



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

SL-0524

September 30, 2004

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

Dear Chairman Diaz:

SUBJECT: SUMMARY REPORT — 515<sup>th</sup> MEETING OF THE ADVISORY COMMITTEE ON  
REACTOR SAFEGUARDS, SEPTEMBER 9-11, 2004 AND OTHER RELATED  
ACTIVITIES OF THE COMMITTEE

During its 515<sup>th</sup> meeting, September 9-11, 2004, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report and memoranda:

REPORT:

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

- Report on the Safety Aspects of the License Renewal Application for the Dresden 2 and 3 and Quad Cities 1 and 2 Nuclear Power Stations, dated September 16, 2004

MEMORANDA:

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

- Proposed Regulatory Guide 1.75, Revision 3, "Criteria for Independence of Electrical Safety Systems," dated September 10, 2004
- Draft Regulatory Guide, DG-1.XXX, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," dated September 14, 2004

HIGHLIGHTS OF KEY ISSUES

1. Final Review of the License Renewal Application for the Dresden and Quad Cities Nuclear Plants

The Committee met with the NRC staff and representatives of the Exelon Generation Company (Exelon) to review and discuss the results of the staff evaluation of the license renewal application for Dresden 2 & 3 and Quad Cities 1 & 2 Nuclear Power Stations and the associated final Safety Evaluation Report. The applicant has requested approval for continued operation of these plants for a period of 20 years beyond the current license expiration dates. The operating licenses for Dresden 2 and 3 expire on December 22, 2009 and January 12, 2011. The Quad Cities 1 and 2 licenses expire December 14, 2012.

Committee Action

The Committee issued a report to the NRC Chairman dated September 16, 2004, concluding that the programs instituted and committed to by Exelon, to manage age-related degradation, are appropriate and

provide reasonable assurance that the Dresden and Quad Cities Nuclear Power Stations can be operated in accordance with the current licensing bases for the period of extended operation without undue risk to the health and safety of the public. The Committee recommended that the Exelon application for renewal of the operating license for Dresden and Quad Cities Nuclear Power Station be approved once the staff requires that the steam dryers for the Dresden and Quad Cities plants are included within scope of license renewal and once the staff has confirmed that the applicant will conduct an evaluation of applicable operating experience prior to entering the period of extended operation.

## 2. Proposed Changes to the License Renewal Program

The Committee met with representatives of NRR to discuss proposed changes to the scoping and screening reviews of license renewal applications. The staff described an assessment of its scoping and screening review process and a proposed approach for sampling the systems to be reviewed as part of a license renewal application. The team performing this assessment recommended that audits and inspections be better coordinated to eliminate duplication of effort and that the inconsistencies among license renewal guidance documents be corrected. A methodology in which only a portion of the auxiliary systems and the steam and power conversions systems would be reviewed was also proposed. The selection of systems to be reviewed in detail would consider inherent risks and experience from previous reviews of license renewal applications. The staff believes that this proposed sampling would improve the effectiveness and efficiency of reviews while providing reasonable assurance that the applicant has identified all structures, systems, and components required by license renewal regulations.

### Committee Action

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

## 3. Proposed Technical Specifications for Ensuring Steam Generator Tube Integrity

The Committee met with representatives of NRR to discuss the staff's review of more performance-based technical specifications (TS) for steam generator tube integrity. The staff stated that all outstanding issues regarding the proposed TS have been resolved and a safety evaluation for the lead plant (Farley) will be issued on September 17, 2004. The proposed TS will set new Limiting Conditions for Operation (LCOs) and establish a new administrative TS for a Steam Generator Program. The LCO for operational leakage will be lowered from 500 gpd to 150 gpd for each SG to provide added assurance that the plant can be shut down before tube rupture. The Steam Generator Program TS will specify performance criteria for tube integrity, provisions for monitoring, repair criteria, and provisions for inspection. The structural integrity performance criteria specify safety factors for normal and design basis accident (DBA) loads. The accident leakage performance criterion limits DBA leakage to one gpm for all SGs. The SG tube repair criteria and methods are consistent with those currently approved. The scope, method, and frequency of tube inspections shall be done to ensure that integrity is maintained until the next inspection. The staff is reviewing a Generic License Change Package for these new TS and is preparing a Generic Letter on Steam Generator Tube Inspections.

A representative of the Nuclear Energy Institute (NEI) stated that industry has already committed to implementing NEI 97-06, "Steam Generator Program Guidelines," the associated Electric Power Research Institute documents, and the General License Change Package.

### Committee Action

This was an information briefing. No Committee action was necessary. The members plan to provide the staff with a list of topics to be discussed at a future Materials and Metallurgy Subcommittee meeting regarding the resolution of technical issues raised by the staff regarding NEI 97-06.

4. Safeguards and Security Matters

The Committee heard briefings by and held discussions with representatives of the NRC staff and NEI regarding safeguards and security matters. **Note: This session was closed to protect information classified as national security information as well as safeguards information pursuant to 5 U.S.C. 552b(c)(1) and (3).**

Committee Action

This was an information briefing. No Committee action was necessary.

5. Assessment of the Quality of the Selected NRC Research Projects

The Office of Nuclear Regulatory Research (RES) is required to have an independent evaluation of the quality of its research programs. This evaluation is mandated by the Government Performance and Results Act (GPRA) and needs to be in place during the next fiscal year. The Committee has agreed to assist RES in assessing the effectiveness and utility of the NRC research programs. The Committee has previously developed a strategy for reviewing the quality of selected research projects. This strategy is to be tried during FY 2004 and refined in FY 2005. During the September 9-11, 2004 ACRS meeting, the Committee discussed the preliminary results of the cognizant ACRS members' assessment of the quality of the NRC research projects on Sump Blockage and on MACCS Code.

Committee Action

The Committee plans to discuss the assessment of the quality of the research projects on Sump Blockage and MACCS Code during October 7-9, 2004 ACRS meeting.

6. Differences in Regulatory Approaches and Requirements Between U.S. and Other Countries

In an April 28, 2003 Staff Requirements Memorandum (SRM), resulting from the April 11, 2003 ACRS meeting with the Commission, it was stated that "In the course of its routine activities of reviewing and advising the Commission on reactor issues, the Committee should explore and consider other international regulatory approaches. Where there are significant differences in regulatory approaches and requirements, the Commission should be informed." Dr. Nourbakhsh, ACRS Senior Staff Engineer, has prepared the draft of a white paper to be used by the ACRS in responding to the Commission. During the September 9-11, 2004 ACRS meeting, the Committee discussed the draft White Paper regarding divergence in regulatory approaches between U.S. and other Countries.

Committee Action

The Committee plans to discuss the draft final of the White Paper on differences in regulatory approaches and requirements between U.S. and other countries during the October 7-9, 2004 ACRS meeting.

7. Trip Report — AP1000 Workshop in China

Dr. Thomas Kress, Chairman of the ACRS Subcommittee on Future Plant Designs, provided a trip report to the Committee regarding a workshop held in Beijing, China on July 26-28, 2004. He stated that the workshop was the direct result of a proposal from the Chinese regulatory authorities made to Chairman Diaz during his visit in April 2004. The purpose of the workshop was to acquaint the Chinese with the U.S. nuclear regulatory process, particularly for design certification, and specifically with the activities associated with the design certification of the AP1000. The workshop team from the NRC was headed by Mr. Ashok Thadani. Other team members included Dr. Stephen Bajorek, Mr. Jerry Wilson, and Mr. Kevin Burke.

The team members presented an overview of the NRC, the differences between the 10 CFR Parts 50 and 52 licensing processes, specifics on the design certification process, an overview of the AP1000 design, a description of the vendor's test program and analytical models, a summary of the NRC's treatment of severe accidents, a summary of several policy and technical issues, and the role of the ACRS in the design certification process.

All of the presentations were very well received and good, probing questions were asked by the attendees. The team members exhibited great competence in their presentations and answers to questions.

8. Trip Report — Chalk River Facility in Canada

In response to the ACRS Chairman's request, Dr. Dana Powers provided a brief summary of his visit to the Chalk River facility in Canada. He stated that the ACRS is aware of the pre-application efforts for the Advanced Candu Reactor (ACR)-700 design. Originally, the ACRS Planning and Procedures Subcommittee has had an interest in examining a possible schedule to visit the Chalk River facility.

Currently, it seems that the detailed analyses have not been completed of either design basis accidents or severe accidents for the ACR-700. Design. Dr. Powers recommended postponing the site visit at a later date, and noted some of the issues that the ACRS will encounter with the certification of the ACR-700 design. Such issues could include the adequacy of the staff's review of thermal hydraulic analyses, adequacy of the staff's application to ACR-700 of rules and regulations established originally for boiling water and pressurized water reactors, and fire safety issues.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

- The Committee considered the EDO's response of July 30, 2004, to conclusions and recommendations included in the ACRS letter of April 27, 2004, concerning SECY-04-0037, "Issues Related to Proposed Rulemaking to Risk-Inform Requirements Related to Large Break Loss-of-Coolant Accident (LOCA) Break Size and Plans for Rulemaking on LOCA with Coincident Loss-of-Offsite Power." The Committee decided that it was satisfied with the EDO's response.

**The staff will consider the need to develop criteria that could be used to monitor and to limit any changes in risk associated with late containment failure as part of a future revision to RG 1.174.**

- The Committee considered the EDO's response of July 20, 2004, to conclusions and recommendations included in the ACRS letter of June 9, 2004, concerning Digital Instrumentation and Controls Research Program.

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

- The Committee considered the EDO's response of July 21, 2004, to conclusions and recommendations included in the ACRS letter of June 15, 2004, concerning Draft Final 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems, and Components for Nuclear Power Reactors." The Committee decided that it was satisfied with the EDO's response.

**The staff committed to keeping the ACRS apprized of the insights gained from the trial use of Regulatory Guide 1.201 in light of the issues and concerns highlighted in the Committee's June 15, 2004 report.**

- The Committee considered the EDO's response of August 10, 2004, to conclusions and recommendations included in the ACRS report of July 20, 2004, concerning a Report on the Safety Aspects of the Westinghouse Electric Company Application for Certification of the AP1000 Passive Plant Design.

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

- The Committee considered the EDO's response of August 25, 2004, to conclusions and recommendations included in the ACRS letter of May 21, 2004, concerning Resolution of Certain Items identified by the Advisory Committee on Reactor Safeguards in NUREG-1740, "Voltage-Based Alternative Repair Criteria." In general the Committee was satisfied with the EDO's response. However, the staff disagreed with the Committee recommendation regarding the best estimation of the heat transferred from the vessel to the steam generator during severe accidents. The Committee plans to prepare a response to the EDO on this matter during the October 2004 meeting.

**The staff committed to keep the Committee informed of activities related to open items in the Steam Generator Action Plan and to provide a copy of the screening analysis for Generic Issue-197 "Iodine Spiking Phenomena." The Committee plans to review steam generator tube pullout force data when provided by the staff.**

#### OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from July 7, 2004 through September 7, 2004, the following Subcommittee meetings were held:

- Planning and Procedures - September 7, 2004

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

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

- The Committee plans to provide the staff with a list of topics to be discussed at a future Materials and Metallurgy Subcommittee meeting regarding the resolution of technical issues raised by the staff during their review of proposed technical specifications for ensuring steam generator tube integrity.

- The staff committed to revising the standard review plan and inspection procedures to incorporate knowledge gained from previous reviews of license renewal applications. This guidance will assist the staff in selecting the systems to be examined in detail as part of the review of license renewal applications.
- The Committee decided to review the draft Regulatory Guide DG-1XXX, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," after the public comments have been resolved.
- The Committee plans to discuss the assessment of the quality of the research projects on Sump Blockage and MACCS Code during October 7-9, 2004 ACRS meeting.

#### PROPOSED SCHEDULE FOR THE 516<sup>th</sup> ACRS MEETING

The Committee agreed to consider the following topics during the 516<sup>th</sup> ACRS meeting, to be held on October 7-9, 2004:

- Safety Evaluation of the Industry Guidelines Related to Pressurized Water Reactor (PWR) Sump Performance
- Pre-Application Safety Assessment Report for the Advanced CANDU 700 (ACR-700) Design
- Proposed Recommendations for Resolving GSI-185, "Control of Recriticality Following Small-Break LOCAs in PWRs"
- Mitigating System Performance Index Program
- Response to the August 25, 2005 EDO Response to the May 21, 2004 ACRS Letter on Resolution of Certain Items Identified by the ACRS in NUREG-1740, "Voltage-Based Alternative Repair Criteria"
- Technology Neutral Framework for Future Plant Licensing
- Assessment of the Quality of the NRC Research Projects
- Divergence in Regulatory Approaches and Requirements Between U.S. and Other Countries

Sincerely,

**/RA/**

Mario V. Bonaca  
Chairman