



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

June 19, 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 552nd MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS (ACRS),
May 8-10, 2008

I certify that based on my review of the minutes from the 552nd 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	06/ 19 /08	06/ 19 /08

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CERTIFIED

Date Issued: June 11, 2008

Date Certified: June 19, 2008

TABLE OF CONTENTS
MINUTES OF THE 552nd ACRS MEETING

May 8-10, 2008

- I. Opening Remarks by the ACRS Chairman (Open)
- II. Selected Chapters of the SER Associated with the ESBWR Design Certification Application
- III. Insights from PHEBUS – FP Tests
- IV. Draft NUREG/CR Report on PRA Methods for Digital Systems
- V. Executive Session (Open)
 - A. Reconciliation of ACRS Comments and Recommendations
 - B. Report on the Meeting of the Planning and Procedures Subcommittee Held on May 7, 2008
 - C. Future Meeting Agenda

APPENDICES

- I. *Federal Register Notice*
- II. Meeting Agenda
- III. Attendees
- IV. Future Agenda and Subcommittee Activities
- V. List of Documents Provided to the Committee

During its 552nd meeting, May 8-9, 2008, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports, letters, and memoranda

REPORTS

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

- Draft NUREG/CR-6962, "Approaches for Using Traditional Probabilistic Risk Assessment Methods for Digital Systems," and Related Matters, dated May 19, 2008
- PHEBUS Fission Product (PHEBUS-FP) Program, dated May 30, 2008

LETTERS

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

- Interim Letter 3: Chapters 4, 6, 15, 18, and 21 of the NRC Staff's Safety Evaluation Report with Open Items Related to the Certification of the ESBWR Design, dated May 23, 2008
- Response to the January 17, 2008 EDO letter regarding Susquehanna Steam Electric Station Units 1 and 2 Extended Power Uprate (EPU), dated June 3, 2008

MEMORANDA

Memoranda to R. W. Borchardt, Executive Director for Operations, NRC, from Frank P. Gillespie, Executive Director, ACRS:

- Multiple Draft Regulatory Guides to be Issued as Final, dated May 15, 2008
- Withdrawal of Regulatory Guide 3.42, dated May 15, 2008
- Draft Regulatory Guides 1178, 1190, 1198 and 1200, dated May 15, 2008
- Draft Regulatory Guides 3024 and 3033, dated May 15, 2008

MINUTES OF THE 552nd MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
May 8-10, 2008
ROCKVILLE, MARYLAND

The 552nd meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on May 8-10, 2008. Notice of this meeting was published in the *Federal Register* on April 23, 2008 (72 FR 21994-21995) (Appendix I). The purpose of this meeting was to discuss and take appropriate action on the items listed in the meeting schedule and outline (Appendix II). 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. Dennis Bley, Dr. George E. Apostolakis, Mr. Charles Brown, Dr. Michael Corradini, Mr. Otto L. Maynard, Dr. Dana A. Powers, Mr. John Sieber, and Mr. John Stetkar. D. Joseph Armijo was unable to attend this meeting. For a list of other attendees, see Appendix III.

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 announced that Mr. Charles Brown, Jr. is an official member of the committee with an expertise in digital instrumentation and control.

II. Selected Chapters of the NRC Staff's Safety Evaluation Report with Open Items Related to the Certification of the ESBWR Design

[Note: Mr. David Bessette 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 Americas, LLC (GEH) to discuss Chapters 4, "Reactor," 6, "Engineered Safety Features," 15, "Accident Analysis," 18, "Human Factors Engineering," and 21, "Computer Code Validation,"

of the draft, Safety Evaluation Report (SER) with open items related to the ESBWR design certification application.

The staff presented a brief summary of the status of various issues in the above Chapters related to power flow stability, reliability of the vacuum breaker system, and applicability of the TRACG code for the ESBWR ATWS analysis. In addition, GEH and the staff discussed the ESBWR thermal-hydraulic issues raised by the ESBWR Subcommittee during its meetings on January 16-17 and April 9, 2008.

Committee Action

The Committee issued a letter to the EDO on this matter, dated May 23, 2008, identifying several issues that merit additional attention, including: confirmation of coupled neutronic and thermal-hydraulic stability including interactions between the core and chimney; assurance of the proper operation of the vacuum breaker system by appropriate surveillance testing, leakage monitoring, and isolation capability; demonstration of the performance of passive safety systems addressing issues such as gap binding; and assurance that the proposed principals of Human Factors Engineering are appropriately integrated into the ESBWR design.

III. Insights from the PHEBUS-Fission Product (PHEBUS-FP) Program

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

The Committee met with representatives of the NRC staff and the French Institut de Radioprotection et de Sûreté Nucléaire (IRSN) to discuss the results of the PHEBUS-FP tests. PHEBUS-FP is an international program carried out in Caderache, France. The PHEBUS facility is a small scale representation of the core, reactor coolant system, and containment. Five experiments were run varying the steam flow, irradiation of the fuel, control rod material (silver-indium-cadmium and boron carbide), and pH of the sump water in the containment module. The PHEBUS-FP experiments simulate the major aspects of a severe accident, including degradation of irradiated fuel, release of fission products, transport of fission products through a simulated reactor coolant system, and injection of the fission products into a simulated reactor containment.

The staff stated that the data from these integral tests were valuable for validating and refining the models and computer codes used for reactor accident analysis, in particular the MELCOR code, and in assessing the adequacy of accident source terms for use in reactor-related regulatory analyses. The results supported many of the modeling assumptions in MELCOR and the source term described in NUREG-1465. The first two tests have been used to improve the modeling of fuel slumping in MELCOR. The tests also indicated that cesium was not transported predominantly as cesium hydroxide as previously believed. Silver vaporized from control rod alloys transported to the containment sumps, where it reacted with iodine to form insoluble compounds that limit free iodine in the containment atmosphere. In the tests with a boron carbide control rod, there were other reactions of iodine that limited its release to the containment atmosphere. The nature of these reactions will be studied in follow-on programs. The release of iodine from the sump was observed to be independent of pH over a range from 5 to 9.

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated May 30, 2008, stating that PHEBUS-FP is an example of a successful international cooperative research program. It is yielding data for validating and refining of severe accident analysis computer codes as well as assessing the appropriateness of the accident source terms. The strategy for developing a mechanistic understanding of gaseous iodine behavior is appropriate and the planned work should be supported.

IV. Draft NUREG/CR Report on PRA Methods for Digital Systems

[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 its contractor Brookhaven National Laboratory (BNL) to discuss draft NUREG/CR- 6962, "Approaches for Using Traditional Probabilistic Risk Assessment Methods for Digital Systems."

The principal objective of the current BNL project is to determine the capabilities and limitations of using traditional reliability modeling methods to develop and quantify digital system reliability models, with the desired goal of supporting the development of regulatory guidance for assessing risk evaluations involving digital systems.

This draft NUREG/CR specifically addresses the development of a draft criteria and lays out the process by which the first reliability study of an example digital system will be performed. Preliminary work on these tasks indicates that the traditional methods of event tree/fault tree and Markov modeling appear to be useful for the PRA of Digital Instrumentation & Control (DI&C) systems, but it also reveals limitations in the state-of-the-art using traditional PRA methods and areas where additional research and development are needed.

As part of this BNL project, the traditional event tree/fault tree and Markov methods were applied to two example systems (referred to as "benchmark" test cases). The first benchmark test case involves a digital feed-water control system (DFWCS) of a two-loop pressurized water reactor and the second involves a reactor protection system.

Detailed information was only available for the DFWCS system. Therefore, the DFWCS was used in the NUREG/CR report to illustrate how the traditional reliability modeling methods will be applied in the later tasks of the project (i.e., in the actual benchmark studies).

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated May 19, 2008. The Committee recommended that the draft NUREG/CR-6962 be revised before publication to state clearly that its methods do not address software failures and that it employs simulation in addition to traditional PRA methods. The revised NUREG/CR report should focus on failure mode identification only. The Committee also stated that the staff should establish an integrated program that focuses on failure mode identification of DI&C systems and takes advantage of the insights gained from the investigations on traditional PRA methods and on advanced simulation methods. In addition, the quantification of the reliability of DI&C systems should be deferred until a good understanding of the failure modes is developed.

V. Plant License Renewal Subcommittee Report

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

The Chairman of ACRS Subcommittee on Plant License Renewal provided a report to the Committee regarding the interim review of the Carolina Power & Light Company's (CP&L) license renewal application for the Shearon Harris Nuclear Power Plant and the associated NRC staff's Safety Evaluation Report (SER) with Open Items.

The current operating license for the Shearon Harris Nuclear Power Plant expires on October 24, 2026. CP&L submitted the license renewal application on November 14, 2006, and the staff's draft SER was issued on March 18, 2008, and contains one open item. The open item is related to the classification applicable to feedwater regulating and bypass valves. The staff's position is that these valves are safety-related equipment, and should be scoped under

10 CFR 54.4(a)(1). The applicant believes, however, that they are not safety-related, and therefore, should be scoped under 10 CFR 54.4(a)(2). The staff and CP&L are in the process of resolving this open item.

Committee Action

The Committee plans to discuss the final SER related to the license renewal application for the Shearon Harris Nuclear Power Plant in a future meeting.

VI. Executive Session

[Note: Mr. Frank Gillespie 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 April 11, 2008, to comments and recommendations included in the March 6, 2008, ACRS report on the review and evaluation of the NRC Safety Research Program. The staff has agreed with the ACRS recommendations. The Committee will be afforded opportunities to discuss staff's responses during its future meetings on specific programs. The Committee decided that it was satisfied with the EDO's response.
- The Committee considered the EDO's response of April 17, 2008, to comments and recommendations included in the March 20, 2008, ACRS report on the review of Entergy Nuclear Operations' license renewal application for the Vermont Yankee Nuclear Power Station and the associated NRC staff's final SER. The Committee decided that it was satisfied with the EDO's response.
- The Committee considered the EDO's response of April 24, 2008, to comments and recommendations included in the March 20, 2008, ACRS report on the final review of Entergy Nuclear Operations' license renewal application for the James A. FitzPatrick Nuclear Power Plant and the associated NRC staff's final SER. The Committee decided that it was satisfied with the EDO's response.

- The Committee considered the EDO's response of April 24, 2008, to comments and recommendations included in the March 20, 2008, ACRS letter on Chapters 9, 10, 13, and 16 of the staff's SER related to the certification of the ESBWR design. 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 May 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 July 2008 were 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

Proposed Topics for Meeting With the NRC Commissioners

The ACRS is scheduled to meet with the Commission on Thursday, June 5, 2008. The following topics were approved by the Commission and will be discussed:

Overview (WJS/SD)

- Accomplishments
- License Renewal
- New Plant Activities
- Ongoing / Future Activities

Safety Research Program Report

Digital I&C Matters

State-of-the-Art Reactor Consequence Analyses

ESBWR Design Certification

Extended Power Uprate and Related Technical Issues

Visit to the Braidwood Nuclear Plant and Meeting with the Region III Administrator

The Committee will visit the Braidwood Nuclear Plant and the Region III offices. A proposed schedule agreed to by the Committee is as follows:

- Tuesday, July 22, 2008 — travel to Braidwood
- Wednesday, July 23, 2008 — plant visit
- Thursday, July 24, 2008 — meet with the Regional Administrator

OIG Report on the Audit of NRC's Power Uprate Program

The Office of the Inspector General (OIG) performed an audit of the NRC's Power Uprate Program and documented its findings and recommendations in a report dated March 11, 2008. A summary list of OIG recommendations is as follows:

- Revise Inspection Procedure (IP) 71004 to provide more specificity with regard to the use of the inspection procedure.
- Provide cross references from baseline and other inspection procedures that are called for in IP 71004.
- Document or index cumulative IP 71004 and other uprate-related inspection activities in a centralized location or in an easily retrievable way so that internal and external stakeholders can easily find the results.
- Develop training for technical reviewers and project managers that is specifically focused on writing or contributing to a safety evaluation.
- Implement internal controls to ensure communication of the safety evaluation, highlighting the recommended areas of inspection and regulatory commitment sections to the regions and resident inspectors.
- Strengthen and communicate the coordinating authority of Power Uprate and Generic Communications Branch or assign a coordinating authority to be responsible for all aspects of power uprate activities.
- Identify and communicate roles and responsibilities for headquarters and regional points of contact for power uprates.
- Develop a tool for project managers to share and record information, monitor trends, and capture best practices and lessons learned.

In a letter dated March 24, 2008 the EDO responded to the OIG recommendations. The EDO stated that the staff agrees with six of the eight recommendations. The staff does not agree with recommendations 2 and 4.

Cancelling Scheduled Subcommittee Meetings and Full Committee Meeting Items

Subcommittee meetings and items for the full Committee meetings are scheduled in mutual agreement between the staff and the Committee members. In accordance with the Federal Advisory Committee Act (FACA) requirements, notice for individual ACRS meetings is published in the Federal Register 15 days in advance of the meeting. Cancelling a meeting a few days before the scheduled date will not provide adequate time for the ACRS staff to issue an amendment to the Federal Register Notice to inform the public and industry of the cancellation of the meeting; it takes about 5-6 days to publish an amendment to the Federal Register Notice.

Recently, a Thermal-Hydraulic Phenomena Subcommittee meeting was cancelled at the request of the staff. An amendment was issued however it was not published in the *Federal Register* Notice until after the meeting. As a result, several industry people showed up for the meeting. A Subcommittee meeting on Reliability and PRA was cancelled late at the end of the week. Again, there was no time to amend the *Federal Register* Notice and which caused a disruption in travel plans for the stakeholder.

The long-standing policy of the Committee is as follows:

- If a Subcommittee meeting is noticed in the *Federal Register*, it should not be cancelled. However, under inevitable circumstances (e.g. inclement weather), it could be cancelled in coordination with the meeting participants. The ACRS staff will amend the *Federal Register* notice to notify the external stakeholders about the cancellation of the meeting.
- If an item is scheduled for the full Committee meeting, it should not be cancelled. The NRC staff should be asked to provide at least a status briefing to the Committee.

Scheduling Subcommittee Meetings

It has become difficult to find hotels with available rooms at the government rate that are in close proximity to the NRC. During certain times of the year, hotel reservations need to be made up to 4 months in advance. This problem arises when subcommittee meetings are scheduled with relatively short notice.

Trip to Salem Nuclear Plant

At the invitation of the licensee, Drs. Banerjee, Bley, and Mr. Maynard along with several ACRS staff engineers, visited the Salem Nuclear Plant on April 24, 2008 to look at the replaced steam generators and containment sump screen. A brief report on the observations made by the members during this visit is recommended and should be provided to the members who did not attend.

Withdrawal of Regulatory Guides

The staff proposes to withdraw the following Regulatory Guides and seeks Committee's endorsement:

- Regulatory Guide 1.139, "Guidance for Residual Heat Removal."

This Guide describes an overly conservative and prescriptive method for complying with the regulations. Existing plant licensees have developed alternatives, without reliance on this Guide, for complying with the regulations; these alternatives were approved by the staff on a case-by-case basis. Since alternatives, acceptable to the staff, have been developed by the existing plant licensees without relying on its Guide and guidance for the staff reviewers is provided in the SRP, the staff has decided that there is no further use for this Guide.

- Regulatory Guide 3.42, "Emergency Planning for Fuel Cycle Facilities and Plants Licensed Under 10 CFR Parts 50 and 70."

This Guide provides guidance for applicants developing emergency plans for fuel cycle facilities licensed under 10 CFR Part 50 as well as for applicants of special nuclear materials licensed under 10 CFR Part 70. The staff is withdrawing this Guide because no fuel cycle facilities are currently licensed under both 10 CFR

Part 50 and 10 CFR Part 70. For fuel cycle and materials facilities licensed under 10 CFR Part 70, Reg. Guide 3.67, "Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities," provides adequate guidance for developing emergency plans.

- Draft Final Regulatory Guides

The staff plans to issue several Regulatory Guides as final which are in Division 3, "Fuels and Materials Facilities," Division 6, "Products," and Division 10, "General." Proposed versions of these Guides were provided previously to the former ACNW&M for possible review prior to issuing them for public comment. Since most of these Guides concern process issues, the Committee does not need to review them.

Proposal Division 1 Regulatory Guides

The staff plans to issue the following Division I Regulatory Guides for public comment.

- Proposed Revision 2 to RG 1.200, An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results from Risk-Informed Activities.
- Proposed Revision 2 to RG 1.125, Physical Models for Design and Operation of Hydraulic Structures and Systems for Nuclear Power Plants
- Proposed Revision 1 to RG 1.62, Manual Initiation of Protective Actions
- Proposed Revision 1 to RG 1.151, Instrument Sensing Lines.

Since these are Division I Regulatory Guides, the Committee may want to review the draft final version of these Guides after reconciliation of public comments.

In addition, the staff plans to issue the following Division 3 Reg. Guides for public comment:

- Proposed Revision 1 to Regulatory Guide 3.25 (DG-3033), Standard Format and Content of Safety Analysis Reports for Uranium Enrichment Facilities.

This Guide is being revised to endorse NUREG-1520, "Standard Review of License Application for a Fuel Cycle Facility." Since this is a minor revision, the Committee does not need to review this Guide.

- Proposed Revision 1 to RG 3.5, (DG-3024), "Standard Format and Content of License Applications for Conventional Uranium Mills"

This Guide is being revised to update the references, such as NUREGs, and the format. These are not technical changes. Therefore, the Committee does not need to review this Guide.

Reorganization of the ACRS Office

The reorganization of the ACRS Office will become effective on June 1, 2008. The updated organizational chart, staff engineer assignments, staff biographies, and pictures was discussed.

Proposed ACRS Meeting Dates for CY 2009 – CY 2012

In March 2008, the staff provided the ACRS a description of the Committee's anticipated workload and a proposed schedule for subcommittee and full committee meetings. The proposed ACRS meeting dates from CY 2009 through CY 2012 are included in the attached calendars (pp. 39-42) and summarized below.

Meeting Number	Dates	Days
---	January 2009	(No Meeting)
559	February 5-7, 2009	Thursday-Saturday
560	March 5-7, 2009	Thursday-Saturday
561	April 9-11, 2009	Thursday-Saturday
562	May 7-9, 2009	Thursday-Saturday
563	June 3-5, 2009	Wednesday-Friday
564	July 15-17, 2009	Wednesday-Friday
---	August 2009	(No Meeting)
565	September 10-12, 2009	Thursday-Saturday
566	October 8-10, 2009	Thursday-Saturday
567	November 5-7, 2009	Thursday-Saturday
568	December 3-5, 2009	Thursday-Saturday
---	January 2010	(No Meeting)
569	February 4-6, 2010	Thursday-Saturday
570	March 4-6, 2010	Thursday-Saturday
571	April 8-10, 2010	Thursday-Saturday
572	May 6-8, 2010	Thursday-Saturday
573	June 9-11, 2010	Wednesday-Friday
574	July 14-16, 2010	Wednesday-Friday
---	August 2010	(No Meeting)
575	September 9-11, 2010	Thursday-Saturday
576	October 7-9, 2010	Thursday-Saturday
577	November 4-6, 2010	Thursday-Saturday
578	December 2-4, 2010	Thursday-Saturday
---	January 2011	(No Meeting)
579	February 10-12, 2011	Thursday-Saturday
580	March 10-12, 2011	Thursday-Saturday
581	April 7-9, 2011	Thursday-Saturday
582	May 12-14, 2011	Thursday-Saturday
583	June 8-10, 2011	Wednesday-Friday
584	July 13-15, 2011	Wednesday-Friday
---	August 2011	(No Meeting)

585	September 8-10, 2011	Thursday-Saturday
586	October 6-8, 2011	Thursday-Saturday
587	November 3-5, 2011	Thursday-Saturday
588	December 1-3, 2011	Thursday-Saturday
---	January 2012	(No Meeting)
589	February 9-11, 2012	Thursday-Saturday
590	March 8-10, 2012	Thursday-Saturday
591	April 12-14, 2012	Thursday-Saturday
592	May 10-12, 2012	Thursday-Saturday
593	June 6-8, 2012	Wednesday-Friday
594	July 11-13, 2012	Wednesday-Friday
---	August 2012	(No Meeting)
595	September 6-8, 2012	Thursday-Saturday
596	October 4-6, 2012	Thursday-Saturday
597	November 1-3, 2012	Thursday-Saturday
598	December 6-8, 2012	Thursday-Saturday

Dr. Abdel-Khalik suggested that the April 2009 meeting dates currently scheduled for April 9-11 be changed to April 2-4.

The proposed dates for subcommittee meetings would be the following:

- two days before a full committee meeting,
- the second Thursday/Friday after a full committee meeting, or
- the Thursday/Friday during the third week of a month with no full committee meeting.

The meeting was adjourned at 7:00 p.m. on June 9, 2008.



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

APPENDIX II

April 17, 2008

SCHEDULE AND OUTLINE FOR DISCUSSION
552nd ACRS MEETING
MAY 8-10, 2008

**THURSDAY, MAY 8, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

- 1) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (WJS/CS/SD)
 - 1.1) Opening statement
 - 1.2) Items of current interest

- 2) 8:35 - 10:30 A.M.
11:20 Selected Chapters of the SER Associated with the ESBWR
Design Certification Application (Open/Closed) (MLC/DEB)
 - 2.1) Remarks by the Subcommittee Chairman
 - 2.2) Briefing by and discussions with representatives of the NRC staff and General Electric – Hitachi Nuclear Energy (GEH) regarding selected Chapters of the NRC staff's Safety Evaluation Report (SER) With Open Items associated with the Economic Simplified Boiling Water Reactor (ESBWR) design certification application.

[Note: A portion of this session may be closed to protect information that is proprietary to GEH and its contractors pursuant to 5 U.S.C. 552b (c) (4).]

Members of the public may provide their views, as appropriate.

**~~10:30 - 10:45 A.M.~~
11:20 - 11:30**

*****BREAK*****

- 3) ~~10:45 - 12:30 P.M.~~
11:30 - 1:20 Insights from PHEBUS – FP Tests (Open) (JSA/DEB/HPN)
 - (3.1) Briefing by and discussions with representatives of the NRC staff regarding the findings of the large-scale integral tests conducted in connection with the PHEBUS – FP Program and their implications on containment iodine behavior.

Representatives of the nuclear industry and members of the public may provide their views, as appropriate.

**~~12:30 - 1:30 P.M.~~
1:20 - 2:00**

*****LUNCH*****

- 4) ~~1:30 – 3:30 P.M.~~
2:00 – 3:45 Draft NUREG/CR Report on PRA Methods for Digital Systems (Open) (GEA/CEA)
4.1) Remarks by the Subcommittee Chairman
4.2) Briefing by and discussions with representatives of the NRC staff and Brookhaven National Laboratory (BNL) regarding draft NUREG/CR – XXX Report on Approaches for Using Traditional PRA Methods for Digital Systems and other related matters.

Representatives of the nuclear industry and members of the public may provide their views, as appropriate.

~~3:30 – 3:45 P.M.~~
3:45 – 4:00

*****BREAK*****

- 5) ~~3:45 – 7:00 P.M.~~
4:00 – 6:30 Preparation of ACRS Reports (Open)
Discussion of proposed ACRS reports on:
5.1) Selected Chapters of the SER Associated with the ESBWR Design Certification Application (MLC/DEB)
5.2) Insights from PHEBUS – FP Tests (JSA/DEB/HPN)
5.3) Draft NUREG/CR Report on PRA Methods for Digital Systems (GEA/CEA)
5.4) Response to the EDO Response dated January 17, 2008, to the December 20, 2007 ACRS Report on the Susquehanna Power Uprate Application) (SB/ZA)

FRIDAY, MAY 9, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 6) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (WJS/CS/SD)
- 7) 8:35 - ~~9:15~~ A.M.
9:30 Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (WJS/FPG/SD)
7.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.
7.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.
- 8) ~~9:15 – 9:30 A.M.~~
9:30 – 9:48 Reconciliation of ACRS Comments and Recommendations (Open) (WJS, et al. /CS, et al.)
Discussion of the responses from the NRC Executive Director for Operations to comments and recommendations included in recent ACRS reports and letters.
- 9:48 – 10:10 A.M. BREAK**

- 9) ~~9:30 – 10:00 A.M.~~ Subcommittee Report (Open) (JWS/PW)
~~10:10 – 10:20~~ Report by and discussions with the Chairman of the ACRS Subcommittee on Plant License Renewal regarding the license renewal application for the Shearon Harris Nuclear Power Plant that was discussed during the Subcommittee meeting on May 7, 2008.

~~10:00 – 10:15 A.M.~~ *****BREAK*****

- 10) ~~10:15 – 12:00 P.M.~~ Preparation for Meeting with the Commission on June 5, 2008
~~10:20 – 12:05~~ (Open) (WJS, et al. /FPG, et al.)
Discussion for meeting with the Commission on June 5, 2008.

~~12:00 – 1:30 P.M.~~ *****LUNCH*****
~~12:05 – 12:45~~

~~12:45 – 1:10 P.M.~~ **ETHICS TRAINING**

- 11) ~~1:30 – 6:30 P.M.~~ Preparation of ACRS Reports (Open)
~~1:10~~ Discussion of proposed ACRS reports on:
11.1) Selected Chapters of the SER Associated with the ESBWR Design Certification Application (MLC/DEB)
11.2) Insights from PHEBUS – FP Tests (JSA/DEB/HPN)
11.3) Draft NUREG/CR Report on PRA Methods for Digital Systems (GEA/CEA)
11.4) Response to the EDO Response dated January 17, 2008, to the December 20, 2007 ACRS Report on the Susquehanna Power Uprate Application) (SB/ZA)

SATURDAY, MAY 10, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- ~~12) 8:30 – 1:00 P.M.~~ Preparation of ACRS Reports (Open)
~~(10:30-10:45 A.M. BREAK)~~ Continue discussion of proposed ACRS reports listed under Item 11.

- ~~13) 1:00 – 1:30 P.M.~~ Miscellaneous (Open) (WJS/FPG)
Discussion of matters related to the conduct of Committee activities and matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

NOTE:

Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.

One (1) electronic copy and thirty-five (35) hard copies of the presentation materials should be provided to the ACRS.

APPENDIX III

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
552nd Full Committee Meeting
NRC ATTENDANCE
April 8, 2008

	<u>NAME</u>	<u>NRC ORGANIZATION</u>
1	J. Gilmer	NRO
2	J. Ashcraft	NRO
3	H. Wagage	NRO
4	A. Notafrancesco	RES
5	H. Esmaili	RES
6	A. Droed	NRO
7	G. thoma	NRO
8	W. Wang	NRO
9	T. Attard	NRR
10	P. Yausky	NRR
11	R. Gael	NRO
12	J. Bongarra	NRO
13	A. Cubbage	NRO
14	M. Scott	NRR
15	G. Hammer	NRO
16	S. LaVie	NSIR
17	A. Hiser	NRR
18	R. Taylor	NRR
19	D. Galvin	NRO
20	M. Yoder	NRR
21	J. Donoghue	NRO
22	J. Mitchell	RES
23	M. Snodderly	NRO
24	A. Kuracky	RES
25	S. Arndt	NRR
26	D. Santos	RES
27	A. Boatright	NRR
28	M. Salaj	RES
29	G. Kelly	NRO
30	M. Gutierrez	RES
31	R. Sydnor	RES
32	P. Rebstock	RES
33	C. Douitt	NRR
34	D. Helton	RES
35	C. Lui	RES

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
552nd Full Committee Meeting

OUTSIDE ORGANIZATIONS
May 8, 2008

1	D. Piedmeyer	GE Hitachi
2	J. Kinsey	GE Hitachi
3	G. Wadkins	GE Hitachi
4	A. Levin	AREVA
5	W. Marquino	GE Hitachi
6	J. Diaz-Quiroz	GE Hitachi
7	R. Stattel	GE Hitachi
8	M.D. Alamgir	GE Hitachi
9	T. Chu	BNL

LIST OF DOCUMENTS FROM THE
552ND ACRS MEETING MAY 8-10, 2008

Agenda Item 2:

Selected Chapters of the SER Associated with the ESBWR Design Certification Application

1. Proposed Schedule
2. Status Report
3. References
4. ACRS ESBWR Letters Issued
5. ESBWR Subcommittee Consultant Reports

Agenda Item 3:

Insights from PHEBUS – FP Tests

6. Proposed Schedule
7. Status Report
8. References

Agenda Item 4:

Draft NUREG/CR Report on PRA Methods for Digital Systems

9. Table of Contents
10. Proposed Agenda
11. Status Report
12. Draft NUREG/CR “Approaches for Using Traditional PRA Methods for Digital Systems”, including the following:
 - Appendix A, “Summary Report of the External Review Panel Meeting on Reliability Modeling of Digital Systems (May 23–24, 2007)”
 - Appendix B, “Detailed FMEA of the DFWCS at Different Levels”
 - Appendix C, “Modeling of Software Failures”
 - Appendix D, “Other Methods for Modeling Digital Systems”



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

May 13, 2008

SCHEDULE AND OUTLINE FOR DISCUSSION
553rd ACRS MEETING
JUNE 4-6, 2008

**WEDNESDAY, JUNE 4, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH,
ROCKVILLE, MARYLAND**

- 1) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (WJS/CS/SD)
- 1.1) Opening statement
 - 1.2) Items of current interest
- 2) 8:35 - 10:00 A.M. ARTIST Test Program (Open) (JSA/DEB)
- 2.1) Remarks by the Subcommittee Chairman
 - 2.2) Briefing by and discussions with representatives of the NRC staff regarding the synthesis on the findings from the ARTIST tests on aerosol retention in the secondary side of a steam generator, and related matters.

Representatives of the nuclear industry and members of the public may provide their views, as appropriate.

10:00 - 10:15 A.M. *BREAK*****

- 3) 10:15 - 11:45 A.M. Risk Assessment Standardization Project (Open) (GEA/HJV)
- 3.1) Briefing by and discussions with representatives of the NRC staff regarding the Risk Assessment Standardization Project (RASP) and related matters.

Representatives of the nuclear industry and members of the public may provide their views, as appropriate.

11:45 - 1:45 P.M. *LUNCH*****

- 4) 1:45 - 3:45 P.M. Overview of the U.S. Evolutionary Power Reactor (EPR) Design (Open) (DAP/DAW)
- 4.1) Remarks by the Subcommittee Chairman
 - 4.2) Briefing by and discussions with representatives of the NRC staff and AREVA Nuclear Power Inc. regarding design features of the EPR and related matters.

Members of the public may provide their views, as appropriate.

3:45 - 4:00 P.M. *BREAK*****

- 5) 4:00 - 5:00 P.M. Status of the Development of Rules and Regulatory Guidance in the areas of Safeguards and Security (Open) (MVB/MB)
5.1) Briefing by and discussions with representatives of the NRC staff regarding the status of activities associated with the development of rules and regulatory guidance in the safeguards and security areas.
- 6) 5:00 - 5:30 P.M. Status of the Quality Assessment of Selected Research Projects (Open) (DAP/HPN)
6.1) Report by and discussions with the Chairmen of the ACRS Panels regarding the status of the quality assessment of the research projects on: FRAPCON / FRAPTRAN Code work at the Pacific Northwest National Laboratory; and NUREG-6943, "Study of Remote Visual Methods to Detect Cracking in Reactor Components."
- 5:30 - 5:45 P.M. ***BREAK*****
- 7) 5:45 - 7:00 P.M. Preparation of ACRS Report (Open)
Discussion of proposed ACRS report on:
7.1) ARTIST Test Program (JSA/DEB)

THURSDAY, JUNE 5, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 8) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (WJS/CS/SD)
- 9) 8:35 - 9:30 A.M. Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (WJS/FPG/SD)
9.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.
9.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.
- 10) 9:30 - 9:45 A.M. Reconciliation of ACRS Comments and Recommendations (Open) (WJS, et al. /CS, et al.)
Discussion of the responses from the NRC Executive Director for Operations to comments and recommendations included in recent ACRS reports and letters.
- 9:45 – 10:00 A.M. ***BREAK*****
- 11) 10:00 – 11:15 A.M. Preparation for Meeting with the Commission (Open) (WJS, et al. /FPG, et al.)
Discussion of the following topics for meeting with the Commission:

- Overview (WJS/SD)
- Safety Research Program Report(DAP/HPN)
- Digital I&C Matters (GEA/CEA)
- State-of-the-Art Reactor Consequence Analysis (SOARCA) Program (WJS/HPN)
- ESBWR Design Certification (MLC/DEB)
- Extended Power Upgrades and related Technical Issues (MVB/ZA)

11:15 - 1:15 P.M.

*****LUNCH*****

- 12) 1:30 – 3:30 P.M. Meeting with the Commission (Open) (WJS, et al. /FPG, et al.)
Meeting with the Commission, Commissioners' Conference Room, One White Flint North, to discuss topics listed under item 11.
- 13) 4:00 – 6:00 P.M. Preparation of ACRS Report (Open)
Discussion of proposed ACRS report on:
13.1) ARTIST Test Program (JSA/DEB)

FRIDAY, JUNE 6, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 14) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (WJS/CS/SD)
- 15) 8:35 - 10:30 A.M. Overview of the US-Advanced Pressurized Water Reactor (US-APWR) Design (Open) (OLM/NMC/DEB)
15.1) Remarks by the Subcommittee Chairman
15.2) Briefing by and discussions with representatives of the NRC staff and Mitsubishi Heavy Industries, Ltd. regarding design features of the US-APWR and related matters.

Members of the public may provide their views, as appropriate.

10:30 – 10:45 A.M.

*****BREAK*****

- 16) 10:45 - 11:45 A.M. Status of NRC Staff Activities Associated with the Resolution of Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on Pressurized-Water Reactor (PWR) Sump Performance" (Open) (SB/DEB)
16.1) Briefing by and discussions with representatives of the NRC staff regarding the status of NRC staff activities associated with the Resolution of GSI-191.

Representatives of the nuclear industry and members of the public may provide their views, as appropriate.

11:45 - 1:15 P.M. *LUNCH*****

- 17) 1:15 - 1:30 P.M. Miscellaneous (Open) (WJS/FPG)
Discussion of matters related to the conduct of Committee activities and matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

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