



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

April 7, 2009

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

FROM: Cayetano Santos, Chief */RA/*
Reactor Safety Branch
Advisory Committee on Reactor Safeguards

SUBJECT: MINUTES OF THE 559th MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS (ACRS),
FEBRUARY 5-7, 2009

I certify that based on my review of the minutes from the 559th 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.

OFFICE	ACRS	ACRS:RSB
NAME	SMeador	CSantos/sam
DATE	04/ 07 /09	04/ 07 /09

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Date Certified: April 7, 2009

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During its 559th meeting, February 5-7, 2009, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following report, letters, and memoranda:

REPORT

Report to Dale E. Klein, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS:

- SECY-08-0197, "Review of Options to Revise Radiation Protection Regulations and Guidance with Respect to the 2007 Recommendations of the International Commission on Radiological Protection," dated February 18, 2009

LETTERS

Letters to R. W. Borchardt, Executive Director for Operations, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Draft Final NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking," and Draft Appendix A, "Example Implementation of the Process for the Treatment of PRA Uncertainty in a Risk-Informed Regulatory Application," dated February 23, 2009
- Draft Final Regulatory Guide DG-5021, "Managing the Safety/Security Interface," dated February 18, 2009

MEMORANDA

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

- Draft Regulatory Guides 1.189 (DG-1214), 1.28 (DG-1215), and DG-5028, dated February 11, 2009
- Draft Final Regulatory Guide 1.212, dated February 9, 2009

MINUTES OF THE 559th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
February 5-7, 2009
ROCKVILLE, MARYLAND

The 559th meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on February 5-7, 2009. Notice of this meeting was published in the *Federal Register* on January 27, 2009 (72 FR 4782-4783). The purpose of this meeting was to discuss and take appropriate action on the items listed in the meeting agenda. The meeting was open to public attendance.

A transcript of selected portions of the meeting is available in the NRC's Public Document Room at One White Flint North, Room 1F-19, 11555 Rockville Pike, Rockville, Maryland. Copies of the transcript are available for purchase from Neal R. Gross and Co., Inc., 1323 Rhode Island Avenue, NW, Washington, DC 20005. Transcripts are also available at no cost to download from, or review on, the Internet at <http://www.nrc.gov/ACRS/ACNW>.

ATTENDEES

ACRS Members: Dr. Mario V. Bonaca (Chairman), Dr. Said Abdel-Khalik (Vice-Chairman), Dr. J. Sam Armijo (Member-at-Large), Dr. George E. Apostolakis, Dr. Sanjoy Banerjee, Mr. Dennis Bley, Mr. Charles Brown, Dr. Michael Corradini, Mr. Otto L. Maynard, Dr. Dana A. Powers, Mr. Harold Ray, Dr. Michael Ryan, Dr. William Shack, Mr. John Sieber, and Mr. John Stetkar.

I. Chairman's Report (Open)

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

Dr. Mario V. Bonaca, Committee Chairman, convened the meeting at 8:30 a.m. In his opening remarks he announced that the meeting was being conducted in accordance with the provisions of the Federal Advisory Committee Act. He reviewed the agenda items for discussion and noted that no written comments or requests for time to make oral statements from members of the public had been received. Dr. Bonaca also noted that a transcript of the open portions of the meeting was being kept and speakers were requested to identify themselves and speak with clarity and volume.

II. Draft Final NUREG-1855, Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking

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

The Committee met with representatives of the NRC staff, Electric Power Research Institute (EPRI), and ERIN Engineering to discuss draft final NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision-making," and the associated Appendix A, "Example Implementation of the Process for the Treatment of PRA Uncertainty in a Risk-Informed Regulatory Application."

The NRC staff described key elements of the report and discussed the collaboration between the NRC and EPRI in generating this document. EPRI described the scope and limitations of the report, and explained that the report addresses model and completeness uncertainties, and identifies which uncertainties should be designated as “key.”

EPRI also discussed the changes made to the report since the ACRS subcommittee meeting on September 30, 2008. In the new draft, the scope of the report has been clarified and the emphasis has been placed on what is needed (rather than what is not needed). Many of these changes were in response to the members’ comments at the September 30, 2008, subcommittee meeting.

ERIN Engineering also discussed an example of the use of the methods described in the main body of the document. The example is based on a proposed extension of the allowed outage time for the residual heat removal system at a hypothetical Boiling Water Reactor/4.

The Committee issued a letter to the Executive Director for Operations on this matter, dated February 23, 2009, recommending that NUREG-1855 be published without the Appendix A, and that the NRC staffs revise and separately publish the Appendix A to include additional examples illustrating applications of the diverse aspects of the guidance described in the NUREG report. The ACRS will review the revised Appendix A when made available by the staff.

III. Draft Final Regulatory Guide DG-5021, Safety/Security Interface

[Note: Ms. Maitri Banerjee was the Designated Federal Official for this portion of the meeting.]

The Committee met with representatives of the NRC staff to discuss the draft final Regulatory Guide DG-5021 that was developed to support the new rule 10 CFR 50.78, “Safety/Security Interface Requirements for Nuclear Power Reactors.” The draft final regulatory guide, reviewed by the Committee, incorporated public comments, as appropriate. Although the emphasis of DG-5021 is to identify areas where planned or emergent changes could impact plant security provisions, it cites the use of existing change management processes for identifying adverse impact on safety. The Committee agreed with the provisions of the guide including the use of current management controls and processes, enhanced by additional screening processes and training, for implementation of the rule.

The Committee issued a letter to the Executive Director for Operations on this matter, dated February 18, 2009, recommending that the draft Regulatory Guide DG-5021 be issued as final. The Committee also recommended that all regulatory guidance for changes in the licensing basis (e.g., Regulatory Guide 1.174, “An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis”) be updated to address consideration of the interface between safety and security, and the impact of the change on security.

IV. Digital Upgrade of the Oconee Reactor Protection System and Engineered Safety Features

[Note: Ms. Christina Antonescu was the Designated Federal Official for this portion of the meeting.]

The Committee met with representatives of the NRC staff and Duke Energy to discuss the digital upgrade of the Oconee Reactor Protection System (RPS) and Engineering Safety Features (ESF). The staff provided an overview of the Oconee License Amendment Request (LAR) to replace the existing RPS and ESF systems with a Digital Reactor Protective System/Engineered Safeguard Protective System (RPS/ESPS) system which is based on the TELEPERM XS platform. The new Oconee Digital Protection System will provide a plant response that does not require any manual operator actions for at least 30 minutes for all Chapter 15 accidents with the single exception of a manual trip during a small break loss of coolant accident.

Based on the review of the LAR, the staff has identified several issues. The primary issues include:

- Diversity and Defense-in-Depth
- Communications
- Changes to TXS Platform

The staff and Duke Energy have developed a strategy to resolve the remaining issues. The final Safety Evaluation Report (SER) is planned for completion in July 2009. This was an information briefing and no Committee action was necessary at this time. The Committee plans to review the final SER associated with this LAR.

VI. SECY-08-0197, Options to Revise Radiation Protection Regulations and Guidance Based on Recommendations of the International Commission on Radiological Protection (ICRP)

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

The Committee met with representatives of the NRC staff to discuss the Options Paper to revise the NRC radiation protection regulations and guidance based on the 2007 ICRP recommendations included in Publication 103, "The 2007 Recommendations of the International Commission on Radiological Protection." During the 557th ACRS meeting held November 6-7, 2008, the NRC staff presented to the ACRS a plan to prepare the Options Paper.

The NRC staff presented three options for revising the NRC radiation protection regulatory framework: (1) Make no changes to the existing regulatory framework; (2) Update certain portions of the regulations, not previously revised, to conform to existing 10 CFR Part 20 concepts and quantities based on ICRP Publications 26 and 30; and (3) Begin the process of aligning, to a greater degree, the NRC's regulatory framework with the recommendations contained in ICRP Publication 103. The staff prefers Option 3. Under this Option, several factors were identified, including: the schedule upon which additional technical information will be available; the need to revise certain regulations and address their implementation for licensing new reactors; the variety of other technical and policy issues that may be considered when various portions of the regulations are proposed for amendment; and the availability of resources.

The Committee issued a report to the NRC Chairman, dated February 18, 2009, endorsing the NRC staff's preferred option 3. This Option would begin the process of moving toward a greater degree of alignment between the regulatory framework of 10 CFR Parts 20 and 50 and Appendix I of Part 50 with the recommendations contained in the December 2007 ICRP Publication 103. In addition, the Committee recommended that the NRC staff continue its participation in ICRP and other national and international committees and standards organizations, and that the NRC not develop separate radiation protection regulations for plant and animal species.

VII. Subcommittee Reports

Plant License Renewal Subcommittee Report (Beaver Valley License Renewal Application)

The Chairman of the Plant License Renewal Subcommittee provided a report to the Committee summarizing the results of the February 4, 2009, meeting with the NRC staff and representatives of FirstEnergy Nuclear Operating Company (FENOC) to review the draft Safety Evaluation Report (SER) related to license renewal application for the Beaver Valley Power Station (BVPS) Units 1 and 2. The NRC staff's draft SER, issued in January 2009, contained one open item. The current operating license expires on January 29, 2016, for Unit 1, and May 27, 2027, for Unit 2. During the meeting, FENOC representatives described the operating history, the license renewal review methodology, the aging management programs, and its commitment tracking system. The primary issues discussed were the submerged 4kV cables, the BVPS Unit 1 containment liner, fatigue cycles estimates, the nil ductility acceptance criterion, and the Boral Surveillance Program. The Committee plans to review the final SER related to the license renewal application for the BVPS, Units 1 and 2 in July 2009.

Plant License Renewal Subcommittee Report (NIST License Renewal Application)

The Chairman of the Plant License Renewal Subcommittee provided a report to the Committee summarizing the results of the February 4, 2009, meeting with the NRC staff and representatives of the National Institute of Standards and Technology (NIST) to review the license renewal application for the National Bureau of Standards Reactor (NBSR) and the associated NRC staff's SER with Open Items. On April 9, 2004, NIST submitted its application to renew the NBSR operating license for an additional 20 years. The applicant continues to operate the facility in accordance with the current license under the provisions of 10 CFR 2.109,

“Effect of timely renewal application.” The NRC staff’s draft SER was issued in January 2009 and contained one open item. The open item is related to the operator training and requalification program. The NRC staff is currently reviewing the applicant’s program in this area. The Committee plans to review the final SER related to the license renewal application for the NBSR in April 2009.

VIII. Executive Session

[Note: Mr. Edwin Hackett 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 response of December 2, 2008, to conclusions and recommendations included in the October 29, 2008, ACRS interim letter on Chapters 19 and 22 of the NRC staff’s safety evaluation report with open items related to the certification of the ESBWR design. The Committee decided that it was satisfied with the EDO’s response.
- The Committee considered the response of the Director, Office of Nuclear Regulatory Research (RES) dated December 15, 2008, on quality assessment of the selected research projects included in the ACRS letter dated October 22, 2008. The Committee decided that it was satisfied with the RES response.

B. Report of the Planning and Procedures Subcommittee Meeting

Review of the Member Assignments for the February ACRS Meeting

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

Anticipated Workload for ACRS Members

The anticipated workload for ACRS members through April 2009 was discussed. The objectives were:

- 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

Actions, Agreements, Assignments, and Commitments from the ACRS Retreat

The 2009 ACRS retreat was held on January 27-28, 2009 at the Residence Inn, Bethesda. Actions, agreements, and commitments resulting from the retreat were discussed.

Staff Requirements Memorandum (SRM)

In the January 8, 2009 SRM resulting from the November 7, 2008 ACRS meeting with the Commissioners, the Commission stated:

- The staff should consider what has been learned from the analyses of PWR sump performance and determine if issues have arisen that call for revising BWRs.
- With regard to power uprates for BWRs consistent with previous Commission direction, the staff should continue working to resolve the differences of opinion between the Committee and the staff concerning containment overpressure credit, and as necessary and appropriate, provide policy decision papers to the Commission if a resolution cannot be reached.

Browns Ferry Units 1, 2, and 3 Extended Power Uprate Applications

The staff provided a draft Safety Evaluation (SE) report for Browns Ferry Units 1 and 2 in early April in support of a Subcommittee meeting in May and full Committee meeting in June. For Unit 3, the steam dryer information may not be available until late (October/November) 2009. There were some discussions among the staff about providing a partial SE to the ACRS in April for discussion at the May Subcommittee and June full Committee meetings. After the steam dryer information is made available to the Committee, it needs to review only that information and provide a final report to the Commission. The staff would like to know whether the Subcommittee/full Committee will be willing to review partial SE for Unit 3 and possibly for Units 1 and 2 in May and June respectively.

It should be noted that during its October 20, 2006 meeting with the Commission, the Committee stated the following:

ACRS will review the extended power uprate application for Browns Ferry Units 1, 2, and 3 after receiving the complete Safety Evaluation report.

Biennial ACRS Report on the NRC Safety Research Program

The biennial ACRS report on the NRC Safety Research Program is due to the Commission on March 15, 2010. Drs. Shack and Powers will have the lead in coordinating the preparation of the report. Assignments for the members as well as format, content, and schedule for providing input to the report will be provided to the members during the March ACRS meeting.

Quality Assessment of Selected NRC Research Projects

During its November 2008 meeting, the Committee selected the following research projects and Panels for quality assessment in FY2009:

- NUREG/CR-6964, "Crack Growth Rates and Metallographic Examinations for Alloy 600 and Alloy 82/182 from Field and Laboratory Materials Testing in PWR Environments"
Panel: Armijo (Chair), Abdel-Khalik and Ray
- NUREG/CR-XXXX, "Diversity and Defense-in Depth for Digital Instrumentation and Control Systems"
Panel: Brown (Chair), Apostolakis and Sieber

Normally, the Committee report is provided to the RES Director in October of each year. Since the Committee needs to prepare its biennial report on the NRC Safety Research Program this year, Dr. Powers proposed that the Committee complete its Quality Assessment report in July 2009.

Tour of the Mitsubishi and Westinghouse Simulators in Pittsburgh

Several ACRS members and ACRS staff toured the Westinghouse simulator on February 18 and the Mitsubishi simulator on February 20, 2009. On February 19, 2009, a Subcommittee meeting was scheduled to discuss selected Topical reports associated with US-APWR. Proposed schedule for the Subcommittee meeting and an itinerary for touring the simulators was discussed.

Reappointment of an ACRS Member

The Commission has reappointed Dr. Shack for a fifth term. He joins the elite group of members [Drs. Siess (24 yrs.), Okrent (24 yrs.), and Kerr (20 yrs.)] who served 20 or more years on the Committee.

ACRS Meeting With the Commission

The ACRS is scheduled to meet with the Commission between on Thursday, June 4, 2009 to discuss items of mutual interest. A list of proposed topics was provided to the Planning & Procedures Subcommittee and the full Committee during the March meetings.

TRACE Thermal-Hydraulic System Analysis Code

During the ACRS meeting with the Commission on November 7, 2008, Dr. Abdel-Khalik made several comments regarding the capability of the TRACE code in evaluating the passive system safety performance. Dr. Sheron, the RES Director, sent a memorandum to the Commissioners responding to the comments made by Dr. Abdel-Khalik at the Commission meeting.

Revision to the ACRS Charter

In approving the renewal of the ACRS Charter, the Commission added a new paragraph stating that the ACRS shall report to and advise the Commission on issues associated with nuclear materials and waste management. This action stems from the merger of the ACNW&M with the ACRS.

Draft Regulatory Guides

The staff plans to issue the following Draft Regulatory Guides (DG) for public comment and would like to know whether the Committee wants to review these Guides prior to being issued for public comment.

- Proposed Revision 2 to Regulatory Guide 1.189 (DG-1214), "Fire Protection for Nuclear Power Plants"
Regulatory Guide 1.189 lacked clear guidance with respect to the treatment of fire-induced circuit failures. In SECY-08-0093, "Resolution of Issues Related to Fire-Induced Circuit Failures," the staff proposed clarifications to the NRC's guidance with regard to fire-induced circuit failures. The proposed Revision 2 (DG-1214) is to include the fire-induced circuit-failure clarifications described in SECY-08-0093.
- Proposed Revision 4 to Regulatory Guide 1.28 (DG-1215), "Quality Assurance Program Requirements (Design and Construction)"
Regulatory Guide 1.28, Revision 3, endorsed the American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) NQA-1-1983 standard, "Quality Assurance Program Requirements for Nuclear Power Plants." The proposed Revision 4 endorses the ANSI/ASME NQA-1-2008 standard, "Quality Assurance Program Requirements for Nuclear Facilities Applications," including ANSI/ASME NQA-1a-2008 (which is Addendum A to the NQA-1 standard).
- Draft Regulatory Guide (DG) - 5028, "Guidance on Making Changes to Emergency Response Plans for Nuclear Power Reactors"
The NRC staff's objectives for 10 CFR 50.54(q) are to ensure that licensees (1) follow and maintain the effectiveness of their approved emergency plans, (2) evaluate proposed changes to these plans for their impact on the effectiveness of the plans, and (3) obtain prior NRC approval for changes that would reduce the effectiveness of the plans. These actions are essential if these plans are to continue to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The purpose of DG-5028 is to provide guidance on the implementation of 10 CFR 50.54(q) with respect to making changes to emergency response plans.

Final Regulatory Guide

The staff issued the following Regulatory Guide without ACRS review and would like to know whether the Committee wants to review this Guide.

- Regulatory Guide 1.212, "Sizing of Large Lead-Acid Storage Batteries"

DG-1183 "Sizing of Large Lead-Acid Storage Batteries," was issued for public comment. No public comments were received. DG-1183 was issued as Regulatory Guide 1.212 "Sizing of Large Lead-Acid Storage Batteries," on November 20, 2008, without providing to the ACRS for review.

Travel Request

Dr. Said Abdel-Khalik requested Committee approval and support to attend the meeting of the OECD/NEA Task Force on Advanced Reactors Experimental Facilities, scheduled to be held between in Paris.

The meeting was adjourned at 7:00 p.m. on February 6, 2009.