



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

August 18, 2011

The Honorable Gregory B. Jaczko
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: SUMMARY REPORT – 585th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, JULY 13-15, 2011

Dear Chairman Jaczko:

During its 585th meeting, July 13-15, 2011, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report, letters, and memoranda:

REPORT

Report to Gregory B. Jaczko, Chairman, NRC, from Said Abdel-Khalik, Chairman, ACRS:

- Response to the June 8, 2011, EDO Letter Regarding Draft Final Revision 3 of Regulatory Guide (RG) 1.152, "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants," dated August 11, 2011

LETTERS

Letters to R. W. Borchardt, Executive Director for Operations, NRC, from Said Abdel-Khalik, Chairman, ACRS:

- Topical Report NEDC-33173P, Supplement 2, Parts 1, 2, and 3, "Analysis of Gamma Scan Data and Removal of Safety Limit Minimum Critical Power Ratio (SLMCPR) Margin," dated August 11, 2011
- Request for Waiver of ACRS Review of Final Rule: U.S. Advanced Boiling Water Reactor Aircraft Impact Design Certification Amendment (RIN 3150-AI84), dated July 20, 2011

MEMORANDA

Memoranda to R. W. Borchardt, Executive Director for Operations, NRC, from Edwin M. Hackett, Executive Director, ACRS:

- Information Requested During the April 7, 2011, ACRS Meeting, dated July 20, 2011
- Supplement 2 to NUREG-1891, dated July 20, 2011
- Proposed Regulatory Guide DG-1270, dated July 20, 2011.
- Draft Final Regulatory Guide 1.156, dated July 20, 2011

HIGHLIGHTS OF KEY ISSUES

1. Safety Evaluation Report Associated with NEDC-33173, Supplement 2, Parts 1, 2, and 3, "Analysis of Gamma Scan Data and Removal of Safety Limit Minimum Critical Power Ratio (SLMCPR) Margin"

The Committee met with representatives of the NRC staff and General Electric Hitachi (GEH) to discuss the safety evaluation report (SER) associated with Supplement 2 to NEDC-33173P-A, "Analysis of Gamma Scan Data and Removal of Safety Limit Minimum Critical Power Ratio (SLMCPR) Margin." The main topical report, NEDC-33173P-A, "Applicability of GE Method to Expanded Domains," describes the extension of the GEH suite of analytical methods and codes to prediction of core response for operations at extended power uprate (EPU) and maximum extended load limit line analysis plus (MELLLA+) domains. The SER for NEDC-33173P-A applied a 0.02 SLMCPR margin for EPU operation and a 0.03 SLMCPR margin for MELLLA+ operation because of uncertainties associated with the bundle and pin powers that factor into the SLMCPR calculations. In Supplement 2 to NEDC-33173P-A, GEH provided the bundle and pin power gamma scan data for fuel loaded in Cofrentes Cycle 15 (BWR/6, uprated by 12%) and Fitzpatrick (BWR/4 uprated by 4.1%), respectfully. The staff presented their basis for approving the removal of the 0.02 SLMCPR margin for EPU conditions. However, the staff concluded that an SLMCPR margin of 0.01 should be retained for MELLLA+ applications. This 0.01 margin is intended to account for the additional sources of uncertainties stemming from the spectrally hard conditions expected in the MELLLA+ domain, which is beyond the current BWR experience base.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated August 11, 2011, concurring with the staff's conclusion that the 0.02 additional margin on the SLMCPR imposed for EPUs may be removed. The Committee also recommended that the 0.03 additional margin on SLMCPR imposed for operation in MELLLA+ conditions be reduced to 0.02.

2. 10 CFR 50.46c Emergency Core Cooling System Rulemaking

The Committee met with representatives of the NRC staff and Electric Power Research Institute (EPRI) to discuss the staff's technical basis for the treatment of ballooned and ruptured regions of fuel cladding in loss-of-coolant accident (LOCA) analyses as part of the 10 CFR 50.46c emergency core cooling system rulemaking effort. In the NRC's integral LOCA research program, bending moment and failure energy were measured to determine the resistance to fracturing of ballooned cladding following a LOCA. The findings of this research program were used to develop a recommendation for how to address the ballooned region within the rulemaking for 10 CFR 50.46c. The staff described this recommended approach as well as how the ballooned region is addressed under the current 10 CFR 50.46 rule. The staff also discussed test results which indicate that limiting oxidation in the ballooned region continues to be appropriate. EPRI representatives stated that the industry is supportive of the NRC's research efforts on the mechanical behavior of the ballooned and ruptured cladding region but the application of the test results is not consistent with the principles of the proposed 10 CFR 50.46c rule, which is based on maintaining cladding ductility.

Committee Action

This was an information briefing. No Committee action was necessary. The Committee will review the proposed rule language for 10 CFR 50.46c during a future ACRS meeting.

3. Technical Basis and Rulemaking Language Associated with Low-Level Waste Disposal Site-Specific Analysis

The Committee met with representatives of the NRC staff to discuss the proposed rulemaking language and technical basis to include site-specific analyses into revisions of 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." The staff presented proposed draft rule language to add requirements for a performance assessment and an intruder assessment into the requirements of Subpart D of Part 61, and to include a time of compliance of 20,000 years for demonstrating compliance with the performance objectives in 10 CFR Part 61. The staff also discussed the public comments received on the proposed rule language from the public comment period and from a May 2011 public meeting held with stakeholders.

Committee Action

This was an information briefing. No Committee action was necessary. The Committee will review this matter and consider a proposed report during its September 8-10, 2011, meeting.

4. Small Modular Reactor Issue Identification and Ranking Process

The Committee met with representatives of the NRC staff to discuss the advanced reactor issue identification and ranking process (IIRP). Given the ongoing interest of small modular reactor (SMR) vendors to submit licensing applications in the near future, the staff developed this process to identify and prioritize issues under NRC control that could impede the design, licensing, construction, or export of SMRs. This phenomena identification and ranking table (PIRT)-like process uses knowledgeable staff, not directly tied to ongoing issue resolution, in facilitated brainstorming sessions to identify gaps in the NRC's programs and knowledge base related to SMR licensing and prioritize these issues. Potential results include the identification of rulemaking needs, policy and technical issues, design decisions, and confirmatory research needs. Several IIRPs were completed recently (e.g., emergency planning, source term, control room staffing) and several are underway (e.g., security, cross-organizational issues). The staff described the process and presented the results obtained for a recently completed IIRP on control room staffing.

Committee Action

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

5. Assessment of the Quality of Selected NRC Research Projects

The Committee discussed the status of the ACRS Panels' review of the quality assessment of NRC research projects on NUREG/CR-6969, "Analysis of Experimental Data for High Burnup PWR Spent Fuel Isotopic Validation – ARIANE and REBUS Programs (UO₂ Fuel)," and NUREG/CR-7027, "Degradation of LWR Core Internal Materials Due to Neutron Irradiation."

Committee Action

The Committee will discuss its report on the quality assessment of the research projects noted above during its September 8-10, 2011, meeting.

6. Request for Waiver of ACRS Review of Final Rule: U.S. Advanced Boiling Water Reactor Aircraft Impact Design Certification Amendment (RIN 3150-A184)

The Committee reviewed the request from the Division of New Reactor Licensing, Office of New Reactors, dated June 27, 2011, asking the ACRS to waive their review of the Final Rule on the U.S. Advanced Boiling Water Reactor (ABWR) Design Certification Amendment. The amendment to the certified ABWR design requested by the South Texas Project Nuclear Operating Company (STPNOC) on June 30, 2009, addresses the requirements of 10 CFR 50.150, "Aircraft Impact Assessment."

Committee Action

The Committee finds the request to waive ACRS review of the subject final rule to be acceptable because the changes to the final rule described in the June 27, 2011, request do not affect the conclusions in the Committee's September 20, 2010, report to the Commission on the staff's SER related to the amendment to the ABWR design certification.

7. Information Requested During the April 7, 2011, ACRS Meeting

On April 7, 2011, the NRC staff briefed the ACRS on the recent events at the Fukushima reactor site in Japan. In response to questions raised by ACRS members during this meeting, the staff committed to provide the Committee with additional information regarding the 50-mile evacuation zone recommendation. The Committee is aware that the June 17, 2011, letter from Chairman Jaczko to Senator Webb addressed some of the questions.

Committee Action

The Committee requested that the staff identify any information from the June 17, 2011, letter that is responsive to questions raised by the members during the April 7, 2011, ACRS meeting and provide these responses to the ACRS in writing. In addition, the ACRS requested a written response to questions raised at the April 7, 2011, meeting that were not addressed in the June 17, 2011, letter.

8. Supplement 2 to NUREG-1891

The Committee considered Supplement 2 to NUREG-1891, "Safety Evaluation Report Related to the License Renewal of Pilgrim Nuclear Power Station, Docket No. 50-293," and decided not to review it. The Committee has no objection to the staff's proposal to issue the supplement.

9. Proposed Regulatory Guide DG-1270

The Committee considered proposed Revision 2 to Regulatory Guide 1.91 (DG-1270), "Evaluations of Explosions Postulated to Occur at Nearby Facilities and on Transportation Routes near Nuclear Power Plants," and decided not to review it. The Committee has no objection to the staff's proposal to issue this Guide for public comment. The Committee would like to have an opportunity to review the draft final version of this Guide after reconciliation of public comments.

10. Draft Final Regulatory Guide 1.156

The Committee considered Revision 1 to Regulatory Guide 1.156, "Qualification of Connection Assemblies for Nuclear Power Plants," and decided not to review it. The Committee has no objection to the staff's proposal to issue this regulatory guide.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

The Committee considered the EDO's response of June 10, 2011, to comments and recommendations included in the May 20, 2011, ACRS letter on the high temperature gas-cooled reactor (HTGR) NRC research plan. The Committee decided that it was satisfied with the EDO's response.

The Committee considered the EDO's response of June 16, 2011, to comments and recommendations included in the May 25, 2011, ACRS report on the safety aspects of the license renewal application for the Salem Nuclear Generating Station. The Committee decided that it was satisfied with the EDO's response.

The Committee considered the EDO's response of June 22, 2011, to comments and recommendations included in the May 18, 2011, ACRS letter on the draft Final Rule, "Enhancements to Emergency Preparedness," and related regulatory guidance documents. The Committee decided that it was satisfied with the EDO's response.

The Committee considered the EDO's response of June 8, 2011, to comments and recommendations included in the April 20, 2011, ACRS letter on draft Final RG 1.152, Revision 3, "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants." The Committee issued a response to the NRC Chairman on this matter, dated August 11, 2011, reiterating the ACRS position on cyber security that it is important to find a path forward that would ensure the integration of safety and security reviews.

The Committee considered the EDO's response of June 24, 2011, to comments and recommendations included in the May 19, 2011, ACRS letter on draft Final Revision 1 to RG 1.44, "Control of the Processing and Use of Stainless Steel." The Committee decided that it was satisfied with the EDO's response.

SCHEDULED TOPICS FOR THE 586th ACRS MEETING

The following topics are scheduled for the 586th ACRS meeting, to be held on September 8-10, 2011:

- Selected Chapters of the SER with Open Items Associated with the US-APWR Design Certification and the Comanche Peak Combined License Application
- Draft Final Revision 2 to Regulatory Guide 1.115, "Protection Against Turbine Missiles"
- Near Term (90 day) NRC Task Force Report Regarding the Events at the Fukushima Site in Japan
- SER Associated with Revision 19 of the AP1000 Design Control Document (DCD) Amendment

- Technical Basis and Rulemaking Language Associated with Low-Level Waste Disposal and Site-Specific Analysis
- Draft Report on the Biennial ACRS Review of the NRC Safety Research Program
- Assessment of the Quality of Selected NRC Research Projects

Sincerely,

/RA/

Said Abdel-Khalik
ACRS Chairman

- Technical Basis and Rulemaking Language Associated with Low-Level Waste Disposal and Site-Specific Analysis
- Draft Report on the Biennial ACRS Review of the NRC Safety Research Program
- Assessment of the Quality of Selected NRC Research Projects

Sincerely,

/RA/

Said Abdel-Khalik
ACRS Chairman

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Letter to The Honorable Gregory B. Jaczko, NRC Chairman, from Said Abdel-Khalik, ACRS Chairman, dated August 18, 2011

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