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

December 28, 2009

MEMORANDUM TO: ACRS Members

FROM: Sherry Meador **/RA/**
Technical Secretary, ACRS

SUBJECT: CERTIFICATION OF THE MEETING MINUTES FROM THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS 566th FULL COMMITTEE MEETING HELD ON OCTOBER 8-10, 2009 IN ROCKVILLE, MARYLAND

The minutes of the subject meeting were certified on October 23, 2009 as the official record of the proceedings of that meeting. A copy of the certified minutes is attached.

Attachment:
As stated

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

October 23, 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 566th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS), OCTOBER 8-10, 2009

I certify that based on my review of the minutes from the 566th 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	10/23/2009	10/23/2009

OFFICIAL RECORD COPY

CERTIFIED Date Certified: 10/23/2009

TABLE OF CONTENTS
MINUTES OF THE 566th ACRS MEETING

October 8-10, 2009

During its 566th meeting, October 8-10, 2009, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letter, and memorandum:

REPORTS

Reports to Gregory B. Jaczko, Chairman, NRC, from Mario V. Bonaca, Chairman, ACRS:

- Report on the 3-Dimensional Finite Element Analysis of the Oyster Creek Nuclear Generating Station Drywell Shell, dated October 16, 2009

- Report on the Draft Final Revision 2 to Regulatory Guide 1.189 (DG 1214), "Fire Protection for Nuclear Power Plants," dated October 20, 2009

- Closure of Steam Generator Action Plan Items 3.1k, 3.4, 3.5, 3.10, 3.11, and 3.12, dated October 22, 2009

- Report on the Safety Aspects of the License Renewal Application for the Susquehanna Steam Electric Station, Units 1 and 2, dated October 23, 2009

LETTER

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

- NRC Staff's Safety Evaluation Report with Open Items Regarding the North Anna, Unit 3 Combined License Application, dated October 23, 2009

MEMORANDUM

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

- Withdrawal of Regulatory Guide 1.56, dated October 14, 2009

MINUTES OF THE 566th MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

ROCKVILLE, MARYLAND

The 566th meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on October 8-10, 2009. Notice of this meeting was published in the *Federal Register* on September 25, 2009 (72 FR 49042-49043). 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 Bonaca (Chairman), Dr. Said Abdel-Khalik (Vice-Chairman), Mr. J. Sam Armijo (Member-at-Large), Dr. George E. Apostolakis, Dr. Sanjoy Banerjee, Dr. 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 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.

HIGHLIGHTS OF KEY ISSUES

II. Combined License (COL) Application for North Anna, Unit 3, Economic Simplified Boiling Water Reactor (ESBWR), and the Draft Safety Evaluation Report (SER) with Open Items

[Note: Mr. Christopher Brown was the Designated Federal Official for this portion of the meeting}

The Committee met with representatives of the NRC staff and the applicant, Dominion Virginia Power (Dominion), to discuss the COL application for North Anna, Unit 3, and the associated NRC staff's draft Safety Evaluation Report (SER) with Open Items. Some of the topics discussed were: hydrologic engineering; geology; qualification and In-Service Testing (IST) Programs; plant water system, and Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC).

Dominion representatives provided an overview of the North Anna, Unit 3, COL activities. Dominion discussed the responses to selected requests for additional information (RAIs) issued by the staff. In particular, Dominion discussed RAIs related to the function of the makeup water system; during shutdown/refueling mode, the plant service water system, and the circulating water system.

The staff provided the status of the resolution of the open items in the draft SER, especially the open issues related to the buried fiberglass piping used in the plant service water system and the proposed resolution to this issue. The staff also discussed the remaining open items on stability of subsurface materials and foundations, and safety-related mechanical equipment qualification. In closing, the staff stated that there were a few open items related to ITAAC and the Design Acceptance Criteria (DAC) that will be treated in a generic manner in the future.

The Committee issued a letter to the Executive Director for Operations on this matter, dated October 23, 2009, recommending that the staff proceed with the development of the final SER after resolving all open items. The Committee stated that at this time it has not identified any significant issues regarding the North Anna COL application.

II. License Renewal Application and Final SER for the Susquehanna Steam Electric Station, Units 1 and 2

{Note: Mr. Peter Wen was the Designated Federal Official for this portion of the meeting]

The Committee met with representatives of the NRC staff and PPL Susquehanna, LLC (PPL or the applicant) to discuss the final SER related to the license renewal application for the Susquehanna Steam Electric Station, Units 1 and 2.

PPL discussed its general site information, operating experience, corrective actions, and commitment tracking process. PPL made 60 regulatory commitments for its license renewal program. The applicant also discussed four follow-up items resulting from the ACRS interim review: condition of underground medium voltage cables, station blackout recovery scoping, condition of containment, and aging of main steam line flow restrictors. PPL stated that it has established adequate aging management programs for the period of extended operation.

The NRC staff provided an overview of its review results, documented in the SER, and regional inspection results. The staff provided additional information regarding the applicant's plant-specific Boral operating experience, the Boral Coupon Testing Program, and the associated aging management program. The staff concluded that the applicant's Water Chemistry Program and Boral Coupon Testing Program are adequate to manage the aging effects of Boral used in the spent fuel pool racks. The staff also provided a brief discussion on the applicant's Metal Fatigue Monitoring Program and the effects of reactor coolant environment on the fatigue life of components and piping.

The Susquehanna final SER contained no open items. Based on its review, the staff concluded that the requirements of 10 CFR 54.29(a) have been met.

The Committee issued a report to the NRC Chairman on this matter, dated October 23, 2009, recommending that the PPL application for renewal of the operating licenses of Susquehanna Steam Electric Station, Units 1 and 2, be approved.

III. Resolution of Several Steam Generator Action Plan (SGAP) Items

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

The Committee met with representatives of the NRC staff to discuss the resolution of the remaining task items in the SGAP. In particular, the staff discussed the closure of task items 3.1k, 3.4, 3.5, 3.10, and 3.12. The SGAP task items were intended to develop a better understanding of reactor coolant system conditions and corresponding component behavior under severe accidents. In addition, the items were expected to define the risk associated with severe accident induced steam generator tube ruptures leading to containment bypass. The presentation topics were from the following technical areas of research: thermal-hydraulics (computational fluid dynamics methods), steam generator tube material failures, reactor coolant system material failures, component behavior studies, and probabilistic risk assessment (PRA). The thermal-hydraulics analysis takes the PRA sequence being evaluated and determines the fluid temperatures and pressures as a function of time. These conditions are then used as inputs to the reactor coolant system material failure and component behavior models. The thermal-hydraulic results and material failure information are combined into a PRA model to determine the risk associated with the consequential steam generator tube rupture. The methods and models for evaluating reactor components under severe accident conditions were discussed. The staff stated that the remaining SGAP items can be closed and that the remaining issues associated with consequential steam generator tube failure risk no longer require the level of coordination and agency focus required to implement the action plan process.

The Committee issued a letter to the Chairman on this matter, dated October 22, 2009, recommending that the staff proceed with closure of the remaining SGAP items.

IV. 3-Dimensional Finite Element Analysis of the Oyster Creek Drywell Shell

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

The Committee met with representatives of the NRC staff and Exelon Nuclear Generation Company (Exelon) to discuss the 3-dimensional (3-D) finite element analysis (FEA) of the Oyster Creek Nuclear Generating Station (Oyster Creek) drywell shell. During the Oyster Creek license renewal process, Exelon committed to perform a 3-D FEA of its drywell shell prior to entering the period of extended operation. By letter dated January 22, 2009, Exelon submitted the results of the Oyster Creek drywell shell analysis.

During the meeting, Exelon provided background information, described the drywell, discussed drywell thickness measurements, and summarized the analyses. Exelon explained why the ultrasonic thickness internal grid locations are representative of the general area average thickness. Exelon discussed specifically the modeling of the vent header boundary conditions, and explained the reasons why the vent pipes/header will not buckle before the shell. Exelon also discussed its finite element model, sensitivity studies, and overall results.

The staff presented its overview of the 3-D FEA and regional inspection results. The staff concluded that the Oyster Creek 3-D FEA was performed utilizing widely accepted engineering practices consistent with ASME Code, good engineering judgment, and applied conservatively biased realistic assumptions. The staff also concluded that the evaluations in all cases (baseline and sensitivity cases) confirm the Oyster Creek drywell shell complies with the ASME Code limits, and provide reasonable and realistic quantification of the available safety margin of the drywell shell for the postulated loading conditions.

The Committee issued a report to the NRC Chairman on this matter, dated October 16, 2009, stating that the analysis presented by Exelon fulfills its commitment to provide a modern, realistic, 3-D FEA that better quantifies the available safety margin for the current Oyster Creek drywell shell configuration. The Committee agreed with the staff's conclusion that this analysis was performed using good engineering practices and judgment and used conservatively biased realistic assumptions.

V. Draft Final Revision 2 to Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants"

[Note: Mrs. Kathy Weaver was the Designated Federal Official for this portion of the meeting]

The Committee met with representatives of the NRC staff to review draft final Regulatory Guide (RG) 1.189, Revision 2, "Fire Protection for Nuclear Power Plants." The staff described the changes in RG 1.189 including discussions of safe shutdown success path components and components important to safety, the use of operator manual actions and fire modeling for assessing components important to safe shutdown, and examples of safe shutdown success path components and components important to safe shutdown.

The staff also discussed the previously unresolved issues in relation to the Nuclear Energy Institute document (NEI), NEI 00-01, Revision 2, "Guidance for Post Fire Safe Shutdown Circuit Analysis," and subsequent staff resolution of these issues. In addition, the staff discussed the industry comment that NEI 00-01 should be referenced in the Guide.

The Committee issued a report to the NRC Chairman on this matter, dated October 20, 2009, recommending that Regulatory Guide 1.189, Revision 2 be issued as final.

VI. 10 CFR Part 52 Regulatory Process

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

Representatives of the NRC staff provided an overview of the new reactor licensing process under 10 CFR Part 52, "Early Site Permits, Standard Design Certifications, and Combined Licenses for Nuclear Power Plants." The staff discussed requirements for licensing such as applicant qualifications, design acceptability, environmental impacts, operational programs, site safety, and verification of the closure of ITAAC and DAC. The staff also discussed the regulatory process related to Early Site Permit (ESP), Design Certification, COL, Standard Design Approval, Manufacturing License, and Limited Work Authorization (LWA).

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

VII. Draft ACRS Report on the NRC Safety Research Program

The Committee discussed the draft 2010 ACRS biennial report to the Commission on its review and evaluation of the NRC Safety Research Program and will continue these discussions during its November 5-7, 2009 meeting.

VIII. AP1000 Subcommittee Report

The Chairman of the AP1000 Subcommittee provided a report regarding the matters discussed at the October 6-7, 2009, Subcommittee meeting. In that meeting, the Subcommittee was briefed by representatives of the NRC staff and the Westinghouse Electrical Company on three Chapters of the amended AP1000 Design Control Document (DCD) as well as the corresponding Chapters of the draft SER with open items. The specific Chapters were Chapter 3 (Design of Structures, Components, Equipment, and Systems), Chapter 8 (Electric Power), and Chapter 18 (Human Factors Engineering). The Standard Review Plan Sections 3.7 and 3.8 pertaining to the treatment of seismic issues and the design of containment structures were not discussed, and have been deferred to a later Subcommittee meeting. It was noted that these Chapters contain about 30 open items pertaining to the staff's AP1000 design review. The Subcommittee plans to continue its review of the AP1000 DCD amendments during future meetings.

VI. 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 September 22, 2009, to comments and recommendations included in the July 24, 2009 ACRS letter concerning draft final Regulatory Guide 1.215, "Guidance for ITAAC Closure under 10 CFR Part 52." The Committee was partially satisfied with the EDO's response.

  The staff has argued that using the design certification process, and post-licensing inspections and reviews, will be adequate to support DAC closure. Since detailed design information may not be available during the design certification process, the ACRS remains concerned that the DAC closure process is not satisfactorily defined to ensure adequacy of the design. ACRS and NRO have initiated a dialogue focused on this subject. The ACRS is looking forward to ongoing engagement on this subject with NRO as the staff continues to work out the details for ITAAC/DAC closure.

- The Committee considered the EDO's response of August 25, 2009, to comments and recommendations included in the July 27, 2009 ACRS letter concerning draft Final Revision 3 to Regulatory Guide (RG) 1.100, "Seismic Qualification of Electrical and Active Mechanical Equipment and Functional Qualification of Active Mechanical Equipment for Nuclear Power Plants." The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of August 27, 2009, to comments and recommendations included in the July 22, 2009 ACRS letter concerning draft Template NEI-08-08, "Generic FSAR Template Guidance for Life Cycle Minimization of Contamination," and Draft DC/COL-Interim Staff Guidance -06. The Committee decided that it was satisfied with the EDO's response.

B. Report of the Planning and Procedures Subcommittee Meeting

Review of the Member Assignments and Priorities for ACRS Reports and Letters for the May ACRS Meeting

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

Anticipated Workload for ACRS Members

The anticipated workload for the ACRS members through February 2010 was discussed and 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

Webstreaming of the ACRS Meetings

During its April and May 2009 meetings, the Committee discussed the March 6, 2009 Staff Requirements Memorandum (SRM) in which the Commission stated that:

If the ACRS decides to pursue Webstreaming of the ACRS Meetings, the ACRS should prepare a proposed plan reflecting their interest, in coordination with the Office of Administration.

During the May meeting, the Committee established a Panel to assess the pros and cons of participating in the Webstreaming Program and to provide recommendations for use by the Committee in making a decision. The Panel consists of:

Dr. Corradini, Chairman
Dr. Armijo
Dr. Banerjee
Mr. Ray
Mr. Stetkar.

ACRS Meeting With the Commission

At the September meeting, we informed the Committee of our intent to request the Commission to postpone the ACRS meeting with the Commission scheduled for December 4, 2009 to April 9, 2010. Accordingly, subsequent to the September ACRS meeting, we requested that the Commission postpone the meeting with the ACRS to April 2010. This request was made in view of the heavy workload at the December meeting, and postponing some items to the February 2010 meeting to accommodate the Commission meeting may have significant impact on the staff schedule. However, the Commission decided to meet with the ACRS between 9:30 and 11:30 a.m. on Friday, December 4, 2009. We plan to request that the meeting be held between 1:30 and 3:30 p.m. so as to accommodate scheduling some presentations in the morning of December 4, 2009.

A proposed list of topics for meeting with the Commission is as follows:

- Overview (Bonaca)

Major Accomplishments
Future Plan Design Activities
Containment Accident Pressure Issue
Major Areas of Ongoing and Future ACRS Activities

- Inspection, Tests, Analyses, and Acceptance Criteria (ITAAC)/Design Acceptance Criteria (DAC) Closure Process (Bley)

- Amendment to the AP1000 Design Control Document (Ray)

- Three-Dimensional Analysis of the Oyster Creek Drywell Shell (Shack)

- Beaver Valley Containment Liner Corrosion (Armijo)

Dr. Armijo commented that since the Beaver Valley containment liner corrosion is one of many issues reviewed by the Committee prior to recommending approval of the license extension, there is no need for a separate presentation on this issue, and it could be covered under the Overview.

As far as Item 3, AP1000, is concerned, the Committee has not written a letter on the amendment to the AP1000 Design Control Document. A letter is scheduled to be completed at the November ACRS meeting. Without a documented Committee position on this matter, this should not be included as a line item in the Agenda.

Mini Retreat

A mini retreat is scheduled for Saturday, November 7, 2009 to discuss the ACRS process for reviewing amendments to the Design Control Documents (DCD) related to the previously certified designs. Some of the issues for discussion include:

- Is it effective to apply the same process (chapter-by-chapter review) being used in reviewing the new design certification applications (e.g., ESBWR, EPR, US APWR) to the review of amendments to the DCDs associated with previously certified designs (e.g., AP1000, ABWR)?

- Does the Committee add value by reviewing all changes and is it the efficient use of Committee's time?

- Should the Committee review only the major design changes and other safety-significant changes? Should the Committee ask the staff to provide a list of such changes along with the staff's evaluation?

Travel Issue

The ACRS Travel team does its best to ensure all paper work is completed in a timely manner and airline tickets are issued by Carlson Travel. Under unusual circumstances, if the members do not have their tickets issued by Carlson, they are requested to purchase the ticket with the Government TRAVEL CARD.

Interim Staff Guidance and Regulatory Guide

a) Interim Staff Guidance

The staff issued the following Interim Staff Guidance (ISG) and would like to know whether the Committee wants to review this ISG.

ISG 09-016, "Compliance with 10 CFR 50.54(hh)(2) and 10 CFR 52.80(d) Loss of Large Areas of the Plant Due to Explosions or Fires from a Beyond-Design Basis Event."

The staff prepared ISG09-016 to provide guidance to new reactors regarding implementation of the new rule in 50.54(hh)(2) that implements Section B.5.b of the post 9/11 order to existing reactors.

Based on his review of ISG09-016, Dr. Bonaca recommends that the Committee review this ISG.

b) Draft Regulatory Guide

The staff plans to issue the following Draft Final Regulatory Guide and would like to know whether the Committee wants to review this Guide prior to being issued final.

Proposed Revision 1 to Regulatory Guide 1.62 (DG-1190), “Manual Initiation of Protective Actions”

Regulatory Guide 1.62 is a proposed Revision 1 that was issued as draft Regulatory Guide (DG-1190) on December 23, 2008 for public comment. The comment period ended February 20, 2009. The major changes to this draft final guide are: (1) to update the IEEE Standard 279-1971 to the IEEE Standard 603-1991, and (2) to expand the scope of manual actions covered by this Guide.

Based on his review of Regulatory Guide 1.62, Mr. Brown recommends that the Committee not review this Guide.

c) Withdrawal of Regulatory Guide

Regulatory Guide 1.56, “Maintenance of Water Purity in Boiling Water Reactors”

Regulatory Guide (RG) 1.56 was issued for comment in July 1978 and never finalized. RG 1.56 was intended to support Title 10, Part 50, of the *Code of Federal Regulations*, “Domestic Licensing of Production and Utilization Facilities,” Appendix A, “General Design Criteria for Nuclear Power Plants,” General Design Criterion (GDC) 14, “Reactor Coolant Pressure Boundary,” and GDC 31, “Fracture Prevention of Reactor Coolant Pressure Boundary.” RG 1.56 describes an acceptable method for maintaining water purity levels in the reactor coolant in order to ensure that degradation of the reactor coolant pressure boundary is

not exacerbated by poor chemistry conditions. The staff considers water chemistry to be an operational issue for plants. It is in the licensee's best interest to operate the plant with a chemistry regime that optimizes component performance. There is adequate industry-generated guidance available for licensees to develop a plant-specific water chemistry program. The industry routinely updates this guidance to incorporate the latest knowledge and lessons learned in the area of water chemistry.

Based on his review of the proposed withdrawal of this Guide, Dr. Armijo recommends the Committee to agree with the staff's proposal to withdraw this Guide.

Christmas Party

Each year the Committee sponsors a Christmas Party for the ACRS Office staff during the December meeting. The Committee should decide whatever it wants to keep up with the tradition this year.

The meeting was adjourned at 7:00 pm on October 9, 2009.