comment NUREG will be published on September 30, 2005. The final technical bases document will be published on October 30, 2005.

Mr. Cozens, NRR, provided an overview of changes to NUREG-1800. A section was added to incorporate the new audit process and provide expectations for applications with approved extended power uprates. The tables were also modified to reflect changes in and provide a better link to the Generic Aging Lesson Learned Report.

Ms. Hull, NRR, described the changes to the NUREG-1801. This NUREG was revised to incorporate past precedents, interim staff guidance, and lessons learned from previous reviews. Changes to aging manage programs included modifications, additions, and deletions. The aging management review line items were standardized. A new definitions chapter was added for terms used for materials, environments, and aging mechanisms.

Mr. Lintz, NRR, provided an overview of Draft Guide-1140 which is the Proposed Revision 1 to RG 1.188. RG 1.188 endorses NEI 95-10 (Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule) Revision 3 dated March 2001. The Draft Guide endorses NEI 95-10 Revision 5 dated January 2005 with two exceptions. The exceptions deal with alternatives to scoping of non-safety-related piping and supports and the use of short term exposure to leakage to determine the need for aging management.

The last presentation by Mr. Chang, NRR, described a two-tier process for the scoping review of BOP systems. The Tier-1 review applies screening criteria to identify systems for a more detailed Tier-2 review. The screening criteria consider safety importance/risk significance, operating experience, and previous license renewal review experience. This new process was applied to Brunswick and 15 of 39 BOP systems were selected for the Tier-1 review. This new process will focus the review on more important systems and conserve limited staff resources.



Committee Action

This briefing was for information only. No committee action is necessary.

VII. Preparation for Meeting with the NRC Commissioners (Open)

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

The ACRS is scheduled to meet with the NRC Commissioners between 1:30 and 3:30 p.m. on Thursday, April 7, 2005, to discuss items of mutual interest. Topics proposed by the ACRS were sent to the Secretary of the Commission, requesting Commissioners' feedback. On March 2, 2005, the ACRS was informed that the Chairman had approved the list of topics proposed by the ACRS.

VIII. 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

The Committee considered the EDO's February 1, 2005 response to the ACRS's letter of December 10, 2004 concerning the Committee's review of the proposed staff Safety Evaluation (SE) related to the Nuclear Energy Institute (NEI) guidance report "Pressurized Water Reactor Sump Performance Evaluation Methodology." Following its initial review of this matter in October, 2004, the Committee had responded with a second letter to the EDO on 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 will be alerting the responsible national standards organizations about technical shortcomings in one of their guidance documents. Overall, however, the Committee continued to believe that both the SE 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. The Committee did not consider the EDO's response to be acceptable.

The EDO's February 1, 2005 response acknowledged the ACRS concerns, and expressed the view that the staff continues to take steps to address them. The Staff is conducting ongoing confirmatory work on the NUREG/CD-6224 head loss correlation, and downstream and chemical effects are also being evaluated. The staff will provide the results of these studies to the Committee as they become available.

Notwithstanding these limitations, the EDO continues to believe that it is important for the staff to continue moving forward to address GSI-191, and the staff believes that it has provided appropriate conservative judgements to address uncertainties in the methodology. It has therefore issued the staff SE on December 6, 2004.



The Committee discussed this response, and it acknowledged the staff's desire to move forward towards resolution of the issue. It determined that it will have to continue to discuss this issue with the staff, as individual licensee responses are received in the fall of 2005, and as new information arises from the ongoing research efforts. The Committee looks forward to reviewing future refinements to the guidance documentation by both the staff and the industry, in the hope that they will provide well-founded technical justification of the resolution of GSI-191.

[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:

B. <u>Report on the Meeting of the Planning and Procedures Subcommittee</u> (Open)

The Committee heard a report from the ACRS Chairman and the Executive Director, ACRS, regarding the Planning and Procedures Subcommittee meeting held on March 2, 2005. The following items were discussed:

<u>Review of the Member Assignments and Priorities for ACRS Reports and Letters for the</u> <u>February ACRS meeting</u>

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

Anticipated Workload for ACRS Members

The anticipated workload for ACRS members through May 2005 is attached. The objectives were 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 included in Section IV of the Future Activities list.

Meeting with the NRC Commissioners

The ACRS is scheduled to meet with the NRC Commissioners between 1:30 and 3:30 p.m. on Thursday, April 7, 2005, to discuss items of mutual interest. Topics proposed



by the ACRS were sent to the Secretary of the Commission, requesting Commissioners' feedback. On March 2, 2005, we were informed that the Chairman had approved the list of topics proposed by the ACRS. Other Commissioners' feedback were being sought by the Office of SECY. Presentation slides prepared by the cognizant ACRS staff engineers were distributed to the members on Friday, March 4, 2005.

Self-Assessment of ACRS Performance

A SECY paper, documenting the results of the self-assessment of the ACRS performance is due to the Commission on May 31, 2005. As has been the practice, we plan to obtain feedback from internal and external stakeholders on the ACRS performance as well as value added by the ACRS to the regulatory process. To accomplish this, a survey questionnaire has been developed by the ACRS staff and LINK Technologies, which is being provided to the members for information. A draft Commission paper summarizing the survey results will be provided to the Committee during the April ACRS meeting for review and comment.

Meeting with the EDO, Deputy EDOs, and Program Office Directors

The ACRS was scheduled to meet with the EDO, Deputy EDOs, and Program Office Directors (NRR, RES, and NMSS) between 9:30 and 11:30 a.m. on Friday, May 6, 2005, to discuss items of mutual interest.

[Note: This meeting has been postponed to September 9, 2005.]

Ad Hoc Subcommittees

During the January 27-28, 2005, expanded meeting of the Planning and Procedures Subcommittee meeting, the Subcommittee established the following Ad Hoc Subcommittees and the full Committee endorsed the establishment of these Subcommittees during its February 2005 meeting:

- Ad Hoc Subcommittee on Digital I&C Systems
- Ad Hoc Subcommittee on Early Site Permits
- Ad Hoc Subcommittee on Power Uprates

Normally, Ad Hoc Subcommittee are established to deal with a specific issue within a short period and abolished subsequent to completion of the assigned task. Since Digital I&C issues, Early Site Permits, and Power Uprates will continue for a long period, the above Ad Hoc Subcommittees should be made regular Subcommittees.

MEMBER ISSUES

Issues Raised by Drs. Bonaca and Kress

The issues raised by Drs. Bonaca and Kress are attached. The Subcommittee briefly discussed these issues during the meeting.

Miscellaneous

- During the February 2005 ACRS meeting, the Committee considered TVA's invitation to the ACRS to visit Browns Ferry plants. The Committee should decide on the dates for this visit.
- The 17th annual Regulatory Information Conference was held on Tuesday, March 8 thru Thursday, March 10, 2005, at the Bethesda North Marriott Hotel and Conference Center. Those members who would like to attend this conference should inform the ACRS Executive Director. Also, those who plan to attend other meetings, such as ANS meetings, should inform the ACRS Executive Director.
- The ACNW discussed the status of NRC staff's review of the USEC Inc. license application for a Gas Centrifuge Uranium Enrichment Facility between 4:00-5:00 p.m. on Wednesday, March 16, 2005. Those ACRS members who would like to attend this session should inform the ACRS Executive Director.
- If the ACRS is interested in using a consultant to assist the Committee in reviewing seismic issues associated with early site permit applications, Dr. Hinze, ACNW member, could be invited to provide such assistance.

C. Future Meeting Agenda

Appendix IV summarizes the proposed items endorsed by the Committee for the 520th ACRS Meeting, March 3-5, 2005.

The 520th ACRS meeting was adjourned at 11:58 a.m. on March 5, 2005.



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

March 24, 2005

MEMORANDUM TO:

Note & Green h. ACRS Members Noble S. Green, Jr. **Technical Secretary**

FROM:

SUBJECT:

PROPOSED MINUTES OF THE 520th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS -MARCH 3-5, 2005

Enclosed are the proposed minutes of the 520th 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

April 1, 2005

MEMORANDUM TO: Noble S. Green, Jr., Technical Secretary Advisory Committee on Reactor Safeguards

FROM:

Graham B. Wallis Embar B. wallis ACRS Chairman

SUBJECT:

CERTIFIED MINUTES OF THE 520th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS), MARCH 3-5, 2005

I certify that based on my review of the minutes from the 520th 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.



facility at 6900 Georgia Avenue, NW., Washington, DC for unrestricted use. The NRC staff has evaluated WRAMC's request and the results of the surveys and has concluded that the completed action complies with the criteria in 10 CFR part 20, subpart E. The staff has found that the environmental impacts from the action are bounded by the impacts evaluated by NUREG-1496, Volumes 1–3, "Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Facilities'' (ML042310492, ML042320379, and ML042330385). On the basis of the EA, the NRC has concluded that the environmental impacts from the action are expected to be insignificant and has determined not to prepare an environmental impact statement for the action.

IV. Further Information

Documents related to this action, including the application for the license amendment and supporting documentation, are available electronically at the NRC's Electronic Reading Room at http://www.nrc.gov/ reading-rm/adams.html. From this site, you can access the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. The ADAMS accession numbers for the documents related to this Notice are: Environmental Assessment (ADAMS Accession No. ML050460068); Amendment Request for WRAMC Building T-2 (ADAMS Accession No. ML043220447); Historical Site Assessment for WRAMC Building T-2 (ADAMS Accession No. ML043220460); and Final Status Survey for WRAMC Building T-2 (ADAMS Accession No. ML043220467). Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS, should contact the NRC PDR Reference staff by telephone at (800) 397-4209 or (301) 415-4737, or by e-mail to pdr@nrc.gov.

Please note that on October 25, 2004, the NRC terminated public access to ADAMS and initiated an additional security review of publicly available documents to ensure that potentially sensitive information is removed from the ADAMS database accessible through the NRC's Web site. Interested members of the public may obtain copies of the referenced documents for review and/or copying by contacting the Public Document Room pending resumption of public access to ADAMS. The NRC Public Document Room is located at NRC Headquarters in Rockville, MD, and can be contacted at (800) 397-4209, (301) 415-4737 or by e-mail to *pdr@nrc.gov*.

Dated in King of Prussia, Pennsylvania this 15th day of February, 2005.

For the Nuclear Regulatory Commission. Ronald R. Bellamy.

Chief, Decommissioning Branch, Division of Nuclear Materials Safety, Region I. [FR Doc. 05–3402 Filed 2–22–05; 8:45 am] BILLING CODE 7590–01–P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards; Meeting Notice

In accordance with the purposes of Sections 29 and 182b. of the Atomic Energy Act (42 U.S.C. 2039, 2232b), the Advisory Committee on Reactor Safeguards (ACRS) will hold a meeting on March 3–5, 2005, 11545 Rockville Pike, Rockville, Maryland. The date of this meeting was previously published in the **Federal Register** on Wednesday, November 24, 2004 (69 FR 68412).

Thursday, March 3, 2005, 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.: Revised Draft

8:35 a.m.-IO a.m.: Revised Draft NUREG on 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 revised draft NUREG-xxx, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," and related matters.

10:15 a.m.-12:15 p.m.: Proposed Rulemaking Package 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 rulemaking package for risk-informing 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors."

1:15 p.m.-2:45 p.m.: Draft Safety Evaluation Report Related to North Anna Early Site Permit Application (Open)---The Committee will hear presentations by and hold discussions with representatives of the NRC staff and Dominion Nuclear North Anna, LLC regarding the NRC staff's draft Safety Evaluation Report related to the North Anna Early Site Permit Application. 3 p.m.-5 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.

5.15 p.m.-6.45 p.m.: Preparation of ACRS Reports (Open)—The Committee will discuss proposed ACRS reports on matters considered during this meeting.

Friday, March 4, 2005, 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.-10:30 a.m.: Proposed

Revisions to Generic License Renewal Guidance Documents/Scoping Review Process for BOP Systems (Open)-The Committee will hear presentations by and hold discussions with representatives of the NRC staff regarding proposed revisions to: NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants;" NUREG-1801, "Generic Aging Lessons Learned (GALL) Report;" and Draft Regulatory Guide DG-1140, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses" (Proposed Revision 1 to Regulatory Guide 1.188) that endorses, with certain exceptions, NEI 95-10, Rev. 5, "Industry Guidelines for Implementing the Requirements of 10 CFR 54-The License Renewal Rule.' The Committee will also discuss with the staff the scoping review process for balance-of-plant (BOP) systems.

10:45 a.m.-12:15 p.m.: Preparation for Meeting With the NRC Commissioners (Open)—The Committee will discuss topics for meeting with the NRC Commissioners which is scheduled for April 7, 2005.

1:15 p.m.-2:15 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.

2:15 p.m.-2:30 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.

2:45 p.m.-6:45 p.m.: Preparation of ACRS Reports (Open)—The Committee will discuss proposed ACRS reports.

Saturday, March 5, 2005, Conference Room T-2B3, Two White Flint North, Rockville, Maryland

8:30 a.m.-12:30 p.m.: Preparation of ACRS Reports (Open)—The Committee will continue its discussion of proposed ACRS reports.

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

Procedures for the conduct of and participation in ACRS meetings were published in the Federal Register on October 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.

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 *pdr@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.

Dated: February 16, 2005.

Andrew L. Bates,

Advisory Committee Management Officer. [FR Doc. 05–3396 Filed 2–22–05; 8:45 am] BILLING CODE 7590–01–P

NUCLEAR REGULATORY COMMISSION

Regulatory Guide; Issuance, Availability

The U.S. Nuclear Regulatory Commission (NRC) has issued a new guide in the agency's Regulatory Guide Series. This series has been developed to describe and make available to the public such information as methods that are acceptable to the NRC staff for implementing specific parts of the NRC's regulations, techniques that the staff uses in evaluating specific problems or postulated accidents, and data that the staff needs in its review of applications for permits and licenses. Regulatory Guide 1.202, "Standard

Regulatory Guide 1.202, Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors,'' provides guidance for licensees to use in meeting the NRC's regulatory requirements for the various cost estimates that the agency requires for different stages and methods of decommissioning. Specifically, on July 29, 1996, the NRC amended its regulations on decommissioning procedures that lead to termination of an operating license for nuclear power reactors, as specified in Title 10, Section 50.82, of the *Code of Federal Regulations* (10 CFR 50.82). That rulemaking included changes to the decommissioning-related provisions of 10 CFR part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders"; part 50, "Domestic Licensing of Production and Utilization Facilities"; and part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Regulatory Guide 1.202 describes a method that the NRC staff considers acceptable for complying with those amended regulations.

In November 2001, the NRC staff published a draft of this guide as Draft Regulatory Guide DG-1085. Following the closure of the public comment period on January 30, 2002, the staff resolved all stakeholder comments in the course of preparing the new Regulatory Guide 1.202.

The NRC staff encourages and welcomes comments and suggestions in connection with improvements to published regulatory guides, as well as items for inclusion in regulatory guides that are currently being developed. You may submit comments by any of the following methods.

Mail comments to: Rules and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555– 0001.

Hand-deliver comments to: Rules and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. on Federal workdays.

Fax comments to: Rules and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission at (301) 415–5144.

Requests for technical information about Regulatory Guide 1.202 may be directed to C.L. Pittiglio at (301) 415– 1435 or via e-mail to *CLP@nrc.gov*.

Regulatory guides are available for inspection or downloading through the NRC's public Web site in the Regulatory Guides document collection of the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/doccollections. Electronic copies of Regulatory Guide 1.202 are also available in the NRC's Agencywide Documents Access and Management System (ADAMS) at http:// www.nrc.gov/reading-rm/adams.html, under Accession No. ML050230008. Note, however, that the NRC has temporarily suspended public access to ADAMS so that the agency can complete security reviews of publicly



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

February 14, 2005

Mr. Rosen did not attend.

SCHEDULE AND OUTLINE FOR DISCUSSION 520th ACRS MEETING MARCH 3-5, 2005

THURSDAY, MARCH 3, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH. ROCKVILLE, MARYLAND

- 8:30 8:35 A.M. 1) 8:34 8:37
- Opening Remarks by the ACRS Chairman (Open) (GBW/JTL/SD) **Opening statement** 1.1)
- Items of current interest 1.2)
- Revised Draft NUREG on Expert Elicitation on Large-Break LOCA 2) 8:35 - 10:00 A.M. 8:37 9:54 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 the revised draft NUREG-xxx, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process," and related matters.

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

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

10:15 - 12:15 P.M. 10:16 12:18

12:18

10:16

:17 .12:15 - 1:15 P.M. Proposed Rulemaking Package for Risk-Informing 10 CFR 50.46. (Open) (WJS/MRS/RC)

- Remarks by the Cognizant Subcommittee Chairman 3.1)
- 3.2) Briefing by and discussions with representatives of the NRC staff regarding the proposed rulemaking package for riskinforming 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.

LUNCH

- 1+15 2+45P.M. 4) Draft Safety Evaluation Report Related to North Anna Early Site 1:17 2:30 P.M. Permit Application (Open) (DAP/MME)
 - Remarks by the Cognizant Subcommittee Chairman 4.1)
 - 4.2) Briefing by and discussions with representatives of the NRC staff and Dominion Nuclear North Anna, LLC regarding the NRC staff's draft Safety Evaluation Report related to the North Anna Early Site Permit Application.

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



3)

2:30 3:02 2:45 - 3:00 P.M.

BREAK

5) 3:00 - 5:00 P.M. 3:02 4:45 <u>Technical Basis for Potential Revision of the Pressurized Thermal</u> <u>Shock (PTS) Screening Criteria in the PTS Rule</u> (Open) (WJS/HPN/CS)

- 5.1) Remarks by the Cognizant Subcommittee Chairman
- 5.2) 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.

5:00 - 5:15 P.M. ***BREAK***

6) 5:15 - 6:**4**5 P.M. 6:34

4:45 5:13

Preparation of ACRS Reports (Open)

_ Discussion of proposed ACRS reports on:

- 6.1) Revised Draft NUREG on Expert Elicitation on Large-Break
 LOCA Frequencies (GEA/MRS)
- う6.2) Proposed Rule for Risk-Informing 10 CFR 50.46 (WJS/MRS/RC)
- Ø 6.3) North Anna Early Site Permit Application (Tentative)
 (DAP/MME)
- (1)6.4) Technical Basis for Potential Revision to the PTS Screening Criteria (WJS/HPN/CS)

FRIDAY, MARCH 4, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 7) 8:30 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (GBW/JTL/SD)
- 8) 8:35 10:30 A.M. <u>Proposed Revisions to Generic License Renewal Guidance</u> <u>Documents/Scoping Review Process for BOP Systems</u> (Open) (MVB/CS)
 - 8.1) Remarks by the Cognizant Subcommittee Chairman
 - 8.2) Briefing by and discussions with representatives of the NRC staff regarding proposed revisions to: NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants;" NUREG-1801, "Generic Aging Lessons Learned (GALL) Report;" and Draft Regulatory Guide DG-1140, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses" (Proposed Revision 1 to Regulatory Guide 1.188) that endorses, with certain exceptions, NEI 95-10, Rev. 5, "Industry Guidelines for Implementing the Requirements of 10 CFR 54 The License Renewal Rule." The Committee will also discuss with the staff the scoping review process for balance-of-plant (BOP) systems.

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

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|-------------------|--|--|
| | 48 10:30 - 10:48 A.M. | ***BREAK*** |
| 9) | 48 19 10:45 - 12:45 P.M. | <u>Preparation for Meeting with the NRC Commissioners</u> (Open) (GBW, et.al/JTL, et.al) Discussion of topics for meeting with the NRC Commissioners which $P_{\text{pr. Wall, s}}^{\text{r. Wall, s}}$ is scheduled for April 7, 2005. (12:19 p.m.) |
| | 19 /8 12:15 - 1:15 P.M. | ***LUNCH*** |
| 10) | 1:18 1:45 1:45-2:45 P.M. | Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (GBW/JTL/SD) 10.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings. 10.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments. |
| 44) | 1:45 - 2:00 | Reconciliation of ACRS Comments and Recommendations (Open) |
| | -2:07 - 4:00 P.M. | (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. |
| | | ***BREAK*** |
| (12) | 2:60 2:45-6:45 P.M. | Preparation of ACRS Reports (Open) Discussion of the proposed ACRS reports on: 12.1) Revised Draft NUREG on Expert Elicitation on Large-Break LOCA Frequencies (GEA/MRS) 12.2) Proposed Rule for Risk-Informing 10 CFR 50.46 (WJS/MRS/RC) 12.3) North Anna Early Site Permit Application (Tentative) (DAP/MME) 12.4) Technical Basis for Potential Revision to the PTS Screening Criteria (WJS/HPN/CS) |
| <u>SAT</u> ROC | <u>URDAY, MARCH 5, 2</u> KVILLE, MARYLAND | 005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, |

| <u>NOCHVILLE, MARTLAND</u> | | | | |
|---|---|--|--|--|
| 11:10 A.M. | | | | |
| 13) 8:30 - 12:30 P.M. | Preparation of ACRS Reports (Open) | | | |
| (10:30-10:45 A.M. BREAK) /0:55~//;/0 | Continue discussion of proposed ACRS reports listed under Item 12. | | | |
| 14) -12:30 - 1:00 P .M. | Miscellaneous (Open) (GBW/JTL) | | | |
| 11:10 11:58 A.M. | 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. | | | |

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NOTE:

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- 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

520TH ACRS MEETING March 3-5, 2005

NRC STAFF (3/3/05)

- J. Seyah, NRR Y. Li, NRR
- J. Rosenthal, RES
- S. Coffon, NRR
 - S. Malik, RES

S. Sheng, NRR

M. Mitchell, NRR

- C. Boyd, RES M. Jungi, RES
- F. Eltawila, RES
- R. Woods, RES

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

- S. Traiforos, LINK
- N. Chapman, Sercit/Bechtel
- B. Bishop, Westinghouse Electric
- B. Jaquith, Westinghouse
- G. Zimak, Northrop Grumnam Newport News
- W. Harrison, STP NOC
- J. Hartz Westinghouse Electric
- S. Kauffman, DOE
- J. Butler, NEI
- S. Dolloy, McGraw Hill Platts

- E. Grecheck, Dominion
- E. R. Grant. Exelon
- S. Routh, Bechtel
- A. Crone, U.S. Geological Survey
- C. Mueller, U.S. Geological Survey
- B. Arcleri, ISL
- Y.H. Chang, UMD
- T. Yamada, INES
- C. Boggess, Westinghouse Owner's Group

NRC STAFF (3/4/05)

J. Dozier, NRR J. Strnisha, NRR P.T. Kuo, NRR C.Y. Li, NRR A. Pal, NRR S. Jones, NRR D. Nguyen, NRR M. Lintz, NRC N. Dudlet, NRR D. Merzke, NRC L. Tran, NRR K. Chang, NRC K. Hsu, NRR H. Asher, NRC B. Elliot, NRR S. Hoffman, NRC S. Lee, NRR C. Colleli, OIG G. Galletti, NRR

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

- M. Bowman, Parallax
- A. Barone, Parallax
- R. Wells, Parallax
- S. Traiforos, LINK
- T. Yamada, INES
- E. D. Patel, Parallax



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

March 10, 2005

SCHEDULE AND OUTLINE FOR DISCUSSION 521st ACRS MEETING APRIL 7-9, 2005

THURSDAY, APRIL 7, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 1) 8:30 8:35 A.M. <u>Opening Remarks by the ACRS Chairman</u> (Open) (GBW/JTL/SD) 1.1) Opening statement
 - 1.2) Items of current interest
- 2) 8:35 10:00 A.M. <u>Final Review of the License Renewal Application for Joseph M.</u> Farley Nuclear Plant, Units 1 and 2 (Open) (MVB/CS)
 - 2.1) Remarks by the Cognizant Subcommittee Chairman
 - 2.2) Briefing by and discussions with representatives of the Southern Nuclear Operating Company and the NRC staff regarding the license renewal application for Joseph M. Farley Nuclear Plant, Units 1 and 2 and the associated final Safety Evaluation Report prepared by the NRC staff.

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

- 3) 10:15 11:15 A.M.
 - A.M. <u>NUREG-1792, "Good Practices for Implementing Human Reliability</u> <u>Analysis"</u> (Open) (GEA/SLR/MME)
 - 3.1) Remarks by the Cognizant Subcommittee Chairman
 - 3.2) Briefing by and discussions with representatives of the NRC staff regarding NUREG-1792 and the NRC staff's resolution of the comments and recommendations included in the May 13, 2004 ACRS letter.

4) 11:15 - 12:15 P.M. <u>Preparation for Meeting with the NRC Commissioners</u> (Open) (GBW, et. al/JTL, et.al) Discussion of the following topics scheduled for the ACRS meeting

- with the NRC Commissioners:
- a) Overview (GBW)
- b) PWR Sump Performance (GBW)
- c) Risk-Informing 10 CFR 50.46 (GEA)
- d) Technical Basis for Potential Revision to the Pressurized Thermal Shock Screening Criteria (WJS)
- e) License Renewal/Power Uprates (MVB)
- f) Differences in Regulatory Approaches Between U.S. and Other Countries (DAP)

12:15 - 1:30 P.M. ***LUNCH***

| 5) | 1:30 - 3:30 P.M. | <u>Meeting with the NRC Commissioners, Commissioners' Conference</u> <u>Room, One White Flint North, Rockville, MD</u> (Open) (GBW, et al./JTL, et al.) Meeting with the NRC Commissioners to discuss the topics listed under Item 4. |
|----|------------------|--|
| | 3:30 - 4:00 P.M. | ***BREAK*** |
| 6) | 4:00 - 4:15 P.M. | <u>Subcommittee Report</u> (Open) (JDS/CS) Report by the Acting Chairman of the ACRS Subcommittee on Plant License Renewal regarding interim review of the license renewal application for Millstone Power Station, Units 2 and 3 and the associated draft Safety Evaluation Report prepared by the NRC staff. |
| 7) | 4:15 - 6:30 P.M. | Preparation of ACRS Reports (Open) Discussion of proposed ACRS reports on: 7.1) License Renewal Application for Joseph M. Farley Nuclear Plant, Units 1 and 2 (MVB/CS/SD) 7.2) NUREG-1792, "Good Practices for Implementing Human |

FRIDAY, APRIL 8, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 8) 8:30 8:35 A.M. <u>Opening Remarks by the ACRS Chairman</u> (Open) (GBW/JTL/SD)
- 9) 8:35 10:30 A.M. <u>Accie</u>
- .M. <u>Accident Sequence Precursor Program and Development of SPAR</u> <u>Models</u> (Open) (JDS/GEA/MRS/EAT)

Reliability Analysis" (GEA/SLR/MME)

- 9.1) Remarks by the Cognizant Subcommittee Chairman
- 9.2) Briefing by and discussions with representatives of the NRC staff regarding the status of the Accident Sequence Precursor Program and development of the Standardized Plant Analysis Risk (SPAR) Models.

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 11:45 A.M. <u>Future ACRS Activities/Report of the Planning and Procedures</u> <u>Subcommittee</u> (Open) (GBW/JTL/SD)
 - 10.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.
 - 10.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.

2

Reconciliation of ACRS Comments and Recommendations (Open) 11) 11:45 - 12:00 Noon (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. ***LUNCH*** 12:00 - 1:00 P.M.

- 1:00 6:30 P.M. Preparation of ACRS Reports (Open) 12) (3:00-3:15 P.M. BREAK)
 - Discussion of the proposed ACRS reports on:
 - 12.1) License Renewal Application for Joseph M. Farley Nuclear Plant, Units 1 and 2 (MVB/CS)
 - 12.2) NUREG-1792, "Good Practices for Implementing Human Reliability Analysis" (GEA/SLR/MME)

SATURDAY, APRIL 9, 2005, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

| 13) | 8:30 - 12:30 P.M. | <u>Preparation of ACRS Reports</u> (Open) |
|-----------------|----------------------------|--|
| (10:30 - | - 10:45 A.M. BREAK) | Continue discussion of proposed ACRS reports listed under Item 12. |
| 14) | 12:30 - 1:00 P.M. | <u>Miscellaneous</u> (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 ۲ 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 520th ACRS MEETING March 3-5, 2005

[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 DOCUMENTS

- 1. Opening Remarks by the ACRS Chairman
 - 1. Items of Interest, dated March 3-5, 2005
- 2. <u>Revised Draft NUREG on Expert Elicitation on Large-Break LOCA Frequencies</u>
 - 2. Revised Draft NUREG on Estimating LOCA Frequencies through the Elicitation Process
 - 3. LBLOCA Redefinition Industry Evaluation Status

3. Proposed Rulemaking Package for Risk-Informing 10 CFR 50.46

- 4. Changes to Proposed Rule Risk-Informing 10 CFR 50.46 [Viewgraphs]
- 4. Draft Safety Evaluation Report Related to North Anna Early Site Permit Application
 - 5. Safety Review of the North Anna Early Site Permit Application [Viewgraphs]
 - 6. Site Vicinity Geologic Map (color) 25-Mile Radius of North Anna Site
- 5. <u>Technical Basis for Potential Revision of the Pressurized Thermal Shock (PTS)</u> <u>Screening Criteria in the PTS Rule</u>
 - 7. Thermal Hydraulic Evaluation of Pressurized Thermal Shock
- 8. <u>Proposed Revisions to Generic License Renewal Guidance Documents/Scoping Review</u> <u>Process for BOP Systems</u>
 - 8. Proposed Revisions to Generic License Renewal Guidance Documents [Viewgraphs]
 - 9. License Renewal Scoping Review Process for BOP Systems
- Preparation for Meeting with the NRC Commissioners
 10. ACRS Meeting with the Commission
- 10. Future ACRS Activities/Report of the Planning and Procedures Subcommittee
 - 11. Future ACRS Activities/Final Draft Minutes of Planning and Procedures Subcommittee Meeting - March 2, 2005 [Handout #10.1]
- <u>Reconciliation of ACRS Comments and Recommendations</u>
 Reconciliation of ACRS Comments and Recommendations [Handout #1]



Appendix V 520th ACRS Meeting

MEETING NOTEBOOK CONTENTS Original Agenda Color Code - 520th ACRS Meeting Overtime Schedule

<u>TAB</u>

DOCUMENTS

2 Revised Draft NUREG on Expert Elicitation on Large-Break LOCA Frequencies

- 1. Table of Contents
- 2. Proposed Schedule
- 3. Status Report, dated March 3, 2005
 - Attachment 1 Letter dated December 10, 2004, from Mario V. Bonaca, ACRS Chairman to Chairman Diaz, USNRC, Subject: Estimating Loss-of-Coolant Accident Frequencies Through the Elicitation Process
 Attachment 2 - Letter dated February 4, 2005, from Luis A. Reyes, EDO, to Mario V. Bonaca, ACRS Chairman, Subject: Estimating Loss-of-Coolant Accident Frequencies Through the Elicitation Process
 Draft NUREG Report [Predecisional] on Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process.
- 3 Proposed Rulemaking Package for Risk-Informing 10 CFR 50.46
 - 4. Table of Contents
 - 5. Proposed Schedule
 - 6. Status Report, dated March 3, 2005

Attachment 1 - Letter dated December 17, 2004, from Mario V. Bonaca, ACRS Chairman, to Luis A. Reyes, EDO, Subject: Risk-Informing 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors"

Attachment 2 - Letter dated January 18, 2005, from Luis A. Reyes, EDO, to Mario V. Bonaca, ACRS Chairman, Subject: Risk-Informing 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors"

Attachment 3 - Letter dated February 14, 2005, from Catherine Haney, Program Director, NRR, to multiple addresses, NRR, Subject: Office Concurrence on Proposed Rule - Risk Informed Changes to Loss-of-Coolant Accident Technical Requirements (TAC #MB8397) 2004 (Pre-Decisional for Internal ACRS Use Only

E-mail dated February 9, 2005, from Richard Dudley, NRR to Michael Snodderly, ACRS, Subject: 10 CFR 50.46a (Pre-Decisional for Internal ACRS Use Only)

Appendix V 520th ACRS Meeting

- 4 Draft Safety Evaluation Report Related to North Anna Early Site Permit Application
 - 7. Table of Contents
 - 8. Proposed Agenda
 - 9. Status Report, dated March 3, 2005
 - 10. Attachments
 - 1. ACRS Letter, dated March 12, 2003
 - 2. Plant Parameters Envelope (Table 1.3-1/SSAR)
 - 3. Summary of Open Items and Confirmatory Items (DSER)

5. <u>Technical Basis for Potential Revision of the PTS Screening Criteria in the PTS Rule</u>

- 11. Table of Contents
- 12. Proposed Schedule
- 13. Status Report, dated March 3, 2005
- 14. Attachments
 - A. Letter dated February 21, 2003, from Mario V. Bonaca, ACRS Chairman, to William D. Travers, EDO, Subject: Reevaluation of the Technical Basis for the Pressurized Thermal Shock Rule
 - B. Letter dated July 18, 2002, from George E. Apostolakis, ACRS Chairman, to William D. Travers, EDO, Subject: Risk Metrics and Criteria for Reevaluation of the Technical Basis for the Pressurized Thermal Shock Rule
 - C. Letter dated February 14, 2002, from George E. Apostolakis, ACRS Chairman, to William D. Travers, EDO, Subject: Risk Metrics and Criteria for Reevaluation of the Technical Basis for the Pressurized Thermal Shock Rule
- 8. <u>Proposed Updates to Generic License Renewal Guidance Documents and the Scoping</u> <u>Review Process for Balance of Plants Systems</u>
 - 15. Table of Contents
 - 16. Proposed Meeting Schedule
 - 17. Status Report
 - 18. Attachments
 - A. Memorandum to David Matthews, Director, DRIP, from Suzanne Black, Director, DSSA, Subject: Sampling Approach for the Review of the Scoping and Screening of License Renewal Applications
 - 19. References

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS 520th FULL COMMITTEE MEETING

March 3-5, 2005

TODAY'S DATE: March 3, 2005

NRC STAFF - PLEASE SIGN BELOW

PLEASE PRINT (CLEARLY)

NAME John Seyah Yong L1 Jack (Brenthal Chris Boyd Mike Jung Roy Woods Simon Sheng Mathie Mithell Stephanie Caffon SHAM MAUK FAROUK ELTAWICA

NRC ORGANIZATION AQ K/RA RES NRC/RES MRC Res RES NRC NRC/NRR/DE NRC/NRA/DE/EACE NRCINRE $\mathcal{P} \mathcal{P}$ Me KES DEF NRC/RES



ADVISORY COMMITTEE ON REACTOR SAFEGUARDS 520th FULL COMMITTEE MEETING March 3-5, 2005

March 3, 2005 Today's Date

ATTENDEES PLEASE SIGN IN BELOW PLEASE PRINT

NAME

AFFILIATION

LINK SPYROS TRAFOROS Bechtel SERCH hapman NCI inchouse Elec vuce est Nest AQUITH ろのて \sim 100 ZIMA VOR throp Grumman Neudort & N ryn IVASon WESTINGTUFF AMES IANTZ. ELELTAIL DOE torm Kauffman OHN BUTLFAL NEI atts MGRAW HM Tran ugene Grecheck DOMINION Eddie R Grant Exelon Steve Routh Bechtul nthony 200 osral rono harles Mueller U.S. Geological JU Bill Arcieri 156 UMD Chang uL Hsien JNES AMA ompl BOGGES-HERYL JESTINGHODSE (WHER'S GROUP
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS 520th FULL COMMITTEE MEETING

March 3-5, 2005

TODAY'S DATE: March 4, 2005

NRC STAFF - PLEASE SIGN BELOW

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NAME ercy az 01 UD Pal A lawer DUOLET NOFL Tran HSL K. BARRY ELLIOT SAMSON LEE reg S. Gallett Struisha JIM vang -Yang me

NRC ORGANIZATION P RLERB RLEP NICI NRR DE/EEIB EEIB NRADE NRR / BRID! RLEB NRR/DRIP/RLEPB NRR/DRIP/RLEP-B DE/EMCB NAR NRRIDRIPIRLEP DIPM/IPSB NRR NRE DELEMEB NRC SPLR NRR NRC/NRC, ISPU II



ADVISORY COMMITTEE ON REACTOR SAFEGUARDS 520th FULL COMMITTEE MEETING March 3-5, 2005

March 4, 2005 Today's Date

ATTENDEES PLEASE SIGN IN BELOW PLEASE PRINT

NAME

AFFILIATION

Maro, Pavallax 4an 2lax and Erc//cx INK 5 NRC MERZKE DANIEL JNES E-VallaX ATEL $\tilde{}$ La N/2 IJans tB NRC re Hot man NRC-016 10 1

ITEMS OF INTEREST

520th ACRS MEETING

MARCH 3-5, 2005

ITEMS OF INTEREST ADVISORY COMMITTEE ON REACTOR SAFEGUARDS 520th MEETING March 3-5, 2005

STAFF REQUIREMENT

<u>Page</u>

| • | Staff Requirements - Briefing on NMSS Programs, Performance, and Plans - Waste Safety, 9:30 A.M., Tuesday February 15, 2005, Commissioners' Conference Room, One White Flint North, Rockville, Maryland (Open to Public Attendance) dated February 28, 2005 | | |
|--|--|--|--|
| • | Staff Requirements - SECY-05-0005 - Options for Research Effectiveness Review Board, dated February 16, 2005 | | |
| ORDERS | | | |
| • | In the Matter of Safety Light Corporation - Bloomsburg, PA Site (Materials Licensing Suspension) - Docketed and Served January 22, 2005 | | |
| In the Matter of Safety Light Corporation - Bloomsburg, PA Site (Materials Licensing Suspension) - Docketed and Served January 22, 2005 | | | |
| • | Statement given by Commissioner Jeffrey S. Merrifield at the February 24, 2005, Briefing of the US NRC on Nuclear Fuel Performance | | |
| • | Speech given by Commissioner Jeffrey S. Merrifield, at the Nuclear Energy Conference: Opportunities for Growth and Investment in North America, Washington, D.C., "Not your Father's Nuclear Regulator" The Role of the Licensing Process in the Future of Nuclear | | |

STATEMENT SUBMITTED

 Statement Submitted by the U.S. NRC to the Subcommittee on Energy and Air Quality Committee on Energy and Commerce, U.S. House of Representative - Concerning: The Energy Policy Act of 2005, Presented by Luis A. Reyes, EDO, submitted February 10, 2005

Energy, dated February 16, 2005 8-14

SIGNIFICANT ENFORCEMENT ACTIONS

NRC NEWS

INSIDE NRC

| • | Duke Power to Develop a COL Application, Volume 27/ Number 4/February 21, 200528-30 | | |
|------------------|--|--|--|
| • | Regulatory Stability Reaffirmed as One of Industry's Top Priorities, Volume 27/ Number 4/ February 21, 2005 | | |
| OTHER NEWS ITEMS | | | |
| • | The Cleveland Plain Dealer - Report Questions Perry's Safety Ethic, Federal Inspectors Criticize Nuclear Plant's Response to December Pump Failures, dated Friday, February 25, 2005 | | |
| NUCL | EAR NEWS FLASHES | | |
| • | A Multilateral Agreement to Develop Next-Generation Nuclear Technology, dated February 28, 2005 | | |
| • | The Risks From Loss-of-Offsite Power and Station Blackout are Lower, dated February 28, 2005 | | |
| • | An Incident Involving Release of Noble Gases and Iodine from the Phebus Reactor, dated February 25, 2005 | | |
| • | The NRC Should Examine Whether Living Near a Nuclear Plant Increases Cancer Risk, dated February 18, 2005 | | |

IN RESPONSE. PLEASE REFER TO: M050215

REVISED

February 28, 2005

MEMORANDUM TO:

Luis A. Reyes **Executive Director for Operations**

Karen D. Cvr General Counsel

FROM:

Annette L. Vietti-Cook, Secretary /RA/ A L Bates, for

SUBJECT: STAFF REQUIREMENTS - BRIEFING ON NMSS PROGRAMS, PERFORMANCE, AND PLANS - WASTE SAFETY, 9:30 A.M., TUESDAY, FEBRUARY 15, 2005, COMMISSIONERS' CONFERENCE ROOM, ONE WHITE FLINT NORTH, ROCKVILLE, MARYLAND (OPEN TO PUBLIC ATTENDANCE)

The Commission was briefed by the NRC staff on the waste safety programs, performance, and plans in the Office of Nuclear Material Safety and Safeguards. The Commission identified the following issues for staff action:

- 1. As a result of the NRC amending its regulations to be compatible with IAEA transportation standards, some spent fuel transportation casks no longer will be certified for use unless they can pass the new standards by an effective date in 2008. In addition, new casks may be designed to meet the new standards. The staff should provide information on its expectations regarding the number of casks of concern and the potential impact on NRC resources.
- 2. The staff should explore the advantages and disadvantages of conducting an IAEA Transport Safety Appraisal Service (TRANSAS) mission in the United States, in cooperation with the Department of Transportation and the Department of Energy and provide its recommendations to the Commission.
- 3. The staff should keep the Commission fully informed as emerging issues and technologies give rise to near-term policy issues and demands on resources, for example, in the area of low-level waste and waste-incidental-to-reprocessing (WIR). With regard to WIR, the staff should inform the Commission of its plans for conducting open and closed meetings with DOE and the affected states in the future. The staff should endeavor, to the extent practical, that meetings concerning WIR and involving NRC, DOE, and the appropriate state (either South Carolina or Idaho) be open to the public. (EDO)

(SECY Suspense: 3/31/05)

The staff should keep the Commission informed as the Department of Energy (DOE) 4. develops strategies for addressing greater than class C (GTCC) waste. At the appropriate time, the staff should provide to the Commission its recommendations concerning NRC's potential role, particularly in the area of development of DOE's generic environmental impact statement. As part of its recommendations, the staff should also provide to the Commission the advantages and disadvantages of each option considered. In the meantime, staff should refrain from committing to any particular type of involvement in the DOE GEIS. In addition, OGC should provide the Commission with its independent recommendation on this matter. (EDO) (OGC)

| (SECY | Suspense: | 5/1/05) |
|-------|-----------|---------|
| (SECY | Suspense: | 5/1/05) |

Page 2

CC: Chairman Diaz Commissioner McGaffigan Commissioner Merrifield Commissioner Jaczko **Commissioner Lyons** DOC CFO OCA OIG OPA Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail) PDR

February 16, 2005

| MEMORANDUM TO: | Luis A. Reyes Executive Director for Operations | | | | |
|----------------|--|------|--|--|--|
| FROM: | Annette L. Vietti-Cook, Secretary | /RA/ | | | |
| SUBJECT: | STAFF REQUIREMENTS - SECY-05-0005 - OPTIONS FOR RESEARCH EFFECTIVENESS REVIEW BOARD | | | | |

The Commission has approved Option 2 to terminate the Research Effectiveness Review Board. The staff should continue to develop interdependent operating plans, periodic status reviews, and office level coordination meetings to further improve the effectiveness of the Office of Nuclear Regulatory Research projects. The ACRS or ACNW should continue to review major research projects addressing nuclear safety issues.



cc:

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

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| RAS 9392 | | | | | |
| | | | | DOCKE | TED 02/22/05 |
| | | | | SER | VED 02/22/05 |
| COMMISSIONERS: | | | | | |
| Nils J. Diaz, Chairman Edward McGaffigan Jeffrey S. Merrifield Gregory B. Jaczko Peter B. Lyons | | | | | |
| In the Matter of | } | | | | |

Bloomsburg, Pennsylvania Site

(Materials Licensing Suspension)

Docket Nos. 30-5980-EA & 30-5982-EA

ASLBP No. 05-835-01-EA

CLI-05-07

)

ORDER

The Commission is taking the unusual step of exercising its supervisory role over licensing and enforcement proceedings. On January 24, 2005, the Board denied Safety Light's motion to set aside the immediate effectiveness of the staff's order suspending two materials licenses held by Safety Light because the Board found that adequate evidence supported the Staff's conclusion that a willful violation occurred. However, on February 18, 2005, the Board issued an order directing the staff to investigate claims raised by Safety Light's customers that Safety Light's products are indispensable components of equipment necessary for national defense. The Board also directed the staff to address how national defense and security concerns apply in the instant matter in light the staff's factual assessments of the above claims, assuming **arguendo** that national defense and security concerns are appropriate factors to consider when evaluating the appropriateness of enforcement measures and when evaluating a licensee's exemption request.

In view of the Board's most recent order, the public interest and other issues that have been raised, $\frac{1}{2}$ and the imminence of the evidentiary hearing, we find it appropriate to, and hereby do, lift the immediate effectiveness of the staff's December 1/2000 license suspension order.

IT IS SO ORDERED.

For the Commission

/RA/

Annette L. Vietti-Cook Secretary of the Commission

Dated at Rockville, Maryland this 22nd day of February 2005.

¹ We note, for example, Safety Light's claim that it will be forced permanently out of business if its license is not restored prior to the end of February. *See* Safety Light Corporation's Motion to Set Aside Immediate Effectiveness of Order Suspending License, (Dec. 29, 2004), at 2, 13.

<u>Privacy Policy</u> | <u>Site Disclaimer</u> Last revised Tuesday, February 22, 2005



- 5 -



NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION Office of Public Affairs Telephone: 301/415-8200 Washington, D.C. 20555-0001 E-mail: opa@nrc.gov Web Site: http://www.nrc.gov/OPA

No. S-05-002

Statement of Commissioner Jeffrey S. Merrifield at the February 24, 2005, Briefing of the U.S. Nuclear Regulatory Commission on Nuclear Fuel Performance

Mr. Chairman, this is a meeting that I have sought for some time, and despite the snowstorm today, one that I am anxious to proceed through.

Since joining the Commission in 1998, I have taken the opportunity to visit all 103 operating reactors in the United States, as well as all of the fuel cycle facilities. As I concluded that effort, I began to notice that fuel reliability was becoming a more and more frequent topic of discussion.

According to information I received from our licensees, we recently had between 1/4 and 1/3 of the plants operating with failed fuel, a trend that is dramatically different than the significant improvement in fuel reliability we had seen in the late 1990's. Indeed, the more recent increase in fuel failures approached levels that we have not seen since the early 1990s.

Now, just so there is no misunderstanding of my concerns in this area, I am not here to suggest that there is a significant increase in the risk of a severe accident resulting from this trend. Indeed, data from our Office of Research validates that there is no significant change in the core damage frequency from this trend. Further, as some will point out, when compared with the total number of fuel pins in the total inventory, we are not talking about big numbers.

Nonetheless, this is a trend we can neither ignore nor tolerate. The fact is that damaged fuel creates significant and frequently long-lived operational challenges to the plants and the individuals who work there. Greater difficulty in managing worker dose, limitations on the allowable time workers and inspectors can enter high-dose areas, higher costs and complexity of future decommissioning activities, and greater challenges in managing spent fuel may result from this problem. In addition, increasing complications in material control and accountability are an issue we all face.

The loss of public confidence that results when nuclear plants operate with leaking fuel, or worse yet in this post 9/11 world, when licensees cannot account for some failed fuel elements that are supposed to be stored in their spent fuel pools, should be a concern to both the NRC and the industry.

Today, a vast majority of the operating fleet has reconstituted fuel in its spent fuel pools where failed pins have been removed and new pins installed so the fuel bundles can be fully utilized. Unfortunately, this has led to the difficulties we have recently faced at Millstone, Vermont Yankee and Humbolt Bay. This is a history that we will be living with for some time.

From a regulatory perspective, fuel cladding is the first of the three primary barriers to the release of fission products. Erosion of this first barrier weakens the foundation of our defense-in-depth strategy. Now while some, including the NRC staff, will focus on the fact that the current level of fuel failures does not exceed our technical specifications, the fact is that while a utility may not be in violation of an NRC requirement, using the NRC technical specifications as an operating goal neither makes good business sense, nor is it consistent with the goal of excellence established by the Institute for Nuclear Power Operations (INPO).

When one begins to look at what is the reason for the recent trend, there are a variety of potential causes. The failure of licensees to keep on top of foreign material exclusion, new designs in reactor fuel, changes in cladding materials, higher fuel burnup, power uprates, and longer operating cycles are among the potential causes that come to mind. What is clear is that there is no single cause, nor is this issue isolated to any one licensee or fuel vendor.

To its credit, the Nuclear Energy Institute, which includes both the users and vendors of the fuel, has recognized that this is an important challenge and has committed significant resources to understanding the potential solutions. With research monies directed toward the Electric Power Research Institute (EPRI), it is clear that NEI is putting its money were its mouth is. For our part, I think the NRC has to closely monitor this effort as well as ensure that our staff understands these trends and is providing the Commission with timely and useful options for any policy decisions that may arise.

Today Joe Sheppard and our other panelists will explain how they intend to meet their selfimposed goal of "Zero Defects." I think this is a laudable goal, and I look forward to understanding how they intend to get there.



NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION Office of Public Affairs Telephone: 301/415-8200 Washington, DC 20555-001 E-mail: opa@nrc.gov Web Site: http://www.nrc.gov/OPA

No. S-05-001

"Not Your Father's Nuclear Regulator" The Role of the Licensing Process in the Future of Nuclear Energy

Jeffrey S. Merrifield, Commissioner U.S. Nuclear Regulatory Commission at Nuclear Energy Conference: Opportunities for Growth and Investment in North America Washington, D.C.

February 16, 2005

Good morning ladies and gentlemen. It is a pleasure to be here this morning. Given the dynamic state of the nuclear industry today, it seems quite clear why this conference is focusing on the opportunity for growth. As a Commissioner of the Nuclear Regulatory Commission (NRC), I cannot be an advocate of nuclear power. Nonetheless, neither can I ignore the direction this industry is going. To meet our mission of protecting public health, safety and the environment, our agency must be prepared for this changing future. Today, I would like to discuss my personal views on how the NRC's licensing process will play a critical role in the development of a growing nuclear industry. The process is more predictable than it was in years past, and it has been improved to recognize technological breakthroughs in reactor design and lessons learned from years of operating experience. I would also like to share with you a brief summary of the challenges we have yet to resolve in the licensing of new power reactors.

In the past, the NRC has shouldered much of the criticism for the fact that no new power reactors have been constructed in the United States in the last twenty years. Truth be told, the uncertainty of the NRC's regulatory and hearing processes was a major contributor to the industry's decision not to venture in this direction. Regulatory instability, however, is no longer the convenient excuse for the failure of nuclear power plants to be built. Twenty years ago, ten years ago, or maybe even five years ago, that view may have been justified, but today, it is not.

Like those in the military who are faulted for always preparing to fight their last war, individuals who are stuck in the past, but who fail to learn and evolve from those lessons will not be able to accurately understand where they are going in the future. Some of you who have heard me speak before will recognize that I like to weave lessons from the past with my own views of where we are going. More so than any other technology, it is critically important that both the regulator and the leaders of the nuclear sector understand and learn from past successes and mistakes.

From a regulatory perspective, I think it is useful to compare where the nuclear sector is today with where it was twenty years ago. Looking back at 1985, a number of factors combined to portend a very dark outlook for the future of nuclear power. At that time, the nuclear fleet consisted of 89 units, 16 of which had been in an extended shutdown for six months or more. As a whole, the fleet was operating at a capacity factor of 63%. Consumer prices, although lower than the late 70's, were still high by today's levels with inflation running at 3.55% percent and a prime interest rate of 10% percent. The price of nuclear fuel had skyrocketed to costs averaging 1.28 cents per kilowatt-hour and there was no relief in sight.

This grim financial outlook was only partially responsible for the decline in nuclear power that occurred in the mid-eighties. In 1985, public support for nuclear power was running barely over 50%. A seemingly low percentage, which would be further degraded a year later with the accident at Chernobyl. Construction of new plants, which had previously been predicted to explode during this time period, was coming to a dramatic halt. Costs for those plants still under construction were growing exponentially due to post-Three Mile Island changes imposed by the Nuclear Regulatory Commission and the failure of utility managers to hold down costs. The NRC's Atomic Safety and Licensing Board had challenges opposing operating licenses for 14 different reactors on its docket in 1985. By that year, the Shoreham operating license proceeding had already been on the docket for eight years and the Seabrook proceeding had been under review for over three years. The bankruptcy of Public Service of New Hampshire was just a mere three years away. Given these statistics, it is no wonder that utilities decided to pull the plug on the construction of 38 units between 1980 and 1985. Finishing off this bleak picture, Wall Street, which is an enormous player in deciding whether plants will be built, had no stomach and no interest for this technology.

What has changed? Well, for one thing, the NRC has made dramatic changes to the way we conduct business. License renewals and power uprates are two clear examples that demonstrate how the NRC has honed its licensing process to be significantly more efficient and effective. I doubt that anyone would have been willing to place a bet in 1985, or even 1995, that the NRC would be able to renew the licenses of one third of our 103 unit fleet in a period of just over six years, with a review time averaging approximately 22 months for most applications. Nor would it have been anticipated that the agency would have approved over 100 power uprates totaling over 4,000 megawatts electric. Similar efficiencies in licensing spent fuel storage casks, and on-site spent fuel storage facilities demonstrate the agency's commitment to holistic improvement to our regulatory review processes. While we have had some operational miscues, including the core offloading and safety culture issues at Millstone in the mid 90s and more recently the vessel head degradation at Davis-Besse, I think I can confidently say that the NRC knows much more about regulating these reactors than we did 20 years ago, and the safety of these plants has been significantly enhanced since that time.

All of the examples I just mentioned, however, relate to operations at currently licensed facilities, so I imagine you are asking yourselves "but what about the licensing of new reactors?"

As you know, the two-step process by which we historically licensed power reactors was considered cumbersome and unpredictable. First, licensees were required to navigate the NRC's technical review and hearing processes to obtain a construction permit. Once granted, licensees would sink millions of dollars into constructing the facility. After construction was substantially completed, the licensee was again required to submit to an NRC review process, as well as run the gauntlet of the operating license hearing. This left many of the most controversial issues to the end of the licensing process, often resulting in considerable delay to completion, and in some cases, like the Seabrook and Shoreham facilities, a complete halt to the project.

The NRC recognized the need for a simpler, more predictable licensing process and it had already taken steps to revise its regulations when Congress modified the Atomic Energy Act to provide the statutory authority for a new, progressive one-step licensing process. The NRC implemented this legislation through promulgation of Part 52, which as you well know, can be credited with a significant role in the growing desire in the industry to explore new construction possibilities. The Part 52 licensing process is designed to resolve the more controversial issues earlier in the process, prior to undertaking a huge investment in construction. This change will allow licensees, as well as their investors, to have more financial certainty in making a multi-billion dollar investment.

Licensing Becomes More Efficient

Part 52 established three new pieces of our licensing structure. First, we developed an early site permit process, which allows licensees to seek pre-approval of sites for new reactor units. By obtaining an early site permit, applicants can significantly reduce licensing uncertainty because site-related issues are resolved and presumed final for purposes of litigation. We have already received three applications for early site permits from existing licensees and are currently in the middle of the two-year review and adjudication process for these licenses. Barring any unforeseen circumstances, these reviews should be completed by early next year.

Next, we created standard design certifications. Here, the NRC extensively reviews a reactor design and then approves the design for general use through notice and comment rulemaking. Use of a pre-approved design in a combined license application removes consideration of design aspects from the staff's licensing review. We have already approved three designs, and the NRC staff has recommended that a fourth design be published for public comment in the next month. The NRC is also engaged in conducting pre-design review or preliminary review discussions with six different companies (GE, AECL, Framatome, PBMR Ltd., Toshiba, General Atomics and Westinghouse), so we could potentially see several more design applications emerge from these efforts in the near future.

Finally, we created the combined license which grants an applicant both a construction permit and operating license. This reduces regulatory risk for applicants by limiting adjudication of licensing issues to one hearing, instead of the two required under the previous licensing process. Applicants can further reduce regulatory uncertainty by utilizing an early site permit and design certification in their combined license applications. Three different consortiums of utilities have announced that they want to explore this new licensing process, with even more companies that may choose to go forward on their own.

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NRC Safety Reviews Improved By Technology

I am proud to say that it is not only our licensing process that has been improved. Significant changes have been made over the last 10 years to refine the effectiveness and efficiency of our safety reviews. The Commission, on which I have now served for six and a half years, has demanded constant improvement on the part of our staff, while remaining ever vigilant of our safety mission. Virtually every schedule provided by our staff is continually met with one question from the Commission: "Is this the best we can do?"

Evolutions in technology are one of the reasons the staff has been able to reduce the time for safety reviews while increasing staff confidence in our quality assurance findings. Take the example of reactor design reviews. Twenty years ago, one of the complications the NRC faced in reviewing designs for nuclear power plants was the unique nature of the designs provided by our licensees. Faced with designs that were constantly changing and that often had to be modified during the course of construction, the NRC was confronted with significant complications in conducting effective and timely reviews. Such late hour changes also provided yet another opportunity for opponents of these plants to claim that the designs were unsafe and not subject to sufficient NRC review.

Today, the picture is much different. The widespread use of computer-aided design has significantly advanced the quality of the design materials that are reviewed by the NRC staff. This technological advance, coupled with a more advanced nexus between the design and how the construction will actually be carried out, has resulted in the staff feeling more confident in making quality assurance findings. This also reduces the likelihood that a design will need to be changed during construction, thereby reducing licensee costs and workload for the NRC staff. Given the fact that most combined license applicants will reference a pre-certified design that has already been extensively reviewed by the staff, safety reviews for new licenses should be much more effective, predictable, and timely.

Adjudication of License Applications

Another highly significant, but not so obvious process improvement at the Commission is the manner in which we conduct legal proceedings. Without fanfare, last year the Commission issued a change to Part 2 of our regulations, which governs the rules of practice for our adjudicatory process. The amended regulations tailor hearing procedures to the different types of licensing activities in order to better focus the limited resources of involved parties and the NRC. One of the more noteworthy changes was establishment of specific timelines for our judges on how long a legal proceeding should take. This will allow the judges to take a more active role in case management and conduct a more efficient review of contentions brought before the Commission. Another significant change established the use of more informal procedures for the conduct of most proceedings. Now, rather than endless debates between competing experts, and unfocused and unending hearings, our judges will be able to concentrate on the facts and reach common sense, safety-focused decisions in a timely way.

As an attorney, I recognized the inherent weaknesses in our former process, and I am convinced that these changes will improve the efficiency of our legal proceedings. I must mention, however, that shortly after the final rule was published, it was challenged in Federal court by several public interest groups. The crux of the petitioners' challenge was that the rule violated the Atomic Energy Act and the Administrative Procedure Act by abolishing formal hearings in reactor licensing cases. In

December, however, the 1st Circuit Court of Appeals struck down this challenge and upheld the view of the Commission.

Our changes to the adjudicatory process did not stop with revision of our procedures for the conduct of hearings. We are also working to bring in new, highly qualified judges to conduct the proceedings. The Atomic Safety and Licensing Board Panel (Board) is blessed with an excellent Chief Judge, Paul Bollwerk, who has worked tirelessly to replace vacancies on the Board created by the aging workforce issues facing the nuclear industry as a whole. His efforts have also been aimed at ensuring adequate staffing for potential Yucca Mountain proceedings.

The Commission, recognizing the need for outstanding judges, has recently assumed a role where we personally interview the finalists for open Board positions. Within the last year, we have hired three new legal judges and three new technical judges, whom I believe will significantly enhance our capabilities to conduct effective safety reviews. This influx of highly qualified judges, combined with the enhancements to our regulations under Part 2, will hopefully erase some of the lingering concerns about regulatory instability within our agency and establish improvements to our legal proceedings that will endure well beyond my tenure on the Commission.

Construction of New Plants

Improved NRC licensing and legal processes are not the only reasons I see the industry heading into an era of growth. Evolutions in technology will change the way in which new plants will be manufactured and constructed. Computer aided manufacturing allows for an even greater ability to meet customer requirements, and also brings with it a greater confidence that the NRC's quality assurance requirements will be met. With no existing domestic capabilities to manufacture large components such as steam generators, pressure vessels, or pressurizers, our licensees, as well as our staff, will need to spend time in Europe and Asia assuring that these components meet our requirements. CAD/CAM design and manufacturing, when effectively tied to an excellent quality assurance program, will assure that far distant markets make no difference in producing safe, high caliber components.

Construction of new plants may be approached in a modernized fashion as well. For the first time, detailed engineering of the entire plant will essentially be complete by the start of construction. Additionally, using techniques developed in Japan and elsewhere, the plants of the future will likely employ extensive modular construction techniques, with modules barged in from distant ports to be assembled with massive cranes. This modular construction provides licensees with the opportunity to increase quality and reduce costs. At the same time it presents our agency with opportunities to improve inspection techniques since modules for each plant will contain similar technology. Once the staff verifies the quality assurance and safety of a particular module, it can more easily effectuate safety enhancements for all modules to follow. There will be challenges associated with this verification, however, given that the staff may need to inspect modules during their construction overseas since there may be limited access to components once a module is installed at the facility. As we prepare for the possibility of new plant orders, we are actively working to prepare our staff and modify our procedures to meet these new demands. While unforeseen challenges will invariably arise, we can and shall meet them consistent with our safety mission.

Future Challenges

Earlier, I spoke about regulatory instability no longer being a convenient excuse. So as not to appear entirely sanguine about the work our agency has to do, I would focus briefly on two areas that I believe will require the continued attention of the Commission.

The first, which affects both currently operating reactors and new reactors alike, is security. Quite obviously in a post-9/11 environment, our agency has expended considerable time and resources in meeting this challenge. The nation's nuclear power plants, which were highly secured prior to September 11th, have been required to beef up security by adding a significant number of guards, increased weaponry, improved training requirements, and other numerous and costly security enhancements. According to industry figures, almost a billion dollars have been spent in improving the security at the plants. Despite having handed down a series of orders mandating these changes, the Commission and its staff recognize the progress that has been made, and realize that we need to achieve a new normalcy. In my view, 2005 will be the year where we change our focus from requiring new security enhancements for licensees, to stabilizing our current security requirements for the new world we face. For me, the enhanced, robust security programs of our licensees have achieved just about everything we can reasonably demand of a civilian security force.

The second issue, which could potentially have considerable impact on the construction of new reactors, is management of agency resources. As I mentioned previously, the NRC has several early site permit applications and one design certification under review, several other reactor designs are nearing submission for certification, and three different consortia have expressed interest in testing our combined license process. These submittals, coupled with the regular business of license renewals, power uprate requests, rulemakings, and security issues, have stretched our existing agency resources further than I would have imagined. Add in the possibility of a Yucca Mountain high level waste respository application and we could be facing a significant resource crisis. My fellow Commissioners and I are aware of the potential resource challenges and have tried to address them through the agency's Strategic Plan and our senior agency management. Nonetheless, this will remain a significant challenge.

Conclusion

Referring back to my earlier comments, it is easy to see how far the nuclear sector has come if you look at today's statistics. We now have a nuclear fleet of 103 units that is operating at a capacity of approximately 88% with no units in regulatory shutdown. Safety factors at these plants continue to be at very high levels. Inflation is running at 2.68% with the current prime interest rate at 5.5%, which is just over half its level in 1985. The price of nuclear fuel, although higher than the recent past, is 0.44 cents per kilowatt-hour, which is one third of the price in 1985. Today, 65% of the American public is supportive of building new nuclear power plants, which is significantly larger than times past. And as I have said at length, the NRC of today is a far more efficient, effective, timely regulator of the safety of our nation's nuclear fleet.

Today, you may hear some speakers express concerns as to whether the NRC licensing process will work as promised. And I am sure that some of these people will remain concerned about this issue no matter what information I share with you today. Albert Einstein once said that "Anyone who has never made a mistake has never tried something new." We are working through a new licensing

process and the complications posed by new plant designs. I can't promise that we won't make mistakes, but we are committed to meeting these challenges head on. It is my personal belief that the NRC is prepared to review and resolve potential regulatory problems and safety concerns in a timely manner. Compared with where this industry was in 1985, things are far different, and while there may be a myriad of reasons why Wall Street and the nuclear utilities have hesitated to build new nuclear power plants, blaming the NRC should no longer be the principal reason.

Thank you very much.

STATEMENT SUBMITTED

BY THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

TO THE

SUBCOMMITTEE ON ENERGY AND AIR QUALITY

COMMITTEE ON ENERGY AND COMMERCE

UNITED STATES HOUSE OF REPRESENTATIVES

CONCERNING

THE ENERGY POLICY ACT OF 2005

PRESENTED BY

LUIS A. REYES

EXECUTIVE DIRECTOR FOR OPERATIONS

SUBMITTED: February 10, 2005

Introduction

Mr. Chairman and members of the Committee, it is a pleasure to appear before you to discuss the views of the United States Nuclear Regulatory Commission on the Energy Policy Act of 2005. My discussion will focus on those provisions that would directly affect the work of the Commission and the operations of its licensees.

The Commission is dedicated to ensuring adequate protection of public health and safety, the common defense and security, and the environment in the application of nuclear technology for civilian use. It is of the view that, overall, enactment of the nuclear-related provisions of H.R. 6, as reported by the conference committee, would be a significant step forward for the protection of public health and safety and the common defense and security. Indeed, it considers some of the provisions in the bill to be the most important nuclear security proposals relating to commercial nuclear activities that have been placed before the Congress. This legislation would also assist NRC in evaluating license applications for new nuclear facilities.

As your Committee is aware, the Commission has taken many actions since September 11, 2001, to improve security at NRC-regulated facilities. Major actions we have taken include:

- Ordering owners of nuclear power plants to increase physical security to defend against a more challenging adversarial threat;
- Requiring strict site access controls for personnel;
- Requiring utilities to conduct vehicle checks at greater stand-off distances;

- Enhancing communication and liaison with the intelligence community;
- Improving communication between military surveillance authorities, NRC, and its licensees in the event of emergency;
- Ordering plant owners to improve their capability to respond to events involving large explosions or fires;
- Enhancing readiness of security organizations by strengthening training and qualification programs for plant security forces;
- Enhancing force-on-force exercises to provide a more realistic test of plant capabilities to defend against an adversarial force;
- Requiring security improvements for high-risk radioactive sources; and
- Reorganizing the NRC to better manage nuclear security and emergency response.

We have also worked with national experts to assess the consequences of terrorist attacks on nuclear facilities, including an attack from a large commercial aircraft. For the facilities analyzed, the results confirm that the likelihood of both damaging the reactor core and releasing

radioactivity that could affect the public health and safety is low. Even in the unlikely event of a radiological release in these circumstances, the studies indicate that there would be time to implement on-site and off-site mitigating actions. These results have also validated the off-site emergency planning basis. We continue to add realism to our analyses while ensuring adequate protection of the public.

Legislative Needs

Over the years, the Nuclear Regulatory Commission has repeatedly expressed its support of enactment of legislation needed to strengthen the security of facilities regulated by the Commission. H.R. 6, as approved by the conference committee – hereafter, I will simply refer to that version as "H.R. 6" or "the bill" – contains provisions that would provide the statutory authority for additional steps that should be taken to protect the country's nuclear infrastructure from terrorist attack and other criminal activities, and to prevent malevolent use of radioactive material.

Most important, it contains a provision that would allow the Commission to authorize guards at NRC-regulated facilities and activities to receive and possess, and, in appropriate circumstances, to use more powerful weapons against violent attacks against a nuclear facility and to thwart attempts to steal nuclear material that could cause significant harm in the wrong hands. (Section 663 of the bill.) It would also expand the current requirement for fingerprinting, for criminal history checks, of individuals with unescorted access to a utilization facility or access to safeguards information, including in the provision other NRC licensees and their employees who either have access to radioactive material that could be used for malevolent purposes or access to safeguards information. (Section 662 of the bill.) It would criminalize the unauthorized introduction of dangerous weapons into nuclear facilities. (Section 664 of the bill.)

In addition, it would criminalize sabotage of construction of nuclear facilities and would cover a wider range of facilities and activities in the provision than are presently covered – for example, it would add primary and backup facilities from which radiological emergency preparedness alert and warning systems are activated. (Section 665 of the bill.)

Other provisions important to nuclear safety and enhancement of NRC's effectiveness and efficiency that are included in the bill are: (1) authorization for homeland security-related activities to be covered from the General Fund, with the exception of fingerprinting, criminal background checks, and security inspections (Section 668 of the bill); (2) clarification that NRC's jurisdiction extends to former licensees of production or utilization facilities to the extent that they own or control decommissioning funds (Section 626 of the bill); (3) clarification of the length of combined construction permits and operating licenses for new reactors (Section 621 of the bill); (4) authorization for NRC to charge Federal agencies fees for licensing and inspections (Section 623 of the bill); (5) elimination of NRC's antitrust review authority over power reactor licensee applications – such reviews duplicate the work of other Federal agencies, such as the Federal Energy Regulatory Commission and the Department of Justice, and would allow NRC's limited resources to be better used (Section 625 of the bill); and (6) human resources provisions that would contribute to maintaining the NRC's necessary regulatory expertise (Sections 622 and 624 of the bill). We were also pleased to see an extension of the Price-Anderson Act provisions applicable to NRC licensees in the bill (Section 602 of the bill).

Some provisions in H.R. 6 are not necessary to perform our mission, because the Commission has already addressed them, or is in the process of doing so, or because they do not necessarily improve security beyond what the NRC is already achieving through its activities,

and because implementing them would divert NRC's limited security resources from higher priority activities. One such provision is section 661 of the bill, requiring a study of nuclear facility threats that pose a risk to the security of various classes of NRC-licensed facilities. Section 661 would authorize revision of the Design Basis Threat by rulemaking, which raises important questions about protection of classified and safeguards information. The section would also require the Commission to establish an operational safeguards response evaluation program that ensures that the physical protection capability and operational safeguards response for sensitive nuclear facilities will be tested periodically through force-on-force exercises. The NRC has established such a program. Another such provision is section 666, which would require the NRC to establish a system to ensure that export and import of radioactive materials are accompanied by a manifest, and that each individual receiving or accompanying the transfer of the materials in the United States shall be subject to a security background check. We have already taken the appropriate actions to protect the public from high risk sources.

<u>Summary</u>

The Commission would welcome the prompt enactment of many H.R. 6 provisions that relate to commercial use of radioactive material since they would assist the NRC in its efforts to further ensure the adequate protection of the public health and safety and the common defense and security.

I appreciate the opportunity to appear before you today. The Commission would welcome the opportunity to work with your Committee, and the Committee's staff, on achieving the goal of

passing this important legislation.



EA-01-083 - Perry 1 - (FirstEnergy Nuclear Operating Company)

February 24, 2005

EA-01-083 EA-01-091

Mr. Lew Myers Chief Operating Officer FirstEnergy Nuclear Operating Company Perry Nuclear Power Plant P. O. Box 97, A290 10 Center Road Perry, OH 44081

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY - \$55,000 [OFFICE OF INVESTIGATIONS REPORT NO. 3-2000-025 AND REPORT NO. 3-2000-025S]

Dear Mr. Myers:

fers to the investigation conducted by the U.S. Nuclear Regulatory Commission (NRC) Office of Investigations (OI) in Cleged employment discrimination, during March 2000, by the Williams Power Corporation (Williams Power), a contractor at the FirstEnergy Nuclear Operating Company's (FENOC) Perry and Davis-Besse Nuclear Power Plants. A summary of OI Report No. 3-2000-025, concerning apparent violations of 10 CFR 50.7, "Employee Protection," was provided to FENOC on May 4, 2001. A predecisional enforcement conference (PEC) was held on September 26, 2001, with FENOC and Williams Power at the NRC Region III office in Lisle, Illinois. Enforcement action by the NRC staff was postponed until the U.S. Department of Justice (DOJ) completed further review of the matter.

Based on OI Report No. 3-2000-025, information presented by representatives of FENOC and Williams Power at the PEC, and upon information provided to the NRC following the PEC, the NRC staff has concluded that a violation of 10 CFR 50.7 occurred at Perry (EA-01-083). Additional information was provided by the complainant in an undated letter (postmarked November 24, 2001); in letters dated January 16 and February 28, 2002, from FENOC; in letters from Williams Power dated October 17, October 19, and November 13, 2001; and in an October 12, 2001, letter from the former Site Superintendent for Williams Power at the Perry Nuclear Power Plant (Perry). Three painters employed by Williams Power engaged in activities protected by 10 CFR 50.7 as described in the attached Notice of Violation and Proposed Imposition of Civil Penalty. Immediately afterwards, the Site Superintendent for Williams Power threatened the painters with termination if they did not volunteer for a layoff. As a result, two painters were laid off and the third was forced to resign. The protected activities were a contributing factor to the threats to the three painters, the layoffs, and the constructive discharge (forced resignation), employment actions adverse to the compensation, terms, conditions and privileges of the painters' employment. Therefore, the actions of the Site Superintendent caused FENOC and Williams Power to be in violation of 10 CFR 50.7. In assessing this violation, the NRC considered the Site Superintendent's position in the overall organization of Williams Power. Accordingly, this violation is categorized in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600 (Enforcement Policy) at Severity Level III (EA-01-083).

In accordance with the Enforcement Policy, the base civil penalty amount for a Severity Level III violation on March 9, 2000, was \$55,000. Because Perry was the subject of an escalated enforcement action in EA-99-012 (a Severity Level III violation of 10 CFR 50.7 which resulted in a civil penalty), within the two years preceding the current violation, the NRC compared the civil penalty adjustment factors for Identification and Corrective Action. The violation was identified by the

NRC staff. Although the Perry Ombudsman was aware that the painters were laid off following their meeting with the Ombudsman, and the Ombudsman notified the then FENOC Vice President for Perry, FENOC did not follow-up with Williams Power to determine the circumstances of the lay-off. Therefore, credit is not warranted for the civil penalty adjustment

for Identification. Credit is warranted for the Corrective Action civil penalty adjustment factor. Corrective actions ed, but were not limited to: (1) conducting a site survey of the safety conscious work environment (SCWE); (2) conducting stand-downs to discuss SCWE and chain-of-command; (3) revising bid specifications and contracts to include added references to 10 CFR 50.7 and SCWE; (4) conducting continual training for supervisors to include SCWE; and (5) establishing an Oversight and Process Improvement Department to provide oversight of employee concerns program. Additionally, Williams Power established a written policy statement that it would not tolerate employment discrimination. In addition, FENOC canceled its contract with Williams Power for work at the Davis-Besse Nuclear Plant (Davis-Besse) during the Spring and Summer 2001, pending resolution of this issue.

Therefore, to emphasize the need for prompt identification of violations, the importance of a workforce that is free of employment discrimination, and in recognition of your previous escalated enforcement action, I have been authorized, after consultation with the Director, Office of Enforcement, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) in the base amount of \$55,000 for the Severity Level III violation at Perry.

Two related matters require disposition. First, one painter who was laid off on March 9, 2000, by Williams Power at Perry was subsequently denied employment as a painter with Williams Power on March 17, 2000, at FENOC's Davis-Besse. Investigation by OI developed information indicating that the Production Manager for Williams Power at Davis-Besse may have discriminated against the painter because of the painter's earlier protected activities at Perry. At the PEC on September 26, 2001, however, representatives of FENOC and Williams Power presented information indicating that the local union had not referred the painter to Williams Power for employment at Davis-Besse. Information presented by Williams Power also indicated that the individual whom Williams Power had designated to be the Production Manager at Davis-Besse did not report to that facility as of March 17, 2000, and, therefore, would not have been able to discriminate against the painter. Therefore, this issue of potential employment discrimination at Davis-Besse on March 17, 2000, is closed without further action (EA-01-091).

Second, the issues concerning the Williams Power General Foreman's instruction to the painters to violate a painting procedure were identified to FENOC by the painters and the information was entered into the Perry corrective action system as Condition Report No. 00-752. No enforcement action is being taken for this matter since it was identified to the licensee, to formation was entered into the corrective action system, and the matter was investigated by FENOC which led to were action against the General Foreman. Other issues the painters brought to the attention of FENOC concerned investrial safety. A FENOC investigation of the issues led to disciplinary action against the General Foreman by Williams Power.

You are required to respond to this letter and should follow the instructions in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

If you disagree with this enforcement sanction, you may request alternative dispute resolution (ADR) with the NRC. Alternative dispute resolution is a general term encompassing various techniques for resolving conflict outside of court using a neutral third party. The technique that the NRC has decided to employ during a pilot program which is now in effect is mediation. Additional information concerning the NRC's pilot program is described in the enclosed brochure (NUREG/BR-0317) and can be obtained at <u>http://www.nrc.gov/what-we-do/regulatory/enforcement/adr.html</u>. The Institute on Conflict Resolution (ICR) at Cornell University has agreed to facilitate the NRC's program as an intake neutral. Please contact the ICR at (607) 255-1124 within 10 days of the date of this letter if you are interested in pursing resolution of this issue through ADR.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures , and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential



Sincerely,

/RA/

James L. Caldwell Regional Administrator

Dockets No. 50-346; 50-440 Licenses No. NPF-3; NPF-58

Enclosures: 1. Notice of Violation and Proposed Imposition of Civil Penalty 2. NUREG/BR-0317

NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY

FirstEnergy Nuclear Operating Company Perry Nuclear Power Plant, Unit 1 Docket No. 50-440 License No. NPF-58 EA-01-083

an NRC investigation completed on February 26, 2001, a violation of NRC requirements was identified. In a propose with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the NRC proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205. The particular violation and associated civil penalty are set forth below:

10 CFR 50.7 prohibits, in part, discrimination by a Commission licensee or a licensee contractor against an employee for engaging in certain protected activities. Discrimination includes discharge and other actions that relate to compensation, terms, conditions or privileges of employment. The protected activities are established in Section 211 of the Energy Reorganization Act of 1974, as amended, and in general are related to the administration or enforcement of a requirement imposed under the Atomic Energy Act or the Energy Reorganization Act. Protected activities include providing information to a licensee or an employer about alleged violations of the Atomic Energy Act or Energy Reorganization Act.

Contrary to the above, and in violation of 10 CFR 50.7, in March 2000, the Site Superintendent for Williams Power Corporation (Williams Power), a contractor at the Perry Nuclear Power Plant (Perry), discriminated against painters employed by Williams Power for having engaged in protected activities. Specifically, three painters employed by Williams Power contacted a licensee maintenance supervisor on March 8, 2000, to discuss concerns about violation of licensee painting procedures by Williams Power. Condition Report No. 00-752 was prepared on March 9, 2000, based on the information the painters provided to the maintenance supervisor on March 8, 2000. On March 9, 2000, the three painters met with the Perry Ombudsman to discuss their concerns, including instructions of a Williams Power General Foreman that the painters were not to follow licensee procedures in preparing surfaces before applying paint in the Fuel Handling Building. Immediately following their meeting with the Perry Ombudsman, the painters were told by the Site Superintendent for Williams Power at Perry that they could volunteer for lay off or be terminated. As a result, two painters were subsequently laid off on March 9, 2000, and the third painter resigned his employment with Williams Power on March 10, 2000. The painters' discussion with the FENOC Maintenance Supervisor and their meeting with the Ombudsman were protected activities which contributed to the threat by the Williams Power Site Superintendent, to the subsequent layoff of two painters, and to the resignation of the third painter.

This is a Severity Level III violation (Supplement VII). Civil Penalty - \$55,000 (EA-01-083)

Social to the provisions of 10 CFR 2.201, FirstEnergy Nuclear Operating Company (Licensee) is hereby required to satisfies a written statement or explanation to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, within 30 days of the date of this Notice of Violation and Proposed Imposition of Civil Penalty (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; EA-01-083" and should include for each alleged violation: (1) admission or denial of the alleged violation, (2) the reasons for the violation if admitted, and if denied, the reasons why, (3) the corrective steps that have been taken and the results achieved, (4) the corrective steps that will be taken to avoid further violations, and (5) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as why the license should not be modified, suspended, or revoked or why such other action as may be proper should not be taken. Consideration may be given to extending the response time for good cause shown.

Within the same time as provided for the response required above under 10 CFR 2.201, the Licensee may pay the civil penalty proposed above, in accordance with NUREG/BR-0254 and by submitting to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, a statement indicating when and by what method payment was made, or may protest imposition of the civil penalty in whole or in part, by a written answer addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission. Should the Licensee fail to answer within 30 days of the date of this Notice of Violation and Proposed Imposition of Civil Penalty, an order imposing the civil penalty will be issued. Should the Licensee elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalty, in whole or in part, such answer should be clearly marked as an "Answer to a Notice of Violation" and may: (1) deny the violation listed in this Notice, in whole or in part, (2) demonstrate extenuating circumstances, (3) show error in this Notice, or (4) show other reasons why the penalty should be imposed. In addition to protesting the civil penalty in whole or in part, such answer may request remission or mitigation of the penalty. In requesting mitigation of the proposed penalty the factors addressed in Section VI.C.2 of the Enforcement Policy should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of the Licensee is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing a civil penalty.

failure to pay any civil penalty due which subsequently has been determined in accordance with the applicable ons of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282c.

The response noted above (Reply to Notice of Violation, statement as to payment of civil penalty, and Answer to a Notice of Violation) should be addressed to: Frank Congel, Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852-2738, with a copy to the Regional Administrator and Enforcement Officer, U.S. Nuclear Regulatory Commission, Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352, and a copy to the NRC Resident Inspector at the Perry Nuclear Power Plant.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 24th day of February 2005

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http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/reactors/ea01083.html

http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/reactors/ea01083.html

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Office of Public Affairs Washington, DC 20555-0001

Telephone: 301/415-8200 E-mail: opa@nrc.gov www.nrc.gov

No. 05-039

March 1, 2005

NRC EXPECTS STRONG ATTENDANCE AT 17TH ANNUAL REGULATORY INFORMATION CONFERENCE

More than 1,200 people, a record for pre-registration, are expected to attend the Nuclear Regulatory Commission's Regulatory Information Conference (RIC), March 8-10, at the Marriott Bethesda North, 5701 Marinelli Road, Rockville, Md. Attendees will include representatives from Canada, France, Japan, the Republic of Korea and more than 20 other foreign countries, a record level of overseas participation at the conference. Also expected are professional staff members from the U.S. Congress.

The agency will mark a number of important events during this conference, including:

- The first public presentations by the newest Nuclear Regulatory Commission members, Gregory Jaczko and Peter Lyons, who will address the RIC on March 9. NRC Chairman Nils Diaz, Commissioners Edward McGaffigan and Jeffrey Merrifield and other senior agency officials will also speak at the conference;
- The RIC's return to Rockville, after several years in downtown Washington, D.C.; and
- The beginning of the integration of the RIC with the former Nuclear Safety Research Conference, which had been run by the NRC's Office of Nuclear Regulatory Research.

The conference is free, onsite registration will be provided and the sessions will be open to the public. The conference brings together NRC managers, regulated utilities and other interested stakeholders to meet and discuss nuclear safety initiatives and regulatory trends. Topics at this year's conference include licensing new nuclear power plants, emergency preparedness and fire protection.

The conference agenda is available on the NRC's Web site at this address: <u>http://www.nrc.gov/public-involve/conference-</u> symposia/ric/.

> Privacy Policy | Site Disclaimer Last revised Tuesday, March 01, 2005



Inside NRC

Volume 27 / Number 4 / February 21, 2005

Duke Power to develop a COL application

After an internal economic analysis indicated nuclear power would be the best way to meet its future baseload demand, Duke Power decided it would begin work on a combined construction permit-operating license (COL) application for a new reactor, a company official said last week.

Duke Power Chief Nuclear Officer Henry "Brew" Barron surprised many in the industry by announcing Feb. 16 at a Platts nuclear energy conference that his company is seriously considering putting a new reactor in service by 2015. Although other companies are looking at potentially building new reactors, none has gone as far as publicly specifying a date by which it anticipates a need for new baseload.

Although the economic conditions

evaluated could change, Barron said, Duke Power wants to keep the nuclear option open and get started right away on the licensing process. The company anticipates making a decision on construction in about five years, he said. Because of its tight planning timetable, Duke Power has decided to bypass an early site permit (ESP) request and instead will seek site approval in the COL application, Barron said. He told the conference that Duke is considering advanced LWR designs by General Electric, Westinghouse, and Areva. Selections on the design and site are expected by the year's end, he said. The company is looking at sites within the Duke Power service territory, he said.

After his talk, Barron told Platts that the company is only considering LWR designs because it wants to stick with technology that both Duke and the NRC are familiar with. Duke is targeting a COL submittal in early 2008 and anticipates about a 33-month review.

Duke is part of the 11-member consortium NuStart Energy Development LLC that is working toward developing a COL application. NuStart members, in addition to Duke, include Constellation, Florida Power & Light, EDFInternational North America, Entergy Nuclear, Exelon, Progress Energy, Southern Co., and the Tennessee Valley Authority. They have partnered with General Electric and Westinghouse to explore the vendors' ESBWR and AP1000 reactor designs, respectively.

Barron said Duke would not pull out of NuStart. In fact, he said, the company is relying on the other consortium members to help with the engineering work on the designs. In addition to seven PWRs, Duke Power owns eight coalfired stations, 31 hydro stations, and several combustion turbine units, Barron said. Duke Power's parent, Duke Energy, has holdings that include natural gas, electric businesses and a real estate company. Earlier this month, Duke Energy reported operational earnings of \$1.3-billion and net cash flow from operations of \$4.1-billion, Barron told the conference. He said nearly half of Duke Energy's earnings before interest and taxes came from Duke Power.

Last year Duke "developed a unique arrangement by which profits or losses from short-term wholesale electric sales are no longer included in our traditional retail rate-of-return calculation," Barron said. "Rather, the profits are split with half of them benefiting our shareholders while the remaining 50% returned to our large industrial customers and communities through annual contribution programs." The programs varied from helping customers pay their heating bills to regional community college grants.

"This new wholesale electric sales arrangement returned about \$30-million back to the community and our individual customers in 2004," Barron said. "This arrangement encourages using temporary excess generating capacity by making it benefit both our communities and our shareholders."

New plant financing

Barron identified "project risks," such as the costs associated with embarking on an untested licensing process and uncertainties about the ultimate cost of the facility, and "short-term impact on the equity shareholders" as two of the biggest concerns Duke would face in building a new plant. A firm construction schedule and fixed price will be important, he said. That drives "good planning" and will be crucial to demonstrate to the financial community that there is "discipline in the process," Barron said. The company also would have to address shareholder earnings during the construction period, when there would be an increase in debt service, he said. He indicated that Duke Power would use its corporate balance sheet to finance a new reactor project. "Duke Power views projects individually and as part of a larger portfolio, with financing accomplished at the Duke Energy level," he said.

Barron said he anticipated that some assumptions would change in time. But at the moment, nuclear is attractive because of tightening environmental emissions restrictions and volatility in natural gas prices, he said. Natural gas-fired plants will help in the interim to diversify Duke's energy sources, but gas is not the right choice for future baseload, he said. The costs of keeping coal in compliance with emissions standards and fluctuations in fuel prices also make it less desirable. Barron said the company has spent \$1.5-billion on pollution controls at the "youngest" of its coal units. Its oldest coal-fired plant is now more than 75 years old, he said. The combination of the emissions benefits and stable fuel pricing makes nuclear the lowest-cost alternative for baseload generation, he said.—Jenny Weil, Washington

Inside NRC

Volume 27 / Number 4 / February 21, 2005

Regulatory stability reaffirmed as one of industry's top priorities

The nuclear industry decided at a closed-door summit Feb. 17 that ensuring regulatory stability should be among its top three priorities. Passing a comprehensive energy bill and resolving the issue of spent fuel disposal. According to sources, the consensus of industry representatives was that there needs to be strong commissioners ---who are not antinuclear---to provide firm direction to the staff through written guidance. Cementing such instructions and codifying changes to the regulations would ease the industry's concern about what will happen when the current group of experienced commissioners leave. One source said the industry worries about a possible "regression" at NRC as there is turnover on the commissioners.

Nuclear Energy Institute's (NEI) newly installed President/CEO Frank Bowman spoke briefly about regulatory challenges at a Platts nuclear energy conference Feb. 16. "We must guard against the shifting objectives after goals are achieved," he said. "We must apply the highly successful safetyfocused and stable regulatory process that evolved in the reactor oversight area to all facets of nuclear power regulation." That theme was carried into the industry's nuclear energy summit. NEI said in a policy brief given to industry executives at the meeting that NRC's
"underlying regulations have undergone little change and remain outdated in many areas." NEI said that with a nudge from Congress, it believed NRC could step up the pace of work in revising its regulations. It also pointed to the need to improve NRC's significance determination process (SDP), which it says was once "straightforward" but now has become "complex and time-consuming."

It also wants to get more clarity on so-called cross-cutting issues—which could reach across human performance, problem identification and resolution, and safety-conscious work environment—and lock in on security requirements. NEI noted that NRC has twice revised its design basis threat since the Sept. 11, 2001 attacks. Utilities have been "trying to hit a moving target" on security requirements, said one industry representative.

Industry sources acknowledge that NRC's adjudicatory process is becoming more disciplined. They point to the fact that the LES enrichment plant licensing case is on schedule. However, the agency has still not finished the review of Private Fuel Storage LLC's spent fuel storage application, now in its seventh year. A decision by an NRC administrative licensing board is expected this week.

Bowman and several other nuclear industry executives took time out of the summit to pay a half-hour visit to Vice President Dick Cheney, who, sources said, continued to express support for more nuclear plants. But a source said that Cheney also encouraged the industry to try to expand its base of support.

NEI Senior Vice President/Chief Nuclear Officer Marvin Fertel told NRC in a Feb. 9 letter that the industry would send the agency a list of its plans and priorities on new plant licensing and other activities that were developed at the summit.

NRC Commissioner Jeffrey Merrifield disagrees with the industry's arguments that new plant construction faces regulatory "uncertainty" (see story, page 13). Merrifield says the agency has made fixes and that it is up the industry to prove its case.—*Michael Knapik and Jenny Weil, Washington*





THE PLAIN DEALER

Report questions Perry's safety ethic

Federal inspectors criticize nuclear plant's response to December pump failures

Friday, February 25, 2005

John Funk Plain Dealer Reporter

A question about the Perry nuclear power plant's commitment to safety has turned up in a federal inspection of the Lake County facility.

The preliminary results of the recent Nuclear Regulatory Commission investigation into reactor pump failures at Perry suggest that repair crews were overly rushed to repair the pumps when they first failed on Dec. 23.

The inspection findings also note that when the pumps began to falter -- causing wide and potentially uncontrollable energy swings in the reactor -- Perry's operators didn't react quickly enough despite multiple alarms. The reactor shut itself down.

ingineers traced the pump failures to electrical controls, and operators restarted the reactor in just three ys. Ten days later, the controls failed again – shutting down the reactor for most of the month as more oblems were uncovered – and prompting the NRC to create a special inspection team.

That panel presented its preliminary findings to Perry's managers a week ago, but will not complete the final public report for at least three weeks, said an agency spokesman.

The inspectors, according to an internal document, said they were concerned that the workers fixing the controls after the first incident were pressured to work faster because plant managers scheduled a "re-start" meeting before the workers had gotten to the root of the problem.

Plant owner FirstEnergy Corp. of Akron disputes that there was any pressure to quickly restart the reactor.

"Absolutely not," said spokesman Todd Schneider. "When we restarted, we had checked everything we could possibly check."

Setting a restart meeting before the troubleshooting is complete is "a typical practice," he said. "You set a schedule. That's the established way to return the plant to service. As you make further discoveries, that schedule can change."

Schneider also said the crew that failed to scram the reactor on Dec. 23 was given immediate additional training. He noted - as did the NRC - that when the pumps had problems on Jan. 6, the operating crew responded quickly because it had been trained on improved procedures.

That's hardly comforting, said David Lochbaum, nuclear safety engineer with the Union of Concerned Scientists, a watchdog group.

"If an aircraft crew pilots you into a mountain, it's not much good to you if another crew did well on a nulator," he said. "You would prefer that all crews react similarly."

The failure of the Dec. 23 operator crew to quickly respond to the power swings is surprising, said ochbaum, because after an incident in 1988 at an Illinois reactor similar to Perry, the NRC required erators of all such reactors to beef up their procedures. The agency also required hardware changes, nich in this case allowed Perry to automatically shut down.

The scheduling of the restart meeting before the workers got to the bottom of the pump problems "would have been unexpected at any plant," said Lochbaum, "particularly at one owned by FirstEnergy."

Stressing production over safety is exactly what got Toledo-area sister plant Davis-Besse in trouble - and indicates a weak safety culture. In a nuclear plant with a healthy safety culture, workers and managers are committed to safety above all else.

FirstEnergy is still struggling to develop a robust safety culture at Davis-Besse. The NRC earlier this week announced it will conduct another round of safety culture inspections there after an independent contractor concluded Davis-Besse's new managers made little progress on safety culture over the last year, and even lost ground in some areas.

To reach this Plain Dealer reporter:

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NUCLEAR NEWS FLASHES

Monday, February 28, 2005

--A MULTILATERAL AGREEMENT TO DEVELOP NEXT-

GENERATION NUCLEAR TECHNOLOGY was signed today by officials from the U.S., Canada, France, Japan, and the U.K. The signing ceremony took place at the French Embassy in Washington, D.C. The agreement expands upon the existing coordination established under the Generation IV International Forum (GIF) to provide for international collaboration in research and development on so-called Generation IV nuclear energy systems. In addition to the five countries that signed the framework agreement today, there are six other GIF participants: Argentina, Brazil, the European Union, South Africa, South Korea, and Switzerland. The GIF partners are focusing on six technologies for international deployment by 2030: the gas-cooled fast reactor; the sodium fast reactor; the lead-cooled fast reactor; the molten salt reactor; the supercritical water reactor; and the very-high temperature reactor.

--THE RISKS FROM LOSS-OF-OFFSITE POWER AND STATION

BLACKOUT ARE LOWER than previous agency estimates, according to a recently released draft report by the NRC Office of Nuclear Regulatory Research. The study looked at the current core damage risk from station blackout scenarios at all 103 operating U.S. reactors and found that improvements in emergency diesel generator performance was the major contributor to reducing that risk. Following the Aug. 14, 2003 blackout across parts of the U.S. and Canada, NRC committed to updating and reevaluating loss-of-offsite power frequencies and durations and station blackout risk. Comments on the draft report (Nureg/CR-INEEL/EXT-04-2525) should be submitted by April 15, NRC said in today's Federal Register. The report is on NRC's electronic document system Adams under accession number ML050140399.

NUCLEAR NEWS FLASHES Friday, February 25, 2005

--AN INCIDENT INVOLVING RELEASE OF NOBLE GASES AND IODINE FROM THE PHEBUS reactor at Cadarache has been uprated to Level 1 (anomaly) on the International Nuclear Event Scale (INES), the Commissariat a l'Energie Atomique (CEA) said today. The incident occurred Jan. 21 during removal of an experimental device containing fission products, generated during the last test of the international Phebus Fission Products program, conducted by the Institute of Radiation Protection & Nuclear Safety. A procedure for closing valves was not properly followed, the CEA said to explain the release of noble gases and radioactive iodine, which it said represented 10 millionths of the Cadarache center's annual limit. There were no consequences for personnel or the environment, the CEA said. The incident had initially been rated at INES Level 0 but was uprated because analysis showed that procedures had not been properly followed, the CEA said.

NUCLEAR NEWS FLASHES

Friday, February 18, 2005

--THE NRC SHOULD EXAMINE WHETHER LIVING NEAR A

NUCLEAR PLANT INCREASES CANCER risks, said Rep. Edward Markey (D-Mass.). Markey released today a letter in which he asked the NRC about the potential links. He suggested that NRC has shrugged off studies that have drawn a connection between increased mortality or incidence of leukemia among people who live near nuclear plants. He asked for copies of peer-reviewed health or epidemiological studies on the effects of living near a reactor, among other information. "The reality is that the data suggest that we should be taking this potential linkage much more seriously," he said in a statement.



Revised Draft NUREG on Estimating LOCA Frequencies through the Elicitation Process

Robert L. Tregoning Lee Abramson Carolyn Fairbanks RES

> Paul Scott Battelle

520th ACRS Meeting March 3, 2005



Presentation Objectives

- Identify major changes to Draft NUREG Report, "Estimating Lossof-Coolant Accident Frequencies through the Elicitation Process."
- Discuss ACRS comments (ML04350369) and staff response (ML050240436) with respect to letter from M.V. Bonaca to N.J. Diaz, "Estimating Loss-of-Coolant Accident Frequencies through the Elicitation Process," dated December 10, 2004.
- Request ACRS letter for proceeding with public comment for draft NUREG report.



Previous ACRS Briefings and Recent Program Milestones

- Previous ACRS briefings.
 - December 2004: Main Committee on draft NUREG.
 - November 2004: RPP Subcommittee on draft NUREG.
 - July 2004: Main Committee on results, sensitivity analyses and use of results for transition break size selection.
 - March/April, 2004: RPP Subcommittee and Main Committee on expert elicitation results.
 - November, 2003: RPP Subcommittee on expert elicitation approach and base case development.
 - July, 2003: Main Committee on the status and approach of expert elicitation.
 - May, 2002: Combined M&M, THP, R&PRA subcommittee briefing on interim LOCA frequency elicitation and LOCA break size redefinition plans.
 - June, July, November, 2001: Overviews of LOCA frequency and break size redefinition effort provided to outline its importance within 10 CFR 50.46 revision framework.
 - March, 2001: Technical issues necessitating LOCA reevaluation.
- Program milestones since December 2004.
 - Completed draft NUREG including responses addressing ACRS comments.
 - Submitted draft NUREG for NRR and ACRS review.



ACRS Comments from November 2004

- 1. The report should include a better explanation of what a generic frequency value for the fleet of plants means and to what extent plant-to-plant variability affected the results.
- 2. The report should state clearly what the understanding of the experts was when they answered questions about LOCA size categories.
- 3. This practice (geometric averaging) is at variance with the methods employed in References 5-7, in which the arithmetic method is applied to the probability distributions of the experts.
- 4. The final distribution reported in the Executive Summary should be the composite distribution that the analysts, based on the sensitivity analyses, believe represents the expert community's current state of knowledge regarding LOCA frequencies.



Changes to (11/04) Draft NUREG

- Sections were re-lettered.
- Sections with no changes or minor changes:
 - Section A Background
 - Section B Objective and Scope
 - Section D Base Case Results
 - Section F Qualitative Results and Discussion
 - Section H Ongoing Work
- Section C Elicitation Approach
 - Added discussion to clarify definition of LOCA categories in Section C.7. (ACRS Comment #2)





Changes to (11/04) Draft NUREG: Section E

Analysis of Elicitation Responses

- Analysis sections completed to reflect prior quantitative results (Section G).
 - Section E.3.4 (Sum of Distributions)
 - Section E.3.4.1 (Calculation of the Mean)
 - Section E.3.4.2 (Calculation of the Variance and Percentiles)
- New sections describing additional or modified sensitivity analyses.
 - Section E.6.1 (Mean Determination)
 - Section E.6.3 (Correlation Structure)
 - Section E.6.4.3 (Aggregation Parameters)
 - Section E.6.4.4 (Mixture Distribution Aggregation)



- Section G previously reflected the current analysis methodology.
- Sections added to reflect additional/modified sensitivity analyses:
 - Section G.6.1 (Mean Determination)
 - Section G.6.3 (Correlation Structure)
 - Section G.6.4.4 (Mixture Distribution Aggregation)
 - Section G.8 (Summary Results)
- Revised summary results based on overconfidence adjustment using the error factor scheme.
 - Improved group LOCA frequency estimates
 - Summary results utilized in Executive Summary.
 - Comparisons with historical results with respect to revised summary estimates.





Changes to (11/04) Draft NUREG: Abstract, Conclusions and Exec. Summary

- Executive Summary
 - The table and figure results now reflect the revised summary results. (ACRS Comment #4)
 - Clarifies what is meant by generic frequencies. (ACRS Comment #1)
 - Summarizes the rationale for using the geometric mean and why mixture distribution aggregation is not appropriate for the actual elicitation results. (ACRS Comment #3)
 - Clarifies that the study results are designed to best represent the expert panel's current state of knowledge regarding LOCA frequencies.
- Abstract and Conclusions
 - Modified to reflect current executive summary.



- ACRS Comment #1
 - The report should include a better explanation of what a generic frequency value for the fleet of plants means and to what extent plantto-plant variability affected the results.
- Staff response
 - Expert panel instructed to develop generic/average values.
 - Panel considered the service history for the entire population of plants.
 - Only factors that impact a large number of plants can significantly affect the average.
 - Therefore, the panel was instructed to account only for broad plantspecific factors and not plant-to-plant variability.
 - Executive Summary clarified to reflect this comment.



- ACRS Comment #2
 - The report should state clearly what the understanding of the experts was when they answered questions about LOCA size categories.
- Staff response
 - Key technical terms, including LOCA size categories, were defined during the elicitation process.
 - LOCA size categories defined as cumulative frequencies at a given flow rate; flow rates then converted to flow areas using simple correlations.
 Flow areas converted to an equivalent break diameter.
 - Each LOCA size category represents the cumulative frequency of a singleended break of the cited size, and all larger breaks (including DEGB) of that size and larger pipe.
 - Section D clarified to reflect this comment.



- ACRS Comment #3
 - This practice (geometric averaging) is at variance with the methods employed in References 5-7 (NUREG-1150, EPRI Report NP-4726, NUREG/CR-6372) in which the arithmetic averaging method is applied to the probability distributions of the experts.
- Staff response
 - Fundamental consideration in this elicitation was to aggregate such that the final results represent the opinions of the panel as a whole.
 - Outlined this philosophy to the experts.
 - Consensus-type estimate (near center of individual opinions).
 - Geometric mean aggregation satisfies consideration.
 - This philosophy was endorsed by the decision analyst on the external peer review panel.



- Staff response to ACRS comment #3, continued.
 - Alternative aggregation methods investigated are consistent with Ref.
 5-7 approaches.
 - Mixture distribution and arithmetic mean techniques.
 - Neither technique provides a consensus-type estimate.
 - Outlier opinions significantly affect estimates.
 - Large differences in results due to choice in aggregation methods.
 - Frequency estimates utilized in any application should reflect risk implications.
 - User has best understanding of risk implications.
 - TBS selection in 50.46 was appropriately cognizant of frequency differences resulting from aggregation methods.
 - Geometric mean (GM) aggregation may be more appropriate for applications which require "best estimate" results.



- ACRS Comment #4
 - The final distribution reported in the Executive Summary should be the composite distribution that the analysts, based on the sensitivity analyses, believe represents the expert community's current state of knowledge regarding LOCA frequencies.
- Staff response
 - Elicitation did not attempt to determine the state of knowledge of the expert community.
 - The study represents the expert panel's current state of knowledge regarding LOCA frequencies for the stated study objectives. (Executive Summary revised).
 - Cannot claim that the study represents the state of knowledge of the expert community.
 - Personal opinions were sought, not their assessment or perception of the expert community's opinion.



- Staff response to ACRS Comment #4, continued.
 - However, panel selection was designed to represent broad organizational, experiential, and international differences within the community.
 - Panel carefully chosen to obtain relevant diversity.
 - The diversity of the experts was intended to encompass the full breadth of views in the expert community.



Summary

- Draft NUREG on expert elicitation has been extensively reviewed.
 - Expert panelists.
 - External peer review.
 - ACRS review.
 - Internal staff review.
- Important to ensure that NUREG is available concurrently with proposed 10 CFR 50.46 rule and statement of considerations.
- Request ACRS letter for proceeding with public comment for draft NUREG report.

LBLOCA Redefinition -Industry Evaluation Status

Presentation to Advisory Committee on Reactor Safeguards March 3, 2005

Wayne Harrison Sr. Staff Licensing Engineer, STP Nuclear Operating Company Chairman, WOG LBLOCA Redefinition Working Group awharrison@stpegs.com





LBLOCA Redefinition

- LBLOCA Redefinition is a key part of a vision for a consistent, risk-informed, performance-based regulatory structure for the long term
 - Consistent with the Commission Policy Statement in 1995
 - supported with the risk-informed Technical Specification initiatives and the Option 2 and Option 3 initiatives.
 - Safety and economic benefits in short-term
 - Establish the framework to identify additional safety benefits in future applications





Industry Actions and Status

- WOG and Industry providing NRC with input for the safety basis for the rule change
 - Evaluating "reference plant" for two examples of likely safety benefits
 - Delay start time for standby diesel generators
 - Delay or manually actuate containment spray
- WOG and Industry supporting development of implementation guidance
 - Demonstration of mitigation capability for breaks larger than transition break size
 - Scheduled to support a draft RG by June 2005
 - Desired outcome is a stable, manageable, cost-effective process





Slide 3

EDG Start Requirements

- Longer start time expected to increase diesel reliability
- Estimated change in reliability is being developed
 - Interviewed station personnel familiar with diesel reliability issues
 - Reviewed INPO EPIX failure data for EDGs from the past 8 years (over 600 diesel failure reports)
- Preliminary results show increased EDG availability
 - Decreased start failures
 - Decreased run-time failures due to wear and tear of fast starts
 - Decreased corrective maintenance for start and run failures.
- Process through several plant specific PRAs to quantify the change in risk





• Containment Spray Requirements

- Changes in containment spray start requirements could change the LOCA accident progression
 - Increase time to transfer to core cooling recirculation
 - Reduces potential for human error in performing manual actions
 - Minimize or eliminate major debris transport mechanism to containment sump
 - For smaller LOCAs, the potential for using normal shutdown cooling as a long-term stable state would be maximized
 - Alternative to recirculation for long term core cooling.
- Benefits are plant dependent
 - Large dry containment plants with a low containment spray actuation setpoint (e.g., 3 to 5 psig) benefit the most





Summary

- Preliminary results are positive
 - Evaluations for both examples show safety benefit
 - Results will be plant-specific
- LBLOCA Redefinition is a key part of a vision for a consistent, risk-informed, performance- based regulatory structure for the long term
 - Demonstration cases are just examples
 - Rule change will establish the framework to identify additional safety benefits in future applications







Briefing for ACRS Richard Dudley, NRR Rulemaking Section March 3, 2005





Proposed Rule Schedule

- Mar. 1, 2005 Office concurrence/comments
- Mar. 3, 2003 ACRS full committee meeting
- Mar. 10, 2005 Resolve any open issues
- Mar. 11, 2005 ACRS letter (tentative)
- Mar. 23, 2005 Proposed rule pkg. to EDO
- Mar. 31, 2005 Proposed rule to Commission

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Planning Schedule*

- May 31, 2005 SRM from Commission (estimate)
- June 2005 Publish proposed rule in FR
- June 30, 2005 Complete first draft of Reg guide
- Summer 2005 Initiate discussion on Reg guide with ACRS subcommittee
- Late summer/early fall 2005 Publish Reg guide for comment (75 days)

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* Dates for planning purposes only based on typical rulemaking schedules



Selection of Transition Break Size for Risk-Informing 50.46 ECCS

Briefing for ACRS Gary Hammer, NRR/DE March 3, 2005

Background

- Staff met with ACRS subcommittee on October 28, 2004 and with full committee on December 2, 2004
- Staff outlined the basis for the TBS selection
 - Used expert elicitation LOCA frequencies.
 - Uncertainties and sensitivities included.
 - Adjustments considered to account for other LOCA frequency contributions.

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Recent Evaluation of TBS (cont)

- Does the TBS need to be modeled as a doubleended break?
 - Current regulations require that the design-basis LOCA be based on a double-ended rupture of the largest pipe in the RCS.
 - Rupture of some pipes ≤ TBS in size (i.e. PWR pressurizer surge line and BWR reactor recirculation lines) result in a double-ended discharge.
 - However, the effects of TBS size breaks are essentially bounded by modeling the breaks as single-ended.
 - Also, expert elicitation estimates were based on single-ended breaks.

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Risk-Informing 50.46 Safety Benefits Calculations

Briefing for ACRS Ralph Landry, NRR/DSSA March 3, 2005







PRA

- Adjust containment spray timing and flow
 - Conserve RWST inventory
 - Reduce debris wash down and improve pump NPSH from sump
 - Extend time for operator action for switchover to recirculation
- Improve EDG reliability
 - Longer start times
 - Less demanding load sequencing

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Schedule

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- Calculations to be completed in May 2005 to support the draft regulatory guide
- Results and insights will be discussed with the appropriate ACRS subcommittee as they are available



Changes to Risk-Informing 50.46 Draft Proposed Rule Language Risk Assessment Briefing for ACRS Michael Tschiltz, SPSB-NRR March 3, 2005

Changes to Rule Related to Risk Assessment

- Late Release Frequency (LRF) <u>no longer</u> included as risk metric with a specific acceptance criteria
- Cumulative tracking of risk associated with inconsequential changes <u>no longer</u> required
- Reduced level of detail in RG 1.174 related requirements in 10 CFR 50.46a
- Acceptance of Bundling Related / Unrelated Changes

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Late Release Frequency

- LRF acceptance criteria removed from proposed rule
- Proposed rule was revised to clarify that for changes that impact containment performance the assessment of the increase in the probability late containment failure will be required
- LRF will be evaluated when considering defensein-depth.

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Reduced Level of Detail in RG 1.174 Related Requirements

- Guidance in RG 1.174 is not legally enforceable
- Proposed §50.46a rule should include a minimum level of legal requirements
- The draft proposed rule includes only high level criteria that deal with

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- PRA scope and quality
- Risk acceptance criteria
- Reporting requirements

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Limitations on Bundling

- If a change were necessary to bring a facility into compliance with NRC regulations, it could not be bundled
- Changes that are Bundled together must not
 - Increase the risk from significant accident sequences

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- Cause lower ranked accident sequences to become significant
- Create new significant accident sequences

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Presentation to the Advisory Committee on Reactor Safeguards

Safety Review of the North Anna Early Site Permit Application

Presented by Michael Scott Senior Project Manager New, Research and Test Reactors Program March 3, 2005



Purpose

- Brief the Committee on the North Anna early site permit (ESP) application and the status of the NRC staff's safety review of that application
- Support the Committee's review of the application and subsequent interim letter to the Commission
- Answer the Committee's questions



• Agenda

| • | Background and Milestones | 5 min |
|---|---------------------------------------|-------|
| • | North Anna ESP Application | 5 min |
| • | Draft Safety Evaluation Report (DSER) | 5 min |
| • | DSER Issues | 5 min |
| • | Future-Oriented Items | 5 min |
| • | Conclusions | 5 min |
| • | Discussion / Committee questions | |



Background and Regulatory Framework

- Subpart A to 10 CFR Part 52 governs ESPs
- Subpart B to 10 CFR Part 100 contains applicable siting evaluation factors
- 10 CFR 52.23 requires ACRS to report to Commission on portions of application that pertain to safety (i.e., Site Safety Analysis Report)
- Purpose of ESP process is to resolve issues related to siting at early stage
- North Anna is first of three ESP applications the NRC staff is currently reviewing others follow at two-month intervals



Purpose of ESP Process

- Separates, to extent feasible, review of site from review of design
- Allows resolution of site-related issues before expenditure of significant resources
- Allows ESP holder to "bank" site for future use





Future Milestones

- ACRS interim letter to the Commission assumed 03/18/05
- Staff provides final SER (FSER) to ACRS late May 2005 (prior to final division director and Office of the General Counsel concurrence)
- Staff issues FSER 06/16/05
- ACRS letter to the Commission assumed 07/25/05
- Staff incorporates ACRS letter and issues FSER as NUREG 08/29/05
- Mandatory hearings begin fall 2005
- Commission decision assumed mid 2006



- Submitted for a site wholly within the existing North Anna Power Station (NAPS) site, adjacent to existing North Anna units 1 and 2 and partially overlaying site of canceled units 3 and 4 (partially constructed in early 1980s; most structures subsequently removed)
- NAPS is owned by Virginia Power and Old Dominion Electric Cooperative and controlled by Virginia Power
- ESP applicant, Dominion, is a wholly-owned subsidiary of Dominion Resources, Inc. (as is Virginia Power)
- Dominion seeks authorization for limited work in accordance with 10 CFR 52.17(c) and 10 CFR 50.10(e)(1)



- Dominion requests site be approved for location of two "units" of up to 4300 MWt
- Each unit may be one large reactor or multiple smaller reactors
- Dominion has chosen not to submit a specific design but instead has submitted a plant parameter envelope (PPE) based on a number of current and future reactor designs
- Staff's review of PPE values in ESP applications limited to whether they are reasonable



- Rock site
- Regional geologic faults
- Seismic hazard characterized using Regulatory Guide (RG) 1.165 method
 - Low-frequency earthquake M7.2 at 300 km
 - High-frequency earthquake M5.4 at 20 km



- Unit 3 to use once-through cooling
- Unit 4 to use "dry" closed-loop (radiative/convective) cooling to atmosphere to eliminate/minimize lake temperature increase and water demand on lake
- Underground ultimate heat sink (UHS) if design selected requires a UHS
- Dominion considering use of intake and discharge structure of canceled units 3 and 4
- Dominion seeks 20-year ESP term



• DSER

- First-of-a-kind evaluation of safety aspects of an ESP application
- Benefited from resolution of a number of generic issues prior to application submittal
- Review guidance is RS-002, "Processing Applications for Early Site Permits"
- Some "generic" issues arose during application review and needed to be resolved during DSER development



Safety Review Areas and Lead Staff Reviewers

- Meteorology: Brad Harvey
- Hydrology: Goutam Bagchi (contract support from Pacific Northwest Laboratory) (PNL)
- Site Hazards: Kaz Campe (contract support from PNL)
- Geology/seismology: Cliff Munson (support from U.S. Geologic Survey)
- Demography/Geography: Jay Lee
- Emergency Planning: Bruce Musico (consultation with Federal Emergency Management Agency)
- Quality Assurance: Paul Prescott
- Physical Security: Al Tardiff
- Radiological Consequence Analysis: Jay Lee



Issues - Emergency Planning

- Dominion has elected to seek acceptance of "major features" of emergency plans as provided in 10 CFR 52.17(c)(ii)
- Concept is not defined in detail in regulations
- NRC/FEMA have issued draft guidance document, Supplement 2 to NUREG-0654
- Generic industry concern with degree of finality associated with major features
- Staff can grant finality as to the overall description but will need to address implementation details at COL



Issues - Seismic

- Dominion proposed new "performance-based" approach for determining safe shutdown earthquake (SSE) - Not entirely consistent with NRC-approved method in RG 1.165
 - Staff advised Dominion that time required for review of this method would likely result in delay in issuance of staff's review products for the ESP application
 - Applicant ultimately elected to use RG 1.165 method
- Because North Anna is a rock site, site SSE exceeds design SSE at high frequencies for designs certified to date (COL item)



Issues - Site Characteristics vs Design Inputs

- Issue is what is needed and/or appropriate at ESP
 - Staff has given Dominion credit for appropriate consideration of most severe natural phenomena including margin
 - Dominion concerned that ESP should not specify design bases, but rather may specify site characteristics that would serve as minimum site-related design inputs at COL



Issues - Design/Site Interface

- Several examples involving interface between site (intended to be subject of ESP) and design (intended to be subject of design certification and/or COL)
 - Potential interferences between new and existing plants
 - Potential underground UHS in presence of water table near surface
 - Potential for frazil and anchor ice
- These individual items are discussed in backup slides



Future-Oriented Items in DSER

- Open items Staff needs additional information prior to developing FSER
- Confirmatory item Staff needs to verify applicant's planned actions as stated in its responses to requests for additional information
- COL action items Site-related items that are more appropriately addressed at COL stage
- Permit conditions Conditions the staff proposes be imposed on holder of the ESP should one be issued



• DSER Conclusions

- DSER defers general regulatory conclusion regarding site safety and suitability to FSER after open items addressed
- Some conclusions from individual sections without open items
 - Applicant has provided appropriate quality assurance measures equivalent to those in 10 CFR Part 50 Appendix B
 - Site characteristics are such that adequate security plans and measures can be developed



DSER Conclusions

- Additional conclusions from individual sections without open items
 - Population center distance, as defined in 10 CFR100.3, is at least one and one-third times the distance from the reactor to the outer boundary of the low population zone and compliant with 10 CFR 100.21(b) and (h)
 - Applicant has established appropriate atmospheric dispersion characteristics to support radiological calculations
 - Based on PPE and site characteristics, site meets radiological dose consequence criteria in 10 CFR 50.34(a)(1)



DSER Conclusions

- Additional conclusion from individual section without open items
 - Potential hazards associated with nearby transportation routes, industrial and military facilities pose no undue risk to facility that might be constructed on the site



Presentation Conclusions

- Staff has issued first-of-a-kind DSER for North Anna ESP application
- Most open item responses expected by March 3, 2005
- Because of first-of-a-kind nature of this action, staff is working through some issues identified during the review
- Looking forward to seeing interim ACRS letter and to briefing the Subcommittee and the full Committee this summer on final results of staff's review of this application
- Staff is identifying lessons learned for possible inputs to future rulemakings and revisions to guidance







- Dominion proposed new "performance-based" approach for determining safe shutdown earthquake (SSE)
 - Not entirely consistent with NRC-approved method in RG 1.165
 - ASCE Standard 43-05 describes this approach
 - Risk-based approach that targets performance goal
 - 1x10⁻⁵ annual probability of unacceptable performance of Category 1 systems, structures, and components
 - Target seismic risk based on core damage frequencies for existing nuclear power plants



Issues - Seismic

- Because staff had not reviewed or approved the performance-based approach, staff advised Dominion that time required for review of this method would likely result in delay in issuance of staff's review products for the ESP application
- Applicant ultimately elected to use RG 1.165 method with justification for use of reference probability 5x10⁻⁵ per year



Issues - Seismic

- Because North Anna is a rock site, site SSE exceeds design SSE at high frequencies for designs certified to date
- COL applicant would need to resolve disparity if one exists (dependent on design selected)
- See SSE vs. RG 1.60 diagram

North Anna SSE



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Open Items

- 2.1-1, Control of exclusion area
 - Applicant must have control over exclusion area or irrevocable right to obtain control
 - Legal issue being addressed in Office of General Counsel
- 2.3-1, Basic wind speed (fastest mile)
 - Dominion used 100-year return fastest mile value from industry standard
 - Observed data point exceeds 100-year return from standard
 - Dominion has chosen to provide 100-year return 3-second gust in lieu of fastest mile





Open Items

- 2.3-2, Snowpack weight vs snow load
 - Regulatory Guide 1.70 states weight of 100-year snowpack and 48-hour probable max winter precipitation (PMWP) should be used to provide weight of snow and ice on safetyrelated structures

- Staff branch technical position provides clarification:

- Normal winter precipitation load should be weight of 100year snowpack
- Extreme winter precipitation load should be weight of 100year snowpack plus 48-hour PMWP
- Dominion plans to provide 100-year snowpack, 48-hour maximum snowfall, and 48-hour winter PMP
- COL applicant will determine how to combine these characteristics for comparison with design for extreme environmental load category unless otherwise justified

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- 2.3-3, Site characteristic to assess potential for freezing in UHS
 - Dominion plans to submit accumulated degree-days below freezing
 - Issues remain regarding choice of weather station and methodology for calculating
- 2.3-4, Impact of dry cooling on atmospheric temperature
 - Dominion plans to provide qualitative or semi-quantitative assessment
 - Approach recognizes system not designed
- 2.4-1, Coordinate reference system
 - Dominion plans to submit reference system and units of measure







- 2.4-2, Minimize distance to existing systems, structures, and components (SSCs)
 - Existing NAPS Units 3 and 4 discharge tunnel likely within 1 foot of Units 1 and 2 service water piping
 - What will happen if COL applicant finds it cannot use existing structure?
 - Dominion states:
 - Not feasible or necessary to specify vertical separation distance
 - Only one of many examples of possible interferences that can and will be addressed at construction stage
 - 10 CFR 50.59 review of changes provides protection for operating plant



- 2.4-3, Impacts of low-flow conditions
 - Dominion plans to propose minimum lake level same as for NAPS units
- 2.4-4, Ice jam formation and breakup
 - Dominion plans to show impact bounded by already-analyzed impact of breach of upstream dams
- 2.4-5, Minimum intake water temperature
 - No clear quantitative site characteristic regarding frazil ice
 - Dominion plans to note in application that frazil ice conditions could occur at the site
 - COL applicant would need to describe engineered measures to handle frazil ice





- 2.4-6, Stability of underground UHS against ground water pressure head
 - Water table near surface, could lift empty or partially full UHS
 - Absent construction details, would have site characteristic for groundwater elevation
- 2.4-7, Correlate ground water level measurements taken in support of the ESP application with data from long-term piezometers
 - Dominion states they do not correlate well (different purposes and locations)
 - Need to show post-drought data not anomalous
 - Dominion plans to take additional data
 - Dominion will need to assess impact of lack of correlation

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- 2.4-8, Conservative hydraulic conductivity
 - Dominion plans to provide more conservative method
- 2.4-9, Upward hydraulic gradients
 - Dominion plans to show such gradient is small fraction of horizontal flow and bound its impact
- 2.4-10, Variation in hydraulic gradient
 - Dominion plans to provide additional seasonal data
- 2.4-11, Onsite measurement of adsorption and retention coefficients
 - Dominion plans to use onsite measurements of soil conditions and a lookup table from the Environmental Protection Agency to determine coefficients





- 2.5-1, Criteria for ground motion model weighting in the model clusters for the EPRI 2003 ground motion evaluation
 - Dominion has responded to this item
 - Staff has questions regarding evaluation
 - Heavy weighting in one cluster for three ground motion models
 - Seismic attenuation parameter for three models in one cluster
 - Criteria for overall weighting for clusters not clearly explained



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- 2.5-2, Incorporate site-specific geologic properties and their uncertainties into the determination of safe-shutdown earthquake (SSE)
 - Dominion plans to determine SSE at hypothetical rock outcrop consistent with NRC guidance and determine transfer function
 - Dominion has provided method to staff, and staff has no questions on it

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- 13.3-1, Offsite laboratories
- 13.3-2, Orange County emergency notification program
- 13.3-4, Reliance on DOE for plume tracking
- 13.3-5, Various additional details on offsite emergency response measures
- 13.3-7, Guidance and authority for exceeding exposure limits
- 13.3-8, Capabilities of hospital and emergency services
- 13.3-9, Qualification for directors of emergency response
- 13.3-10, Cross-references to NUREG-0654 Supplement 2 and review of Orange County emergency response program

Applicant has provided information to address the above open items, and staff has no additional questions on them





- 13.3-3, Adequacy of technical support center, emergency operations facility, and operational support center
 - Applicant does not plan to provide details on these subjects and plans to withdraw request for the associated major feature
- 13.3-6, Additional information on evacuation time estimate (ETE)
 - Applicant referenced existing NAPS ETE
 - Staff has a number of questions on details of the plan
 - Dominion is reviewing document against staff questions





COL Action Items

- Identify/highlight work needed at COL
- Similar to established concept in design certifications
- Regulatory standing under discussion (unlike design certification, not written into a rule)
- Not all-inclusive
- Applicant believes some are unnecessary when already required by regulations
- Specific items in backup slides
- Based on staff's evaluation of open item responses, some of these items may be changed or deleted in **FSER**

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COL Action Items

- 2.1-1, Specific unit locations
- 2.1-2, Agency control of water bodies within exclusion area
- 2.2-1, Hazards of nearby industrial area
 - Currently undeveloped
 - Zoning could permit hazardous operations in future
- 2.2-2, Design-specific interactions between NAPS and new facility
 - Depends on layout and design of new units





COL Action Items

- 2.3-1, Dispersion of radionuclides to control room
- 2.3-2, Release point characteristics and receptor locations for routine release dose computations
- 2.4-1, Restriction on operations posed by low-water conditions
- 2.5-1, Additional soil borings
- 2.5-2, Compare plot plans with subsurface profile and material properties
- 2.5-3, Submit excavation and backfill plans

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COL Action Items

- 2.5-4, Evaluate groundwater impact on foundation stability and dewatering plans
- 2.5-5, Perform soil column amplification/attenuation analyses
- 2.5-6, Analyze stability of safety-related structures
- 2.5-7, Provide design-related structural criteria
- 2.5-8, Provide plans for ground improvement
- 2.5-9, Verify average shear-wave velocity of materials underlying containment





COL Action Items

- 2.5-10, Provide more detailed slope stability analysis
- 2.5-11, Provide plans for safety-related slopes
- 13.6-1, Provide designs for protected area barriers





Proposed Permit Conditions

- Should an ESP be issued for the site, NRC staff believes the ESP holder needs to be constrained by these conditions
- Based on staff's evaluation of open item responses, some of these items may be changed or deleted in FSER
- May also reclassify some of these as COL action items
- Dominion plans to identify technical concerns with some of these items

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Proposed Permit Conditions

- 2.1-1, Obtain authority to restore site before undertaking limited work activities
- 2.4-1, Maintain minimum separation distance from NAPS SSCs
 - This item likely to be revised based on Dominion's response to open item 2.4-2
- 2.4-2, Maximum water budget
 - Dominion believes minimum lake level is adequate limit





Proposed Permit Conditions

- 2.4-3, Design slopes based on drainage without need for engineered drainage systems that can be blocked
- 2.4-4, Locate safety-related facilities above maximum water level from local intense precipitation
- 2.4-5, Minimum free-surface elevation of UHS
 - This item may be revised based on applicant's response to open item 2.4-6
- 2.4-6, Minimum UHS storage capability
- 2.4-7, Design UHS capacity to address potential for freezing

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Proposed Permit Conditions

- 2.4-8, No reliance on Lake Anna for safety-related water supply
- 2.4-9, Locate ingress/egress opening for safety-related SSCs above 271 ft MSL
- 2.4-10, Provide erosion protection for slopes at intake
- 2.4-11, No compromise of flood control measures for existing NAPS units during construction of new units
- 2.4-12, Locate new units where ground water level does not exceed 270 ft MSL
 - Dominion believes appropriate condition is distance above water table

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Proposed Permit Conditions

- 2.5-1, Replace fractured/weathered rock at foundations
- 2.5-2, Perform additional borings to identify weathered or fractured rock at foundations
- 2.5-3, Do not use saprolite as engineered fill
- 2.5-4, Perform geologic mapping of future excavations for safety-related facilities
- 2.5-5, Improve Zone II saprolitic soils if locating safety-related structures on them













Thermal Hydraulic Evaluation of Pressurized Thermal Shock

Advisory Committee on Reactor Safeguards March 3, 2005

David Bessette Mark EricksonKirk Office of Nuclear Regulatory Research

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Overall Structure of PTS TWCF Estimate & How it is used to Establish PTS Screening Limits



Background

- December 2004, presentation included assessment of RELAP5 predictions of downcomer temperature and pressure, and showed the code predicted these parameters well.
- Data were presented that showed plumes to be weak or non-existent. Sensitivity studies conducted using stronger plumes indicated that if plumes did exist, the effect was negligible
- Current presentation reaffirms conclusions, summarizes assessment results, and addresses the issues of downcomer flows and heat transfer coefficient.

Background

Six Thermal Hydraulic Reports Describe Work Performed

- RELAP5 Applications
 - Arcieri, W.C., Beaton, R.M.S., Fletcher, C.D., Bessette, D.E, "RELAP5 Thermal Hydraulic Analysis to Support PTS Evaluations for the Oconee-1, Beaver Valley-1, and Palisades Nuclear Power Plants," NUREG/CR-6858, October 2004.
- RELAP5 Assessment
 - Fletcher, C.D., Prelewicz, D.A., Arcieri, W.C., "RELAP5/MOD3.2.2γ Assessment for Pressurized Thermal Shock Applications," NUREG/CR-6857, October 1984
- Thermal hydraulic uncertainties
 - Chang, Y.H., Almenas, K., Mosleh, A., Pour-Gol, M., "Thermal Hydraulic Uncertainty Analysis in Pressurized Thermal Shock Risk Assessment," CRR-0401, University of Maryland, October 2004.
- PTS Experiments
 - Reyes, J.N., Scaling Analysis for the OSU APEX-CE Integral Test Facility, NUREG/CR-6731, 2003.
 - Reyes, J.N., et. al., Final Report for the OSU APEX-CE Integral Test Facility, NUREG/CR-6856, October 2004.
- Response to ACRS and peer review comments
 - Bessette, D., Thermal Hydraulic Evaluation of Pressurized Thermal Shock, NUREG-1809, February 2005

Thermal Hydraulic Issues Raised by ACRS and Peer Review

- Main contributors to uncertainty (slides 6-7).
- Overall accuracy and uncertainty in RELAP5 to model thermal hydraulic boundary conditions of average downcomer temperature, pressure, and heat transfer coefficient.
- Accuracy of the heat transfer modeling in RELAP5 for downcomer conditions.
- Appropriateness of average value with respect to temperature and heat transfer variations around the downcomer (plumes, stratification).

Premise of TH Uncertainty Treatment

- A single TH sequence is selected to represent to the PFM analysis ALL of a family of similar sequences in a particular PRA bin
- The parameter, modeling, and measurement uncertainties associated with a RELAP5 representation are small relative to
 - Uncertainty associated with the initiating event frequency for a bin, and
 - Sequence to sequence uncertainty within a bin
- These uncertainties are subsumed. enabling FAVOR to treat P(t), T(t), & h(t) deterministically for a particular sequence



Uncertainty in the frequency of event occurrence

Variability in the severity of different sequences





TH parameter and modelina uncertainties



Main Contributors to Thermal Hydraulic Uncertainties are Boundary Conditions

- Because a bin is defined broadly, the range of behavior that describes a given bin is due mainly to boundary conditions (aleatory) rather than physical models in RELAP5 (epistemic)
- For LOCAs, the key factor is the size of the break:
 - Small break bin 1.4 inch to 4 inch (factor of 8)
 - Medium break bin 4 inch to 8 inch (factor of 4)
 - Large break bin 8 inch to 24 inch (factor of 10)
- For stuck open SRVs bin, it is time of valve reclosure, number of valves stuck open, decay heat.

RELAP5 Calculations of Risk-Significant Transients Palisades Medium Break LOCA Bin



RELAP5 Physical Modeling Uncertainty Determined Through Assessment

- The applicability and uncertainty of RELAP5 was determined through comparisons to integral systems tests.
- Additional separate effects assessment performed for important phenomena.
- RELAP5 calculations compared well to experimental data.
- Assessment included 12 integral system tests representative of riskdominant PTS transients.
- Facilities included UPTF, LOFT, ROSA-IV, ROSA-AP600, APEX-CE, and MIST.
- Facilities covered a range of geometries and scaling approaches and included full-scale tests. One scaling factor common to all was powerto-volume scaling, which was the basis for all LOCA integral system test programs.

RELAP5 Physical Modeling Uncertainties Summary of Assessment Results

| Pressure | Bias (RELAP5-experiment) | -0.093 MPa | (-13 psi) |
|----------|--------------------------|------------|-----------|
|----------|--------------------------|------------|-----------|

Standard deviation (1 σ) 0.32 MPa (46 psi)

Temperature Bias (RELAP5-experiment) -1C (-2F)

Standard deviation (1 σ) 10C (18F)

Heat Integral comparisons of RELAP5 with transfer experimental data from UPTF and APEX under conditions of loop flow stagnation show that the code is realistic or conservative. No nonconservatisms were identified.

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Impact of RELAP5 Uncertainty in Pressure

- Bias (-13 psi) and uncertainty (46 psi) between RELAP5 and experimental data in the prediction of RCS pressure are small. The uncertainty of 46 psi amounts to 2% of normal operating stress.
- For LOCAs, pressure is low at the time of vessel failure. The contribution of pressure to wall stress is small. The uncertainty in the RELAP5 calculation of this pressure is small.
- For SRV scenarios, pressure contributes significantly to wall stress, however, pressure is determined by the SRV setting and not by RELAP5

Impact of RELAP5 Uncertainty in Temperature

- Temperature affects both fracture toughness and the thermal stress in the vessel (and, thereby, the applied fracture driving force).
- RELAP5 effectively has no bias (-1C) in the prediction of downcomer temperature.
- The RELAP5 1σ uncertainty of 10C, while seemingly small, can still be significant at certain times during certain transients with respect to determining fracture toughness.
- For risk-significant transients, the change in downcomer temperature from initial conditions to the time of vessel failure is ~200C, so the uncertainty is ~5% of the total change in temperature.
- In addition, this 10C uncertainty is small (10% to 20%) compared to the variations in a bin of 50C to 150C and is subsumed by the spectrum of transients analyzed to determine uncertainty.

Impact of Heat Transfer Coefficient

- Heat flux is function of h and fluid temperature. A change in heat transfer coefficient has about the same effect on heat flux as a change in fluid temperature. q" = h (ΔT)
- The faster the change in fluid temperature, the larger the wall-to-fluid ΔT. Heat flux is insensitive to the uncertainty in h for slow transients (small break LOCAs and SRV scenarios). Fast transients (large LOCAs) are more sensitive to changes in h.
- Difference in ΔT between base case and HTC x 2:

| ¥ | Small breaks: | 1C to 7C |
|---|-----------------------|------------------|
| × | Medium breaks: | 3C to 10C |
| • | Large breaks: | 18C to 29C |

 Only for large breaks does factor of 2 increase in HTC become greater than the fluid temperature uncertainty of 10C. The event frequency for large break is very low to begin with. (next slide)

Initiating Event Frequency for LOCAs

- Mean initiating event frequency for large break LOCAs is less than 10⁻⁷ based on frequency alone, while medium breaks are less than 10⁻⁶.
- Range of uncertainty in frequency from 5th to 95th percentile is 2 to 3 orders of magnitude



| Break size | 5 th | Mean | 95th | Range 5 th to 95 th |
|---------------|-----------------|-------|-------|---|
| 1.6" | 7 E-6 | 2 E-4 | 9 E-4 | 120 |
| 3" | 2 E-7 | 2 E-5 | 6 E-5 | 390 |
| 7" | 1 E-8 | 2 E-6 | 9 E-6 | 800 |
| 14" | 6 E-10 | 4 E-8 | 2 E-7 | 260 |
| 31" | 4 E-11 | 2 E-8 | 7 E-8 | 1700 |

Downcomer Heat Transfer Mixed Convection Not Relevant

- RELAP5 calculations of downcomer velocities are similar to measured data from UPTF, APEX and CREARE (0.3 to 1.5 m/s)
- Buoyancy enhanced flows produce large circulation cells well-mixed conditions (Gr/Re² < 0.1).
- Factor of 20 enhancement in downcomer mass flows relative to ECC injection rate seen in data from UPTF, Creare, and APEX-CE.
- Buoyancy-opposed mixed convection not relevant.
 - Downcomer Reynolds numbers range from 500,000 to 3,000,000 (compared to 6,000 to 20,000 for Swanson-Catton experiments).
 - Gr/Re² ~0.01 to 0.1 in plant compared to ~0.6 to 2 for Swanson-Catton

Downcomer Heat Transfer and Fluid Temperature Plumes Are Not a Important Factor

- Integral test data show no plumes.
 - Integral system tests more reliable than separate effects tests. Full 3D representation of downcomer, interaction among multiple plumes, upper plenum-downcomer bypass flow path allows in-vessel natural circulation, additional driving forces of core decay heat and heat transfer across core barrel, additional flows induced by break and depressurization
- Separate effects test data exhibited weak plumes (~20C) that decreased in magnitude over the duration of the test.
 - IVO dye tests give a qualitative indication of flow patterns consistent with large mixing cells (NUREG/IA-004). The tests were not intended to be quantitative
- Prior to start of PTS reevaluation, sensitivity studies with stronger plumes (40C, 80C) were performed. Almost no effect on conditional probability of vessel failure (CPF).

Conclusions

- Range of thermal hydraulic conditions in any given bin is larger than the thermal hydraulic uncertainty from physical models in RELAP5.
 - Uncertainties in predictions of pressure, temperature, and heat transfer are subsumed by the range of transients analyzed.
- Plant behavior adequately resolved from the number of thermal hydraulic calculations and corresponding thermal hydraulic bins.
- RELAP5 adequately predicts important phenomena, most importantly the boundary conditions for fracture mechanics analysis.
 - The good comparisons are attributable to the fact that pressure and temperature are global state parameters.
 - Integral assessment of heat transfer in the downcomer showed RELAP5 compared well to data.
 - Mixed convection issue not relevant.
 - Downcomer temperature variations (plumes) are not important



Exceptions to NEI 95-10, Revision 5, continued

- » NEI proposed exposure duration criteria
 - Allows short term exposure to spray/leakage to determine need for aging management.
 - Not in compliance with the regulation.



Exceptions to NEI 95-10, Revision 5

 NEI proposed alternative to the scoping of non-safety-related piping and supports

39

- Alternative adds inappropriate criteria.
- Complicates the application.





- Standardized format
- Scoping process
- Potential TLAA's

NEI 95-10, Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule

- Guidelines for
 - Scope of 10 CFR Part 54
 - Subject to aging management review
 - Maintenance of aging effects

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^{*}**Draft Guide-1140,** Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses

 Endorses, with exceptions, industry license renewal document NEI 95-10, Revision 5



Overview of Draft Guide-1140

Mark Lintz Project Manager

March 4, 2005



Summary

- Changes to the GALL Report and SRP-LR fall into the following general categories:
 - Standardization of MEAP parameters.
 - NRC positions previously approved in other documents.
 - Lessons learned.
 - Operating experience.
 - Technical clarifications or corrections.
 - Clarifications to the audit and review process.



Examples of Revisions to Aging Management Programs

Excerpted from Bases Document:

| AMP | Summary of Change and its Basis |
|--------------------|--|
| XI.M19 | The following changes were made: |
| Steam Generator | 1) Eliminating reference to "staff review of NEI 97-06" & eliminating the requirement for NRC plant-specific review of a licensee's steam generator tube integrity AMP - The staff is reviewing generic revisions to the standard technical specifications, based on |
| Tube Integrity | the provisions of NEI 97-06, which are intended to upgrade the standard technical specifications to assure the condition of the tubes remains adequate for the period of time between inspections. Also, considering that there is a framework in place, including Code of Federal Regulations, plant technical specifications, industry guidelines, and NRC oversight and review of plant's steam generator integrity activities, makes the further review of this AMP unnecessary. |
| | 2) Clarifying that the AMP scope includes steam generator sleeves and plugs. This will make the AMP consistent with the line item in GALL volume 2 section IV. |
| | 3) Including tube support lattice bars and tube support plates made of carbon steel in the AMP scope, and eliminating the requirement for NRC plant-specific review of the aging management program for these components - All PWR licensees have committed voluntarily to a SG degradation management program described in NEI 97-06. The staff has concluded that if the steam generator tube integrity AMP includes the carbon steel tube supports and lattice bars in the program scope, references the licensee's response to NRC GL 97-06 and the licensee's intent to maintain steam generator secondary-side integrity in accordance with NEI 97-06 guidelines, a separate plant-specific program is not needed for these programs. In addition, subsequent NRC plant-specific review of the steam generator tube integrity AMP for these components is not necessary. |



Revisions to Time-Limited Aging Analyses: Evaluation of Aging Management Programs under 10 CFR 54.21(C)(1)(iii)

Excerpted from Bases Document:

| GALL TLAA | Time Limited Aging Analyses | TLAA Revised (Y or N) | Summary of Change and its Basis | Referenced GALL'05 Chapters |
|-----------|--|--------------------------|--|-----------------------------------|
| X.M1 | Metal Fatigue of Reactor Coolant Pressure Boundary | Ŷ | Revised the program description to note that examples of critical components are identified in NUREG/CR-6260. Revised monitoring and trending to indicate that the sample of high fatigue usage locations includes the locations identified in NUREG/CR 6260 and any additional critical components in the plant. | 111, IV, V, VII, VIII |
| X.S1 | Concrete Containment Tendon Prestress | N | N/A | |
| X.E1 | Environmental Qualification (EQ) of Electrical Components | Ŷ | Deleted reference to GSI-168 in program description. It is no longer an open issue. | VI |



Overview of Bases Document

- Team Effort input from ANL, Parallax, and NRC
- Provides
 - Technical justification for both revised and new AMR line-items in GALL'05.
 - Listing, location, & frequency of terms used in AMR tables.
 - Changes in TLAAs and AMPs.
 - Listing, location, & frequency of AMP usage in AMR tables.
 - Summary of update changes for SRP-LR.
 - System-specific audit tools with cross-reference to SRP-LR section and ID, reactor type, and AMR table parameters.
 - Summary of MEAP combinations with cross-reference to SRP-LR ID, location in AMR table, Item ID.




Chpt. IX: Standardized SSC Terms

IX.B Selected Definitions of Terms Used for Describing and Standardizing Structures, Components, Materials, Environments, Aging Effects, and Aging Mechanisms

Definition of Selected Terms for Structures and Components

| Term | Definition as used in this document |
|--|--|
| Bus duct | Bus ducts are electrical buses installed on electrically insulated supports and are constructed with all phase conductors enclosed in a separate metal enclosure or a common metal enclosure. |
| Phase bus | Bus that is enclosed [either within its own enclosure (duct or inside a vault) that is not part of an active component such as a switchgear, load center, or motor control center] |
| Piping, piping components, and piping elements | This general category includes various features of the piping system that are within the scope of license renewal. Examples include piping, fittings, tubing, flow elements/indicators, demineralizer, nozzles, orifices, flex hoses, pump casing and bowl, safe ends, sight glasses, spray head, strainers, thermowells, and valve body and bonnet. |
| Switchyard bus | Switchyard bus is uninsulated, unenclosed, rigid electrical conductor used in switchyards and switching stations to connect two or more elements of an electrical power circuit such as active disconnect switches and passive transmission conductors. |
| Transmission conductors | Transmission conductors are uninsulated, stranded electrical cables used in switchyards, switching stations and transmission lines to connect two or more elements of an electrical power circuit such as active disconnect switches, power circuit breakers, and transformers and passive switchyard bus. |

GALL 2005 (Added Definitions)

- New Definition section (Chapter IX) provided for <u>Materials</u>, <u>Environments</u>, <u>Aging effects/mechanisms</u>, and selected components as relevant to different aging management <u>Programs</u>.
- Standardization of terms used for MEA parameters to make the AMR line-items more generic
 - Traceability to GALL'01 retained
 - Guidance applicability enhanced without compromising relicensing rigor and safety

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Specification of Benign Material/ Environment Combinations Excerpted from GALL Vol. 2

| V ENGINE F Commo | EERED SAI n Miscellar | FETY FEATURE leous Material E | ES Invironment C | ombinations | | | |
|---------------------|--------------------------|---|-------------------------|--|----------------------------|--------------------------------|-----------------------|
| ltem | Link | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | Aging Management Program (AMP) | Further Evaluation |
| V.F-4 (EP-10) | V.F. | Piping, piping components, and piping elements | Copper alloy | Air – indoor uncontrolled (External) | None | None | No |
| V.F-5 (EP-9) | V.F. | Piping, piping components, and piping elements | Copper alloy | Gas | None | None | No |
| V.F-6 (EP-11) | V.F. | Piping, piping components, and piping elements | Copper alloy | Lubricating oil (no water pooling) | None | None | No |
| V.F-7 (EP-12) | V.F. | Piping, piping components, and piping elements | Copper alloy <15% Zn | Air with borated water leakage | None | None | No |



Engineered Safety Features: '05 Revision of '01 Item

GALL 2005

| V A | ENGINEE Containm | RED SAFETY F ent Spray Syster | EATURES n (PWR) | | | | |
|-----------------|---------------------|--|--------------------|-------------------------------|---|--|-----------------------|
| ltem | Link | Structure and/or Component | Materiał | Environment | Aging Effect/ Mechanism | Aging Management Program (AMP) | Further Evaluation |
| V.A-3 (E-17) | V.A.6-c | Heat exchanger shell side components | Steel | Closed cycle cooling water | Loss of material/ general, pitting, and crevice corrosion | Chapter XI.M21, "Closed-Cycle Cooling Water System" | No |
| V.A-4 (E-19) | V.A.6-c | Heat exchanger shell side components including tubes | Stainless steel | Closed cycle cooling water | Loss of material/ pitting and crevice corrosion | Chapter XI.M21, "Closed-Cycle Cooling Water System" | No |

GALL 2001

V Engineered Safety Features

A. Containment Spray System (Pressurized Water Reactor)

| ltem | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | Aging Management Program (AMP) | Further Evaluation |
|----------------------------------|---|--------------------|---|---------------------------------------|--|-----------------------|
| A.6-c | Containment spray heat exchanger (serviced by closed- | Carbon steel. | Chemically treated | Loss of material/ General, pitting | Chapter XI.M21, "Closed-Cycle Cooling Water System" | No |
| A.6.1 A.6.2 A.6.3 A.6.4 | cycle cooling water) Bonnet/cover Tubing Shell Case/cover | stainless steel | borated water on tube side and closed- cycle cooling water on shell side | and crevice corrosion | | |



Careful Analysis of Bolting Line-Items in GALL'01

| Item | Link | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | Aging Management Program (AMP) | Further Evaluation |
|--------------------|------------|----------------------------------|----------------------------|--|--|---|-------------------------|
| VIII.H-1 (S-32) | VIII.H. | Bolting | Steel | Air – outdoor (External) | Loss of material/ general, pitting, and crevice corrosion | Chapter XI.M18, "Bolting Integrity" | No |
| VIII.H-2 (S-40) | VIII.H. | Bolting | Steel | Air with borated water leakage | Loss of material/ boric acid corrosion | Chapter XI.M10, "Boric Acid Corrosion" | No |
| VIII.H-3 (S-03) | VIII.H.2-b | Closure bolting | High- strength steel | Air with steam or water leakage | Cracking/ cyclic loading, stress corrosion cracking | Chapter XI.M18, "Bolting Integrity" | No |
| VIII.H-4 (S-34) | VIII.H. | Closure bolting | Steel | Air – indoor uncontrolled (External) | Loss of material/ general, pitting, and crevice corrosion | Chapter XI.M18, "Bolting Integrity" | No |
| VIII.H-5 (S-33) | VIII.H. | Closure bolting | Steel | Air – indoor uncontrolled (External) | Loss of preload/ stress relaxation | Chapter XI.M18, "Bolting Integrity" | No |
| VⅢ.H-6 (S-02) | VIII.H.2-a | Closure bolting | Steel | Air with steam or water leakage | Loss of material/ general, pitting, and crevice corrosion | Chapter XI.M18, "Bolting Integrity" | No |
| VIII.H-7 (S-29) | VIII.H.1-b | External surfaces | Steel | Air – indoor uncontrolled (External) | Loss of material/ general corrosion | A plant-specific aging management program is to be evaluated. | Yes, plant- specific |
| VIII.H-8 (S-41) | VIII.H.1-b | External surfaces | Steel | Air – outdoor (External) | Loss of material/ General corrosion | A plant-specific aging management program is to be evaluated. | Yes, plant- specific |
| VIII.H-9 (S-30) | VIII.H.1-a | External surfaces | Steel | Air with borated water leakage | Loss of material/ boric acid corrosion | Chapter XI.M10, "Boric Acid Corrosion" | No |

Operating Conditions Affect Integrity of SSCs

Excerpted from GALL'05:

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| IV B1 | REACTC Reactor | OR VESS Vessel In | EL, INTERNALS ternals (BWR) | S, AND REA | CTOR COOLAN | TSYSTEM | | |
|-------------------|-------------------|----------------------|----------------------------------|--------------------|--------------------|--------------------------------------|---|-------------------------|
| ltem | Li | ink | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | Aging Management Program (AMP) | Further Evaluation |
| IV.B1-1 (RP-18 | 5 IV) | /.B1. | Steam Dryers | Stainless steel | Reactor coolant | Cracking/ flow- induced vibration | A plant-specific aging management program is to be evaluated. | Yes, plant- specific |

Excerpted from Draft Bases Document'05:

 Table II.A
 New AMR Line Items based on new 'MEAP' combinations relevant to Mechanical Systems ("A" Auxiliary, "E" Engineered

 Safety Features, R" for Reactor Coolant, "S" for Steam and Power Conversion)

| Item | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | AMP | Precedent and Technical Basis for New Line-Item |
|-------|----------------------------------|-----------------|--------------------|---|--|---|
| RP-18 | Steam Dryers | Stainless steel | Reactor coolant | Cracking/ flow- induced vibration | A plant-specific aging management program is to be evaluated. | For plants performing extended power uprate, steam dryers are in scope for category (a)(2), and may exhibit cracking due to flow-induced vibration and therefore require management by a program. A plant-specific aging management program will be evaluated to provide reasonable assurance that the component's intended functions will be maintained within the CLB for the period of extended operation |



10 CFR 54.4(a)(2) Criteria

Structures, systems, and components (SSCs) satisfying this criteria require an aging management review in accordance with 10 CFR 54.21(a)(3). This criteria includes identification of:

- · Non-safety related SSCs that are connected to safety related SSCs, and
- Non-safety related SSCs not connected to safety related SSCs but that could spatially interact with safety related SSCs.

Excerpted from GALL'05 Vol. 2

| VII K | AUXILIARY S Non-Safety Re | YSTEMS elated Category (A | .)(2) SSCs | | | | |
|--------------------|------------------------------|--|--------------------|--|---|---|-------------------------|
| Item | Link | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | Aging Management Program (AMP) | Further Evaluation |
| VII.K-3 (AP-67) |) VII.K. | Piping, piping components and piping elements | Stainless steel | Waste water (untreated or treated water) | Loss of material/ pitting and crevice corrosion | A plant-specific aging management program is to be evaluated. | Yes, plant- specific |

Excerpted from Draft Bases Document'05:

 Table II.A
 New AMR Line Items based on new 'MEAP' combinations relevant to Mechanical Systems ("A" Auxiliary, "E" Engineered

 Safety Features, R" for Reactor Coolant, "S" for Steam and Power Conversion)

| item | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | АМР | Precedent and Technical Basis for New Line-Item |
|-------|----------------------------------|-----------------|--------------------|---|--|---|
| RP-18 | Steam Dryers | Stainless steel | Reactor coolant | Cracking/ flow- induced vibration | A plant-specific aging management program is to be evaluated. | For plants performing extended power uprate, steam dryers are in scope for category (a)(2), and may exhibit cracking due to flow-induced vibration and therefore require management by a program. A plant-specific aging management program will be evaluated to provide reasonable assurance that the component's intended functions will be maintained within the CLB for the period of extended operation |



Materials Reclassified: New Generic AMR Line-Item

Excerpted from GALL'05:

| V ENGINE D1 Emerge | ERED SA | FETY FEATURE Cooling System (F | S PWR) | | | | |
|-----------------------|---------|-----------------------------------|----------------------|----------------------------|---|--|-----------------------|
| Item | Link | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | Aging Management Program (AMP) | Further Evaluation |
| V.D1-15 | V.D1. | Piping, piping components, | Copper alloy >15% | Closed cycle cooling water | Loss of material/ selective leaching | Chapter XI.M33, "Selective Leaching of Materials" | No |
| (EP-27) | | and piping elements | Zn | | | | |

Excerpted from Draft Bases Document'05:

 Table II.A
 New AMR Line Items based on new 'MEAP' combinations relevant to Mechanical Systems ("A" Auxiliary, "E" Engineered Safety Features, R" for Reactor Coolant, "S" for Steam and Power Conversion)

| ltem | Structure and/or Component | Material | Environment | Aging Effect/ Mechanism | АМР | Precedent and Technical Basis for New Line-Item |
|----------------------------------|---|-------------------------|-------------------------------|--|--|--|
| AP-43 EP-27 RP-12 SP-29 | Piping, piping components, and piping elements | Copper alloy >15% Zn | Closed cycle cooling water | Loss of material/ selective leaching | Chapter XI.M33, "Selective Leaching of Materials " | An approved precedent exists for adding this material, environment, aging effect and program combination item to the GALL Report. The staff has accepted the position that selective leaching of copper-alloy in a closed cycle cooling water environment is properly managed by the Selective Leaching of Materials Program, which includes a one-time visual inspection and hardness measurement of selected components to determine whether loss of material due to selective leaching is occurring. |



New Configuration of GALL'05

| ltem¤ | Linke | Structure and/or Compenents | Materialo | Environmento | Aging Effect/· Mechanisme | Aging Management Program (AMP)ø | Further Evaluations |
|---------------------------|-------------------|--|---|--|---|---|--|
| V.D2-13¶ ¶ (E-29)¤ | V.D2.5-80 | Piping and components internal surfacese | Steelo | Air—indoor un controlled (Internal)¤ | Loss∙of∙material≁ general corrosion ¤ | A plant-specific aging management program is to be evaluated.¤ | Yes, plant- specific¤ |
| V:D2-14¶ ¶ (E-27)¤ | <u>V.D2.1-e</u> • | Piping·and· components· internal· surfaces¤ | Steel¤ | Condensation (Internal)¤ | Loss of material general, pitting, and crevice corrosion= | A-plant-specific aging-management- program-is-to-be-evaluated.¤ | Yes, plant- specific¤ |
| V.D2-15¶ ¶ (EP-2)¤ | <u>EP-2</u> • | Piping, piping components, and piping elements= | Aluminume | Airwithi borated waterleakage∍ | Loss of material boricacid corrosione | Chapter XI.M10, "Boile Add Corrosion" | Non |
| V.D2-16¶ ¶ (EP-26)¤ | <u>EP-26</u> ¤ | Piping, piping components, and piping elements¤ | Aluminumo | Treated-waber¤ | Loss-of-material/- general, pitting, and-crevice- corrosion¤ | Chapter XI.M2,"Water Chemistry"¶ ¶ • The AMP is to be augmented by verifying the effective ness of water chemistry control. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.a | Yes, detection of aging effects is to b evaluated = |
| V.D2-17¶ ∬ (E-11)¤ | <u>∨.D2.1-d</u> ∎ | Piping, piping components, and piping elements¤ | Cast austenitic stainless steel¤ | Treated water >250 °C (>482 °F)¤ | Loss-of-fracture toughness/-thermal aging- embrittlement= | Chapter XI.M12, "Thermal-Aging Embittlement of Cast Austenitic Stainless Steel (CASS)"¤ | Noo |
| V.D2-18¶ ¶ (EP-36)¤ | <u>EP-36</u> • | Piping, piping components, and piping elements= | Copperalloy | Closed over the cooling waters | Loss-of-material/ pittingcrevice,-anc galvanic-corrosione | Chapter XI.M21, "Closed-Cycle Cooling Water System"¤ | Non |
| V.D2-19¶ ¶ (EP-27)¤ | <u>EP-27</u> • | Piping, piping components, and piping elements ^o | Copper-alloy >15%-Zn⊐ | Closed cycle cooling water | Loss-of-material- selective-leaching¤ | Chapter XI.M33, "Selective Leaching o Materials"¤ | No= |



Revisions in all Sections of NUREG-1801

- Mechanical
 - Reactor Vessel Internals & Reactor Coolant System (RCS)
 - Engineered Safety Features (ESF)
 - Auxiliary System (AUX)
 - Steam & Power Conversion System (SPCS)
- Structures
 - Containment Structures
 - Structures & Component Supports
- Electrical
- New Chapter IX: Definitions
- Aging Management Programs & TLAAs



- Aging Management Program (AMP) modifications, additions, and deletion
- Aging management review (AMR) line-items
 - Standardized without compromising safety
 - Every line-item in GALL'01 is traceable to the update so nothing has been lost.
- Primary focus on approved precedents, interim staff guidance, and lessons learned
 - Non-safety related 10 CFR 54.4(a)(2) SSCs
 - Common miscellaneous material environment combinations
 - External surfaces of components and miscellaneous bolting

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|--|-----|---------------|--|--|--|---------------------------|--|--|
| | N] | EW | | | | | N | EW |
| ا مر ب | | | Table-3.2-1Summary | of Aging Manageme | nt-Programsfor-Engin | eered Safety Fea | tures¶ | |
| - | IDo | Турео | Component¤ | Aging:Effect/· Mechanismo | Aging Management Programs • | Further Evaluation | SRP·Refo | Related Item o |
| 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 10 | BWR/ PWR□ | Piping, piping, components, and piping-elements-in-emergency- core-cooling-system-= | Cumulative fatigue damage¤ | TLAA, evaluated in accordance with 10 CFR 54.21(c)¤ | Yes, TLAA | Yes, TLAA (See subsection 3.2.2.2.1)¤ | E-10¶ E-13¶ E-16¤ |
| Ļ | 2= | BWR/∙ PWR¤ | Ducting, piping, piping components, and piping elements internal and external surfaceso | Loss-of-material-due- to-general-corrosion¤ | Plant•specific□ | Yes, ∙plant∙ specific¤ | Yes, plant specific (See subsection 3.22.2.2)¤ | E-25¶ E-26¶ E-29¶ E-30¶ E-35¶ E-44¶ E-46¶ E-46¶ |
| • F • | 30 | BWR/∙ PWR¤ | Piping, piping-components, and piping-elementso | Loss-of-material-due- to-pitting-and-crevice- corrosion= | Plant-specific= | Yes, plant specific¤ | Yes, plant specific (See subsection 3.22.2.3,1) • | EP-320 |
| | 40 | BWR/- PWR¤ | Piping, piping, components, and piping-elements, internal- surfaceso | Loss of material due to pitting and crevice corrosion = | Plant-specific= | Yes, plant specific¤ | Yes, plant specific (See subsection 3.22,2,3,1) • | E-330 |
| Ļ | 5- | BWR∕- PWR□ | Partially encased tanks with breached moisture barriero | Loss of material due to pitting and crevice corrosion = | A plant-specific aging management program is to be evaluated because moisture and water can egress under the tank due to cracking of the perimeter seal from we athering.= | Yes,∙plant∙ specific¤ | Yes, plant specific (See subsection 3.22.2.32) o | E-01¤ |
| رد ۲ ع | 6 | BWR/∙ PWR□ | Piping, piping components, and piping elements in contact with soil | Loss of material due to pitting and crevice corrosion | Plant-specifice | Yes, plant specific¤ | Yes, plant specific (See subsection | EP-310 |



- Revised Sections 3.1 through 3.6 (continued)
 - Further evaluation
 - Consistent with the GALL Report revisions
 - Tables updated
 - Reflects changes to the GALL Report



- Revised Sections 3.1 through 3.6
 - Clarified review methodology of AMP, AMR and FSAR
 - Aligns with audit process
 - Discusses exceptions
 - Provides definition of enhancements



- Revised Section 3.0 text
 - Division of reviews
 - Background on types of reviews
 - Expectations on extended power uprates





Scope of Changes to SRP-LR

- SRP-LR changes corresponding to the update in GALL
- > Update of review process
- Disposition of comments accumulated since issuance of the 2001 draft guidance documents



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| ******* | NRC: Schedule | e and Background For Guidance Updates - Microsoft Internet Explorer provided by Provided by USNAL | <u>_io</u> |
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| 4 | Address http://w | www.nrc.gov/reactors/operating/licensing/renewal/guidance/updated-guidance.ht | GC GC |
| | The followin | ig license renewal guidance documents are currently being updated: | |
| | <u>NURE</u> <u>NURE</u> <u>RG 1.</u> Opera | <u>G-1800</u> , Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants <u>G-1801</u> , Generic Aging Lessons Learned (GALL) Report <u>188</u> , Regulatory Guide for Standard Format and Content for Applications to Renew Nuclear Power Plan ating Licenses | nt |
| | Backgrou | und | |
| | This table lis Guidance Up | sts, in chronological order, the notices, slides, transcripts and summaries regarding License Renewal pdate: | |
| | Date | Description | an a |
| | 02/07/05 | Bases Document for Revision to: Generic Aging Lessons Learned (GALL) Report - NUREG-1801, Revise 1 and Standard Review Plan for License Renewal (SRP-LR) - NUREG-1800, Revision 1 | sion |
| | 01/31/05 | NRC staff is currently soliciting comments on the following updated license renewal guidance docume | ents: |
| | | NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Pc | ower |
| | | Plants NUREG-1801, Generic Aging Lessons Learned (GALL) Report | |
| | | o <u>Volume 1</u> o Volume 2 | |
| 1 | | <u>DG-1140</u>, Regulatory Guide for Standard Format and Content for Applications to Renew Nuclea Rever Plant Operating Licenses, which opderses, with executions, NEL 95, 19, Industry, Guideling | ar |
| | | for Implementing the Requirements of 10 CRF Part 54 - The License Renewal Rule | ines |

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License Renewal Guidance Update Website

- Information is available such as relevant correspondence, meeting notices, summaries, NRC public presentations, 9/30/04 and 1/31/05 posting, etc.
 - http://www.nrc.gov/reactors/operating/licensing/re newal/guidance/updated-guidance.html



Schedule: Looking Ahead

| Date | Expectation |
|------------|--|
| 3/4/2005 | ACRS meeting |
| 4/21/2005 | Public meeting (tentative) |
| 8/6/2005 | Approved documents will be provided to ACRS with new public comment NUREG |
| 9/2005 | ACRS/CRGR meetings |
| 9/30/2005 | Final publication of GALL, SRP-LR, and DG-1140 with public comment NUREG |
| 10/30/2005 | Bases document published. |



Schedule: Completed

| Date | Accomplishment |
|-----------------------|---|
| 1/31/2005 | Approved draft update to GALL, SRP- LR, DG-1140 available for public comment. |
| 2/7/2005 | Draft bases document available on website. |
| 3/2/2005 | Public workshop |
| 2/1/2005 to 3/30/2005 | Public comment period. |





- Enhanced public participation
 - September 30, 2004 Preliminary draft update to GALL (AMR line-items) and SRP-LR posted on public website
 - Frequent public meetings
- Expanded explanations and justification
 - Bases document providing justification for technical changes in NUREG-1800 and NUREG-1801.
 - Public comment NUREG to be available 9/30/05



Background of Effort

- Integrated participation
 - Multi-Office within NRC
 - Office of Nuclear Regulatory Research (RES)
 - Office of Nuclear Reactor Regulation (NRR)
 - Division of Regulatory Improvement Programs (DRIP)

- Division of Inspection Program Management (DIPM)
- Division of Systems Safety & Analysis (DSSA)
- Division of Engineering (DE)
- Contractors
- NEI
- Public groups
- Multi-disciplinary teams



- NUREG-1800, Standard Review Plan for License Renewal Applications for Nuclear Power Plants (SRP-LR)
- NUREG-1801, Generic Aging Lessons Learned (GALL) Report
- DG 1140, Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses



Agenda and Introduction

- Background
- Schedule
- Scope
- > Overview of Changes





| | Updating License Renewal Guidance Documents | Jerry Dozier Senior Engineer & Team Leader | |
|------------|--|---|--|
| S S A COMM | 55.02 54.02 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 55.000 | | |

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Proposed Revisions to Generic License Renewal Guidance Documents

Jerry Dozier Kurt Cozens Amy Hull Mark Lintz

Office of Nuclear Reactor Regulation (NRR) Division of Regulatory Improvement Programs (DRIP) License Renewal & Environmental Impacts Program -License Renewal Section B

> Presented at 520th ACRS Meeting March 4, 2005

License Renewal Scoping Review Process for BOP Systems

March 4, 2005

Chang-Yang Li Plant Systems Branch Division of Systems Safety and Analysis Office of Nuclear Reactor Regulation



BOP Systems Scoping Review Process

- An Optional Two-Tier Review Process
- Tier-1: screen, review (LRA, FSAR), identify systems for Inspection
- Tier-2: review (boundary drawings, and other licensing basis documents in addition to the LRA, FSAR)
- Post-review evaluation for findings with generic implications

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Tier-1 Screening Criteria safety important/risk significant systems high safety significant systems (e.g., AFW, EDG & support systems, essential cooling water) **systems susceptible to common cause failure of redundant trains** (e.g., drain systems providing flood protection, makeup water to CCW systems without independent trains)

Tier-1 Screening Criteria

(Cont.)

operating experience indicating likely passive failures

(e.g., raw water systems, main steam and feedwater systems)

previous LRA review experience of omissions

(e.g., spent fuel cooling, makeup water sources to safety systems)







Completeness of a Scoping Review

- Methodology Review
- Scoping Results Review
 - < Plant-Level Scoping
 - < Mechanical Systems
 - Reactor Systems
 - Engineering Safety Features Systems
 - Auxiliary Systems*
 - Steam and Power Conversion Systems*

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- < Electrical Systems
- < Structures

Inspections

* BOP systems

Efficient and Effective Review

• Effective:

Focused on most important systems, only a small portion of the BOP systems will receive less than full review.

• Efficient:

It conserves limited staff resources and reduces the burden of RAIs for low-safety significant systems.

MEETING WITH COMMISSION ACRS THE

Overview (Cont'd)

Major Accomplishments

 Since the last meeting with the Commission on June 2, 2004, we issued 24 Reports. 12 of These Involved Topics that We Will Discuss Today

Overview (Cont'd)

- Proposed Resolution of Generic Safety Issue 185, "Control of Recriticality Following Small-Break LOCAs in PWRs"
- Draft Proposed Rule on Post-Fire Operator Manual Actions
Overview (Cont'd)

- Issued AP1000 Lessons Learned Letter
- Reviewed proposed Technology-Neutral Framework Document for New Plant Licensing
- Reviewed Early Site Permit Applications (North Anna site)

Overview (Cont'd)

- Resolution of GSIs
- Revisions to SRP
- High-Burnup Fuel Issues
- Use of MOX Fuel in Commercial Reactors
- Safeguards and Security Matters
- Report on the NRC Safety
 Research Program

PERFORMANCE

Graham B. Wallis

Recirculation Phenomena

- Debris Generation
- Debris Transport
- Sump Screen Blockage
- Effect on Recirculation Pumps (NPSH)
- Chemical Effects
- Downstream Effects

Staff and Industry Response

- Regulatory Guide 1.82, Revision 3
- Bulletin 2003-01
- Generic Letter 2004-02
- NRC Research Reports
 - Technical Basis Report
 - Pressure Drop through Filter Beds
 - Chemical Effects
- NEI Guidance Document and Staff SER

• Technical Limitations of Guidance Documentation

- Zone of Influence is Based on ANSI/ANS Standard
 - ACRS Questions Basic Aspects of the Model
 - Unable to Verify that Model is "Conservative", as Claimed by Staff
- Transport Uncertainties are Highly Plant Specific
- Basis for Head Loss Correlation is Questionable
- Limited Database Describing Phenomena is Unsuitable for Extrapolation to Plant Conditions
- Treatment of "Thin-Bed Effect" and Other Heterogeneous Phenomena is Inadequate
- Lack of Information on Coating (Paint) Behavior
- Chemical and Downstream Effects Not Addressed

Risk-Informing 10 CFR 50.46

- LOCAs have been the focus of nuclear plant safety since the first commercial reactor designs.
- Current design basis requires the conservative demonstration of the capability to mitigate a spectrum of break sizes up to the Double-Ended Guillotine Break (DEGB) of the largest pipe in the reactor coolant system.

Risk-Informing 10 CFR 50.46 (Cont'd)

- A Transition Break Size (TBS) will be defined such that the current requirements will be preserved only for break sizes smaller than the TBS.
- The frequency of LOCAs corresponding to breaks larger than the TBS should be less than 1x10⁻⁵ per reactor-year.

Risk-Informing 10 CFR 50.46 (Cont'd)



Risk-Informing 10 CFR 50.46 (Cont'd)

- One could select a conservative TBS, i.e., one that is larger than the break sizes from all the sensitivity analyses at a frequency of 10⁻⁵ per year.
- If a break size that is not bounding is selected, the appropriateness of its selection could be controversial.

PTS REEVALUATION PROJECT

William J. Shack

• PTS Reevaluation Project (Cont'd)



PTS Reevaluation Project (Cont'd)

- Improvement of the accuracy and rigor of PFM code, FAVOR, which is used in these analyses
- The results of these studies show that the current PTS screening criteria in the PTS Rule (10 CFR 50.61) are very conservative

PTS Reevaluation Project (Cont'd)

- The staff has concurred with ACRS recommendation in its report of July 18, 2002, that a risk-informed acceptance criterion for vessel failure frequency should be based on considerations of large early-release frequency and not on core damage frequency
- The staff has also concurred with the ACRS recommendation in its report of February 21, 2003, that supported plans for an external peer review of the technical work

PTS Reevaluation Project (Cont'd)

• TO BE COMPLETED AFTER MARCH MEETING ON PTS

• License Renewal

- Reviewed five applications since June 2004 and plan to review another three during the remainder of CY 2005
- Will review five applications in CY 2006
- Reviewing updates to Generic License Renewal Guidance documents (SRP, GALL, and Regulatory Guide)

License Renewal (Cont'd)

- -Inclusion of steam dryers in scope for Dresden and Quad Cities
- -Proposed revision to GALL to address aging management of steam dryer cracking due to flow induced vibration
- -Evaluation of operating experience at EPU levels
- -RES study on the need for phosphate limits at sites of plants applying for license renewal

Waterford 3

- 8% Extended Power Uprate (EPU)
- First use of EPU Review Standard RS-001
- Similar to EPU for ANO-2
- Large-transient Testing Should be Waived
- Generic Concern Identified Regarding Boron Concentration and Precipitation
- EPU Should be Authorized

DIFFERENCES IN REGULATORY APPROACHES BETWEEN U.S. AND OTHER COUNTRIES

Dana A. Powers

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DIFFERENCES IN REGULATORY APPROACHES (Cont'd)

- Focus on BWRs and PWRs
- Baseline Report by H. Nourbakhsh (Transmitted to the Commission on November 2, 2004)

DIFFERENCES IN REGULATORY APPROACHES (Cont'd)

- Emerging differences in use of quantitative risk estimates
- Greater attention by Europeans to severe accident management measures
- No huge differences in response to sump blockage or vessel head penetration issues

| | | G:Reconciliation | | |
|--|-----------------|------------------|--|--|
| ACRS MEETING HANDOUT | | | | |
| Meeting No. | Agenda Item | Handout No.: | | |
| 520 th | 11 | 1 | | |
| Title RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS | | | | |
| Authors SAM DURAISWAMY | | | | |
| List of Documents Attached | | | | |
| See attached list | | 11 | | |
| | | | | |
| Instructions to Preparer 1. Paginate Attachments 2. Punch holes 3. Place Copy in file box | From Staff Pers | son AMY | | |
| | | | | |

| SUBJECT | ANALYSIS | EDO LTR. | ACRS LTR. |
|---|---------------------|------------------|-----------------------|
| Safety Evaluation of the Industry Guidelines Related to Pressurized Water Reactor Sump Performance (GBW/RC) | 3/1/05 (pp. 1-2) | 2/1/05 (p. 3) | 12/10/04 (pp. 4-5) |



UNITED STATES NUCLEAR REGULATORY COMMISSION ADVISORY COMMITTEE ON REACTOR SAFEGUARDS WASHINGTON, DC 20555 - 0001

March 1, 2005

MEMORANDUM TO: ACRS Members

FROM:

R. Caruso, Senior Staff Engineer

SUBJECT: ANALYSIS OF EDO RESPONSE TO ACRS LETTER CONCERNING THE SAFETY EVALUATION OF THE INDUSTRY GUIDELINES RELATED TO PRESSURIZED WATER REACTOR SUMP PERFORMANCE

Attached for your information is a copy of the EDO's February 1, 2005 response to the ACRS's letter of December 10, 2004, concerning the Committee's review of the proposed staff Safety Evaluation (SE). A copy of the Committee's letter is also attached.

Committee Letter

In its letter, the Committee acknowledged the desire of the staff to move forward with the resolution of this issue. The Committee also noted that the staff will be alerting the responsible national standards organizations about technical shortcomings in one of their guidance documents. Overall, however, the Committee continued to believe that both the SE 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. The Committee did not consider the EDO's response to be acceptable.

EDO Response

The EDO acknowledged the ACRS concerns, and expressed the view that the staff continues to take steps to address them. The Staff is conducting ongoing confirmatory worm on the NUREG/CD-6224 head loss correlation, and downstream and chemical effects are also being evaluated. The staff will provide the results of these studies to the Committee as they become available.

Notwithstanding these limitations, the EDO continues to believe that it is important for the staff to continue moving forward to address GSI-191, and the staff believes that it has provided appropriate conservative judgements to address uncertainties in the methodology. It has therefore issued the staff SE on December 6, 2004.

Analysis

The EDO's response is not satisfactory. The staff has determined that it will continue to "move forward", in spite of well documented technical problems with its proposal, because it believes that it has incorporated sufficient conservatism in the guidance to the industry. The EDO's letter simply restates the staff's position, and rejects the Committee's conclusion that the guidance documentation are not sufficiently robust to support sound regulatory decisions.

Attachments: As stated

cc w/attachments: J. Larkins J. Flack M. Snodderly S. Duraiswamy



UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 1, 2005

Mario V. Bonaca, Chairman Advisory Committee on Reactor Safeguards U.S. Nuclear Regulatory Commission Washington, DC 20555-0001

SUBJECT: RESPONSE TO ADVISORY COMMITTEE ON REACTOR SAFEGUARDS ON SAFETY EVALUATION OF THE INDUSTRY GUIDELINES FOR EVALUATING PRESSURIZED WATER REACTOR SUMP PERFORMANCE

Dear Chairman Bonaca:

Thank you for your letter dated December 10, 2004, concerning the Advisory Committee on Reactor Safeguards' (ACRS) views on the Nuclear Regulatory Commission (NRC) staff's safety evaluation (SE) issued by letter dated December 6, 2004, of the Nuclear Energy Institute (NEI) guidance report (GR) "Pressurized Water Reactor Sump Performance Evaluation Methodology." The SE is part of the NRC staff's plan for resolving Generic Safety Issue (GSI) 191, "Assessment of Debris Accumulation on PWR Sump Performance."

The staff understands the ACRS' concerns and continues to take steps to address them. For example, the staff is conducting ongoing confirmatory work on the NUREG/CR-6224 head loss correlation. Additionally, downstream and chemical effects are also being evaluated. The staff will provide the results to the ACRS as they become available.

Because GSI-191 is an important safety issue and its resolution will result in safety improvement, the staff needs to continue moving forward to address the issue. To compensate for the absence of complete knowledge in certain areas we utilized conservative judgements to address uncertainties. Notwithstanding the noted limitations, the staff still concludes that the SE provides an acceptable methodology that supports sound regulatory decision making.

Thank you for your views and recommendations on this matter. I will continue to keep the ACRS informed of the staff's activities as we move forward to resolve GSI-191.

Sincerely,

Luis A. Reyes Executive Director for Operations

CC:

Chairman Diaz Commissioner McGaffigan Commissioner Merrifield SECY



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

December 10, 2004

Mr. Luis A. Reyes Executive Director for Operations U.S. Nuclear Regulatory Commission Washington, DC 20555-0001

SUBJECT: SAFETY EVALUATION OF THE INDUSTRY GUIDELINES RELATED TO PRESSURIZED WATER REACTOR SUMP PERFORMANCE

Dear Mr. Reyes:

Thank you for your letter of November 26, 2004, which responded to our letter of October 18, 2004, on the staff safety evaluation (SE) of the Industry Guidelines Related to Pressurized Water Reactor Sump Performance.

We appreciate the staff's desire to move ahead to resolve Generic Safety Issue-191, "Assessment of Debris Accumulation on Pressurized Water Reactor (PWR) Sump Performance." As licensees attempt to use the guidance, we anticipate that they will have to cope with several technical problems due to errors in the suggested methods. We disagree with your statement that the knowledge limitations are clearly identified and addressed in the SE. In our letter, we identified a number of these limitations. The purpose of this letter is to restate several of the limitations, and to respond to some of the staff's replies.

The head loss correlation in NUREG/CR-6224 (Ref. 1) is not entirely empirical, as claimed by the staff, but rests in part on the theoretical representation of two physical phenomena: the mechanical compression of the bed and the limit of this compression. The theoretical models for these phenomena are erroneous. Although some results may be predicted with apparent adequacy, the faulty models lead to some conclusions that are obviously at odds with reality. For example, correlating bed compression with the pressure gradient is inconsistent with standard methods in the literature and cannot explain the compression of a fiber bed by the imposed pressure from a superposed particulate bed, as in the "thin bed effect." In addition, the NUREG/CR-6224 equation for the compression limit would predict that a fiber bed could be compressed up to the limiting particulate bed density even when there are no particles present, which makes no sense. The foundation of the correlation of data must be theoretically sound if the user of the guidance is to extrapolate a very limited range of data to real plant conditions.

The Committee commented in its letter that the effect on coatings of a two-phase jet is not well understood. The staff agreed "that the nature and effects of a two-phase LOCA jet on coatings are not well understood and that there is a lack of data on coatings." However, the staff still believes that the guidance is acceptable because of "precedents set by past applications approved by the staff and accepted by the ACRS or based on the staff approach of applying conservative assumptions to bound the unknowns." Unfortunately, because the phenomena are not well known, the uncertainties are also not well known, so the staff's "conservative assumptions" are only engineering judgment, without any technical basis.

We are pleased that the staff has alerted the American Nuclear Society to our technical comments on the 1988 ANSI/ANS standard (Ref. 2). However, the claim that Appendix I of the SE contains a "detailed evaluation" of this model is incorrect. Appendix I explains how to use the model, but repeats the technical errors contained in the model, such as the assumption of an "asymptotic plane" beyond which there are no supersonic effects, and the use of a stagnation density to describe a high-velocity stream. As a result, we have not seen convincing arguments that it is conservative to use the ANSI/ANS standard to determine the size of the zone of influence.

-2-

The staff claims that it is appropriate to assume that the debris bed is homogeneous, with the particles uniformly distributed through it. The staff also claims to supply guidance about the "thin bed effect," which is the extreme case where all the particles concentrate in a single layer. These two arrangements of the debris are limiting situations of the general case in which various degrees of inhomogeneity occur; they cannot be true simultaneously. The guidance should address a wider range of possible inhomogeneities. It should allow the user to predict how much inhomogeneity occurs and the resulting head loss. There also needs to be better guidance on how the head loss evolves with time (as observed in experiments documented by NRC contractors), apparently because of the development of inhomogeneities, and on how extreme inhomogeneity can give rise to anomalously high head loss.

The guidance is also inadequate for evaluating downstream effects. It merely lists issues to be considered. It does not explain how to determine whether the issues are resolved, or how to perform an "integrated evaluation". Licensees will have to derive the acceptance criteria themselves.

There is also no useful guidance on chemical effects. The staff has only told the industry not to get caught by unexpected results from the ongoing experimental program.

We continue to believe that both the SE and the Nuclear Energy Institute 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.

Sincerely

Mand V. Bouaca

Mario V. Bonaca Chairman

References:

- 1. NUREG/CR-6224, "Parametric Study of the Potential for BWR WCCS Strainer Blockage Due to LOCA Generated Debris," G. Zigler et.al., October 1995.
- ANSI/ANS-58.2-1988, "Design Basis for Protection of Light-Water Nuclear Power Plants Against the Effects of Postulated Pipe Rupture," American Nuclear Society, October 6, 1988.