



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

SL-0514

October 14, 2003

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

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT - 505<sup>th</sup> MEETING OF THE ADVISORY COMMITTEE  
ON REACTOR SAFEGUARDS, SEPTEMBER 10-13, 2003, AND OTHER  
RELATED ACTIVITIES OF THE COMMITTEE

During its 505<sup>th</sup> meeting, September 10-13, 2003, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letter, and memoranda:

REPORTS:

Reports to Nils J. Diaz, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS; Subject:

- Report on the Safety Aspects of the License Renewal Application for the St. Lucie Nuclear Plant, Units 1 and 2, dated September 17, 2003
- Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single-Failure Criterion to Safety Systems," dated September 22, 2003
- Draft Final Regulatory Guide x.xxx, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" (formerly DG-1122), dated September 22, 2003
- Draft Final Review Standard for Extended Power Uprates, RS-001, dated September 24, 2003
- Draft Final Revision 3 to Regulatory Guide 1.82, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," dated September 30, 2003

LETTER:

Letter to William D. Travers, Executive Director for Operations, NRC, from Mario V. Bonaca, Chairman, ACRS, Subject: Proposed Recommendations for Resolving Generic Issue 186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants," dated September 24, 2003

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MEMORANDA:

Memoranda to William D. Travers, Executive Director for Operations, NRC, from John T. Larkins, Executive Director, ACRS; Subject:

- Draft Final Revision 1 of Regulatory Guide 1.138, "Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants" (Draft was issued as DG-1109), dated September 15, 2003
- Draft Final Regulatory Guide DG-1099, "Anchoring Components and Structural Supports in Concrete," dated September 15, 2003

HIGHLIGHTS OF KEY ISSUES

1. Safeguards and Security Matters

The Committee met with representatives of the NRC staff, the Nuclear Energy Institute (NEI), and their contractors to discuss safeguards and security matters, including Commission papers on risk-informed guidance for vulnerability assessment and on risk-informed decisionmaking, integration of the results of the vulnerability studies, potential vulnerability to sabotage of spent fuel storage facilities, and NEI-sponsored work in the area of safeguards and security. This meeting was closed pursuant to 5 U.S.C. 552b(c)(1).

Committee Action

The Committee plans to issue reports on selected topics in the near future.

2. Final Review of the St. Lucie License Renewal Application

The Committee heard presentations by and held discussions with representatives of the NRC staff and Florida Power and Light Company regarding the staff's final Safety Evaluation Report (SER) for the St. Lucie Nuclear Plant, Units 1 and 2 License Renewal Application. The staff discussed the resolution of open and confirmatory items that were included in the initial SER. The applicant stated that it plans to implement 70 to 80% of the commitments for license renewal prior to the issuance of the renewed licenses.

Committee Action

The Committee issued a report to the Commission on this matter, dated September 17, 2003. The Committee recommended that the application for renewing the operating licenses for St. Lucie, Units 1 and 2 be approved.

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3. Draft Final Regulatory Guide x.xxx, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities"

The Committee met with representatives of the NRC staff to discuss the draft final Regulatory Guide x.xxx on an approach for determining the technical adequacy of probabilistic risk assessment (PRA) results for risk-informed activities (formerly DG-1122). The Regulatory Guide conditionally endorses the American Society of Mechanical Engineers standard for PRA and is an important step for the increased use of PRA technology in regulatory decisionmaking.

Committee Action

The Committee issued a report to the Commission on this matter, dated September 22, 2003. The Committee recommended that the draft final Regulatory Guide be issued for trial use with an appropriate sample of pilot plants. The Committee looks forward to reviewing guidance being developed by the NRC staff on how to perform sensitivity and uncertainty analyses in early 2004.

4. Technical Assessment and Proposed Recommendations for Resolving GSI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"

The Committee heard presentations by and held discussions with representatives of the NRC staff regarding proposed recommendations for resolving Generic Issue-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants."

The staff stated that NUREG-1774, "Survey of Crane Operating Experience at U.S. Nuclear Power Plants from 1968 through 2002," notes that human error and rigging deficiencies below the hook account for many of the observed load drop events. The report concludes that licensees could have reduced the frequency of crane operating events attributable to human error if they had focused appropriate attention on the crane operating practices described in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." The staff discussed its proposed recommendations to reduce the number and potential severity of load drop events.

Committee's Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated September 24, 2003, agreeing with the staff's position that regulatory action is needed to reduce the number and potential severity of heavy load drop events.

5. Draft Final Review Standard for Reviewing Core Power Uprate Applications

The staff presented the draft final version of Review Standard RS-001, "Review Standard for Extended Power Uprates," which reflects incorporation of public comments, as appropriate. The purpose of developing the Review Standard included (1) standardization of the staff review

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process, (2) predictability of the process and its results, and (3) retention of corporate memory. The standard will be a living document, and the staff will be encouraged to re-assess the guidance and update them to reflect new information that arises. During the review of the proposed version of this Standard, the Committee raised seven concerns and the staff has satisfactorily addressed those concerns in the draft final version of the Review Standard.

#### Committee Action

The Committee issued a report to the Commission on this matter, dated September 24, 2003, recommending that the Review Standard be released for use in the review of future applications for extended power uprates.

6. Draft Final Revision 3 to Regulatory Guide 1.82 (DG-1107), "Water Sources for Long-Term Recirculation Cooling Following a LOCA"

The Committee heard presentations by and held discussions with representations of the NRC staff regarding the draft final Revision 3 to Regulatory Guide (RG) 1.82, which is part of the staff's resolution of GSI-191, PWR Sump Blockage. The staff discussed the RG with the Committee in February 2003, and had subsequently issued it for public comment. The version that was presented to the Committee on September 11, 2003 included staff consideration of the public comments.

#### Committee Action

The Committee issued a report to the Commission on this matter, dated September 24, 2003, recommending that Revision 3 to RG 1.82 be issued. The Committee stated that additional technical work remains to be performed (1) to develop a technical basis to resolve issues related to chemical reactions inside the containment, (2) to develop an acceptable method that can be used directly as guidance for the analysis of sump blockage. In addition, the Committee recommended that alternative solutions be investigated to ensure long-term core cooling. The Committee also stated that the staff should investigate a risk-informed approach to sump screen blockage.

7. Draft Final Revision 1 to Regulatory Guide 1.53, "Application of the Single Failure Criterion to Safety Systems"

The Committee met with representatives of the NRC staff and the Institute of Electrical and Electronics Engineers, Inc. (IEEE) to discuss the draft final Revision 1 to Regulatory Guide 1.53, which endorses IEEE Std 379-2000, "IEEE Standard Application of the Single-Failure Criterion to Nuclear Power Generating Station Safety Systems." This is the first update to Regulatory Guide 1.53 since it was issued in June 1973. The staff stated that IEEE Std 379-2000 provides methods acceptable to the NRC staff for satisfying the NRC's regulations with respect to the application of the single failure criterion to the electrical power, instrumentation, and control portions of nuclear power plant safety systems.

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#### Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated September 22, 2003. The Committee recommended that Revision 1 to Regulatory Guide 1.53 be issued.

#### RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the response from the EDO dated August 4, 2003, to the ACRS report dated May 16, 2003, concerning Improvement of the Quality of Risk Information for Regulatory Decisionmaking. The Committee decided that it was satisfied with the EDO's response.

**In its response, the EDO stated that the ASME Standard needs additional guidance in interpreting and applying some of the supporting level requirements. The peer-review team intends to provide this feedback to ASME. The staff also intends to add this guidance, where appropriate, in DG-1122. The staff plans to meet with the Committee as the above guidance is developed.**

- The Committee considered the response from the EDO dated August 8, 2003, to the ACRS report dated June 24, 2003, concerning Update to License Renewal Guidance Documents. The Committee decided that it was satisfied with the EDO's response.

**The Committee would like to review the results of the RES study and NRR decision on setting a limit on phosphate ion concentration**

- The Committee considered the response from the EDO dated August 11, 2003, to the ACRS report dated May 16, 2003, concerning the Vessel Head Penetration Cracking and Reactor Pressure Vessel Degradation. The Committee decided that it was satisfied with the EDO's response and would further like to review the following:

**— the new models, improvements to the inspection requirements, and other related revisions to regulatory requirements that are stated to be developed by the staff when the root cause of the South Texas Project cracking is known.**

**— the results of RES studies on low-alloy steels exposed to boric acid solutions as well as the models based on those studies.**

**— the RES work to address the capability and reliability of VHP inspection techniques.**

**— the RES longer-term program to explore other types of degradation and other sites that could be susceptible to PWSCC in Alloy 600 as well as the broad-based research plan.**

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**— the integrated analysis method developed by RES to support evaluations of inspection techniques and intervals for long-term management of VHP degradation and incorporation in risk assessments.**

- The Committee considered the response from the EDO dated August 21, 2003, to the ACRS report dated July 16, 2003, concerning Safety Culture. The Committee decided that it was satisfied with the EDO's response.

**The Committee would like to be briefed on further developments of agency activities in the safety culture area.**

#### LIST OF OTHER MATTERS FOR THE ATTENTION OF THE EDO

- The Committee would like to review the proposed resolution of Generic Issue 186, "Potential Risk Consequences of Heavy Load Drops in Nuclear Power Plants."
- The Committee plans to review the draft Regulatory Guide being developed by the staff to provide guidance on performing sensitivity and uncertainty analyses. The staff told the Committee that this Guide may be available for ACRS review in early 2004.

#### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from July 9, 2003, through September 9, 2003, the following Subcommittee meetings were held:

- Thermal-Hydraulic Phenomena - July 16-17, 2003

The Subcommittee reviewed the thermal-hydraulic aspects of the AP1000 design with representatives of the NRC staff and Westinghouse Electric Company, LLC.

- Future Plant Designs - July 17-18, 2003

The Subcommittee discussed the Westinghouse AP1000 Instrumentation and Control design concept, man-machine interface design acceptance criteria, human factors issues, and the status of resolution of open items regarding the design review.

- Thermal Hydraulic Phenomena - August 19 and 20, 2003

The Subcommittee discussed the "Review Standard for Extended Power Uprates," and reviewed the staff's resolution of public comments associated with the Draft Regulatory Guide DG-1107, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident."

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- Planning and Procedures - September 9, 2003

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

- Fire Protection - September 9, 2003

The Subcommittee discussed the status of the revision to 10 CFR 50.48 to endorse NFPA-805 Standard, proposed rulemaking plan on manual actions, and other fire protection matters.

#### PROPOSED SCHEDULE FOR THE 506<sup>th</sup> ACRS MEETING

The Committee agreed to consider the following topics during the 506<sup>th</sup> ACRS meeting, held on October 1-3, 2003:

- Meeting with the NRC Commissioners
- Final Review of the Fort Calhoun License Renewal Application
- Interim Review of the AP1000 Design
- Proactive Materials Degradation Assessment Program
- Subcommittee Report on the Interim Review of the License Renewal Application for H. B. Robinson Nuclear Power Plant
- Subcommittee Report on Fire Protection Matters
- Review of the PIRT Process
- Operating Experience Assessment Report - Effects of Grid Events on Nuclear Power Plant Performance
- Draft Final Revision to Regulatory Guide 1.168 (DG-1123), "Verification, Validation, Review, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants"
- Subcommittee Report on Reactor Fuels
- Format, content, and assignments for the ACRS report on the NRC Safety Research Program
- Safeguards and Security

Sincerely,

**/RA/**

Mario V. Bonaca  
Chairman