



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

November 3, 2008

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 556th MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS (ACRS),
October 2-4, 2008

I certify that based on my review of the minutes from the 556th 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	11/ 03 /08	11/ 03 /08

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CERTIFIED

Date Certified: November 3, 2008

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During its 556th meeting, October 2-3, 2008, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letter, and memoranda:

REPORTS

Reports to Dale E. Klein, Chairman, NRC, from William J. Shack, Chairman, ACRS:

- Report on the Safety Aspects of the License Renewal Application for the Shearon Harris Nuclear Power Plant, Unit 1, dated October 16, 2008
- Status of Resolution of Generic Safety Issue-191, "Assessment of Debris Accumulation on PWR Sump Performance," dated October 22, 2008

LETTER

Letter to R. W. Borchardt, Executive Director for Operations, NRC, from William J. Shack, Chairman, ACRS:

- Interim Letter 5: Chapters 19 And 22 of the NRC Staff's Safety Evaluation Report with Open Items related to the Certification of the ESBWR Design, **dated** October 29, 2008
- Letter to Dr. Brian Sheron, Director, Office of Nuclear Regulatory Research, NRC, from William J. Shack, Chairman, ACRS, ACRS Assessment of the Quality of Selected NRC Research Projects - FY 2008, dated October 22, 2008

MEMORANDA

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

- Proposed Interim Staff Guidance COL/ESP-ISG-004 and DC/COL-ISG-07, dated October 8, 2008
- Draft Final Revision to Regulatory Guides 1.114 and 3.11, dated October 8, 2008
- Withdrawal of Regulatory Guide 6.8, "Identification Plaque For Irretrievable Well-Logging Sources," dated October 8, 2008

MINUTES OF THE 556th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
October 2-3, 2008
ROCKVILLE, MARYLAND

The 556th meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on October 2-3, 2008. Notice of this meeting was published in the *Federal Register* on September 22, 2008 (72 FR 54635-54636). 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. William J. Shack (Chairman), Dr. Mario V. Bonaca (Vice-Chairman), Dr. Said Abdel-Khalik (Member-at-Large), Dr. George E. Apostolakis, Dr. Sam Armijo, 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, and Mr. John Stetkar. Mr. John Sieber was included via teleconferencing.

I. Chairman's Report (Open)

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

Dr. William J. Shack, 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. Shack 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. Dr. Shack then briefly discussed some items of mutual interest to the Committee [10-02 Transcript.pdf](#).

II. License Renewal Application and Final Safety Evaluation Report (SER) for the Shearon Harris Nuclear Power Plant, Unit 1 (Open)

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

The Committee met with representatives of the Carolina Power & Light Company (CP&L) (the applicant) and the NRC staff to discuss the license renewal application (LRA) for the Shearon Harris Nuclear Power Plant (HNP), Unit 1, and the associated NRC staff's final Safety

Evaluation Report (SER). The operating license for HNP, Unit 1 expires on October 24, 2026. The applicant has requested approval for continued operation for a period of 20 years beyond the current license expiration date.

In the final SER, the staff documented its review of the license renewal application and other information submitted by CP&L and obtained during the audits and an inspection conducted at the plant site. The staff reviewed the completeness of the applicant's identification of structures, systems, and components (SSCs) that are within the scope of license renewal; the integrated plant assessment process; the applicant's identification of the plausible aging mechanisms associated with passive, long-lived components; the adequacy of the applicant's aging management programs; and the identification and assessment of time-limited aging analyses requiring review.

The applicant addressed the open item, which is related to the scoping classification of feedwater regulating valves and bypass valves. HNP included these valves in the LRA within the scope of license renewal per the criteria of 10 CFR 54.4(a) (2), because it's believed that these valves are nonsafety-related components. However, the staff initially believed that these valves perform main feedwater isolation function under certain postulated transients and fulfill a safety-related function; therefore, these valves should be included within the scope under 10 CFR 54.4(a) (1). The applicant pointed out a past NRC precedence which allowed credit be taken for the backup nonsafety-related components to mitigate the consequences of a main steamline break inside containment. The staff agreed with the applicant's assessment and determined that the feedwater regulating and bypass valves are properly categorized as nonsafety-related components, and that the requirements of 10 CFR 54.4(a) (2) apply to these valves. The applicant also discussed electrical manholes issue. The applicant described the cable design, manhole inspection program, historical operating experience, and corrective actions.

The staff described its review of the applicant's scoping, screening, aging management programs, time-limited aging analyses, and the resolution of the open item, described above. The staff concluded that the requirement of 10 CFR 54.29(a) has been met.

The Committee issued a report to the NRC Chairman on this matter, dated October 16, 2008. The Committee concluded that the programs established and committed to by the applicant to manage age-related degradation provide reasonable assurance that the HNP, Unit 1 can be operated in accordance with the current licensing basis for the period of extended operation without undue risk to the health and safety of the public. The Committee recommended that the CP&L application for renewal of the operating license for HNP, Unit 1 be approved. In addition, the Committee recommended that prior to entering the period of extended operation the staff inspect the applicant's programs for managing water intrusion into underground cable vaults and cable insulation testing.

III. Status of Resolution of Generic Safety Issues (GSI)-191, "Assessment of Debris Accumulation on Pressurized-Water Reactor (PWR) Sump Performance" (Open)

[Note: Mr. David Bessette was the Designated Federal Office for this portion of the meeting.]

The Committee met with representatives of the NRC staff to discuss the status of resolution of Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR Sump Performance."

The Committee noted that significant progress has been made towards resolving GSI-191. All PWR licensees have installed significantly larger sump screens and some have undertaken further actions, such as changing fibrous insulation and chemical buffer. The staff described progress made toward resolving GSI 191, including the response of licensees to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized Water Reactors." The presentation focused on sump strainer head loss testing, chemical effects, and in-vessel sump strainer downstream effects. The staff indicated that testing of the new strainer design has been performed by nearly all licensees and that the initial review of the industry submittals by the staff is nearing completion. The staff provided an overview of the testing that has been performed and the results obtained.

The Committee issued a report to the NRC Chairman on this matter, dated October 22, 2008, stating that significant progress has been made towards resolving GSI-191. The Committee recommended, to ensure the prototypicality of tests for extrapolation to plant conditions, further guidance be developed for the test cases in which a significant portion of the debris is allowed to settle out upstream of the screens. Also, the staff should develop guidance with regard to the conditions and protocols for the PWR Owners Group tests to facilitate closure of issues related to in-vessel downstream effects.

IV. Selected Chapters of the SER Associated with the Economic Simplified Boiling Water Reactor (ESBWR) Design Certification Application (Open)

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

The Committee met with representatives of the NRC staff and General Electric – Hitachi Nuclear Energy (GEH) to discuss Chapters 19 and 22 of the NRC Staff's SER with Open Items associated with the Economic Simplified Boiling Water Reactor (ESBWR) Design Certification Application.

GEH discussed the objectives of the Design Certification Probabilistic Risk Assessment (PRA), and stated that 386 of 450 requests for additional information on this topic have been resolved. GEH intends to issue Revision 4 of the PRA in December 2008. GEH described the nature and approach of the risk analysis calculations, discussed the results and their implications for the ESBWR risk profile, and noted that the PRA was a major influence on the ESBWR design. They also discussed the criteria used to classify structures, systems, and components (SSCs) as part of the "regulatory treatment of non-safety systems" (RTNSS) program. A high relative risk importance is one of several criteria which can add SSCs to this list.

NRC staff stated that its review of these Chapters covered overall PRA quality as well as the seismic margins analysis, high winds analysis, non-power operational modes, severe accident management, and severe accident mitigation. The staff discussed a number of open items which need to be resolved and also summarized its review of RTNSS. The objectives of this review were to confirm that all non-safety SSCs requiring treatment are identified, to confirm that the reliability and availability missions for active systems are consistent with the risk assessment, and to confirm that the level of treatment is based on the ability to meet reliability/availability missions.

The Committee issued a letter to the Executive Director for Operations on this matter, dated October 29, 2008. The Committee recommended that a more detailed explanation of the applicant's analysis of the low failure probabilities of the passive systems and a more systematic evaluation of the relevant uncertainties be provided. In addition, the technical basis for the failure probability of the digital instrumentation and control systems should be provided and specific issues need to be clarified to ensure the functionality of the Basemat-Internal Melt Arrest and Coolability (BiMAC) device. The Committee also stated that it is awaiting the completion of the staff's review of Revision 3 of the ESBWR PRA, and that it would review the resolution of open items in SER Chapters 19 and 22 in future meetings.

V. Quality Assessment of Selected Research Projects (Open)

[Note: Dr. Hossein Nourbakhsh was the Designated Federal Official for this portion of the meeting.]

The Committee completed its report on the quality assessment of the research projects on: "Assessment of Predictive Bias and the Influence of Manufacturing, Model, and Power Uncertainties in NRC Fuel Performance Code Predictions," and NUREG/CR - 6943, "A Study of Remote Visual Methods to Detect Cracking in Reactor Components." The Committee issued a letter to the Director of the Office of Nuclear Regulatory Research, dated October 22, 2008, transmitting its report on the quality assessment of the research projects noted above.

VI. Historical Perspectives and Insights on Reactor Consequence Analyses (Open)

[Note: Dr. Hossein Nourbakhsh was the Designated Federal Official for this portion of the meeting.]

The Committee discussed the draft White Paper prepared by Dr. Nourbakhsh, ACRS Senior Technical Advisor, regarding historical perspectives and insights on reactor consequence analyses. The Committee plans to issue a letter transmitting the White Paper to the Executive Director for Operations during its November 2008 meeting.

VII. Materials, Metallurgy, and Reactor Fuels Subcommittee Report

The Chairman of the Materials, Metallurgy, and Reactor Fuels Subcommittee provided a report to the Committee summarizing the results of the October 1, 2008, meeting with the NRC staff to review the proposed amendment to 10 CFR 50.61: "Fracture Toughness Requirements for Protection against Pressurized Thermal Shock Events." He stated that the NRC staff provided a detailed discussion on the technical basis for the proposed supplemental rule, including treatment of uncertainties, PRA event sequence analysis, thermal hydraulic analysis, and probabilistic fracture mechanics analysis. The Subcommittee requested additional information regarding the independent review of the FAVOR code, the studies conducted to show the general applicability of the rule to the entire fleet of PWRs, and the justification for not treating thermal hydraulic parameter uncertainties. The staff is expected to provide additional information to the Subcommittee on these topics. The Subcommittee will review the draft final revision to 10 CFR 50.61 after reconciliation of public comments.

VIII. Reliability and PRA Subcommittee Report

The Chairman of the Reliability and Probabilistic Risk Assessment Subcommittee provided a report to the Committee summarizing the results of the September 28, 2008, meeting with the NRC staff and EPRI to discuss draft NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking," and the latest version of the companion EPRI report, "Treatment of Parameter and Model Uncertainty for Probabilistic Risk Assessments." The draft NUREG-1855 is intended to provide the needed guidance recommended by the ACRS. EPRI, in parallel with the NRC, has been developing guidance documents on the treatment of uncertainties. This work is meant to complement the guidance included in NUREG-1855. Where possible the NUREG-1855 refers to the EPRI work for acceptable treatment of uncertainties. The staff plans to complete the NUREG report by the end of the calendar year and then hold a public workshop.

X. Executive Session

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

A. EDO Commitments

- The Committee will review the draft final revision to 10 CFR 50.61, after reconciliation of public comments. Additional information was requested on the independent review of the FAVOR code, the studies conducted to show the general applicability of the rule to the entire fleet of PWRs, and the justification for not treating thermal hydraulic parameter uncertainties.
- The Committee would like to have an opportunity to review the final versions of Interim Staff Guidances COL/ESP-ISG-004 and DC/COL-ISG-07, after reconciliation of public comments.
- The Committee plans to review draft NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking," during a future meeting.
- The Committee plans to review the resolution of open items in SER Chapters 19 and 22 associated with the ESBWR design certification application.

B. Report of the Planning and Procedures Subcommittee Meeting

Review of the Member Assignments and Priorities for ACRS Reports and Letters for the October 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 ACRS members through December 2008 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

Meeting With the Commission

The ACRS is scheduled to meet with the Commission between 2:00 and 3:30 p.m. on Friday, November 7, 2008. Topics approved by the Commission are as follows:

1. Overview (WJS/SD)
 - Accomplishments
 - New Plant Activities
 - Ongoing/Future ACRS Activities, including challenges in the coming year
2. PWR Sump Performance Issues (SB/DB)
3. Committee Views on Power Upgrades for BWRs (MVB/ZA)
4. TRACE Computer Code Development (SAK/HPN)

Operating Plan, Self-Assessment, and Summary Matrix

The ACRS Operating Plan, Self-Assessment, and Summary Matrix of the ACRS reports and letters issued in FY2008 were due to the Commission on October 31, 2008.

Proposed Revisions to the ACRS/EDO Memorandum of Understanding (MOU)

This MOU establishes a process for ensuring that (1) the NRC staff solicits ACRS views early in the development of NRC rules and safety- and risk-significant guidance; in licensing decisions; and in resolution of technical issues, (2) the NRC staff keeps the ACRS informed of emerging issues, and (3) the ACRS responds to staff requests for review and comment in a timely manner. The significant changes are in the following areas:

- Scope of Responsibility - Since the merger of the ACNW&M and ACRS, the scope of responsibility has been expanded to include items from the MOU between the EDO and ACNW. All references to ACNW&M have also been removed.
- Submittal of Documents - The current MOU states that documents needed for discussions at a Subcommittee meeting will be provided no later than two weeks before the Subcommittee meeting. The ACRS staff proposes to change the deadline to four weeks before the Subcommittee meeting. The deadline for providing documents for full committee meetings will remain at four weeks prior to the meeting. The MOU also states that exceptions will be made only with the agreement of the appropriate Office Director and the ACRS Executive Director.
- Resolving ACRS Comments – The current MOU states that the EDO will ensure consideration of ACRS comments by the NRC staff and will respond to ACRS comments in a timely manner. The proposed change by the OEDO staff would state, "The EDO will ensure consideration of ACRS comments by the NRC staff. If no response is required, the ACRS will indicate such on correspondence to

the Commission or EDO. Otherwise, the EDO, or designee, will respond to ACRS comments in a timely manner. The EDO, or designee, may respond by email or letter addressed to the ACRS Chairman with a copy to the ACRS Executive Director.”

Draft Final Regulatory Guides

The staff plans to issue the following Draft Final Regulatory Guides and would like to know whether the Committee wants to review these Guides prior to issuance.

- Draft Final Revision 3 to Regulatory Guide 1.114 “Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Plant”

Revision 3 to Regulatory Guide 1.114 was issued for public comment as DG-1194. The public comment period closed on June 6, 2008. This Guide describes a method acceptable to the NRC staff for complying with the Commission regulations that require the presence of an operator at the controls of a nuclear power plant unit and a senior operator in the control room. This Guide was updated to correct references and improve language to enhance understanding.

- Draft Final Revision 3 to Regulatory Guide 3.11, “Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities”

Revision 3 to Regulatory Guide 3.11 was issued for public comment as DG-3032. The public comment period closed on May 16, 2008. This Guide has been updated to describe the latest engineering practices and methods generally considered by the NRC to be satisfactory for the design, construction, and inspection of the embankment retention systems used for retaining liquid and solid waste from uranium recovery operations.

Withdrawal of Regulatory Guide 6.8, “Identification Plaque for Irretrievable Well-Logging Sources”

The NRC is withdrawing Regulatory Guide 6.8, issued for public comments in October 1978, because it is no longer required. This Guide has never been issued as final. Regulatory Guide 6.8 references 10 CFR Parts 30 and 70, which no longer contain guidance for design or mounting of identification plaques. The current regulation regarding the identification plaques is found in 10 CFR 39.15, “Agreement with Well Owner or Operator.” 10 CFR 39.15(a)(5) provides a specific description for the design and mounting of identification plaques for irretrievable well-logging sources. The instruction in 10 CFR 39.15(a)(5) is sufficient without further guidance.

The staff proposes to withdraw the Regulatory Guide 6.8 and seeks Committee’s endorsement.

Proposed Interim Staff Guidances

The staff plans to issue the following proposed Interim Staff Guidances (ISGs) for public comment and would like to know whether the Committee wants to review these ISGs prior to issuance.

- Proposed Supplement to the Interim Staff Guidance COL/ESP-ISG-004, “Definition of Construction Interim Staff Guidance on Limited Work Authorizations”

This supplemental guidance would be added, along with the resolution of other issues identified in comments received from the public, to COL/ESP-ISG-004 to provide clarifications and examples related to the definition of construction. This additional guidance is intended to clarify the delineation of preconstruction activities and those activities that require prior NRC approval (i.e., construction activities). Upon receiving public comments, the NRC staff will evaluate and disposition the comments, as appropriate. Once the NRC staff completes the COL/ESP-ISG, including this supplemental information, the staff will issue it for use. The NRC staff will also incorporate the approved COL/ESP-ISG-004 into the next revisions of the Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants," and related guidance documents.

- Proposed Interim Staff Guidance DC/COL-ISG-07, "Assessment of Normal and Extreme Winter Precipitation Loads on the Roofs of Seismic Category I Structures"

The purpose of this ISG is to clarify the NRC position on identifying winter precipitation events as site characteristics and site parameters for determining normal and extreme winter precipitation loads on the roofs of Seismic Category I structures. This ISG revises the previously issued staff guidance in March 2007 in NUREG-0080, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants." The NRC staff issues DC/COL-ISGs to facilitate timely implementation of the current staff guidance and to facilitate activities associated with review of applications for design certifications and combined licenses by the Office of New Reactors. The NRC staff will also incorporate the approved DC/COL-ISG-007 into the next revision of the Standard Review Plan and related guidance documents.

ACRS Retreat

During the September meeting, the Committee decided to hold a retreat on January 27-29, 2009. Because of the new conference room construction, arrangements are being made to hold the retreat at the Residence Inn, Bethesda. A proposed list of topics for discussion during the retreat is being prepared by the ACRS Executive Director.

Proposed Changes to Design Certification Rulemaking Process

As part of the EDO's Lean Six Sigma effort for streamlining the design certification (DC) rulemaking, the staff reviewed the role of the ACRS during the rulemaking process. A SECY paper is about to start the concurrence process. The staff believes that the design to be certified constitutes the "proposed reactor safety standard" that the ACRS must review under its statutory role, as opposed to the words of the design certification rule itself. As such, the ACRS fulfills its statutory obligation during its review of the staff's safety evaluation report (SER) and DC application. Therefore, the ACRS does not need to review separately the Federal Register Notice of either the proposed or final design certification rulemaking. Due to the standardized rule language being created for the DC rulemaking, and due to the ACRS' previous review of the technical basis (DC application and associated SER) for the rulemaking, the staff proposes to streamline the ACRS review by focusing its review on the technical comments made on the proposed rule. As a result, all technical comments and the staff's resolution of these comments will be sent to the ACRS for review. In addition, since ACRS briefings will not be expected, they will not be scheduled, but will be provided upon request.

The staff is proposing to address the ACRS in the upcoming months (brown bag lunch, possibly) so that the details about the standardized rule and the overall streamlined process can be better explained. The staff seeks Committee's views on the proposed approach.

Travel Request

Dr. Armijo requests Committee approval and support to attend the ANS 2008 Winter Meeting on November 9-13, 2008, in Reno, Nevada.

The meeting was adjourned at 7:00 p.m. on Friday, October 3 2008.