



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

April 7, 2008

The Honorable Dale E. Klein
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Klein:

SUBJECT: SUMMARY REPORT – 550TH MEETING OF THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS, MARCH 6-7, 2008, AND OTHER RELATED ACTIVITIES OF THE COMMITTEE

During its 550th meeting, March 6-7, 2008, the Advisory Committee on Reactor Safeguards (ACRS) discussed several matters and completed the following reports and letter.

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 Vermont Yankee Nuclear Power Station, dated March 20, 2008.
- Report on the Safety Aspects of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant, dated March 20, 2008.

LETTER

Letter to Luis A. Reyes, Executive Director for Operations, NRC, from William J. Shack, Chairman, ACRS:

- Interim Letter: Chapters 9, 10, 13, and 16 of the NRC Staff's Safety Evaluation Report with Open Items Related to the Certification of the ESBWR Design, dated March 20, 2008.

HIGHLIGHTS OF KEY ISSUES

1. Final Review of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant

The Committee met with representatives of the Entergy Nuclear Operations, Inc. (the applicant), and the NRC staff to discuss the license renewal application for the James A. FitzPatrick Nuclear Power Plant (JAFNPP) and the associated NRC staff's final Safety Evaluation Report (SER). The operating license for JAFNPP expires on October 17, 2014. 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 the applicant and obtained during the audits and inspections conducted at the plant site. The staff reviewed: the completeness of the applicant's identification of structures, systems and components 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 (TLAAs) requiring review.

The applicant addressed two open items which are related to reactor vessel neutron fluence and environmentally assisted fatigue. For resolving the reactor vessel neutron fluence issue, the applicant submitted a new fluence calculation to the staff for review. The staff reviewed this calculation and found it to be acceptable, as it adhered with the guidance of Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence." Regarding environmentally assisted fatigue issues, the applicant amended its license renewal application to bring it within the scope of the Fatigue Monitoring Program and to credit this aging management program as the basis for acceptance of the TLAA in accordance with 10 CFR 54.21 (c)(1)(iii). Other discussion topics included the applicant's drywell and torus monitoring program.

The staff described its review and inspection of the applicant's scoping, screening, and aging management programs; the program implementation at JAFNPP; and resolution of the open items. The staff also confirmed that the applicant has committed to follow the Generic Aging Lessons Learned Report, without exceptions, regarding monitoring of the cumulative usage factor for environmentally assisted fatigue.

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated March 20, 2008. The Committee concluded that the programs established by the applicant to manage age-related degradation provide reasonable assurance that the JAFNPP 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 and recommended that the Entergy Nuclear Operations, Inc., application for renewal of the operating license for JAFNPP be approved.

2. Final Review of the License Renewal Application for the Vermont Yankee Nuclear Power Station

The Committee met with representatives of the Entergy Nuclear Operations, Inc. (the applicant), and the NRC staff to discuss the license renewal application for the Vermont Yankee Nuclear Power Station (VYNPS) and the associated NRC staff's SER; specifically, discussion focused on resolution of the environmentally assisted fatigue (EAF) issue. The applicant and the staff provided a recap of the EAF discussion from the February 7, 2008, ACRS meeting on the Vermont Yankee SER.

The applicant described the methodology used to evaluate EAF and how the methodology was bounding for calculating the cumulative usage factors for the feedwater (FW), core spray (CS), and reactor recirculation (RR) outlet nozzles. The applicant also described the conservatisms

used in the methodology, how thermal transients were calculated, and how chemistry effects were considered in the re-analysis. The staff discussed the review of the applicant's re-analysis for the FW, CS, and RR nozzles as well as the confirmatory analysis performed for the FW nozzle.

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated March 20, 2008. The Committee concluded that the programs established and committed to by the applicant to manage age-related degradation provide reasonable assurance that VYNPS can be operated in accordance with its current licensing basis for the period of extended operation without undue risk to the health and safety of the public and recommended that the Entergy Nuclear Operation, Inc., application for renewal of the operating license of VYNPS be approved.

3. ESBWR Design Certification Review

The Committee met with representatives the NRC staff and General Electric – Hitachi Nuclear Energy Americas, LLC (GEH), to discuss Chapters 9, 10, 13, and 16 from the staff's SER with Open Items and Combined License (COL) Action Items related to the Economic Simplified Boiling Water Reactor (ESBWR) design certification application. During this meeting, the Committee identified several issues in the areas of auxiliary systems and technical specifications that merit further consideration. One issue relates to the need to more fully examine adverse inter-system interactions. A second issue relates to control room habitability and equipment operability in the 72-hour post-accident period when no alternating current power is available. A third issue relates to the effects of inadvertent injection of nitrogen gas during standby liquid control system operation on long-term cooling. A fourth issue relates to the need to develop a sound technical basis for testing passive safety systems.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated March 20, 2008, identifying several issues that merit further consideration by the staff and GEH. The Committee plans to review the staff's resolution of the open items in the SER Chapters during future meetings. The Committee will issue additional interim letters on other SER Chapters that have not been reviewed and plans to comment on potential safety implications of any system interactions in future interim letters and in the final report.

4. Report of the Plant License Renewal Subcommittee

The Chairman of the Plant License Renewal Subcommittee provided a report to the Committee summarizing the results of the March 5, 2008, meeting with the NRC staff and representatives of the Wolf Creek Nuclear Operating Corporation (WCNOC) to discuss the draft SER with Open Items related to the license renewal application for the Wolf Creek Generating Station.

The current operating license for the Wolf Creek Generating Station expires on March 11, 2025. WCNOC submitted the license renewal application on September 27, 2006, and the staff's draft SER was issued on February 1, 2008, and contains five open items and no confirmatory items. Among the five open items, one is related to scoping boundary of station blackout recovery

paths and another is regarding aging management for inaccessible medium voltage cable. The remaining three open items are related to metal fatigue issues. The staff and WCNOG are in the process of resolving these open items.

Committee Action

The Committee plans to discuss the final SER related to the license renewal application for the Wolf Creek Generating Station in a future meeting.

5. Meeting with Commissioner Lyons

The Committee met with Commissioner Lyons to discuss several items of mutual interest, including Digital I&C, long-term regulatory research, nuclear education, public communications on risk-informed matters, State-of-the-Art Reactor Consequence Analyses (SOARCA) Project, and the Next Generation Nuclear Plant (NGNP) Program.

Commissioner Lyons also discussed the anticipated increase in ACRS workload and stated that the ACRS should keep the Commission informed of the Committee's future resource needs to handle the increased workload.

RECONCILIATION OF ACRS COMMENTS AND RECOMMENDATIONS/EDO COMMITMENTS

The Committee considered the EDO's response of January 17, 2008, to comments and recommendations included in the December 20, 2007, ACRS Report on the Susquehanna Steam Electric Station extended power uprate. The Committee decided that it was not satisfied with the EDO's response, and a reply to the EDO's response will be prepared at the April 10 - 12, 2008, Committee meeting.

OTHER RELATED ACTIVITIES OF THE COMMITTEE

During the period from February 10, 2008, through March 5, 2008, the following Subcommittee meetings were held:

- Reliability and Probabilistic Risk Assessment – February 22, 2008

The Subcommittee reviewed the draft report on the International Human Reliability Analysis (HRA) Empirical Study.

- Planning and Procedures – March 5, 2008

The Subcommittee discussed proposed ACRS activities, practices, and procedures for conducting Committee business and organizational and personnel matters relating to ACRS and its staff.

- Plant License Renewal – March 5, 2008

The Subcommittee reviewed the license renewal application and the associated NRC staff's Safety Evaluation Report with Open Items for the Wolf Creek Generating Station.

LIST OF MATTERS FOR THE ATTENTION OF THE EDO

- The Committee Plans to review the resolution of the open items identified in SER Chapters 9, 10, 13, and 16 associated with the ESBWR design certification application during a future meeting. Since many of the systems described in these chapters may interact with systems discussed in other chapters, the Committee plans to review the potential safety implications of any system interactions during future meetings.
- The Committee plans to discuss the final SER related to the license renewal application for the Wolf Creek Generating Station in a future meeting.
- The Committee would like an opportunity to review the staff's basis for withdrawing certain Regulatory Guides and/or Regulations.
- The Committee would like an opportunity to review the draft final versions of Regulatory Guide 3.11 (DG-3032), Revision 3, "Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities," and Regulatory Guide 1.114, (DG-1194), Revision 3, "Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Unit," after reconciliation of public comments.

PROPOSED SCHEDULE FOR THE 551st ACRS MEETING

The Committee agreed to consider the following topics during the 551st ACRS meeting, to be held on April 10 - 12, 2008:

- Extended Power Uprate Application for the Hope Creek Generating Station
- Proposed Licensing Strategy for the Next Generation Nuclear Plant (NGNP)
- Digital Instrumentation and Controls (I&C) Interim Staff Guidance and Related Matters
- ACRS Response to the EDO's response dated January 17, 2008, to the December 20, 2007 ACRS Report on the Susquehanna Power Uprate Application

Sincerely,

/RA/

William J. Shack
Chairman

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- The Committee would like an opportunity to review the draft final version of Regulatory Guide 3.11 (DG-3032), Revision 3, "Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities," and Regulatory Guide 1.114, (DG-1194), Revision 3, "Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Unit," after reconciliation of public comments.

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- ACRS Response to the EDO's response dated January 17, 2008, to the December 20, 2007 ACRS Report on the Susquehanna Power Uprate Application

Sincerely,

/RA/

William J. Shack
Chairman

Distribution:

***See next page

ADAMS ML080950465

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DATE	04/07/08	04/07/08	04/07/08	04/07/08	04/07/08

OFFICIAL RECORD COPY

Letter To: The Honorable Dale E. Klein, NRC Chairman

From: William J. Shack, Chairman
ACRS

Subject: SUMMARY REPORT – 550TH MEETING OF THE ADVISORY COMMITTEE ON
REACTOR SAFEGUARDS, MARCH 6-7, 2008, AND OTHER RELATED
ACTIVITIES OF THE COMMITTEE

Date: 4/07/08

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

April 9, 2008

MEMORANDUM TO: Carol A. Brown, Technical Secretary
Advisory Committee on Reactor Safeguards

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

SUBJECT: MINUTES OF THE 550th MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS (ACRS),
March 6-7, 2008

I certify that, to the best of my knowledge and belief, the minutes of the subject meeting are an accurate record of the proceedings for that meeting.

ADAMS Accession: ML081000445

	ACRS	SUNSI		
NAME	CSantos	JFlack		
DATE	04/09/2008	04/09/2008		



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

MEMORANDUM TO: Carol A. Brown, Technical Secretary
Advisory Committee on Reactor Safeguards

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

SUBJECT: MINUTES OF THE 550th MEETING OF THE ADVISORY
COMMITTEE ON REACTOR SAFEGUARDS (ACRS),
March 6-7, 2008

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ADAMS Accession: ML081000445

	ACRS	SUNS		
NAME	CSantos <i>CS</i>	JFlack <i>JF</i>		
DATE	4/4/08	4/9/2008		

CERTIFIED

Date Issued:
Date Certified:

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- IV. ESBWR Design Certification Review
- V. Report of the Plant License Renewal Subcommittee
- VI. Meeting with Commissioner Lyons
- VII. Executive Session
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MINUTES OF THE 550th MEETING OF THE
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
March 6 - 7, 2008
ROCKVILLE, MARYLAND

The **550th** meeting of the Advisory Committee on Reactor Safeguards (ACRS) was held in Conference Room 2B3, Two White Flint North Building, Rockville, Maryland, on **March 6 - 7, 2008**. Notice of this meeting was published in the *Federal Register* on **February 22, 2008** (73 FR 9840) (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. Dennis Bley, Dr. Said Abdel-Khalik (Member-at-Large), Dr. George E. Apostolakis, Dr. Sam Armijo, Dr. Michael Corradini, Mr. Otto L. Maynard, Mr. Jack Sieber, and Mr. John Stetkar. 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. He announced in his opening remarks that the meeting was being conducted in accordance with the provisions of the Federal Advisory Committee Act. In addition, he reviewed the agenda for the meeting 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. He discussed the items of current interest and administrative details for consideration by the full Committee.

HIGHLIGHTS OF KEY ISSUES

II. Final Review of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant

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

The Committee met with representatives of the Entergy Nuclear Operations, Inc. (the applicant), and the NRC staff to discuss the license renewal application for the James A. FitzPatrick Nuclear Power Plant (JAFNPP) and the associated NRC staff's final Safety Evaluation Report (SER). The operating license for JAFNPP expires on October 17, 2014. 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 the applicant and obtained during the audits and inspections conducted at the plant site. The staff reviewed: the completeness of the applicant's identification of structures, systems and components 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 (TLAAs) requiring review.

The applicant addressed two open items which are related to reactor vessel neutron fluence and environmentally assisted fatigue. For resolving the reactor vessel neutron fluence issue, the applicant submitted a new fluence calculation to the staff for review. The staff reviewed this calculation and found it to be acceptable, as it adhered with the guidance of Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence." Regarding environmentally assisted fatigue issues, the applicant amended its license renewal application to bring it within the scope of the Fatigue Monitoring Program and to credit this aging management program as the basis for acceptance of the TLAA in accordance with 10 CFR 54.21 (c)(1)(iii). Other discussion topics included the applicant's drywell and torus monitoring program.

The staff described its review and inspection of the applicant's scoping, screening, and aging management programs; the program implementation at JAFNPP; and resolution of the open items. The staff also confirmed that the applicant has committed to follow the Generic Aging Lessons Learned Report, without exceptions, regarding monitoring of the cumulative usage factor for environmentally assisted fatigue.

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated March 20, 2008. The Committee concluded that the programs established by the applicant to manage age-related degradation provide reasonable assurance that the JAFNPP 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 and recommended that the Entergy Nuclear Operations, Inc., application for renewal of the operating license for JAFNPP be approved.

III. Final Review of the License Renewal Application for the Vermont Yankee Nuclear Power Station

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

The Committee met with representatives of the Entergy Nuclear Operations, Inc. (the applicant), and the NRC staff to discuss the license renewal application for the Vermont Yankee Nuclear Power Station (VYNPS) and the associated NRC staff's SER; specifically, discussion focused on resolution of the environmentally assisted fatigue (EAF) issue. The applicant and the staff provided a recap of the EAF discussion from the February 7, 2008, ACRS meeting on the Vermont Yankee SER.

The applicant described the methodology used to evaluate EAF and how the methodology was bounding for calculating the cumulative usage factors for the feedwater (FW), core spray (CS), and reactor recirculation (RR) outlet nozzles. The applicant also described the conservatisms used in the methodology, how thermal transients were calculated, and how chemistry effects were considered in the re-analysis. The staff discussed the review of the applicant's re-analysis for the FW, CS, and RR nozzles as well as the confirmatory analysis performed for the FW nozzle.

Committee Action

The Committee issued a report to the NRC Chairman on this matter, dated March 20, 2008. The Committee concluded that the programs established and committed to by the applicant to manage age-related degradation provide reasonable assurance that VYNPS can be operated in accordance with its current licensing basis for the period of extended operation without undue risk to the health and safety of the public and recommended that the Entergy Nuclear Operation, Inc., application for renewal of the operating license of VYNPS be approved.

IV. ESBWR Design Certification Review

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

The Committee met with representatives the NRC staff and General Electric – Hitachi Nuclear Energy Americas, LLC (GEH), to discuss Chapters 9, 10, 13, and 16 from the staff's SER with Open Items and Combined License (COL) Action Items related to the Economic Simplified Boiling Water Reactor (ESBWR) design certification application. During this meeting, the Committee identified several issues in the areas of auxiliary systems and technical specifications that merit further consideration. One issue relates to the need to more fully examine adverse inter-system interactions. A second issue relates to control room habitability and equipment operability in the 72-hour post-accident period when no alternating current power is available. A third issue relates to the effects of inadvertent injection of nitrogen gas during standby liquid control system operation on long-term cooling. A fourth issue relates to the need to develop a sound technical basis for testing passive safety systems.

Committee Action

The Committee issued a letter to the Executive Director for Operations on this matter, dated March 20, 2008, identifying several issues that merit further consideration by the staff and GEH. The Committee plans to review the staff's resolution of the open items in the SER Chapters during future meetings. The Committee will issue additional interim letters on other SER Chapters that have not been reviewed and plans to comment on potential safety implications of any system interactions in future interim letters and in the final report.

V. Report of the Plant License Renewal Subcommittee

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

The Chairman of the Plant License Renewal Subcommittee provided a report to the Committee summarizing the results of the March 5, 2008, meeting with the NRC staff and representatives of the Wolf Creek Nuclear Operating Corporation (WCNOC) to discuss the draft SER with Open Items related to the license renewal application for the Wolf Creek Generating Station.

The current operating license for the Wolf Creek Generating Station expires on March 11, 2025. WCNOC submitted the license renewal application on September 27, 2006, and the staff's draft SER was issued on February 1, 2008, and contains five open items and no confirmatory items. Among the five open items, one is related to scoping boundary of station blackout recovery paths and another is regarding aging management for inaccessible medium voltage cable. The remaining three open items are related to metal fatigue issues. The staff and WCNOC are in the process of resolving these open items.

Committee Action

The Committee plans to discuss the final SER related to the license renewal application for the Wolf Creek Generating Station in a future meeting.

VI. Meeting with Commissioner Lyons

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

The Committee met with Commissioner Lyons to discuss several items of mutual interest, including Digital I&C, long-term regulatory research, nuclear education, public communications on risk-informed matters, State-of-the-Art Reactor Consequence Analyses (SOARCA) Project, and the Next Generation Nuclear Plant (NGNP) Program.

Commissioner Lyons also discussed the anticipated increase in ACRS workload and stated that the ACRS should keep the Commission informed of the Committee's future resource needs to handle the increased workload.

VII. 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 January 17, 2008, to comments and recommendations included in the December 20, 2007, ACRS Report on the Susquehanna Steam Electric Station extended power uprate. The Committee decided that it was not satisfied with the EDO's response, and a reply to the EDO's response will be prepared at the April 10 - 12, 2008, Committee meeting.

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- The Committee would like an opportunity to review the draft final versions of Regulatory Guide 3.11 (DG-3032), Revision 3, "Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities," and Regulatory Guide 1.114, (DG-1194), Revision 3, "Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Unit," after reconciliation of public comments.

B. REPORT ON THE MEETING OF THE PLANNING AND PROCEDURES SUBCOMMITTEE HELD ON MARCH 5, 2008

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

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

Anticipated Workload for ACRS Members

The anticipated workload for ACRS members through May 2008 is attached. The objectives are 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

During this session, the Subcommittee discussed and developed recommendations on items requiring Committee action.

Proposed Topics for Meeting With the NRC Commissioners

The ACRS is scheduled to meet with the Commission on Thursday, June 5, 2008, between 1:30 and 3:30 p.m. Topics proposed by the ACRS staff, and approved by the P&P Subcommittee, for discussion during this meeting are as follows:

1. Overview
 - Significant Accomplishments
 - License Renewal
 - Fire Protection
 - Ongoing / Future Activities
2. Safety Research Program Report
3. Digital I&C Matters
4. State-of-the-Art Reactor Consequence Analyses
5. Future Plant Activities
6. Extended Power Uprates and Related Issues

Appointment of a New Member to the ACRS

In a Staff Requirements Memorandum (SRM) dated February 13, 2008, the Commission states that it has approved the appointment of Mr. Charles Brown to the ACRS. Mr. Charles Brown has accepted the offer. Subsequent to completion of all necessary investigations (e.g. security clearance, conflict of interest), he will become an official member of the ACRS.

In the SRM, the Commission also states that the ACRS Screening Panel should continue to pursue additional digital instrumentation and control (I&C) expertise in an effort to remain current with a rapidly advancing technology.

Withdrawal of Regulatory Guides

Occasionally, the staff withdraws Regulatory Guides that are obsolete or the provisions of these Guides have been included in other Regulatory Guides. It has been the practice of the staff to seek ACRS views on the bases for withdrawing the Regulatory Guides. It seems that the staff has deviated from this practice recently in view of the fact that it did not provide an opportunity to the ACRS to review the bases for its withdrawal of Regulatory Guides 1.176, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Graded Quality Assurance," 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and

Inservice Examinations” and 1.139, “Guidance for Residual Heat Removal.” The staff’s action may be inadvertent or new management may be unaware of the past practice.

Annual Visit to a Plant and Meeting with the Regional Administrator

Each year, the members visit a nuclear plant and meet with the Regional Administrator to discuss items of mutual interest. Mr. Sieber, the Chairman of the Plant Operations and Fire Protection Subcommittee, previously recommended that in 2008 the members visit either LaSalle, Dresden, or Quad Cities. During the February 2008 ACRS meeting, the Committee discussed the Planning and Procedures Subcommittee’s recommendation that:

In view of the anticipated heavy workload and the 130-day restriction, the Committee needs to decide whether to continue the practice of visiting a plant and meeting with the Regional Administrator each year.

The Committee deferred its decision on this matter to the March meeting.

Proposed Schedule for ACRS Review of Reference-Combined License Applications (R-COLAs) (ESBWR and AP1000)

On February 15 and February 25, 2008 the ACRS and NRO staff met to discuss the schedule for the Committee’s review of the Reference COLAs for Bellefonte (AP1000) and North Anna (ESBWR).

The schedule for Bellefonte is as follows:

- July 2009 – NRO will transmit the complete SER with Open Items to the ACRS.
- August 2009 – AP1000 Subcommittee meeting to review the SER with Open Items.
- September 2009 – Full Committee review of, and Interim Letter as needed on, the SER with Open Items.
- October 2009 to June 2010 – Additional AP1000 Subcommittee meetings will be held to review the staff’s resolution of open items and other issues of concern to the members.
- June 2010 – NRO will transmit the complete Final SER to the ACRS.
- July 2010 – AP1000 Subcommittee meeting to review the Final SER.
- The schedule for the Full Committee review of the Final SER will be determined later.

The schedule for North Anna is as follows:

- February to March 2009 - NRO will provide various chapters of the SER with Open Items to the ACRS as they are completed.
- April 2009 - NRO will formally transmit the complete SER with Open Items to the ACRS. NRO will highlight any differences between the chapters previously provided and the complete SER with Open Items.
- May 2009 – ESBWR Subcommittee meeting to review the SER with Open Items.
- June 2009 – Full Committee review of, and Interim Letter as needed on, the SER with Open Items.
- Between June 2009 and the staff’s completion of the Final SER, additional ESBWR Subcommittee meetings will be held to review the staff’s resolution of open items and other issues of concern to the members.
- The schedule for ACRS review of the Final SER will be determined later.

Merger of ACRS and ACNW&M

In a Staff Requirements Memorandum, dated February 5, 2008, the Commission states the following:

- The Commission has approved the merger of ACNW&M [as a Subcommittee] back into the ACRS.
- The Executive Director of the ACRS/ACNW&M should complete all necessary administrative actions to facilitate this merger in an orderly fashion.
 - The Transition Plan should address disposition of topics currently in the ACNW&M action plan, particularly for issues under active consideration, and whether they should continue under the new Subcommittee.
 - Prior to the merger of the two Committees, the ACNW&M will continue to meet under the direction of Dr. Ryan to complete the activities as outlined in the Transition Plan.

During the February 2008 ACRS meeting, the Committee asked the ACRS Executive Director to provide the Transition Plan. A summary of the Transition Plan is provided below.

The ACNW&M plans to complete its review of topics under active consideration prior to its final meeting on May 20-22, 2008. No ACNW&M activities will be transferred to the ACRS, but a new ACRS Subcommittee will be created to review topics associated with materials and radiation protection.

The ACRS staff provided the Commission with a draft Federal Register Notice and Press Release seeking qualified candidates with expertise in the areas of materials and radiation protection for approval. We are awaiting Commission approval.

A copy of the proposed reorganization of the ACRS Office resulting from the merger of the ACRS and ACNW&M is attached.

C. PROPOSED SCHEDULE FOR THE 551st ACRS MEETING

The Committee agreed to consider the following topics during the 551st ACRS meeting, to be held on April 10 - 12, 2008:

- Extended Power Uprate Application for the Hope Creek Generating Station
- Proposed Licensing Strategy for the Next Generation Nuclear Plant (NGNP)
- Digital Instrumentation and Controls (I&C) Interim Staff Guidance and Related Matters
- ACRS Response to the EDO's response dated January 17, 2008, to the December 20, 2007 ACRS Report on the Susquehanna Power Uprate Application

The agenda for the subject meeting shall be as follows:

Wednesday, March 5, 2008—10:30 a.m. until the conclusion of business.

The Subcommittee will discuss the application submitted by the Wolf Creek Nuclear Operating Corporation to extend the operating license of Wolf Creek Generating Station, Unit 1 by an additional 20 years. The purpose of this meeting is to gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate, for deliberation by the full Committee.

Members of the public desiring to provide oral statements and/or written comments should notify the Designated Federal Official, Ms. Maitri Banerjee (Telephone: 301-415-6973) five days prior to the meeting, if possible, so that appropriate arrangements can be made. Electronic recordings will be permitted. Detailed procedures for the conduct of and participation in ACRS meetings were published in the **Federal Register** on September 26, 2007 (72 FR 54695).

Further information regarding this meeting can be obtained by contacting the Designated Federal Official between 7:30 a.m. and 4:15 p.m. (ET). Persons planning to attend this meeting are urged to contact the above named individual at least two working days prior to the meeting to be advised of any potential changes to the agenda.

Dated: February 14, 2008.

G.S. Shukla,

Acting Chief, Reactor Safety Branch.

[FR Doc. E8-3331 Filed 2-21-08; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards (ACRS); Subcommittee Meeting on Planning and Procedures; Notice of Meeting

The ACRS Subcommittee on Planning and Procedures will hold a meeting on March 5, 2008, Room T-2B1, 11545 Rockville Pike, Rockville, Maryland.

The entire meeting will be open to public attendance, with the exception of a portion that may be closed pursuant to 5 U.S.C. 552b (c) (2) and (6) to discuss organizational and personnel matters that relate solely to the internal personnel rules and practices of the ACRS, and information the release of which would constitute a clearly unwarranted invasion of personal privacy.

The agenda for the subject meeting shall be as follows:

Wednesday, March 5, 2008, 8:30 a.m. until 10 a.m.

The Subcommittee will discuss proposed ACRS activities and related matters. The Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate, for deliberation by the full Committee.

Members of the public desiring to provide oral statements and/or written comments should notify the Designated Federal Officer, Mr. Sam Duraiswamy (telephone: 301-415-7364) between 7:30 a.m. and 4 p.m. (ET) five days prior to the meeting, if possible, so that appropriate arrangements can be made. Electronic recordings will be permitted only during those portions of the meeting that are open to the public. Detailed procedures for the conduct of and participation in ACRS meetings were published in the **Federal Register** on September 26, 2007 (72 FR 54695).

Further information regarding this meeting can be obtained by contacting the Designated Federal Officer between 7:30 a.m. and 4 p.m. (ET). Persons planning to attend this meeting are urged to contact the above named individual at least two working days prior to the meeting to be advised of any potential changes in the agenda.

Dated: February 8, 2008,

Cayetano Santos,

Chief, Reactor Safety Branch.

[FR Doc. E8-3332 Filed 2-21-08; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards; Meeting Notice

In accordance with the purposes of Sections 29 and 182b. of the Atomic Energy Act (42 U.S.C. 2039, 2232b), the Advisory Committee on Reactor Safeguards (ACRS) will hold a meeting on March 6-8, 2008, 11545 Rockville Pike, Rockville, Maryland. The date of this meeting was previously published in the **Federal Register** on Monday, October 22, 2007 (72 FR 59574).

Thursday, March 6, 2008, Conference Room T-2B3, Two White Flint North, Rockville, Maryland.

8:30 a.m.-8:35 a.m.: Opening Remarks by the ACRS Chairman (Open)—The ACRS Chairman will make opening remarks regarding the conduct of the meeting.

8:35 a.m.-10:30 a.m.: Final Review of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant (Open)—The Committee will hear presentations by and hold discussions

with representatives of the NRC staff and Entergy Nuclear Operations, Inc., regarding the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant and the associated NRC staff's Final Safety Evaluation Report (SER).

10:45 a.m.-12:15 p.m.: Final Review of the License Renewal Application for the Vermont Yankee Nuclear Power Station (Open)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff and Entergy Nuclear Operations, Inc., regarding the License Renewal Application for the Vermont Yankee Nuclear Power Station and the associated NRC staff's Final SER, specifically, resolution of the environmentally assisted fatigue issue, and other related matters.

1:15 p.m.-3:15 p.m.: Selected Chapters of the SER Associated with the ESBWR Design Certification Application (Open/Closed)—The Committee will hear presentations by and hold discussions with representatives of the NRC staff and General Electric—Hitachi Nuclear Energy (GEH) regarding selected chapters of the SER with open items associated with the 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).]

3:30 p.m.-3:45 p.m.: Subcommittee Report (Open)—Report by and discussions with the Chairman of the ACRS regarding interim review of the License Renewal Application for the Wolf Creek Generating Station discussed during the Subcommittee meeting on March 5, 2008.

3:45 p.m.-7 p.m.: Preparation of ACRS Reports (Open)—The Committee will discuss proposed ACRS reports on matters considered during this meeting.

Friday, March 7, 2008, Conference Room T-2B3, Two White Flint North, Rockville, Maryland.

8:30 a.m.-8:35 a.m.: Opening Remarks by the ACRS Chairman (Open)—The ACRS Chairman will make opening remarks regarding the conduct of the meeting.

8:35 a.m.-9:30 a.m.: Meeting with Commissioner Lyons (Open)—The Chairman will hold discussions with NRC Commissioner Lyons regarding items of mutual interest.

9:30 a.m.-10:15 a.m.: Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open)—Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee

during future ACRS meetings as well as discussion of matters related to the conduct of ACRS business, including anticipated workload and member assignments.

10:15 a.m.–11:15 a.m.: Reconciliation of ACRS Comments and Recommendations (Open)—The Committee will discuss proposed ACRS reports on matters considered during this meeting.

11:30 a.m.–12:30 p.m.: Preparation of ACRS Reports (Open)—The Committee will discuss proposed ACRS reports on matters considered during this meeting.

1:30 p.m.–7 p.m.: Preparation of ACRS Reports (Open)—The Committee will discuss proposed ACRS reports on matters considered during this meeting.

Saturday, March 8, 2008, Conference Room T-2B3, Two White Flint North, Rockville, Maryland.

8:30 a.m.–1 p.m.: Anticipated Future Committee Schedule and Workload (Open)—The Committee will discuss anticipated future ACRS schedule and workload.

1 p.m.–1:30 p.m.: Miscellaneous (Open)—Discussion of matters related to the conduct of Committee matters that were not completed during previous meetings, as time and availability of information permit.

Procedures for the conduct of and participation in ACRS meetings were published in the **Federal Register** on September 26, 2007 (72 FR 54695). In accordance with those procedures, oral or written views may be presented by members of the public, including representatives of the nuclear industry. Electronic recordings will be permitted only during the open portions of the meeting. Persons desiring to make oral statements should notify the Cognizant ACRS staff named below five days before the meeting, if possible, so that appropriate arrangements can be made to allow necessary time during the meeting for such statements. Use of still, motion picture, and television cameras during the meeting may be limited to selected portions of the meeting as determined by the Chairman.

Information regarding the time to be set aside for this purpose may be obtained by contacting the Cognizant ACRS staff prior to the meeting. In view of the possibility that the schedule for ACRS meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should check with the Cognizant ACRS staff if such rescheduling would result in major inconvenience.

In accordance with Subsection 10(d) Public Law 92-463, I have determined that it may be necessary to close a

portion of this meeting noted above to discuss and protect information classified as proprietary to General Electric—Hitachi Nuclear Energy and their contractors.

Further information regarding topics to be discussed, whether the meeting has been canceled or rescheduled, as well as the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefor can be obtained by contacting Mr. Girija S. Shukla, Cognizant ACRS staff (301-415-6855), between 7:30 a.m. and 4 p.m. (ET). ACRS meeting agenda, meeting transcripts, and letter reports are available through the NRC Public Document Room at pdr@nrc.gov, or by calling the PDR at 1-800-397-4209, or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS) which is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> or <http://www.nrc.gov/reading-rm/doc-collections/> (ACRS & ACNW Mtg schedules/agendas).

Video teleconferencing service is available for observing open sessions of ACRS meetings. Those wishing to use this service for observing ACRS meetings should contact Mr. Theron Brown, ACRS Audio Visual Technician (301-415-8066), between 7:30 a.m. and 3:45 p.m. (ET), at least 10 days before the meeting to ensure the availability of this service. Individuals or organizations requesting this service will be responsible for telephone line charges and for providing the equipment and facilities that they use to establish the video teleconferencing link. The availability of video teleconferencing services is not guaranteed.

Dated: February 15, 2008.

Annette L. Vietti-Cook,
Secretary of the Commission.

[FR Doc. E8-3335 Filed 2-21-08; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards (ACRS); Meeting of the ACRS Subcommittee on Reliability and Probabilistic Risk Assessment; Notice of Meeting

The ACRS Subcommittee on Reliability and Probabilistic Risk Assessment (PRA) will hold a meeting on February 22, 2008, Room T-2B3, 11545 Rockville Pike, Rockville, Maryland.

The entire meeting will be open to public attendance.

The agenda for the subject meeting shall be as follows:

Friday, February 22, 2008—8:30 a.m. until the conclusion of business.

The Subcommittee will discuss the draft report, "International HRA Empirical Study, Description of Overall Approach and First Pilot Results from Comparing HRA Methods to Simulator Data." The Subcommittee will hear presentations by and hold discussions with representatives of the NRC staff, Sandia National Laboratories, the Paul Scherrer Institute, and Scientech LLC. The Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate, for deliberation by the full Committee.

Members of the public desiring to provide oral statements and/or written comments should notify the Designated Federal Official, Dr. Hossein P. Nourbakhsh, (Telephone: 301-415-5622) five days prior to the meeting, if possible, so that appropriate arrangements can be made. Electronic recordings will be permitted. Detailed procedures for the conduct of and participation in ACRS meetings were published in the **Federal Register** on September 26, 2007 (72 FR 54695).

Further information regarding this meeting can be obtained by contacting the Designated Federal Official between 7:30 a.m. and 4:15 p.m. (ET). Persons planning to attend this meeting are urged to contact the above named individual at least two working days prior to the meeting to be advised of any potential changes to the agenda.

Dated: February 11, 2008.

Cayetano Santos,

Branch Chief, ACRS.

[FR Doc. E8-3334 Filed 2-21-08; 8:45 am]

BILLING CODE 7590-01-P

SECURITIES AND EXCHANGE COMMISSION

Sunshine Act Meetings

Notice is hereby given, pursuant to the provisions of the Government in the Sunshine Act, Pub. L. 94-409, that the Securities and Exchange Commission will hold the following meetings during the week of February 25, 2008:

Closed Meetings will be held on

Tuesday, February 26, 2008 at 2 p.m.
and Wednesday, February 27, 2008 at 10 a.m.

Commissioners, Counsel to the Commissioners, the Secretary to the Commission, and recording secretaries will attend the Closed Meetings. Certain



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

February 14, 2008

SCHEDULE AND OUTLINE FOR DISCUSSION
550th ACRS MEETING
MARCH 6-8, 2008

**THURSDAY, MARCH 6, 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. Final Review of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant (Open) (MVB/MB)
10:20
2.1) Remarks by the Subcommittee Chairman
2.2) Briefing by and discussions with representatives of the NRC staff and Entergy Nuclear Operations, Inc. regarding the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant and the associated NRC staff's Final Safety Evaluation Report (SER).

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

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

- 3) 10:45 - 12:15 P.M. Final Review of the License Renewal Application for the Vermont Yankee Nuclear Power Station (Open) (MVB/CGH/CLB)
3.1) Remarks by the Subcommittee Chairman
3.2) Briefing by and discussions with representatives of the NRC staff and Entergy Nuclear Operations, Inc. regarding the License Renewal Application for the Vermont Yankee Nuclear Power Station and the associated NRC staff's Final SER, specifically, resolution of the environmentally assisted fatigue issue, and other related matters.

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

12:15 - 1:15 P.M. *LUNCH*****

- 4) 1:15 - 3:15 P.M. Selected Chapters of the SER Associated with the ESBWR Design Certification Application (Open/Closed) (MLC/CGH)
4.1) Remarks by the Subcommittee Chairman
4.2) Briefing by and discussions with representatives of the NRC staff and General Electric – Hitachi Nuclear Energy (GEH) regarding selected Chapters of the SER With Open

Items associated with the 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.

- 3:15 - 3:30 P.M. ***BREAK*****
- 5) 3:30 - 3:45 P.M. Subcommittee Report (Open) (JDS/MB)
Report by and discussions with the Chairman of the ACRS Subcommittee on Plant License Renewal regarding interim Review of the License Renewal Application for the Wolf Creek Generating Station discussed during the Subcommittee meeting on March 5, 2008.
- 6) 3:45 - 7:00 P.M. Preparation of ACRS Reports (Open)
Discussion of proposed ACRS reports on:
- 6.1) License Renewal Application for the James A. FitzPatrick Nuclear Power Plant (MVB/MB)
 - 6.2) License Renewal Application for the Vermont Yankee Nuclear Power Station (MVB/CGH/CLB)
 - 6.3) Selected Chapters of the SER Associated with the ESBWR Design Certification Application (MLC/CGH)

FRIDAY, MARCH 7, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 7) 8:30 - 8:35 A.M. Opening Remarks by the ACRS Chairman (Open) (WJS/CS/SD)
- 8) 8:35 - 9:30 A.M. Meeting with Commissioner Lyons (Open) (WJS/GSS)
- 8.1) Remarks by the ACRS Chairman
 - 8.2) Discussions with Commissioner Lyons regarding items of mutual interest.
- 9) 9:30 - 10:15 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.

10:15 – 10:30 A.M. *BREAK*****

- 10) 10:30 – 11:30 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.
- 11) 11:30 – 12:30 P.M. Preparation of ACRS Reports (Open)
Discussion of proposed ACRS reports on:
11.1) License Renewal Application for the James A. FitzPatrick Nuclear Power Plant (MVB/MB)
11.2) License Renewal Application for the Vermont Yankee Nuclear Power Station (MVB/CGH/CLB)
11.3) Selected Chapters of the SER Associated with the ESBWR Design Certification Application (MLC/CGH)
- 12:30 - 1:30 P.M. ***LUNCH*****
- 12) 1:30 - 7:00 P.M. Preparation of ACRS Reports (Open)
Continue discussion of proposed ACRS reports listed under Item 11.

SATURDAY, MARCH 8, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

- 13) 8:30 A.M. - 1:00 P.M. Anticipated Future Committee Schedule and Workload (Open)
(WJS/FPG)
Discussion of anticipated future ACRS schedule and workload.
- (10:30 - 10:45 A.M. BREAK)**
- 14) 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.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
550TH FULL COMMITTEE MEETING

March 6-8, 2008

PLEASE PRINT

TODAY'S DATE: March 6, 2008

	<u>NAME</u>	<u>NRC ORGANIZATION</u>
1	Gerrit Meyer	Region 5
2	Arara Smith	
3	PETER WEN	ACRS
4	DAN HOANG	NRR / DLR
5	JAMES MEDOFF	NRR / DLR
6	DUC NGUYEN	NRR / DLR
7	Oh Kee	NRR / DLR
8	B T KWO	NRR / DLR
9	KANI FRANOVICH	NRR / DLR
10	Ken Chang	NRR / DLR
11	Bill Rogers	NRR / DLR
12	JOHN TSAO	NRR / DCI
13	Lembrot Lets	NRR / DSS / SR&B
14	ANGELO STUBBS	NRO / DSPA / SBPA
15	Roy MATHEW	NRR / DE /
16	Hansraj ASHAR	NRR / DE /
17	Raj Anluck	NRR / DLR
18	Ganesh Cheruvuvelu	NRR / DCI
19	Tam Tran	NRR / DLR
20	MAVIAKE HEATH	NRR / DLR
21	Jonathan Rowley	NRR / DLR
22	Tommy Le	NRR / DLR
23	Gary L. Stevens	STRUCTURAL
24	Ted Henson	SEIU
25	Joe Kabarek	SEIU
26	Faridch Emami Saba	NRR / DORL
27	Stacie Salami	NRR / DLR
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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
550TH FULL COMMITTEE MEETING

March 6-8, 2008

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TODAY'S DATE: March 6, 2008

	<u>NAME</u>	<u>NRC ORGANIZATION</u>
1	Michael Marshall	NRO/DCIP/CTSB
2	MANNY COMAR	NRO/DNRL/NGE2
3	Leslie Perkins	NRO/DNRL/NGE2
4	C. CRAIG HARBUCK	NRO/DCIP/CTSB
5	GREG MAKAR	NRO/DE/CIB1
6	Rick Branch	NRO/DSRA/
7	JEFF Pochler	NRO/DE/CIB1
8	Jorge Hernandez	NRO/DSRA/SBPA
9	DAVID SHUM	NRO/DSRA/SBPA
10	AMAR PAL	NRO/DE/EEB
11	KEITH HOFFMAN	NRO/DE/CIB2
12	Jamir Diaz	NRO/DCIP/CAVB
13	John Senola	NRO/DSRA/SBPA
14	Chang-Yang Li	NRO/DSRA/SBPA
15	Kim Grubs	NRO/DE/CIB2
16	Hulbert Li	NRO/DE/CIB2
17	ERIC OESTERLE	NRO/DNRL/NGE1
18	Mike Snodderly	NRO/DSRA/SBCU
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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
549TH FULL COMMITTEE MEETING

March 6-8, 2008

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TODAY'S DATE: March 6, 2008

	<u>NAME</u>	<u>AFFILIATION</u>
1	Aurora Smith	Energy Nuclear
2	THOMAS MUSKALYN	Energy Nuclear
3	LAWRENCE LEITER	Energy Nuclear
4	Jan Heinbueckle	Southern Nuclear
5	Chalmer Myer	Southern Nuclear
6	Richard Schallig	STARS (APS)
7	Jim Costedio	Energy Nuclear
8	Pete Dietrich	Energy Nuclear
9	Steve Bono	Energy Nuclear
10	Joe Pachacek	Energy Nuclear
11	BRIAN FINN	Energy Nuclear
12	MICHAEL FALLIN	Constellation Energy
13	Rick Plasser	Energy
14	GARRY G. YOUNG	Energy
15	Duane L. Filchner	PPL Susquehanna
16	Michael Metell	Energy UX
17	David J. Lach	Energy
18	Brian Finn	Energy
19	DAVID MANNAS	Energy
20	Nolan Colebrook	Energy
21	James Jones	HA
22	Jennifer Jones	Legin Group Inc.
23	ALAN COX	Energy
24	Beth Bristol	Energy
25	Scott Goodrum	Energy
26	Paul Sullivan	Energy
27	Gary L. Stevens	Structural Integrity Associates
28	JAMES C. FITZPATRICK	Energy

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
549TH FULL COMMITTEE MEETING

March 6-8, 2008

PLEASE PRINT

TODAY'S DATE: March 6, 2008

	<u>NAME</u>	<u>AFFILIATION</u>
1	HUGH UPTON	GEH
2	J. Alan Beard	GEH
3	Tom Caine	GEH
4	George Wadkins	GEH
5	Kick WACHOWIAK	GEH
6	Larry J. Tucker	GEH
7	MIKE ARCALO	GEH
8	MICHAEL SILVA	GEH
9	JERRY DEEVER	GEH
10	DAVE DAVENPORTS	GEH
11	Jack Noonan	GEH
12	JAMES KINSEY	GE - HITACHI
13	Wayne MARQUINO	GEH
14	PETER JORDAN	GEH
15	JEFF FOWLER	-
16	DAN WILLIAMSON	GEH
17	CHRIS WIEGAND	EXELON NUCLEAR
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

March 20, 2008

AGENDA
551st ACRS MEETING
APRIL 10 - 12, 2008

THURSDAY, APRIL 10, 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 - 11:30 A.M. Extended Power Uprate Application for the Hope Creek
Generating Station (Open/Closed) (SAK/ZA)
10:00 - 10:15 A.M. 2.1) Remarks by the Subcommittee Chairman
BREAK 2.2) Briefing by and discussions with representatives of the
NRC staff and the PSEG Nuclear Company regarding the
Extended Power Uprate Application for the Hope Creek
Generating Station and the associated NRC staff's Safety
Evaluation.

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

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

- 11:30 - 12:30 P.M. ***LUNCH***
- 3) 12:30 - 2:30 P.M. Pressurized Water Reactor Owners Group (PWROG) Topical
Report WCAP-16793-NP, "Evaluation of Long-Term Cooling
Considering Particulate, Fibrous, and Chemical Debris in the
Recirculating Fluid" (Open) (SB/DEB)
3.1) Remarks by the Subcommittee Chairman
3.2) Briefing by and discussions with representatives of the
NRC staff and PWROG regarding the NRC staff's draft
Safety Evaluation associated with the PWROG Topical
Report WCAP-16793-NP, and related matters.

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

- 2:30 - 2:45 P.M. ***BREAK***

- 4) 2:45 – 4:45 P.M. Proposed Licensing Strategy for the Next Generation Nuclear Plant (NGNP) (Closed) (MLC/MB)
 4.1) Remarks by the Subcommittee Chairman
 4.2) Briefing by and discussions with representatives of the NRC staff and Department of Energy regarding the proposed licensing strategy for the Next Generation Nuclear Plant.

[Note: This session will be closed to prevent disclosure of information the premature disclosure of which would be likely to significantly frustrate implementation of a proposed agency action pursuant to 5 U.S.C. 552b (c)(9) (b)]

4:45 - 5:00 P.M. *****BREAK*****

- 5) 5:00 - 7:00 P.M. Preparation of ACRS Reports (Open/Closed)
 Discussion of proposed ACRS reports on:
 5.1) Hope Creek Extended Power Uprate Application (SAK/ZA)
 5.2) PWROG Topical Report WCAP-16793-NP (SB/DEB)
 5.3) Response to the EDO Response to the December 20, 2007 ACRS Report on the Susquehanna Power Uprate Application) (SB/ZA)
 5.4) Proposed Licensing Strategy for the Next Generation Nuclear Plant (NGNP) (MLC/MB) (Closed)

FRIDAY, APRIL 11, 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 - 10:30 A.M. Digital Instrumentation and Controls (I&C) Interim Staff Guidance and Related Matters (Open) (GEA/GSS/CEA)
 7.1) Remarks by the Subcommittee Chairman
 7.2) Briefing by and discussions with representatives of the NRC staff and Nuclear Energy Institute (NEI) regarding Digital I&C interim staff guidance on Cyber Security, Licensing Process, and Review of New Reactor Digital I&C PRAs, as well as assessment of Digital System Operating Experience Data and Digital Categorization Update, current status of Traditional Methods Digital Reliability Modeling research, and related matters.

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

10:30 – 10:45 A.M. *****Break*****

- 8) 10:45 – 11:30 A.M. Future ACRS Activities/Report of the Planning and Procedures Subcommittee (Open) (WJS/FPG/SD)
- 8.1) Discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the full Committee during future ACRS meetings.
 - 8.2) Report of the Planning and Procedures Subcommittee on matters related to the conduct of ACRS business, including anticipated workload and member assignments.
- 9) 11:30 – 11:45 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.
- 11:45 - 12:45 P.M. *****LUNCH*****
- 10) 12:45 - 7:00 P.M. Preparation of ACRS Reports (Open/Closed)
Discussion of proposed ACRS reports on:
- 10.1) Hope Creek Extended Power Uprate Application (SAK/ZA)
 - 10.2) Digital I&C Interim Staff Guidance and related matters (GEA/GSS/CEA)
 - 10.3) PWROG Topical Report WCAP-16793-NP (SB/DEB)
 - 10.4) Response to the EDO Response to the December 20, 2007 ACRS Report on the Susquehanna Power Uprate Application) (SB/ZA)
 - 10.5) Proposed Licensing Strategy for the Next Generation Nuclear Plant (NGNP) (MLC/MB) (Closed)
- 2:45 – 3:00 P.M.
*****Break*****

SATURDAY, APRIL 12, 2008, CONFERENCE ROOM T-2B3, TWO WHITE FLINT NORTH, ROCKVILLE, MARYLAND

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

ML080780528

**LIST OF DOCUMENTS PROVIDED TO THE COMMITTEE
550th ACRS MEETING
March 6-8, 2008**

MEETING HANDOUTS

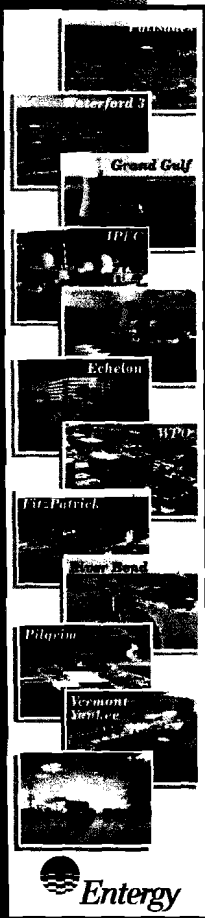
<u>AGENDA ITEM #</u>	<u>DOCUMENTS/HANDOUTS LISTED IN ORDER</u>
1.	<u>Opening Remarks by the ACRS Chairman</u>
2.	<u>Final Review of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant</u> 1. Entergy License Renewal Presentation (Slides) 2. James A. FitzPatrick Nuclear Power Plant License Renewal Safety Evaluation Report (Slides from NRC/NRR)
3.	<u>Final Review of the License Renewal Application for the Vermont Yankee Nuclear Power Station</u> 3. Proposed Schedule for the Session 4. Entergy License Renewal Presentation (Slides) 5. Vermont Yankee Nuclear Power Station Safety Evaluation Report (Environmental Fatigue), (Slides from NRC/NRR)
4.	<u>Selected Chapters of the SER Associated with the ESBWR Design Certification Application</u> 6. Proposed Schedule for the Session 7. ESBWR DCD Tier 2, Chapters 9, 10, 13, and 16 (Slides from GE Hitachi Nuclear Energy) 8. Published Allegations Reports: Assessing Nuclear Vulnerabilities and Critical G4S/Wackenhut Nuclear Security (handout from SEIU) 9. ESBWR Safety Evaluation Report with Open Items, Chapters 9, 10, 13, and 16 (Slides from NRC/NRO)
6.	<u>Preparation of ACRS Reports</u>
7.	<u>Opening Remarks by Chairman</u>
8.	<u>Meeting with Commissioner Lyons</u>
9.	<u>Future ACRS Activities/Report of the Planning and Procedures Subcommittee</u>
10.	<u>Reconciliation of ACRS Comments and Recommendations</u> 10. Memorandum to Sanjoy Banerjee (Chairman, Power Uprates Subcommittee) from Zena Abdullahi (Staff Engineer, ACRS) Regarding, "Analysis of EDO Response to ACRS Letter on the Susquehanna Steam Electric Station, Units 1 and 2, Extended Power Uprate
11. – 13.	<u>Preparation of ACRS Reports</u>

**Copies of most of the handouts can be found posted on the ACRS portion of the NRC Public Website.

[Note: Some documents listed herein may have been provided or prepared for the Committee use only. These documents must be reviewed prior to release to the public.]

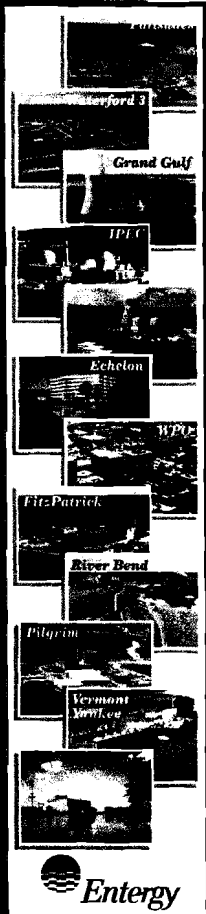
James A. FitzPatrick Nuclear Power Plant

ACRS License Renewal Presentation March 6, 2008



James A. FitzPatrick

Personnel in Attendance



Pete Dietrich
Brian Finn
Garry Young

Site Vice President
Site NSA Director
Manager, Business Development

Steve Bono
Joe Pechacek

Director of Engineering
Manager, Programs & Components
Engineering

Alan Cox

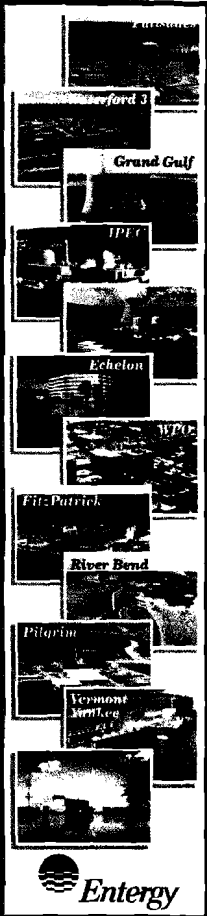
Technical Manager

James Costedio
Rick Plasse
Larry Leiter
Tom Moskalyk
Aturo Smith

Licensing Manager
Licensing Lead
Technical Lead
Structural Lead
ISI Engineer

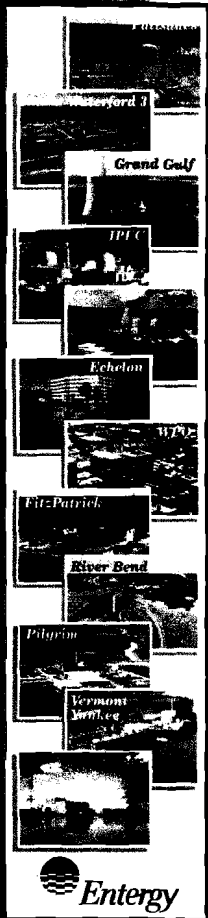
Agenda

- Background
 - Site Description
 - Licensing History
 - Major Plant Improvements
 - Plant Performance
 - License Renewal Project
- Presentation Topics
 - Torus Monitoring
- Questions



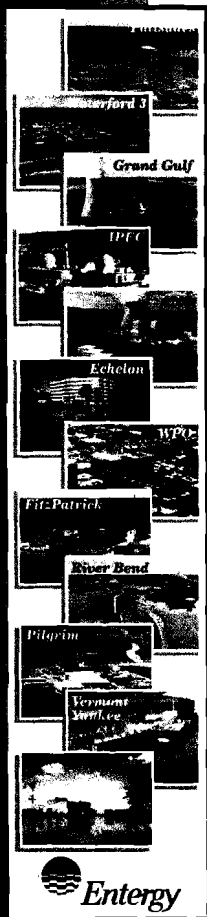
JAFNPP Site Description

- General Electric (NSSS & TG),
Stone & Webster (AE and Constructor)
- BWR-4, Mark I Containment
- 2536 MWt Thermal Power; ~ 881 MWe
- Once-through Cooling from Lake Ontario
- Staff Complement: Approximately 650

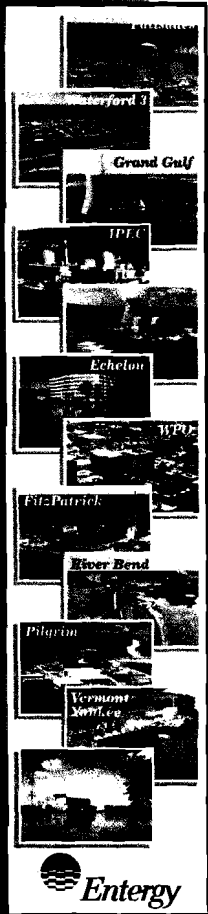


JAFNPP Licensing History

Construction Permit	May 20, 1970
Operating License	October 17, 1974
Commercial Operation	July 28, 1975
Updated Power License (4%)	December 6, 1996
License Transfer to Entergy	November 21, 2000
LR Application Submitted	July 31, 2006
Operating License Expires	October 17, 2014



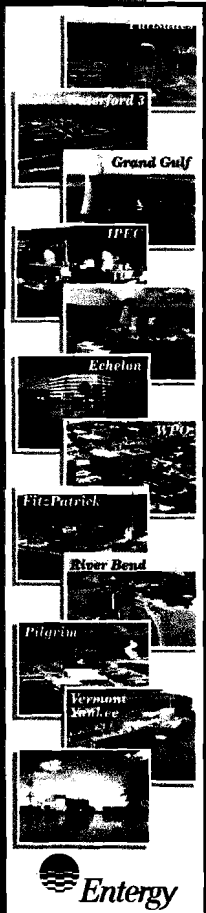
Major Improvements



- 1978 – 1983 Mark I Containment Modifications
- 1988 Hydrogen Water Chemistry
- 1989 Zinc Injection
- 1990 Power Uprate Equipment Upgrades
- 1998 ECCS Suction Strainers Replaced
- 1999 Noble Metals Application
- 2004 LP Turbine Rotor Replacement
- 2004 Noble Metals Application 2
- 2006 HP Turbine Rotor Replacement
- 2006 Offgas Condenser Replacement
- 2006 HPCI Discharge Exhaust Sparger Added

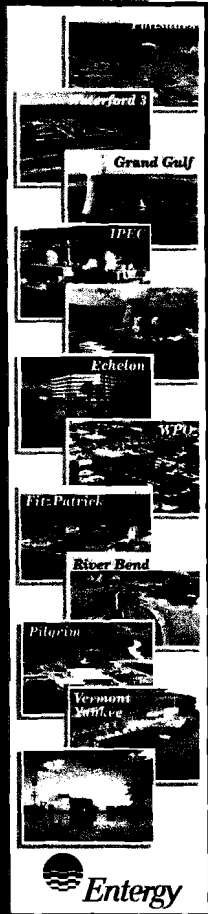
JAFNPP Plant Status

- Current Plant Status
- Outage Summary – Sept 2008
 - Outage items of interest
 - Main Transformer Replacement
 - Core Spray Motor Replacement
 - 345KV Breaker Replacement
 - Screenhouse Upgrades



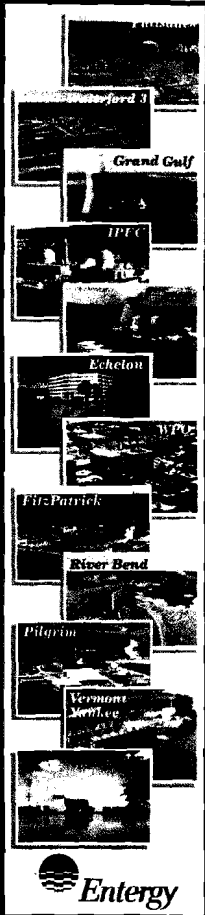
JAFNPP License Renewal Project

- LRA prepared by experienced, multi-discipline Entergy team (utilized corporate and on-site resources)
- Incorporated lessons learned from previous applications
- Peer review conducted
- LRA internal reviews (Safety Review Committees and QA)
- All comments resolved prior to submittal



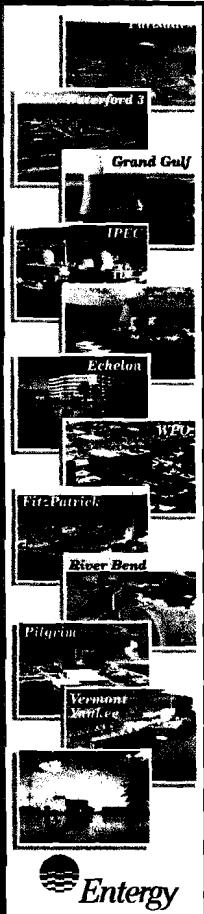
JAFNPP License Renewal Project

- Application Evaluated with GALL Revision 1
- License Renewal Commitments
- 36 Aging Management Programs

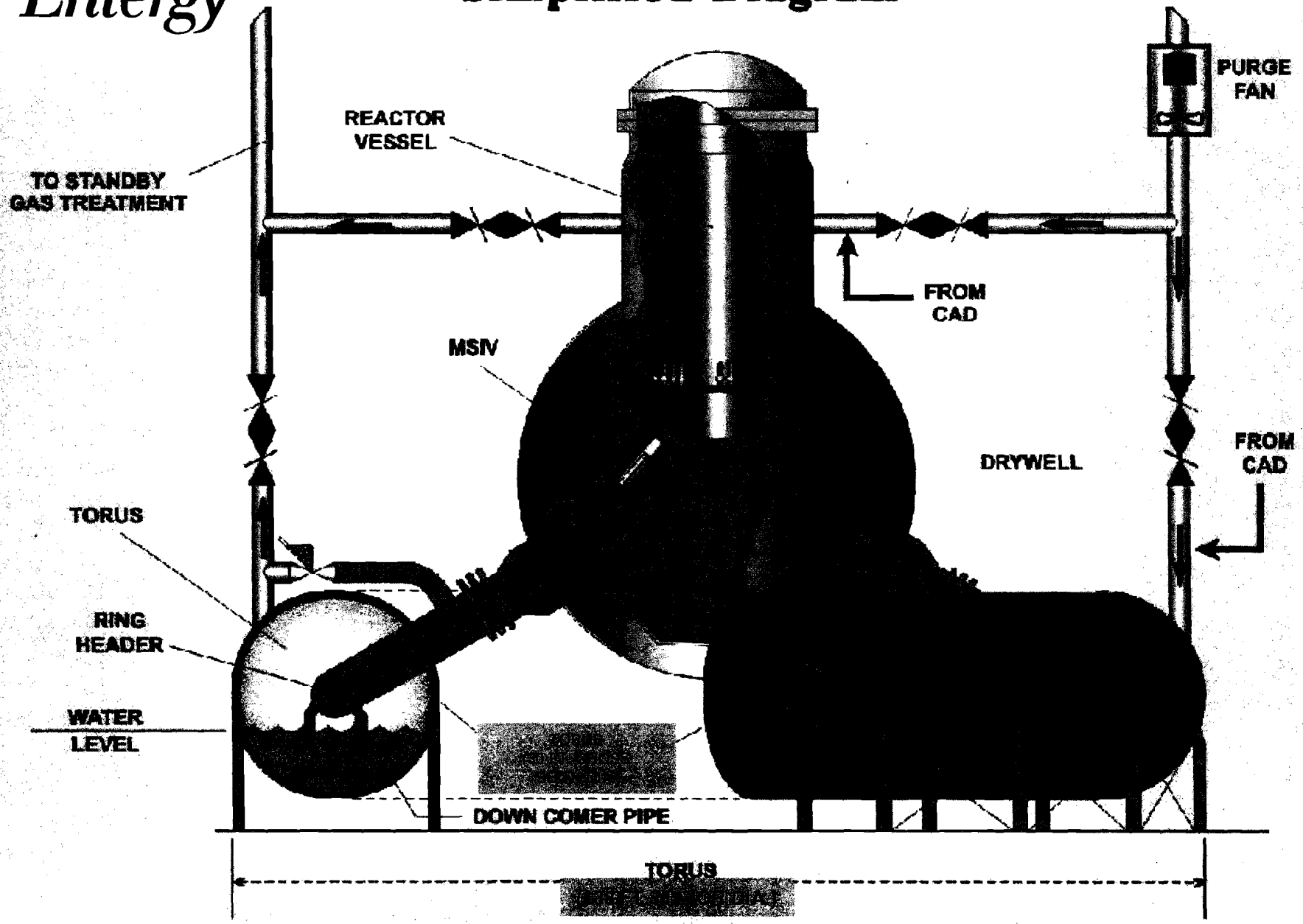


JAFNPP License Renewal Project

- Draft SER Issued July 2007 with 2 Open Items
 - Open Items – 2
 - Reactor Vessel Fluence
 - Environmentally Assisted Fatigue
 - Confirmatory Items – None
- Final SER Issued January 2008
 - All open items resolved

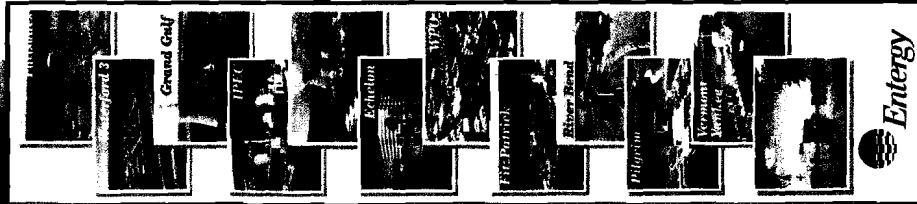


Primary Containment System Simplified Diagram



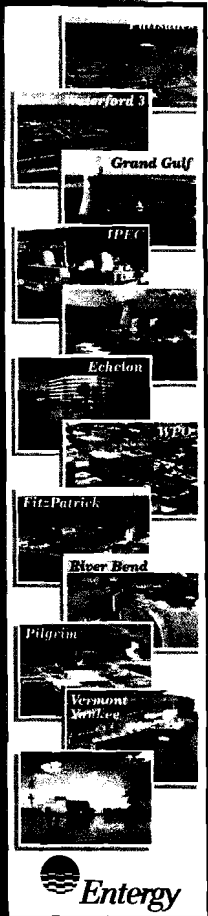
James A. FitzPatrick

Torus Monitoring



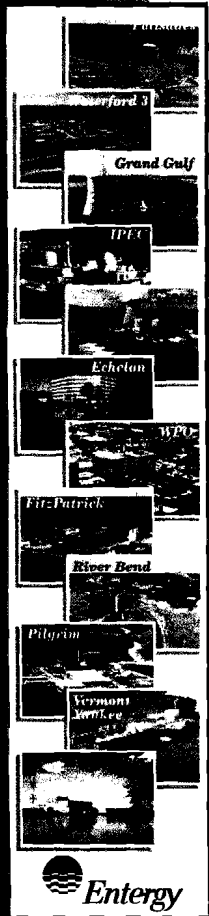
Torus Monitoring

- JAF Containment Inservice Inspection (CII) Program implements IWE provisions
- ASME Code Category E-A Requirements (Containment Surfaces)
 - CII Program is performed in accordance with ASME Section XI 2001 Edition / 2003 Addendum



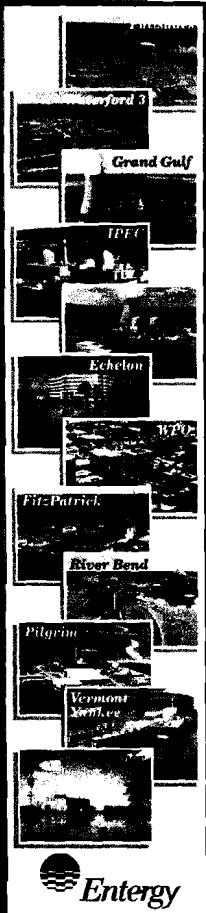
Torus Monitoring

- Inspection scope and frequency is in accordance with Table IWE-2500-1
 - Accessible Surface Areas – General Visual
 - Once Every Period
 - Wetted Surfaces of Submerged Areas – General Visual
 - 100% Once Every Interval
 - BWR Vent System – Accessible Surface Areas
 - 100% Once Every Interval



Torus Monitoring

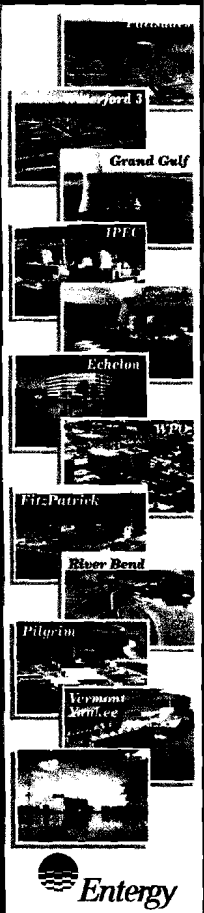
- Inspection scope and frequency is in accordance with Table IWE-2500-1
 - Moisture Barriers – General Visual
 - 100% During Each Inspection Period
 - Containment Surface Areas – Detail Visual
 - Visible Surfaces 100% of surface areas Identified by IWE-1242
 - Surface Area Grid – Ultrasonic Thickness
 - 100% of minimum wall thickness locations each inspection period established in accordance with IWE-2500(b)(3) and IWE-2500(b)(4).



Torus Monitoring

- JAF Program

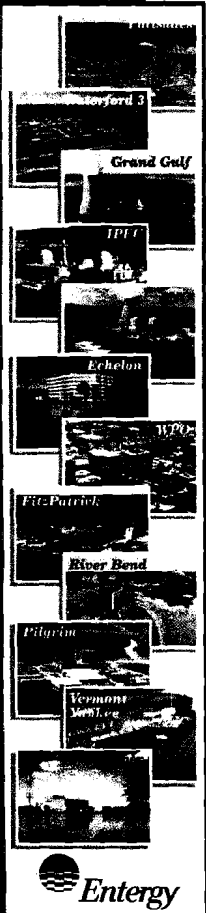
- No identified interior/exterior containment surface areas that have substantial corrosion and/or pitting.
- No identified interior/exterior containment surface areas that are subject to excessive wear from abrasion or erosion that causes a loss of protective coatings, deformation, or material loss.



Torus Monitoring

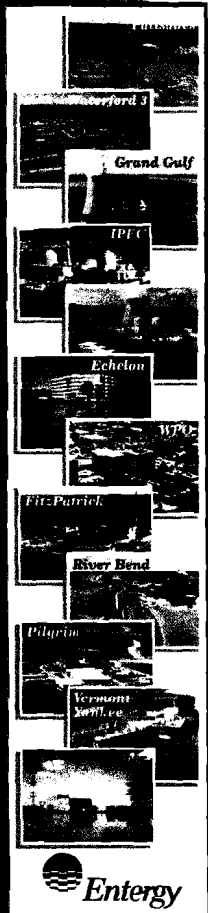
- JAF Program

- JAF has identified 29 locations on the interior surface of the torus (suppression pool) that have minor pitting.
- JAF monitors these locations through the CII Inspection Program which requires more frequent examinations than augmented examinations required by IWE-1241.



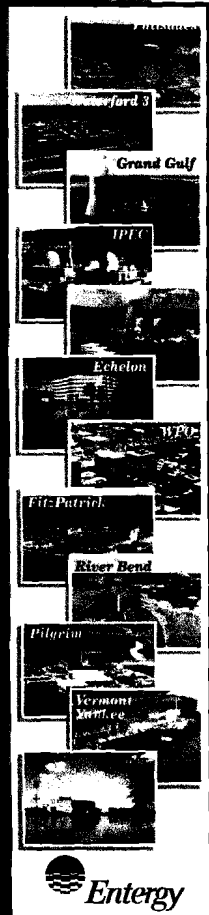
Torus Monitoring


- Ongoing Actions to Ensure Structural Integrity
 - Primary Containment system is inerted with nitrogen and provides atmosphere that is not conducive to corrosion of containment interior surfaces.
 - Torus Preservation and monitoring of interior surfaces identifies and mitigates Torus interior degradation and coating issues.



Torus Monitoring

- Ongoing Actions to Ensure Structural Integrity
 - IWE general examinations monitor the accessible Torus surfaces for degradation.
 - IWE examinations are used to evaluate conditions of the wetted surface areas when drain down or desludging is performed.
 - Torus wall thickness monitoring is performed by ultrasonic examination per the IWE program.






U.S. NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

**Advisory Committee on Reactor Safeguards
 (ACRS) License Renewal Full Committee**

**James A. Fitzpatrick Nuclear Power Plant
 License Renewal Safety Evaluation Report**

Tommy Le, Sr. Project Manager, NRR
 Roy Mathew, Audit Team Leader, NRR
 Glenn Meyer, Inspection Team Leader, RI
 March 6, 2008


1



Introduction

- Overview
- License Renewal Inspections
- Section 2: Scoping and Screening Review
- Section 3: Aging Management Review Results
- Section 4: Time-Limited Aging Analyses (TLAAs)

2



Overview

Recap of September 2007 sub-committee meeting

- 346 Audit Questions
- 118 RAIs Issued
- Safety Evaluation Report (SER) With Open Items was issued July 31, 2007
 - Two (2) Open Items
 - Zero (0) Confirmatory Items
 - Three (3) Standard License Conditions

3



License Renewal Inspections

Glenn Meyer
 Inspection Team Leader, Region I

4



Regional Inspection

- 54.4(a)(2) - non-safety SSCs whose failure could affect safety SSCs
- Spatial and Structural Interactions
- LRA Drawings and procedures reviewed
- Plant walkdowns performed
- Some components or portions of systems needed to be added to scope

5



Regional Inspection

- Spatial interaction – No Inconsistencies Identified
- Structural interaction - No Inconsistencies Identified
- Scoping and screening - No Inconsistencies Identified

6



Regional Inspection

Aging Management

- Reviewed program implementation for 22 AMPs
- Reviewed programs, evaluations, and records
 - Program procedures
 - Operational experience information
 - Corrective actions on prior plant issues
- Interviewed cognizant personnel
- Performed plant walk downs

7



Regional Inspection

Aging Management

- **Aging Management Programs support conclusion that aging effects will be managed**
- **Regional Administrator's Letter To NRR Director issued January 25, 2008**

8



Section 2 Conclusion

- The applicant's scoping and screening methodology consistent with the requirements of 10 CFR 54.4 and 54.21(a)(1)
- SSCs within the scope of license renewal and subject to AMR are consistent with the requirements of 10 CFR 54.4 and 54.21(a)(1)

9



Section 3: Aging Management Review Results

Aging Management Programs (AMPs)

- **Total 36 AMPs**
 - 26 existing AMPs
 - 10 new AMPs
- **GALL Report Consistency**
 - 10 Consistent
 - 20 Consistent with exceptions/enhancements
 - 6 Plant Specific

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Section 3: Aging Management Review Results

- **346 Audit Questions**
- **All Questions except two (2) were resolved**
 - 2 Questions Converted to RAIs
 - Fifty-five of the Questions Resulted in Revisions to the LRA
- **25 Commitments at the End of the Audit**

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Section 3 Conclusion

- Based on its review of the AMRs and AMPs, the staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation

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Section 4 - TLAAs

- **OI 4.2.1-1 – Reactor Vessel Fluence (Resolved)**
 - New (Reg Guide 1.190-based) calculation submitted on November 5, 2007
 - Methodology acceptable and new value is bounded by initial value
- **OI 4.3.3-1 – Environmentally-Assisted Fatigue (Resolved)**
 - The applicant submitted Commitment #20
 - Will comply with 10 CFR 54.21(c)(1)(iii)

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Section 4 Conclusion

- TLAAs
 - 10 CFR 54.3: TLAA list adequate, as amended
 - 10 CFR 54.21(c)(1)(i): analyses remain valid for Period of Extended Operation (PEO), (ii): analyses projected to the end of PEO, and (iii): aging effects will be adequately managed for PEO
 - 10 CFR 54.21(d): Sufficient supplements to FSAR
 - 10 CFR 54.21(c)(2): No plant specific exemptions

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License Conditions

- The first license condition requires the applicant to include the UFSAR supplement required by 10 CFR 54.21(d) in the next UFSAR update, as required by 10 CFR 50.71(e), following the issuance of the renewed license.
- The second license condition requires future activities identified in the UFSAR supplement to be completed prior to the period of extended operation.
- The third license condition requires that all capsules in the reactor vessel that are removed and tested meet the requirements of American Society for Testing and Materials (ASTM) E 185-82 to the extent practicable for the configuration of the specimens in the capsule. Any changes to the capsule withdrawal schedule, including spare capsules, must be approved by the staff prior to implementation. All capsules placed in storage must be maintained for future insertion. Any changes to storage requirements must be approved by the staff, as required by 10 CFR Part 50, Appendix H.

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STAFF CONCLUSION

- The staff has concluded that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the JAFNPP CLB in order to comply with 10 CFR 54.29(a) are in accord with the Act and Commission's regulations.

16

**Advisory Committee on Reactor Safeguards
Plant License Renewal Subcommittee Meeting
Vermont Yankee Nuclear Power Station
March 6, 2008
Rockville, MD**

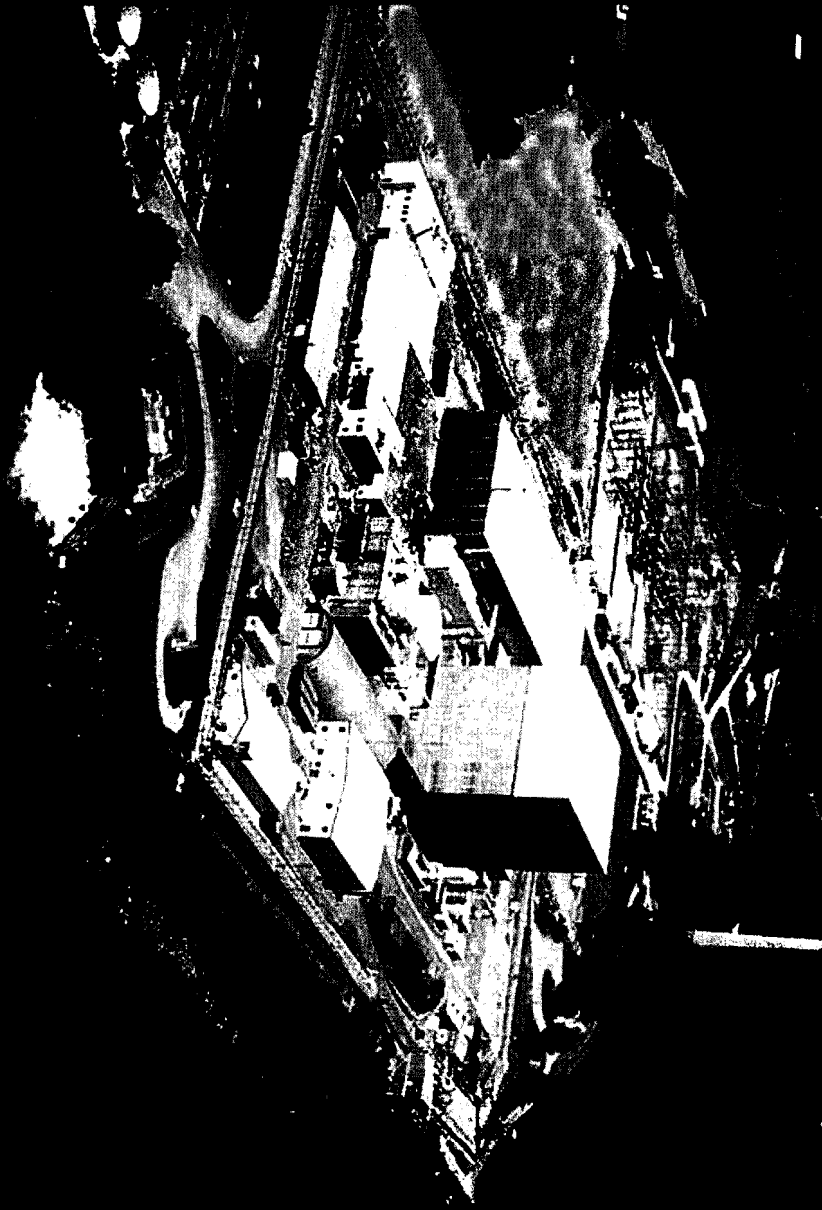
-PROPOSED SCHEDULE-

Cognizant Staff Engineer: Christopher L. Brown clb@nrc.gov (301) 415-7111

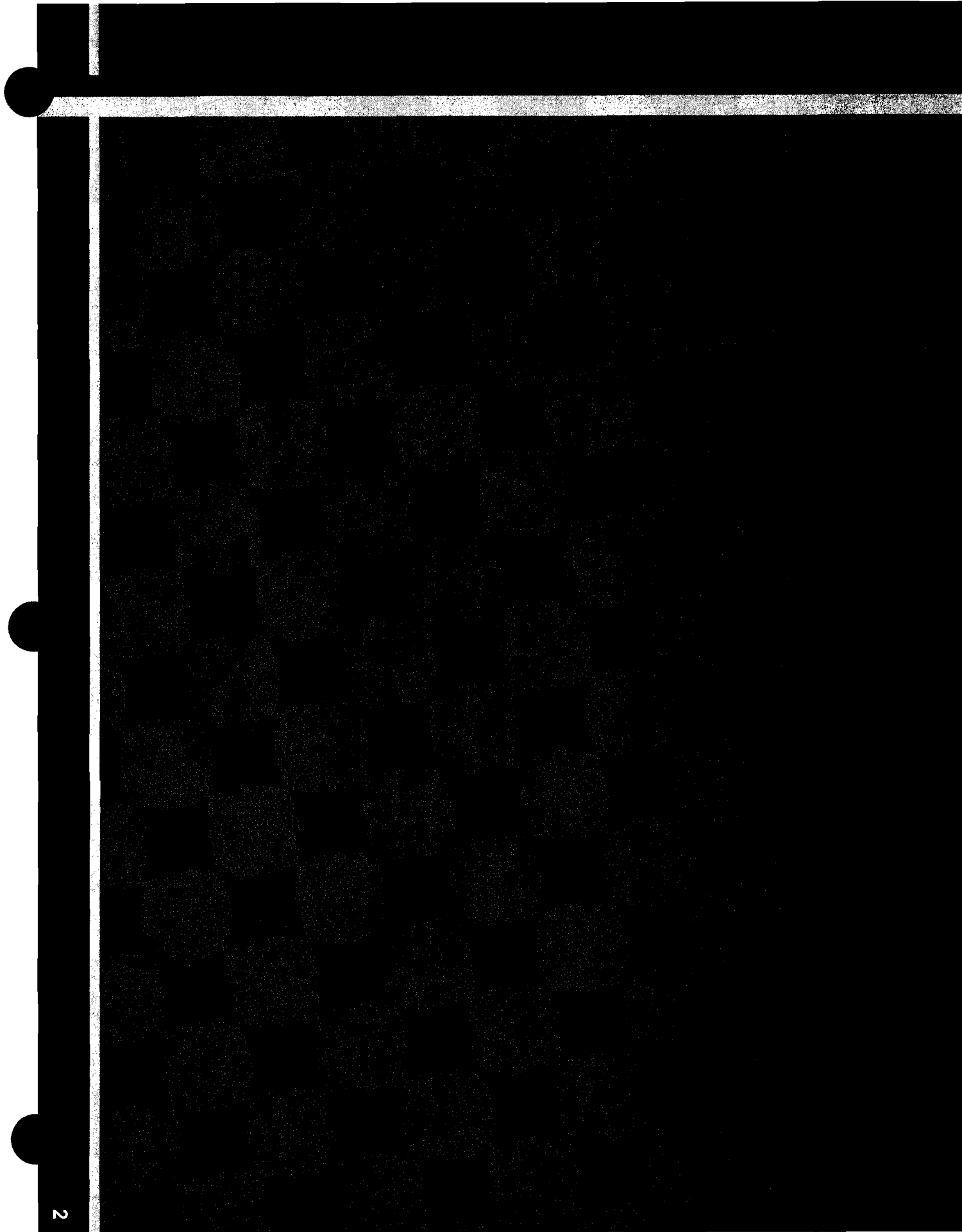
Topics	Presenters	Time
Opening Remarks	M. Bonaca, ACRS	10:45 am - 10:50 am
Staff Introduction	P.T. Kuo, NRR	10:50 am - 10:55 am
Vermont Yankee License Renewal Application Presentation on Environmentally Assisted Fatigue (EAF)	John Dreyfuss, Entergy	10:55 am - 11:40 am
NRC Staff Review Summary	K. Chang, NRR	11:40 am - 12:05 am
Committee Discussion	M. Bonaca, ACRS	12:05 am - 12:15 am

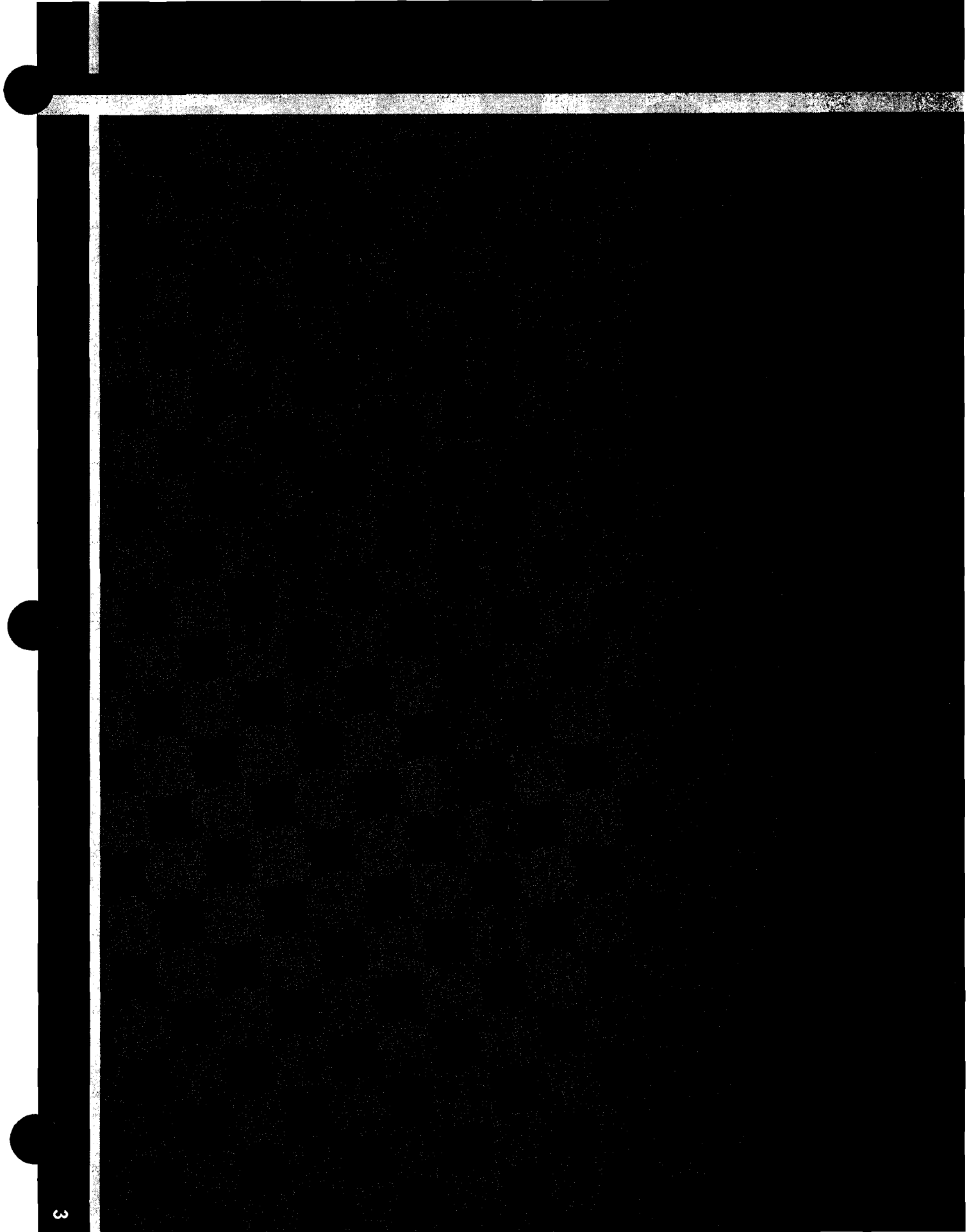
NOTE:

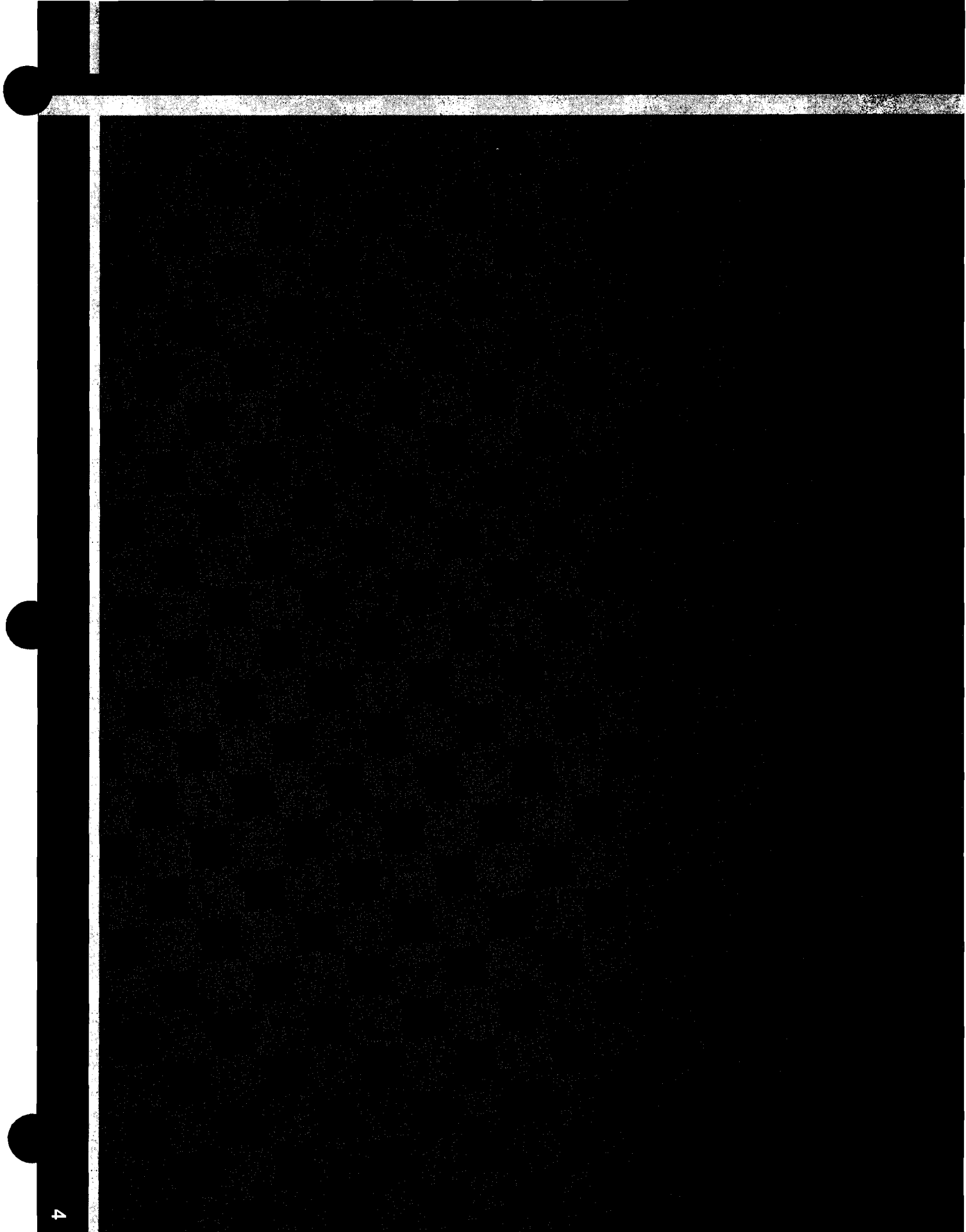
- Presentation time should not exceed 50 percent of the total item. The remaining 50 percent of the time is reserved for discussion.
- 50 copies of the presentation materials to be provided.

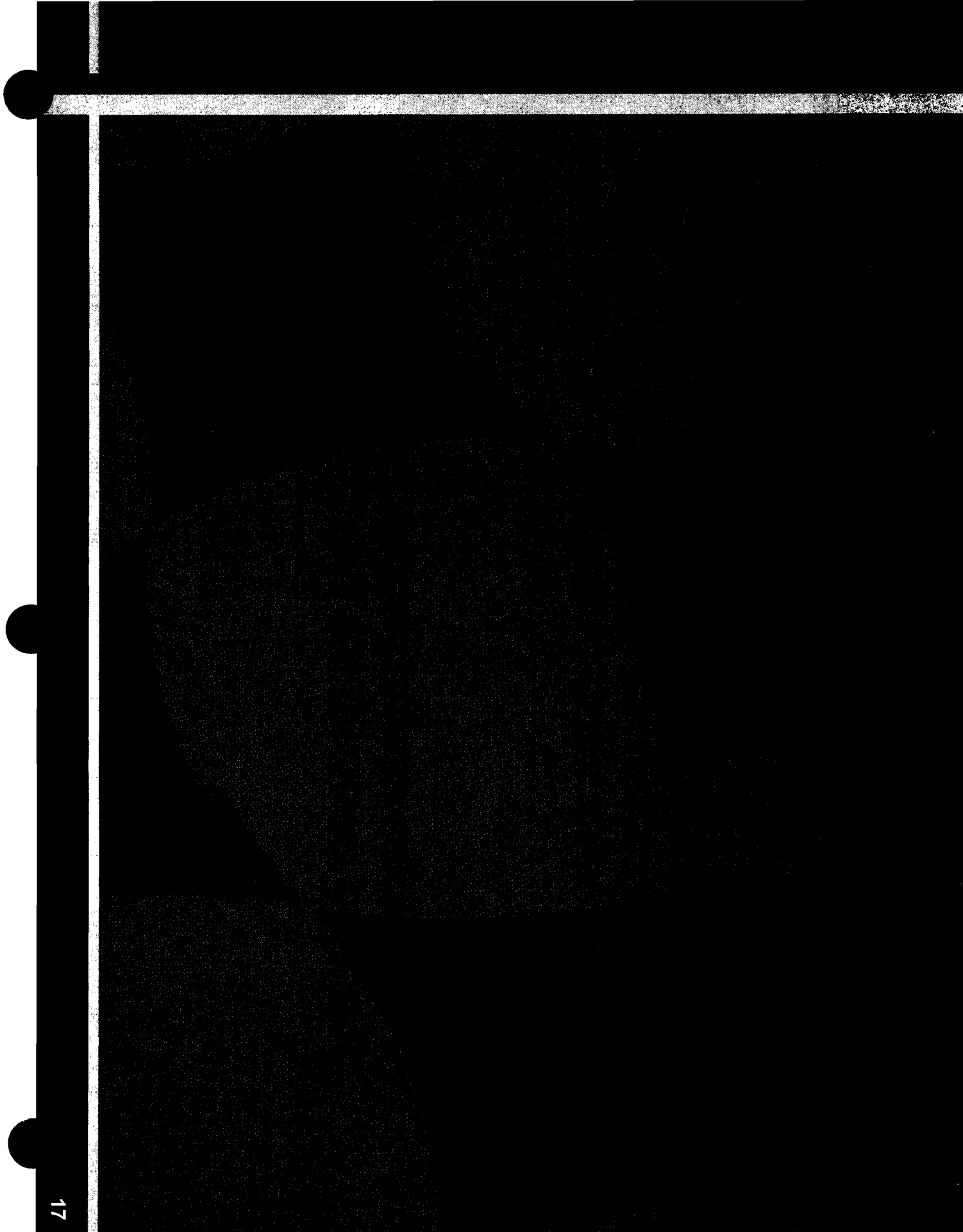


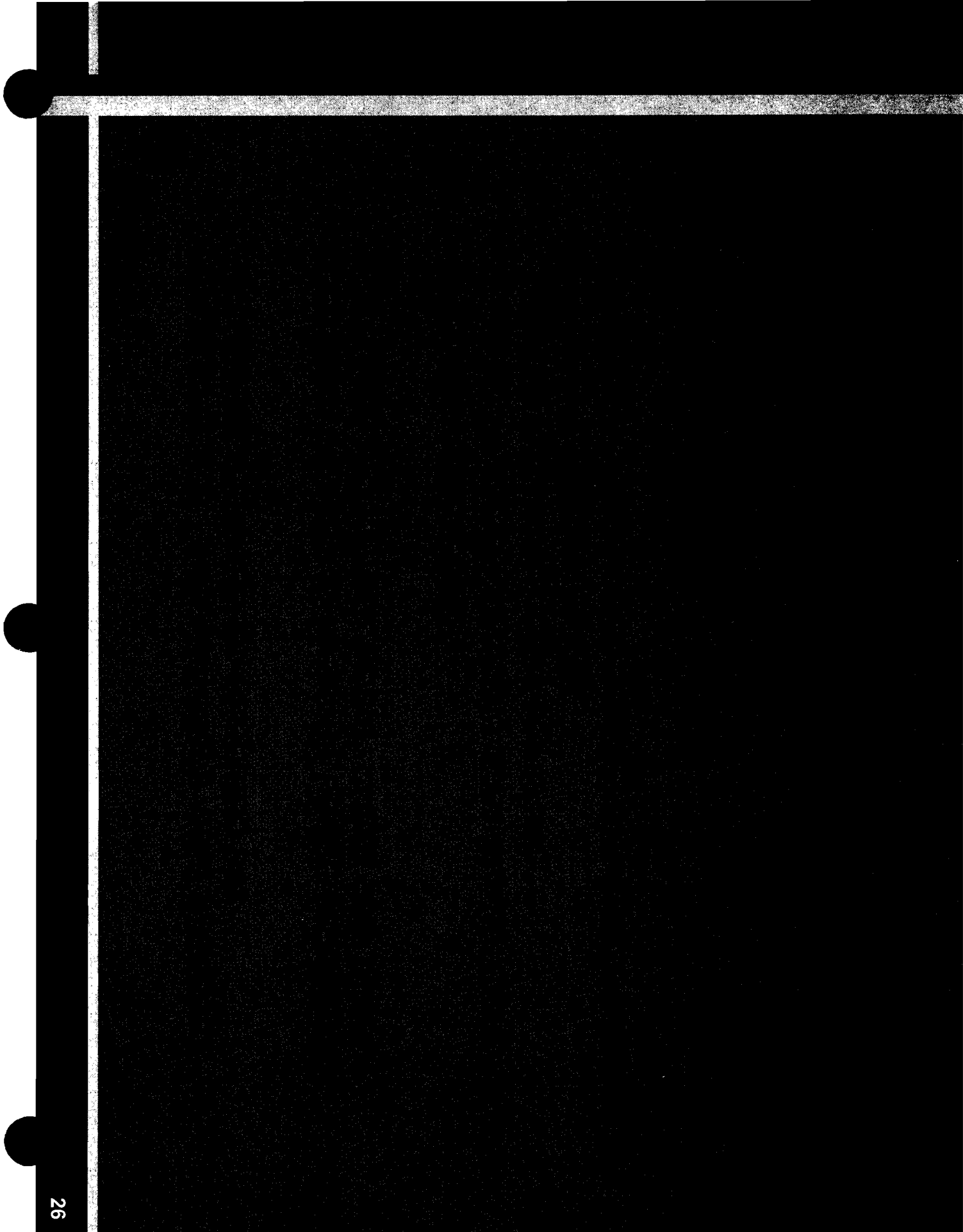
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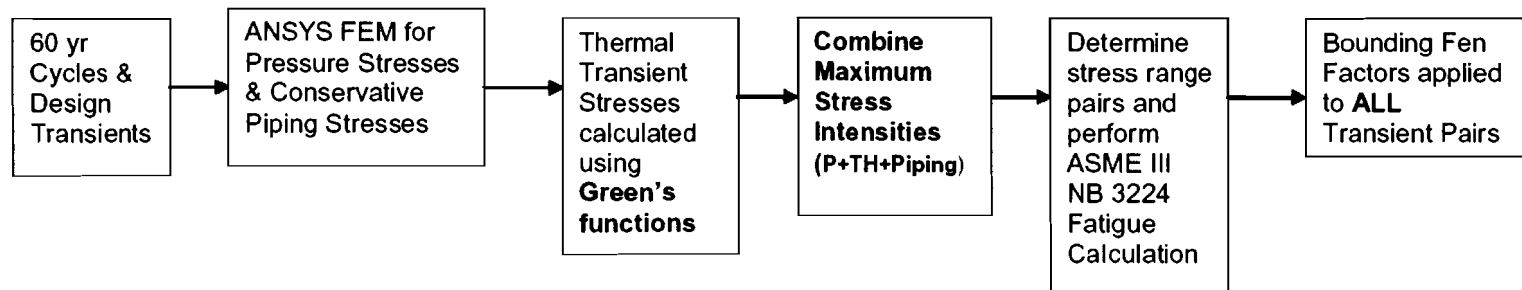




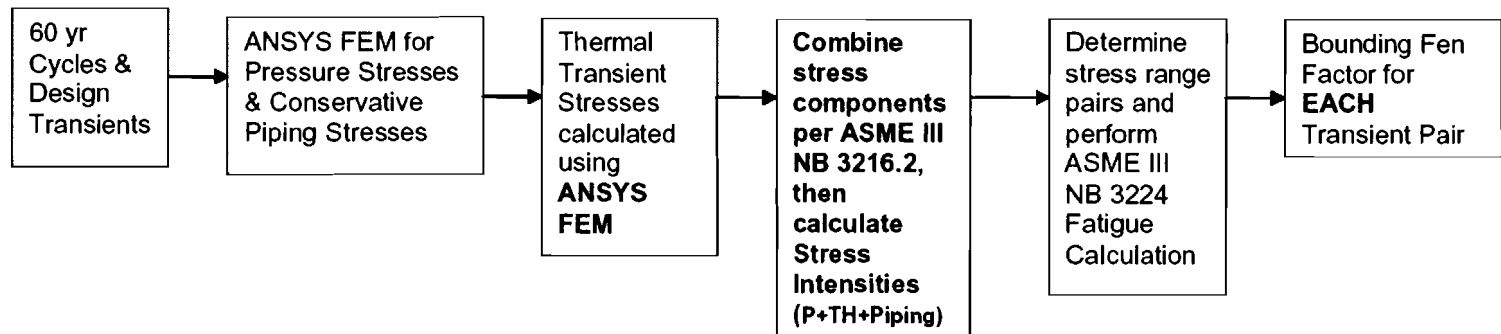




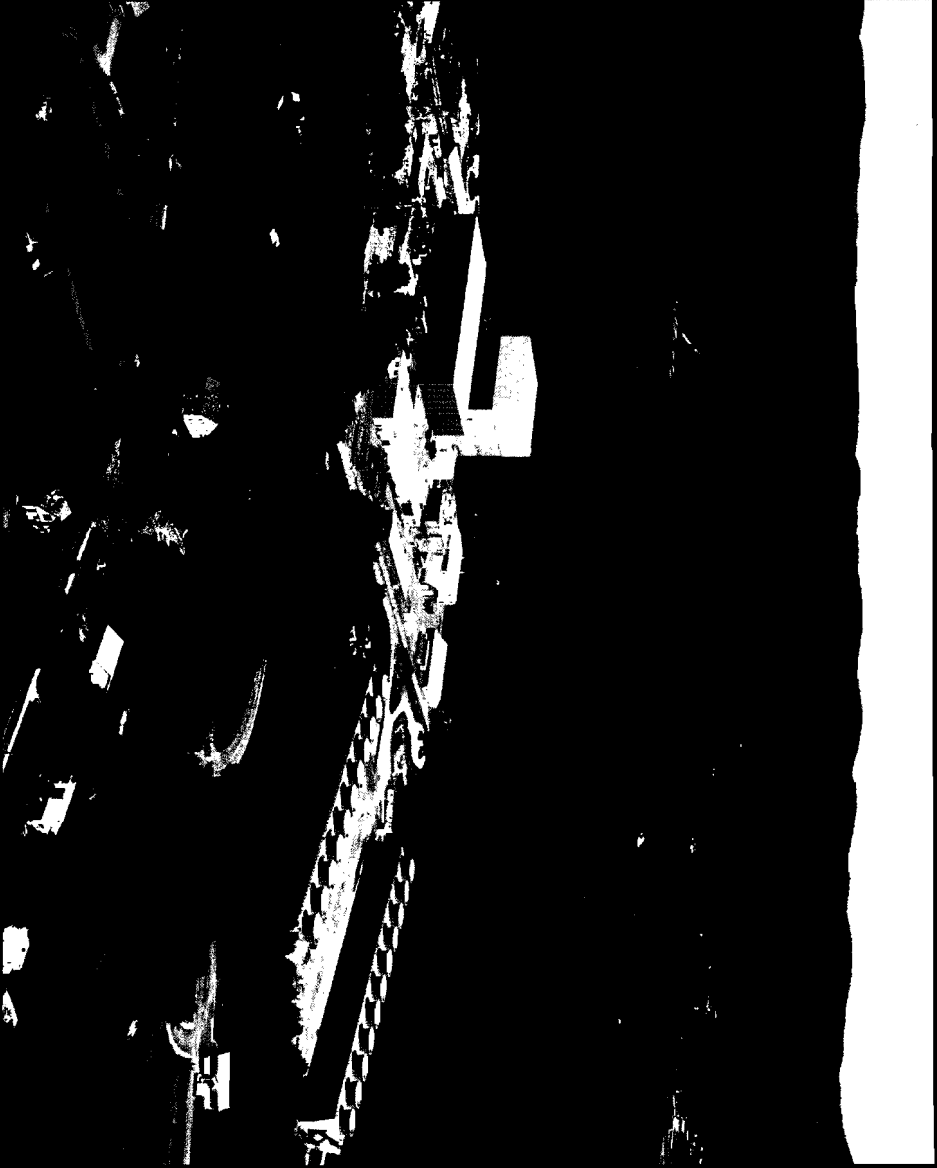
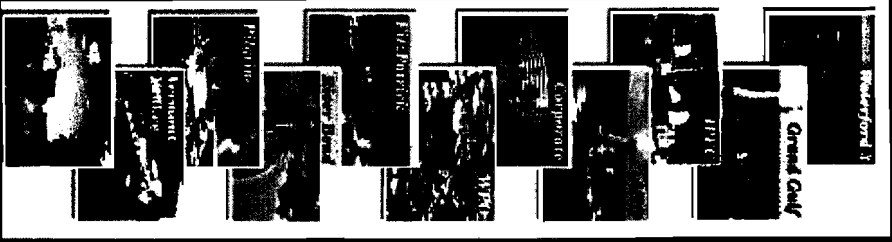
Reanalysis

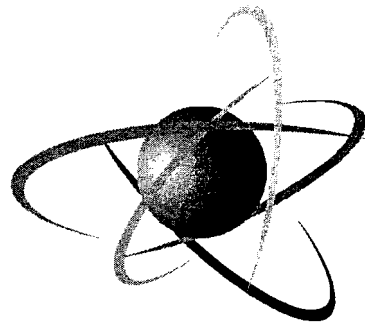


Confirmatory Calculation



Location	Analysis	EAF CUF / Allowable
Safe End	Reanalysis	0.26 / 1.00
	Confirmatory Calculation	0.10 / 1.00
Nozzle Corner (Blend Radius)	Reanalysis	0.64 / 1.00
	Confirmatory Calculation	0.35 / 1.00





U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

**Advisory Committee on Reactor Safeguards
(ACRS) License Renewal Full Committee**

**Vermont Yankee Nuclear Power Station
Safety Evaluation Report
(Environmental Fatigue)**

March 6, 2008

Jonathan Rowley, Project Manager
Office of Nuclear Reactor Regulation



Agenda

- Recap of Environmental Fatigue discussion from February 7, 2008 ACRS meeting on Vermont Yankee SER
- Resolution of Environmental Fatigue concerns
- New License Condition



Environmental Fatigue recap

- VY revised its application to use its Fatigue Monitoring Program to manage metal fatigue for the extended period of operation
- Corrective Actions element of program allows for reanalysis of components to demonstrate limits will not be exceeded during extended period of operation
- VY submitted results of its reanalysis (incorporating environmentally assisted fatigue (EAF)) on September 17, 2007



Environmental Fatigue recap

- NRC onsite audit of reanalysis calculations on October 9 and 10, 2007
- Six audit questions added to Question and Answer database
- Request for additional information (RAI) sent on November 27, 2007
- Response to RAI received on December 11, 2007
- Public meeting on January 8, 2008
 - Agreed to submit confirmatory analysis

Environmental Fatigue recap

- Confirmatory analysis was to include:
 - Performing benchmarking calculations on the VYNPS feedwater nozzle using the axisymmetric finite element model (FEM), taking fully into account all stress components on the nozzle and using the ANSYS FEM computer code to model all defined transients;
 - Demonstrating that the Vermont Yankee specific benchmarking calculations bound the results for the Core Spray and Recirculation outlet nozzles;
 - Calculating fatigue cumulative usage factors (CUFs) using NRC approved ASME Section III NB-3200 methodology;
 - Comparing the resulting CUFs to the previous environmental assisted fatigue calculations to establish whether the previous calculations are adequate.



Environmental Fatigue Resolution

- VY submitted updated (confirmatory) analysis for the feedwater nozzles on January 30, 2008.
 - Same parameters, data, and methodology used as agreed upon
 - CUFs for safe end and blend radius lower than previous analysis



Environmental Fatigue Resolution (cont.)

- Supplemental information was submitted on February 5, 2008.
 - Demonstrated that updated (confirmatory) feedwater nozzle analysis bounds geometry of the recirculation outlet nozzle.
 - Described how water chemistry effects are accounted for in the analysis.



Environmental Fatigue Resolution (cont.)

- NRC audited and reviewed the updated (confirmatory) analysis on February 14, 2008:
 - Axisymmetric finite element model,
 - Analyzed transient definitions and cycles,
 - Water chemistry input
 - Inputs used to develop fatigue life correction factors (F_{en})
 - Dissolved oxygen
 - Strain rate
 - Temperature
 - Sulfur content



Environmental Fatigue Resolution (cont.)

- Updated (confirmatory) analysis declared “analysis of record” on February 21, 2008.
 - Previous analyses used maximum F_{en} for all transient pairs
 - Updated analysis uses more appropriate F_{en} for each transient pair
 - Green’s function application could underestimate CUF
 - Followed ASME Code



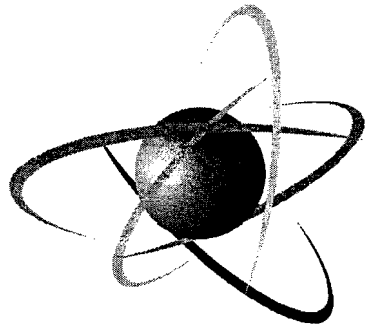
Conclusion

- Updated (confirmatory) analysis is “analysis of record” for EAF CUF values for the feedwater nozzle.
- CUFs calculated in accordance with ASME Code, Section III
- Core spray and reactor recirculation nozzles analysis must be performed.
 - Fourth license condition



License Condition

- The fourth license condition requires that the licensee perform and submit to the NRC for review and approval, a ASME Code analysis for the reactor recirculation outlet nozzle and the core spray nozzle at least two years prior to the period of extended operation. These analyses should be documented in the FSAR as the “analysis of record” for these two nozzles.



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Questions

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
REVIEW OF SELECTED CHAPTERS OF THE
SAFETY EVALUATION REPORT WITH OPEN ITEMS
ASSOCIATED WITH THE ESBWR DESIGN CERTIFICATION
March 6, 2008
Rockville, MD

-PROPOSED SCHEDULE-

Cognizant Staff Engineer: Charles G. Hammer cgh@nrc.gov (301) 415-7363

Topics	Presenters	Time
Opening Remarks	M. Corradini, ACRS	1:15 pm - 1:20 pm
ESBWR Design Control Document (DCD) - Chapter 9, "Auxiliary Systems" ¹ - Chapter 10, "Steam and Power Conversion Systems" ¹ - Chapter 13, "Conduct of Operations" ¹ - Chapter 16, "Technical Specifications" ¹	GE-Hitachi Nuclear Americas LLC	1:20 pm - 2:15 pm
SER with Open Items for Chapters 9, 10, 13 and 16 ¹	Amy Cabbage, Eric Oesterle, Rocky Foster, and Manny Comar, NRO	2:15 pm - 3:10 pm
Committee Discussion	M. Corradini, ACRS	3:10 pm - 3:15 pm

¹ A portion of this session may be closed for presentation of proprietary information.

NOTE:

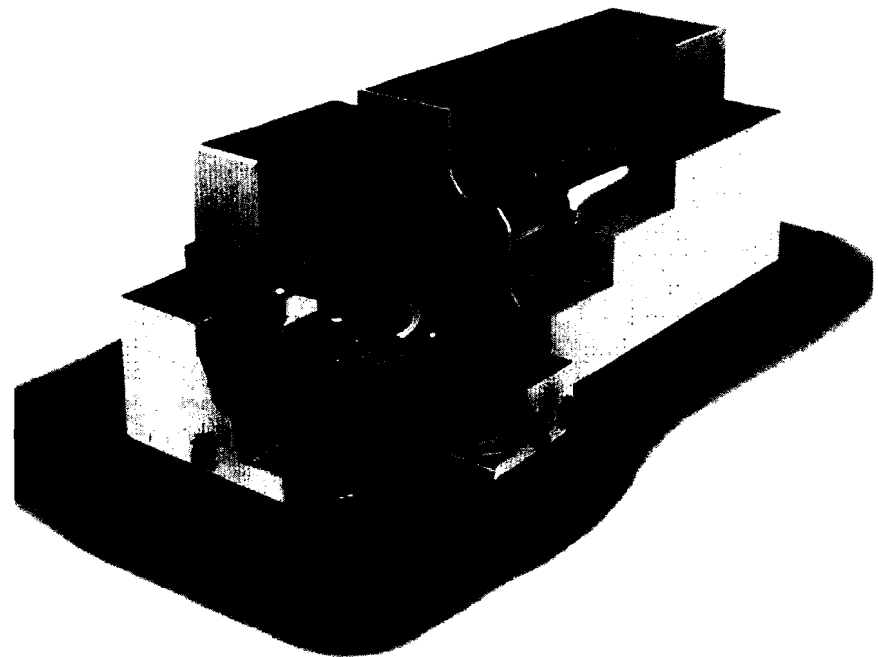
- Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.
- 50 copies of the presentation materials to be provided.

ESBWR DCD Tier 2, Chapters 9, 10, 13, and 16

**Advisory Committee
on Reactor Safeguards**

March 6, 2008

GE Hitachi Nuclear Energy



ESBWR DCD Tier 2

- Chapter 9, Auxiliary System
- Chapter 10, Steam and Power Conversion System
- Chapter 13, Conduct of Operations
- Chapter 16, Technical Specifications



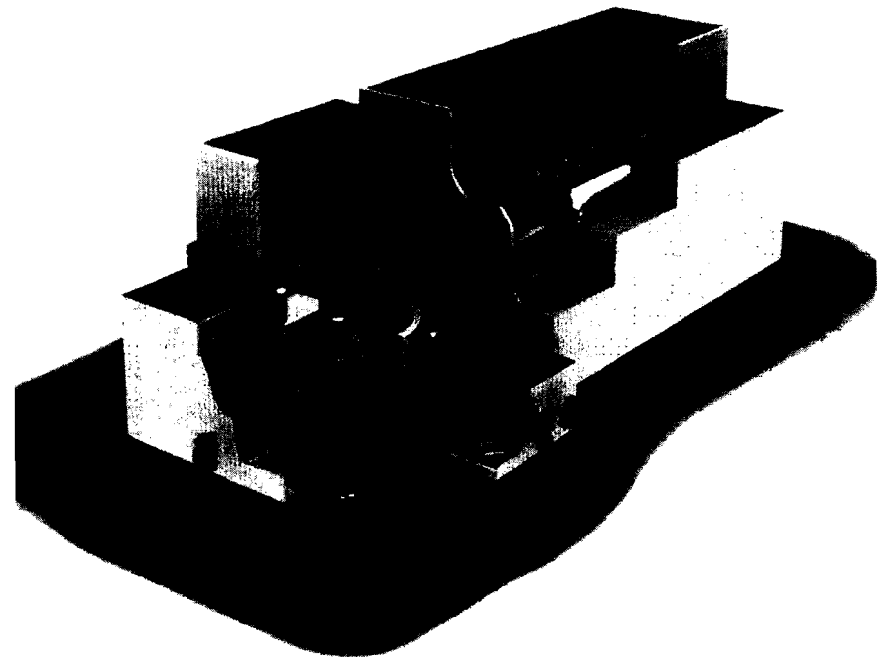
ESBWR - Overview

DCD Chapter 9 Balance of Plant & Auxiliary Systems

**Advisory Committee
on Reactor Safeguards**

Michael A. Arcaro
March 6, 2008

GE Hitachi Nuclear Energy



Overview of Chapter 9 - Auxiliary Systems

- Chapter 9 Provides Description of ESBWR Auxiliary and Balance of Plant Systems Required to Support Operation of ESBWR Under Normal, Transient, Shutdown and Emergency Conditions
- The ESBWR Auxiliary / Support Systems Incorporates Design Features Similar to Those Auxiliary and Support Systems Utilized in Past BWR Designs

Overview of Chapter 9 - Auxiliary Systems

- Section 9.1- Fuel Storage and Handling Systems
 - > New Fuel Storage
 - > Spent Fuel Storage
 - > Fuel and Auxiliary Pools Cooling System
 - > Light Load Handling System (Related to Refueling)
 - > Overhead Heavy Load Handling Systems
- Section 9.2- Water Systems
 - > Plant Service Water, Reactor Components Cooling Water System & Chill Water Systems are RTNSS Systems
- Section 9.3- Compress Gas Systems
 - > Instrument Air System (IAS) and Service Air System (SAS)
 - > Containment Inerting Systems (CIS) and High Pressure Nitrogen Supply Systems (HPNSS)
 - > Hydrogen Water Chemistry System (HWCS)
- Section 9.4 - Heating, Ventilation and Air Conditioning
 - > Control Building HVAC, Fuel Building HVAC, Radwaste Building HVAC, Turbine Building HVAC, Reactor Building HVAC, Electric Building HVAC, Drywell Cooling System
- Section 9.5 - Other Auxiliary Systems
 - > Fire Protection System and Support Systems for Diesel Generator
 - > Lighting System and Communication System

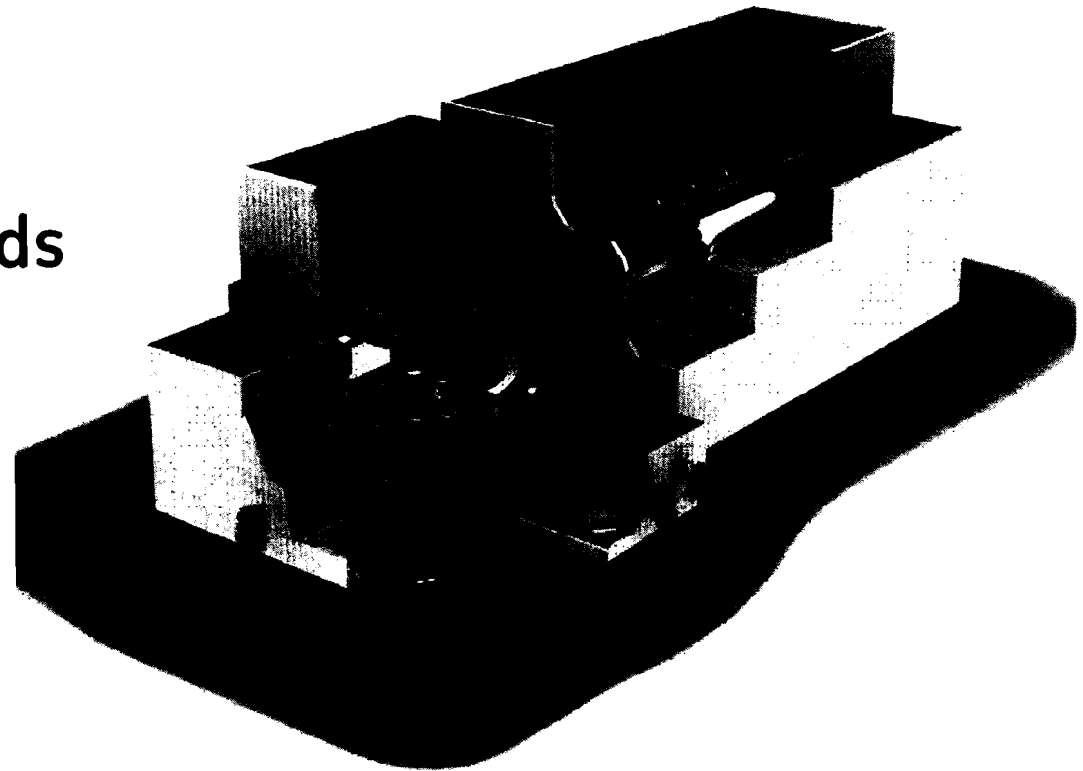
ACRS Topics of Interest

- Hydrogen Water Chemistry (HWC)
 - > ESBWR uses similar material and process selections as ABWR with operational history to date showing no evidence of stress corrosion cracking
 - > HWC is optional design for ESBWR
- Instrument Air / Service Air Moisture and Contamination
 - > IAS design provides redundant air dryer with air quality maintained from SAS compressors (oil free with particles less than 10 microns) by continuously monitoring dew point and periodically testing air quality (ISA 7.0.01) [Ref RAI 9.3-41]
- Control Room Habitability Issues
 - > Passive Heat Sink- [Ref RAI 9.4-33]
 - > Habitability- long term air quality while maintaining required differential pressure with design airflow rate.
- Isolated Inclined Transfer Tube Containing 2 Fuel Bundles- Evaluate Cooling
 - > ESBWR design bounded by BWR/6 analysis

ESBWR DCD Chapter 10 Steam and Power Conversion System

**Advisory Committee
on Reactor Safeguards**

Jack Noonan
March 6, 2008



GE Hitachi Nuclear Energy



Power Cycle Design Overview

- DCD Chapter 10 Content Considers Guidance in NUREG-0800, Standard Review Plan, Sections 10.2 to 10.4.7
- Turbine, Generator, and Power Cycle Systems Do Not Perform or Support Any Nuclear Safety-Related Functions
- The ESBWR BOP Based Upon a Very Conventional BWR Power Plant Cycle ~20% larger than large BWR 6

Turbine and Generator

- Turbine Rotors Utilize Integral Forgings (Monoblocks) to Minimize the Probability of Missile Generation (pre-tested to 120% of rated speed)
- GE has a Long History with this Design Replacing the Old Shrunk on Wheel Style
- A Standard Design Synchronous Generator with Water Cooled Stator Windings and a Hydrogen Cooled Rotor Rated at 1933 MVA (~1600 MWe Gross)

Enhanced Design Features

- Turbine Missile Considerations
 - > Integral Forgings (Monoblock)
 - > Favorable Orientation
- Adjustable Speed Motor-Driven Feedwater Pumps
- Elimination of Gland Seal Steam Evaporator
 - > Improved Reliability
 - > Reduce Maintenance Dose
- Fully Electronic, Redundant, Fail-Safe, and Testable Overspeed Protection System

Summary

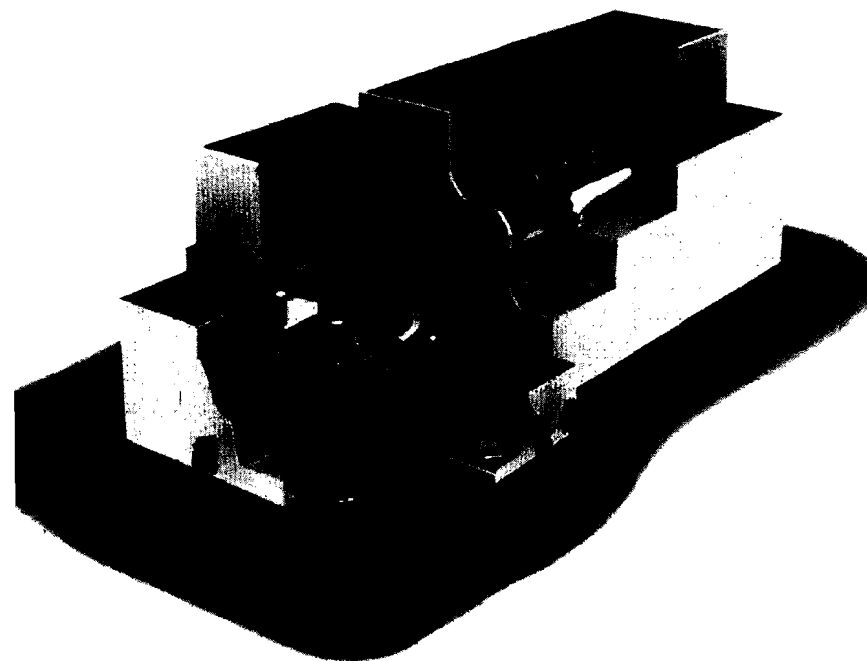
- The ESBWR BOP Designed with Flexibility and can be Sited Anywhere the Design Parameters are met for the Cooling Water Systems (one basic design)
- The Design Incorporates Best Practices & Incorporates Many Industry Lessons Learned
- Fewer BOP Transients, Longer Plant System Life, and Improved Plant Availability through On-Line Testing and Maintenance

ESBWR DCD Chapter 16 Technical Specifications

**Advisory Committee
on Reactor Safeguards**

Dan Williamson
March 6, 2008

GE Hitachi Nuclear Energy



ESBWR TS Development Philosophy

- BWR/6 Standard Technical Specifications (NUREG-1434, Rev 3.1) Utilized as the Basis for Standard Content / Numbering / Form & Format
 - Standardization With Existing Technical Specifications
 - Completion Times and Surveillance Frequencies
 - Generally Consistent with NUREG-1434
 - Utilized Established Precedent
 - Based on Engineering Judgement
- ESBWR-Specific Safety Analyses and Systems Evaluated to Meet Criteria of 10 CFR 50.36
- TS for New Passive Systems Evaluated Specifically

Passive System Surveillances – Precedents Applied

- Gravity-Driven Cooling System (GDACS)
 - Inspection for Flow Obstruction
 - Frequency - Similar to Containment Spray Headers
 - ASME IST of Check Valves and System Flushing – Each Outage
- Isolation Condensers (ICs)
 - Inservice Heat Transfer Test (Stagger 24 Months x4)
- Squib Valve Applications
 - Standby Liquid Control Precedents
 - Firing Circuit Continuity Verification
 - ASME IST (Batch Sample & Replacement Each Outage)

Published Allegations & Reports: Assessing Nuclear Vulnerabilities and Critical of G4S/Wackenhut nuclear security:



"It's taken a long time, as well as a big rise in the cost and demand for energy, for the nuclear-power industry to shake off past safety scares ... If operators can't figure out how to keep their security guards awake, then we may have to hit the snooze button on the nuclear renaissance."

When Snoozing Becomes Alarming Motley Fool January 11, 2008

http://www.fool.com/investing/high-growth/2008/01/11/when-snoozing-becomes-alarming.aspx?terms=nuclear&vstest=search_042607_linkdefault

INDUSTRY ISSUE: INADEQUATE NUCLEAR SECURITY STANDARDS

"While the United States has one of the world's most well-developed regulatory systems for protecting nuclear facilities against sabotage and attack, today's security standards are inadequate to defend against credible threats.

Findings:

Sabotage of a nuclear reactor could result in a large release of radiation.

If a team of well-trained terrorists forcibly entered a nuclear power plant, it could disable safety systems within a matter of minutes, and do enough damage to cause a meltdown of the core, failure of the containment structure, and a large release of radiation. Such an attack could contaminate large regions for thousands of years, producing higher cancer rates and billions of dollars in associated costs."

There is no assurance that reactors can be defended against terrorist attacks.

The NRC stages mock attacks to determine if plant owners can defend their reactors against DBT-level attacks. Test results reveal poor performance, and the integrity of the tests themselves is in question. The federal government is responsible for defending against attacks more severe than the DBT, but it has no mechanism for ensuring that it can provide such protection."

Nuclear power in a warming world: Assessing the Risks, Addressing the Challenges
Union of Concerned Scientists December 2007

CONGRESSIONAL INVESTIGATION

"Rep. John D. Dingell (D-MI), Chairman of the Committee on Energy and Commerce, and Rep. Bart Stupak (D-MI), Chairman of the Subcommittee on Oversight and Investigations, today announced they will conduct a comprehensive review of the Nuclear Regulatory Commission's (NRC) operations following reports of security guards sleeping on the job at the Exelon Peach Bottom nuclear power plant in York County, Pennsylvania.

'The NRC's stunning failure to act on credible allegations of sleeping security guards, coupled with its unwillingness to protect the whistleblower who uncovered the problem, raises troubling questions,' said Rep. John D. Dingell, Chairman of the Committee on Energy and Commerce. 'It appears that there has been a systematic failure, by both NRC officials and the nuclear plant licensee, to ensure that these high-risk facilities are secure and employees are not discouraged from expressing concerns about safety.'

'The Committee would like to know whether it was the repeated notification from a concerned employee or the threat of a videotape showing security workers asleep on the job appearing on the evening news that prompted the licensee to look into this matter,' said Rep. Bart Stupak (D-MI), Chairman of the Subcommittee on Oversight and Investigations. "In addition, the Committee wants to know why the NRC

Published Allegations & Reports – Assessing Nuclear Vulnerabilities and Critical of G4S/Wackenhut nuclear security

remains confident in this same contractor's ability to secure other nuclear facilities throughout the country.”

Energy and Commerce Committee to Probe Breakdowns in NRC Oversight US Fed News January 7, 2008

INCREASING CALLS TO INTEGRATE SECURITY INTO THE RELICENSING PROCESS

“The tragedy that befell our nation on September 11, 2001 demonstrated the utter folly of ignoring the impact of national security issues on nuclear plant safety. The release of radioactive material into the air and water after the recent earthquake in Japan – forcing the emergency shutdown of the world's largest nuclear plant – demonstrates the vulnerability of nuclear plants to natural forces. These facts and the latest National Intelligence Estimate's finding that terrorist capability has recovered underscore the importance of our request that NRC expand its criteria for relicensing to examine all matters involving nuclear plant safety and risk.

The NRC's failure to amend its relicensing regulations is inconsistent with the NRC's own motto of 'Protecting People and the Environment.' By forgoing a vital opportunity to evaluate the entirety of threat to public health and safety in a single, unified public relicensing proceeding, NRC remains blind to its mandate from Congress to protect the public from the dangers inherent in nuclear power generation. We encourage the NRC to change course.”

State Attorney Generals' Letter to NRC Chairman Dale E. Klein, Chief Legal Officers of: Connecticut, Delaware, Illinois, Kentucky, New York, and Vermont, November 15, 2007

“Attorney General Andrew M. Cuomo today announced that he and the Attorneys General of five other states have submitted a letter to the Nuclear Regulatory Commission (NRC) expressing serious concerns about the NRC's continued disregard of safety issues - including susceptibility to earthquakes or terrorist attacks - when deciding whether to renew the operating license of a nuclear power plant beyond its initial 40 year term.”

Attorney General Cuomo & 5 Other States Demand NRC Consider Terrorism and Earthquakes When Relicensing Nuclear Plants Office of the New York State Attorney General Andrew M. Cuomo November 15, 2007

“The Environmental Protection Agency, in a break from the federal nuclear authority, says the potential impact of terrorism should be considered in deciding whether to relicense the Indian Point nuclear power plants.”

EPA: Nuclear licenses should weigh terrorism Associated Press October 30, 2007

“Attorney General Stuart Rabner announced today that New Jersey has filed a petition with the federal Third Circuit Court of Appeals challenging a finding by the Nuclear Regulatory Commission (NRC) that it need not consider the impact of a terrorist attack as part of its relicensing review of the Oyster Creek nuclear power plant in Lacey Township, Ocean County.

...

It is difficult to reconcile the NRC's actions with its stated position on the Oyster Creek matter,” said Rabner. “On the one hand, the NRC has imposed extensive security requirements on nuclear power plants since 9/11 to guard against attacks. On the other hand, it continues to insist that, from a legal perspective, the likelihood of such an attack is merely theoretical, and not worthy of analysis as part of the relicensing process.”

AG Rabner Announces 3rd Circuit Court Challenge to NRC Ruling on Oyster Creek; N.J. Contends Impact of Terrorist Strike Should be Considered In Relicensing Review
Office of the Attorney General of New Jersey, Stuart Rabner April 25, 2007

“This is a public safety concern for all Illinoisans, as well as for those throughout North America,” Attorney General Madigan said. “With a total of six nuclear generating plants and 11 reactors, Illinois has more nuclear generating facilities than any other state in the country. Our national security concerns have changed since these power plants first were built...We rely on the NRC to ensure the operating licenses for these plants are not renewed until we are completely confident that the plants can avoid a catastrophe.”

Madigan Calls for Stricter Regulations When Relicensing Nuclear Power Plants

G4S/WACKENHUT: NEI FORCE ON FORCE CONTRACT & POTENTIAL CONFLICT OF INTEREST

“Since drawings of U.S. nuclear power plants were found in al-Qaida caves in Afghanistan, the nuclear power industry says it has spent \$1 billion beefing up security. That includes more frequent and more realistic mock-terrorist attacks to test the ability of plant guards.

That's an improvement, critics say, but for one key fact: the company hired to run the security tests — Wackenhut Corporation — also is providing security at half the plants. Critics charge Wackenhut has a vested financial interest in making plant security look good.”

Conflict of interest may hurt nuke security NBC Nightly News with Tom Brokaw September 8, 2004

“Wackenhut is responsible for nuclear reactor security at 30 of 64 nuclear power plants in the U.S. Don't you think that there would be a disincentive for the Wackenhut mock terrorist force to rigorously test security at power plants at which Wackenhut also provided the security guard forces as rigorously as it would at power plants at which Wackenhut's competitors provided the security guard forces? If not, why not?”

Letter to NRC Chairman Nils J. Diaz Congressman Edward J. Markey August 23, 2004

“...We were shocked to learn that Nuclear Energy Institute (NEI), the lobbying arm of the nuclear industry, has hired the Wackenhut Corporation to supply and manage these adversary teams. This is more than a case of the proverbial fox guarding the henhouse. It is not an apparent conflict of interest—but a blatant conflict of interest.”

Letter to U.S. NRC Chairman Nils J. Diaz Project on Government Oversight (POGO) July 30, 2004

G4S/WACKENHUT: FORCE-ON-FORCE PROBLEMS

“In August 2004, a force-on-force exercise was held at the NTS [Nevada Test Site]. It is my understanding that during this exercise, two Wackenhut guards confronted each other after rounding a corner of a building, one 'shot' the other in a friendly fire incident, and the second then started a fist fight with the first because he was angry about being 'killed.' Needless to say, the guard force failed the force-on-force exercise.”

Letter to Secretary of the Energy Samuel Bodman Congressman Edward J. Markey February 17, 2005

“Whistleblowers at the South Texas Project nuclear power plant have reported instances of security guards failing to follow protocol, leaving the facility vulnerable to intruders, according to a study by the Union of Concerned Scientists...The report further states that guards' radio equipment doesn't work properly, some mock intrusion drills don't reflect real-world situations, and cleaning and maintenance staff has access to a room where weapons are stored.”

Nuclear plant's security faulted Dallas Morning-News September 6, 2006

“[Energy Department Inspector General] Friedman's office also found that one Wackenhut unit, hired by the NRC to simulate an attack on nuclear facilities, had tipped off another Wackenhut unit charged with guarding the facilities at Y-12 about the attack strategy. Danielle Brian, executive director of the Project on Government Oversight, said in a 2004 letter to the NRC that 'this is more than a case of the proverbial fox guarding the henhouse. It is not an apparent conflict of interest -- but a blatant conflict of interest.’”

Video of Sleeping Guards Shakes Nuclear Industry Washington Post January 4, 2008

Published Allegations & Reports – Assessing Nuclear Vulnerabilities and Critical of G4S/Wackenhut nuclear security

No Assurance of Adequate Defenses against Attack

"The NRC periodically stages mock DBT-level attacks to determine if plant owners can defend against them (this is called force-on-force testing). At nearly half the nuclear plants tested before 9/11, three mock attackers were able to enter quickly and simulate the destruction of enough safety equipment to cause a meltdown—even though operators typically received six months' advance notice of which day the test would occur. The integrity of the tests themselves is also open to question. The NRC awarded Wackenhut the contract to supply the mock adversary team for all force-on-force tests, even though that company supplies the security officers for nearly half of all U.S. nuclear power plants. This situation represents a serious conflict of interest. In fact, the GAO found that one plant's security team performed better during a mock attack because it had obtained advance information about the planned attack scenario."

Nuclear power in a warming world: Assessing the Risks, Addressing the Challenges
Union of Concerned Scientists December 2007

G4S/WACKENHUT: ALLEGED CHEATING AND OTHER SHORTCOMINGS ON SECURITY DRILLS

"[Energy Department Inspector General] Friedman's office also found that one Wackenhut unit, hired by the NRC to simulate an attack on nuclear facilities, had tipped off another Wackenhut unit charged with guarding the facilities at Y-12 about the attack strategy. Danielle Brian, executive director of the Project on Government Oversight, said in a 2004 letter to the NRC that 'this is more than a case of the proverbial fox guarding the henhouse. It is not an apparent conflict of interest -- but a blatant conflict of interest.'"

"Last summer, in testimony before a subcommittee of the House Oversight and Government Reform Committee, Friedman said, 'We did not use the word 'cheating' in the report, but it was. The test was compromised.'"

Video of Sleeping Guards Shakes Nuclear Industry Washington Post January 4, 2008

G4S/WACKENHUT: REPORTED WEAPONS VIOLATIONS

"Federal regulators said they are proposing a \$208,000 fine against Florida Power & Light Co. for security violations at the Turkey Point nuclear power plant. ... In April 2004, FP&L failed to ensure that two armed guards had operable weapons, the agency said. Specifically, it said a contract security officer, employed by Wackenhut Corp., had intentionally removed the firing pins from two weapons. In August 2005, FP&L again failed to ensure that armed responders were equipped with functional weapons, the NRC said. Specifically, a Wackenhut contract security lieutenant removed and broke a firing pin from a weapon." An FPL spokesperson said that the individuals involved in the incident no longer work there.

FP&L Faces Fine over Security Violation South Florida Business Journal January 22, 2008

"In 2003, a Wackenhut employee took two government-owned handguns and one of his own in a briefcase to the National Nuclear Security Administration's Nevada test site, according to an IG report."

Video of Sleeping Guards Shakes Nuclear Industry Washington Post January 4, 2008

"CBS4 discovered the apparent security shortfall during a routine visit to the Turkey Point nuclear power plant Wednesday. When the CBS4 crew arrived at the Homestead facility, they were greeted by a single Wackenhut guard at the front gate. That guard was carrying an M-16 rifle, but upon closer examination, it was clear there was no clip in the gun. The security guard was carrying a very visible, very unloaded gun."

Governor Bush Concerned Over Turkey Point Security CBS4 May 22, 2006

"A former Wackenhut security guard was arrested in Michigan on Friday and charged with stealing a semiautomatic rifle and a thermal rifle sight from St. Lucie Nuclear Plant, authorities said."

Rifle Stolen From St. Lucie Nuclear Plant Recovered, Arrest Made Associated Press March 4, 2006

G4S/WACKENHUT: REPORTED WHISTLEBLOWER RETALIATION

“Exelon Nuclear terminates its contract with Wackenhut Security at its Peach Bottom plant in Pennsylvania after receiving a videotape showing a number of Wackenhut employees sleeping on the job. Exelon thanks the whistle-blower who shot the tape, then lets him go because he works for Wackenhut.” # 68 of

101 Dumbest Moments in Business Fortune December 11, 2007

“Jasinski, a 13-year Wackenhut employee, filed his original complaint with the Occupational Safety and Health Administration, or OSHA, in May 2005, alleging that Wackenhut and Exelon had engaged in discriminatory employment actions, culminating in his suspension and dismissal in April 2005 for engaging in protected activities. These activities included “raising compliance issues with management of both [Exelon and Wackenhut] as part of his duties [and] collecting evidence of violations and calling appropriate enforcement authorities to report violations,” Jasinski said in his complaint.” The parties reached a settlement, but wouldn’t disclose its terms because of a confidentiality agreement.

Exelon, Wackenhut Settle Case Over Nuclear Security Allegations Nucleonics Week July 26, 2006

“The basic facts are that a security guard, employed in a temporary status by The Wackenhut Corporation, brought to the attention of managers the fact that a guard trainee did not have a high school diploma as required for the job. Wackenhut terminated the trainee, as required, but then also terminated the security guard who identified the concern and reprimanded a security training instructor who brought the concern forward, for reasons that the NRC found to be discriminatory. The NRC found that this action violated regulations prohibiting retaliation against workers who bring safety issues to management.”

*NRC Fines Callaway \$55,000 for Retaliation Against Security Personnel
US Nuclear Regulatory Commission May 15, 2001*

G4S/WACKENHUT: EXCESSIVE OVERTIME

“In 2005, the inspector general said that at the NNSA's Oak Ridge site, Wackenhut had routinely worked security personnel more than the 60-hour-a-week maximum permitted there. In addition, Wackenhut had misled the government about worker training. It reported planned training as actual training time, and protective-force personnel had signed attendance rosters for on-the-job refresher training they had not attended, the IG report said.”

Video of Sleeping Guards Shakes Nuclear Industry Washington Post January 4, 2008

- * In 2002, a Wackenhut employee at the Indian Point Nuclear Station in New York told the NRC he was fired after raising a concern about working excessive overtime.
 - * In 2004, Florida Power and Light sought the NRC's permission to exceed work-hour limits because of a high turnover rate among security workers at its Turkey Point Nuclear Station.
 - * In 2006, Time magazine reported that excessive overtime at the Pilgrim Nuclear Station in Massachusetts was linked to poor preparedness and performance by the guard force.
- Overtime bears risk, guards at TMI fear // Some are putting in 60- to 72-hour weeks Patriot News February 5, 2007*

“Guards at TMI work 12-hour shifts, usually for two to three consecutive days, but sometimes longer. Documents provided to The Patriot-News show one officer worked more than 150 hours in a 14-day period, nearly the equivalent of two full-time jobs. The same officer averaged more than 54 hours a week for the first 10 months of 2005.”

Hours and fatigue dog TMI guards-Officers told new hires where to 'nap,' memo says Patriot News January 29, 2006

G4S/WACKENHUT: ASLEEP ON THE JOB AT NUCLEAR POWER AND NUCLEAR WEAPONS PLANTS

“Seven guards have been caught sleeping at the Y-12 nuclear weapons plant in Oak Ridge since 2000. . . Y-12, a potential terrorist target containing the key ingredients for a “dirty bomb,” makes uranium parts for every warhead in the U.S. nuclear arsenal. It also dismantles old weapons and is the nation’s primary storehouse for bomb-grade uranium. . . . Wackenhut Services’ napping-guard record in Oak Ridge came up for questioning after its parent company, The Wackenhut Corp., recently lost a security contract for 10 nuclear power plants after sleeping guards were found at a Pennsylvania station.”

Feds: 7 Guards Caught Sleeping at Tenn. Nuclear Weapons Plant Fox News (AP) January 16, 2008

“The Nuclear Regulatory Commission, in letters sent to FPL and Wackenhut Nuclear Services, said its investigators had ‘substantiated that security officers were willfully inattentive to duty or served as look-outs such that other security officers could be inattentive while on duty.’”

Turkey Point guards snoozed, NRC says Miami Herald October 30, 2007

“They’re on duty and fast asleep, security guards that are supposed to be protecting a major terrorist target [Peach Bottom Atomic Energy Station] in the United States. . . . The security officers shown on the video are all employees of Wackenhut, a security firm that is contracted out to manage the guards. Wackenhut also provides security for major federal agencies including NASA and the Army.”

Nuclear Plant Guards Asleep On The Job WCBS-TV September 25, 2007

“The disciplining of a security guard at the area’s [Limerick] nuclear power plant last week was not the first time the company that provides security there has dealt with a sleeping guard problem . . . As such, Wackenhut’s Nuclear Services Division provides security at Three Mile Island, which earlier this year was at the center of a series of news reports regarding sleeping guards.”

Security firm has had problems with sleeping guards Pottstown Mercury August 3, 2006

“Veteran guards responsible for training new hires to the [Wackenhut] security force that protects Three Mile Island were sharing a key piece of insider information -- the best places to take a nap, according to an internal memo. . . . The link between hours worked and fatigue is a growing concern among security officers and watchdog groups. . . . ‘Excessive work schedules can challenge the ability of security force personnel to remain vigilant and effectively perform their duties,’ the agency said in an order.”

Hours and fatigue dog TMI guards-Officers told new hires where to ‘nap,’ memo says Patriot News January 29, 2006

“On April 15, 2003 at about 4:50 a.m., the Oyster Creek Operations Director arrived at the Oyster Creek Nuclear Generating Station (OCNGS) in his vehicle and . . . noticed that the gate barrier was raised in the open position (which he noted was unusual), and that the [Wackenhut] security officers did not immediately exit the guard house to verify his badge. The Operations Director sounded his horn three times, but was unable to get the attention of the security officers. Subsequently, he exited his vehicle, went to the guard house and observed through the window that the security officers appeared to be asleep. He observed that upon knocking at the door the officers became attentive.”

Oyster Creek Generating Station – NRC Integrated Inspection Report July 29, 2003

G4S/WACKENHUT: INCREASING CALLS FOR PUBLIC ACCOUNTABILITY

“Miami-Dade and federal investigators raided the headquarters Friday night [Dec. 7] of one of the county’s largest government contractors.”

Investigators Raid Wackenhut’s Headquarters NBC 6 South Florida December 9, 2007

“Over the past year, Sanders has been engulfed by allegations of lapses in security at nuclear plants, an audit over whether it overcharged the city of Miami for transit guards, and a bitter dispute with the Service Employees International Union.”

Executive Resigns in Storm Over Sleeping Guards Washington Post January 10, 2008

“The National Nuclear Security Administration is studying the possibility of federalizing guards at nuclear weapons facilities, including Y-12 in Oak Ridge.”

Guards at Y-12 might become federalized Knoxville News-Sentinel December 15, 2007

Published Allegations & Reports – Assessing Nuclear Vulnerabilities and Critical of G4S/Wackenhut nuclear security

“There's a shakeup at the nationwide security company under fire in Nashville for a costly computer theft. According to Channel 4's NBC sister station in Miami, Wackenhut Security CEO Gary Sanders is stepping down. The move comes the same day Metro Nashville's government acknowledged that Channel 4's analysis of problem billing was correct.”

CEO Of Metro Security Contractor Steps Down MSNBC January 9, 2008

Reflecting on Group 4 Securicor's explanation of Gary Sanders resignation as president from Wackenhut, a Washington Post blog noted, "Truthfulness is one of those core values that companies either incorporate into their cultures or they don't. . . . A company in which people withhold unpleasant information from colleagues and superiors, lie to customers and mislead regulators cannot generally be relied on to level with its investors or the public.”

The Reckoning: Corporate Candor Washington Post January 13, 2007

G4S/WACKENHUT: CONGRESSIONAL OVERSIGHT ACTIONS

Testimony of former Wackenhut guard Robin Wright at Oversight Subcommittee on Government Management, Organization and Procurement hearing:

“Unfortunately, I felt that Wackenhut took their government contract and responsibility for our nation's safety too lightly and they provided a shoddy and low level of service to the DHS, which could have had dire consequences for our nation's capital. The problems I witnessed included poor access control, lack of training, careless weapons handling, open posts, failed security tests, security breaches, falsified documents, and irresponsible handling of a hazardous substance attack.”

“Federal Contracting: Do Poor Performers Keep Winning?”

Hearing: Oversight Subcommittee on Government Management, Organization and Procurement July 18, 2007

“[U.S. Rep. Robert Brady, D-Pa.] said he would ask Congress to investigate whether Wackenhut should be barred from receiving government contracts.”

Guards Vote to Join Union Philadelphia Daily News September 13, 2007





Presentation to the ACRS

**ESBWR Safety Evaluation Report with Open Items
Chapters 9, 10, 13, and 16**

Amy Cubbage, Senior Project Manager, NRO

March 6, 2008

ESBWR Chapters 9, 10, 13 and 16

Presenters

- **Lead Project Manager**
 - Amy Cubbage
- **Reviewers**
 - Jorge Hernandez, Balance of Plant Branch
 - David Shum, Balance of Plant Branch
 - Craig Harbuck, Tech Specs Branch
 - Additional reviewers in attendance

ESBWR Chapters 9, 10, 13 and 16

- Discussion topics
 - Chapter 9 - Auxiliary Systems
 - Spent Fuel Pool Passive Decay Heat Removal
 - Inclined Fuel Transfer System
 - Instrument Air and Service Air
 - Hydrogen Water Chemistry
 - Emergency Lighting
 - Chapter 10 - Steam and Power Conversion
 - No specific discussion topics identified
 - Chapter 13 - Conduct of Operations
 - No specific discussion topics identified
 - Chapter 16 - Technical Specification
 - Surveillance Requirements for Passive ECCS and Containment Cooling
 - Surveillance Frequencies
 - Bracketed Items

Chapter 9 – Spent Fuel Pool Passive Decay Heat Removal

- Staff reviewed GEH's boiloff analysis
 - ~2.0m remain above TAF @ 72 hours
 - 1,690m³ (equivalent to 8.85m) lost in 72hrs
 - 3,512 bundles = SFP @ full capacity + 1 full core
 - Transfer gates are closed
 - Initial level is 14.35m (normal level)
- Safety-related Alarms
 - Low level – just below normal level (not more than 2.0m below the normal level)
 - Safe shielding – 3.05m above TAF plus margin
 - TAF elevation – alert that fuel has been exposed
- Staff requested GEH to address a postulated drain through the gates, to define distance between TAF and bottom of gates and time to expose starting at the bottom of the gates. This remains an open item.

Chapter 9 – Inclined Fuel Transfer System

- Staff discussed passive cooling analysis with GEH
 - Worst case time-to-boil for two stuck assemblies is **10 hours**
 - Assemblies at the bottom of tube
 - Tube is partially drained
 - Bottom gate valves closed
 - Makeup water can be added via upper manual valves or bottom valves
 - Doses have been analyzed
- Staff finds there is sufficient time and ability to provide makeup

Chapter 9 – Instrument and Service Air

ACRS Concern: Impacts of Moisture and Contamination in Service Air Systems (SAS) on Instrument Air System (IAS) Resulting From the IAS Filter/Dryer Units Being Bypassed on Actions Taken by Operators

These systems are:

- Continuously monitored for air moisture content
- Periodically tested in accordance with ANSI/ISA-7.0.01-1996
- The bypass line is used only in the event that both IAS filter/dryer train fail at the same time

Chapter 9 – Instrument and Service Air

By design, these systems are:

- Non-safety related systems and do not perform safety-related function
- Not considered as a candidate for RTNSS, and not required to achieve or maintain safe shutdown of the plant
- Pneumatically operated devices, designed as fail-safe and not required to have continuous air supply under emergency or abnormal conditions
- Failure of the IAS and SAS does not compromise any safety-related system or component nor does it prevent a safe shutdown

Chapter 9 -- Instrument and Service Air

Conclusion:

The staff concludes that impacts of moisture and contamination in SAS on IAS resulting from the IAS filtration/dryer units being bypassed would be minimal.

Chapter 9 – Emergency Lighting

- Staff issued RAI 9.5-60 Supplement 1
- GEH response dated 2/26/08
 - GEH response clarifies that emergency lighting in the remote shutdown area is fed from the safety-related UPS for 72-hours similar to the power supply arrangement for the MCR emergency lighting
 - GEH committed to update in DCD rev 5
- GEH response acceptable however conforming change to ITAACs are needed (RAI 9.5-60, Supplement 2, to be issued)

Chapter 9 - Hydrogen Water Chemistry

- Hydrogen water chemistry (HWC) system – included as an option
 - Current regulations do not require licensees/applicants to implement HWC
- No safety significant issues associated with treating HWC as an option
 - ESBWR Class 1 and 2 materials - resistant to SCC degradation
 - Degradation would be identified through in-service inspection as required by ASME Code
 - HWC is available to the licensee/applicant for managing degradation

Chapter 16 – Technical Specifications

- Passive ECCS and Containment Cooling Surveillance Requirements
- ADS, GDCCS, ICS, PCCS, IC/PCC Pools
- Inservice Testing
 - Squib valve testing
 - ICS return line valve testing
 - GDCCS injection line check valves
- Non Condensable Gas Venting
- Resolution of Bracketed items

Chapter 16 – Technical Specifications

Frequency	Surveillance	ADS	GDCS	ICS	PCCS	IC/PCC Pools
12h	Pool Inventory		X			
24h	RPV Vent Capacity		X			
24h	Pool Inventory		X			X
24h	Pool Average Temp.					X

Chapter 16 – Technical Specifications

Frequency	Surveillance	ADS	GDCS	ICS	PCCS	IC/PCC Pools
31d	Nitrogen Pressure for Valves	X		X		
31d	Valve Position Verification			X		
31d	Squib Firing Circuit Continuity	X	X			
24m	Automatic Valve Actuation	X	X	X		X

Chapter 16 – Technical Specifications

Frequency	Surveillance	ADS	GDCS	ICS	PCCS	IC/PCC Pools
24m	Verify Valve Locked Open			X		X
24m (72m)	SRV Manual Actuation	X				
24m (144m)	Verify Drain Lines to GDCS Pool, Vent Lines to Suppression Pool and Flow Path through Condenser from Drywell Unobstructed				X	

Chapter 16 – Technical Specifications

Frequency	Surveillance	ADS	GDCS	ICS	PCCS	IC/PCC Pools
24m (96m)	IC Heat Removal Capacity Verification			X		
10y	Verify Flow Paths Unobstructed		X			
10y	Verify Vent Path From Pools Unobstructed					X
92d	Verify Vent & Drain Line Unobstructed Prior to Start Up				X	

Chapter 16 – Technical Specifications

Conclusions

- Frequencies are consistent with STS and are acceptable based on operating experience with similar components and engineering judgment
- Generic TS SRS for passive ECCS and containment cooling will provide adequate assurance of system operability

Chapter 16 – Technical Specifications

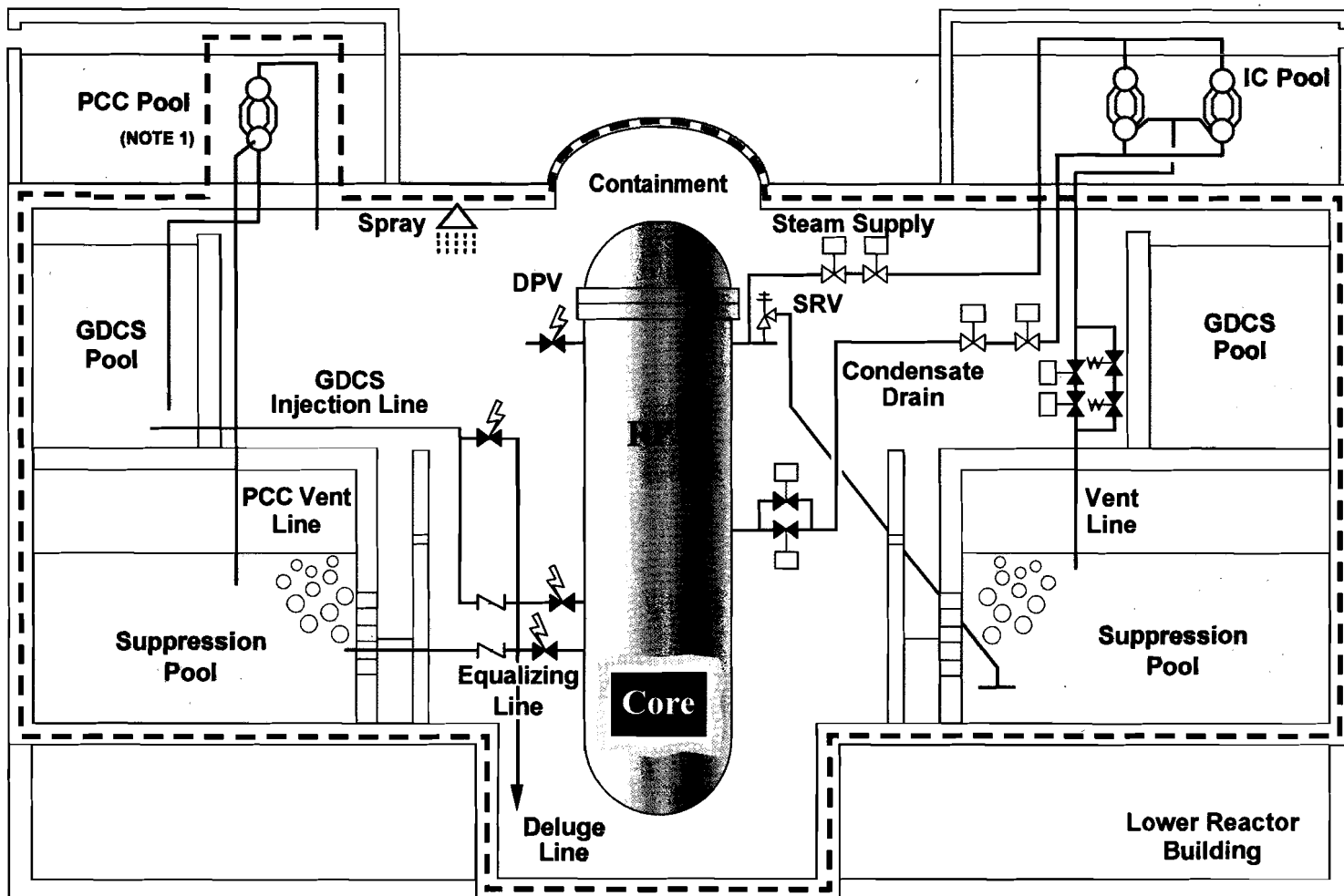
Conclusions (cont.)

- Pending resolution of Open Items, cannot conclude the ESBWR generic TS comply with 10 CFR 50.34, 10 CFR 50.36 and 10 CFR 50.36a
- Completion of generic TS review contingent upon resolution of design and analysis issues outside of DCD chapter 16

ACRS Presentation
ESBWR Design Certification Review

Discussion/Committee Questions

BACKUP



Schematic of ESBWR ECCS



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

March 7, 2008

MEMORANDUM TO: Sanjoy Banerjee, Chairman
 Power Uprates Subcommittee

FROM: Zena Abdullahi, Senior Staff Engineer
 ACRS/ACNW&M

SUBJECT: ANALYSIS OF EDO RESPONSE TO ACRS LETTER ON THE
 SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1
 AND 2, EXTENDED POWER UPRATE

In the 548th meeting of the Advisory Committee on Reactor Safeguards (ACRS), the Committee concluded its review of the Susquehanna Extended Power Uprate Units 1 and 2 (SSES) review. In Recommendation 2 of the SSES letter, the Committee states:

"An appropriate margin should be maintained to the operating limit minimum critical power ratio (OLMCP) to account for uncertainties in the void fraction validation at void fraction and the lack of data for its be reviewed when this interim measure should the effect of uncertainties analyses that account for OLMCP."

*Reconciliation
 This is it*

In addition, the staff guidance document that outlined recommended void sensitivity analysis document was prepared at the request of PPL, its consultant AREVA staff. The objective of the guidance document was to assist the licensee and perform the suggested follow-up analyses easily and in fast turn around manner.

EDO Response

In a January 17, 2008, the EDO letter stated:

"First, the fuel vendor (AREVA) provided full scale void fraction test data covering the range of pressure, flow rates, and void fractions up to the point of dry-out for the ATRIUM-10 fuel design. Second, the staff approval of the AREVA neutronic methods is limited to those transients which show margin to the safety limit minimum critical power ratio, and are therefore, effectively bounded by the critical heat flux test results. Third, AREVA performed a detailed sensitivity analysis demonstrating a negligible impact on the OLMCP for a substantial void fraction bias. The staff agrees that void fraction data above 90% is lacking. However, the staff concludes that for the range of heat flux approved in the application, that any additional uncertainty for nodal void fractions at yet higher values, contributes negligibly to the analyses results such as the dual

recirculation pump trip. The staff reviewed the neutronic feedback effects on potential void fraction biases for pressurization events and found that, when considered in an integral sense, the effects resulted in a power void feedback that is substantially self compensating when determining the operating limit for SSES 1 and 2. The SSES 1 and 2 analysis is fully consistent with the staffs understanding of the power/void feedback phenomenon. Based on these points, the staff has found that an additional penalty to the OLMCPR is not necessary to ensure acceptable safety.”

The staff had also provided supporting background document that justified the bases for its conclusions.

Evaluation

Accurately, predicting the void fractions is important in the calculation of the thermal margins for BWRs. The accuracy of the void predictions affect the coupled neutronic and thermal-hydraulic response and the prediction of the core attributes that influence the thermal limits such as the core reactivity, power distribution, peaking and the reactivity changes (void reactivity coefficient) during transient event. For best estimate codes, where conservative assumptions and safety factors are no longer used, accounting for modeling uncertainties becomes essential.

In this regard, the AREVA void sensitivity analysis relied on limited perturbation of the void uncertainties and biases which did not represent the actual void correlations uncertainty ranges. Conclusions drawn from this specific calculation cannot be applied broadly for all SSES EPU core conditions, because the axial power distribution shifting, peaking, radial power peaking and the associated reactivity changes are calculated from a narrow scope of void sensitivity analyses. Both the direction (slight underprediction) and the magnitude (less than measured) of the void perturbation are insufficient, making the “negligible effect conclusion,” not adequately supported.

The SLMCPR depends highly on the cycle-specific core configuration and operating strategy. Therefore, in order to establish the impact of the void perturbation on the SLMCPR, the sensitivity analyses should be based on a more bounding conditions or it needs to be done on cycle-specific bases. The AREVA void sensitivity analyses again relies on a narrow condition to justify the “compensating SLMCPR and OLMCPR effects” for all cycle conditions.

Also, AREVA did not investigate the sensitivity of the void fraction uncertainties on the neutronic calculations (e.g., void reactivity coefficient) and its impact on the pressurization transient response. The transient response is predominately affected by the void reactivity coefficient and the scram reactivity. The staff's background states that the AREVA did not have a method to perform this sensitivity analyses. Thus, this predominant affect was not addressed. Transient PIRT indicates that the void reactivity has significant affect on the transient response.

In addition, recent study indicates that the event selected for the void perturbation may not be the most limiting event for impact of void fraction biases on the MCPR response. Thus, the staff needs to revisit whether the events analyzed are the most appropriate.

Recommended Committee Actions

The staff should be encouraged to perform additional assessment before concluding that the AREVA ATRIUM-10 void uncertainties and biases have negligible effects.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 17, 2008

Dr. William J. Shack, Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2, EXTENDED
POWER UPRATE

Dear Dr. Shack:

On October 9 and 10, and November 14, 2007, the U.S. Nuclear Regulatory Commission (NRC) staff presented its review of the Susquehanna Steam Electric Station, Units 1 and 2 (SSES 1 and 2), extended power uprate (EPU) application to the Advisory Committee on Reactor Safeguards (ACRS) subcommittee on power uprates. During the 547th and 548th meetings of the ACRS, on November 1 and December 7, 2007, respectively, the staff discussed the EPU with the ACRS full committee. By letter dated December 20, 2007, the ACRS forwarded its conclusions and recommendations on the staff's review of the SSES 1 and 2 EPU application to Chairman Klein. In that letter, the ACRS provided the following conclusions and recommendations:

1. The PPL application for the SSES EPU should be approved subject to the conditions imposed in the Safety Evaluation (SE) and the modification in recommendation 2.
2. An appropriate margin should be added to the operating limit minimum critical power ratio (OLMCPR) as an interim measure to account for uncertainties in the void fraction correlation and the lack of data for its validation at void fraction above 90 percent. This interim measure should be reviewed when PPL submits more detailed analyses that account for the effect of uncertainties in the void fraction on the OLMCPR.
3. We concur with the staff that the load rejection and main steam isolation valve closure transient tests should not be required. The plant transient testing program adequately addresses the performance of the modified systems.
4. We concur with the staff that the monitoring that will be performed during power ascension to the uprate conditions provides adequate assurance that if vibration modes are induced in the steam dryer, they will be identified.
5. The proposed methodology for reducing the Oscillation Power Range Monitor scram setpoint values to account for errors caused by bypass voiding is acceptable.

6. The staff should develop the capability and perform a thorough review and assessment of the risk of pellet-cladding interaction (PCI) fuel failures with conventional fuel cladding, during anticipated operational occurrences (AOOs).
7. Review Standard (RS)-001, "Review Standard for Extended Power Upgrades," provides a structured process for the review of EPU applications. The guidance document should be improved to include cross-referencing of related section between the power uprate safety analysis report (PUSAR) and the staff's SEs.

In addition to the recommendations and conclusions, several ACRS members provided additional comments expressing their concern that the licensee's plan to operate the units with conventional (non-barrier) fuel has increased the risk of pellet-cladding-interaction fuel failures during AOOs at EPU conditions.

In regards to recommendation 2, the NRC staff performed a detailed review of the application of AREVA methods and models to SSES at EPU conditions. In its review, the staff considered several technical points that were unique to the SSES EPU application. First, the fuel vendor (AREVA) provided full scale void fraction test data covering the range of pressure, flow rates, and void fractions up to the point of dry-out for the ATRIUM-10 fuel design. Second, the staff approval of the AREVA neutronic methods is limited to those transients which show margin to the safety limit minimum critical power ratio, and are therefore, effectively bounded by the critical heat flux test results. Third, AREVA performed a detailed sensitivity analysis demonstrating a negligible impact on the OLMCPR for a substantial void fraction bias. The staff agrees that void fraction data above 90% is lacking. However, the staff concludes that for the range of heat flux approved in the application, that any additional uncertainty for nodal void fractions at yet higher values, contributes negligibly to the analyses results such as the dual recirculation pump trip. The staff reviewed the neutronic feedback effects on potential void fraction biases for pressurization events and found that, when considered in an integral sense, the effects resulted in a power/void feedback that is substantially self compensating when determining the operating limit for SSES 1 and 2. The SSES 1 and 2 analysis is fully consistent with the staff's understanding of the power/void feedback phenomenon. Based on these points, the staff has found that an additional penalty to the OLMCPR is not necessary to ensure acceptable safety. The staff appreciates the committee's concerns and helpful insight provided during the review and will avail themselves to the committee, if requested, to discuss this matter at length.

In response to recommendation 6, the NRC staff will investigate current computational capabilities to model the complex phenomena associated with non-uniform fuel pellet expansion and stress-corrosion cracking (SCC). As necessary, the staff will develop guidance related to an application methodology and regulatory approach for implementing a PCI/SCC fuel failure criteria.

In regards to recommendation 7, the NRC staff continues to assess further means for improving the efficiency of the staff's review of EPU applications and to enhance consistency, quality, and completeness of EPU reviews. To that end, the staff continues to encourage both pressurized-water reactor and boiling-water reactor EPU applicants to use the RS-001 numbering scheme to identify the technical review areas in its applications. If an applicant desires to use a different numbering scheme, then the staff encourages EPU applicants to provide a table that cross-references the RS-001 matrix to the licensee's numbering scheme, as

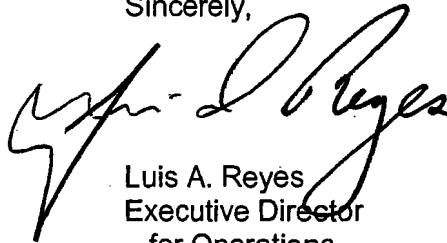
W. Shack

- 3 -

PPL Susquehanna did in Attachment 12 to its initial EPU application dated October 11, 2006 (the RS-001 matrix was annotated with references to the licensee's PUSAR). The staff will revise its internal guidance to ensure that future transmittals of draft SEs to ACRS include a table that provides cross-references between the staff's SE and the applicable sections of the licensee's PUSAR and supplemental responses.

The NRC staff appreciates the Committee's insights concerning the SSES 1 and 2 EPU amendment review.

Sincerely,

A handwritten signature in black ink, appearing to read "Luis A. Reyes". The signature is written in a cursive style with a large, sweeping initial "L".

Luis A. Reyes
Executive Director
for Operations

cc: Chairman Klein
Commissioner Jaczko
Commissioner Lyons
SECY



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

December 20, 2007

The Honorable Dale E. Klein
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 AND 2 EXTENDED
POWER UPRATE APPLICATION

Dear Chairman Klein:

During the 548th meeting of the Advisory Committee on Reactor Safeguards, December 6–8, 2007, we completed our review of the NRC staff's Safety Evaluation (SE) associated with the Susquehanna Steam Electric Station (SSES) extended power uprate (EPU) application. Our Subcommittee on Power Uprates also reviewed this matter on October 9–10, 2007, and November 14, 2007. During these reviews, we had the benefit of discussions with the staff, Susquehanna PPL, (PPL, the licensee) and its consultant, AREVA. We also had the benefit of the documents referenced.

CONCLUSIONS AND RECOMMENDATIONS

1. The PPL application for the SSES EPU should be approved subject to the conditions imposed in the SE and the modification in recommendation 2.
2. An appropriate margin should be added to the operating limit minimum critical power ratio (OLMCPR) as an interim measure to account for uncertainties in the void fraction correlation and the lack of data for its validation at void fraction above 90 percent. This interim measure should be reviewed when PPL submits more detailed analyses that account for the effect of uncertainties in the void fraction on the OLMCPR.
3. We concur with the staff that the load rejection and main steam isolation valve closure transient tests should not be required. The plant transient testing program adequately addresses the performance of the modified systems.
4. We concur with the staff that the monitoring that will be performed during power ascension to the uprate conditions provides adequate assurance that if vibration modes are induced in the steam dryer, they will be identified.
5. The proposed methodology for reducing the Oscillation Power Range Monitor (OPRM) scram setpoint values to account for errors caused by bypass voiding is acceptable.
6. The staff should develop the capability and perform a thorough review and assessment of the risk of pellet-cladding interaction (PCI) fuel failures with conventional fuel cladding, during anticipated operational occurrences (AOOs).

7. Review Standard (RS)-001, "Review Standard for Extended Power Uprates," provides a structured process for the review of EPU applications. The guidance document should be improved to include cross-referencing of related sections between the power uprate safety analysis report (PUSAR) and the staff's SEs.

DISCUSSION

SSES Units 1 and 2 are boiling-water reactor (BWR)/4 design, with Mark II containment. PPL has applied for an EPU of approximately 20 percent above the original licensed thermal power (OLTP) level of 3293 MWt to 3952 MWt. The current licensed thermal power (CLTP) level of 3489 MWt is approximately 6 percent higher than the originally licensed thermal power. While the SSES application is similar to other uprates that have been approved, such as Quad Cities Units 1 and 2, Brunswick Units 1 and 2, and Vermont Yankee, the uprate is the first to use AREVA ATRIUM-10 non-barrier fuel and for which AREVA methods are used for analyses of fuel and system behavior.

BWR fuel designs have evolved to 10x10 rod arrays, which provide larger heat transfer areas that can result in acceptable minimum critical power ratios (MCPs) for both normal operating conditions and anticipated transients at EPU conditions. Such fuel designs also help lead to acceptable calculated peak clad temperatures during loss-of-coolant accidents. To minimize increases in the peak heat fluxes relative to current design levels, the fuel loading for EPUs is adjusted to radially flatten the core power distribution. All this leads to peak heat fluxes for EPUs that are within the range of experience, although the average void fractions at the core exit are higher than those covered by current operating experience. Because the increased uncertainties associated with these higher void fractions result in increased uncertainties in the associated reactor physics calculations, as well as in the pressure drop and void fraction predictions, the staff has required increases in the power distribution uncertainties that are to be applied to the safety limit minimum critical power ratio (SLMCPs) to provide additional margin in the MCPs safety limit. The added margin that is required may be changed as more gamma scan data on ATRIUM-10 fuel under appropriate operating conditions are obtained and compared with the predictive capabilities of the reactor physics codes. We concur with the staff's assessment that the increase in the power distribution uncertainties applied to the cycle-specific SLMCPs is an appropriate interim measure.

The EPU will also lead to higher core average void fractions than at OLTP conditions. The uncertainties in the prediction of the higher void fractions appear to be ± 0.05 , and there are no void fraction data above 90 percent. To account for these uncertainties, the licensee performed calculations in which the proposed void fraction correlation was replaced with another correlation, which had a bias of 0.02 in void fraction in the range of interest. The calculations were intended to investigate the effect of changes in the void fraction correlation on the reactor power and on the thermal limits. The results of the analysis showed that the SLMCPs and the OLMCPs impact balance each other such that the net effect on the OLMCPs is small. However, further calculations are needed to validate these preliminary findings. The effect of the ± 0.05 uncertainty should be addressed by performing calculations with the same void fraction correlation in which the key correlation parameters are varied to span the void fraction uncertainty ranges and the effects on the OLMCPs and then assessed.

An appropriate margin should be added to the OLMCPR as an interim measure to account for uncertainties in the void fraction correlation and the lack of data for its validation at void fraction above 90 percent. When the licensee submits more detailed analyses that account for the effect of uncertainties in the void fraction on the OLMCPR, the interim measure should be reviewed.

At the high-power/low-flow conditions that are susceptible to instabilities, the presence of bypass voiding in the upper regions of the core leads to errors in the local power range monitor (LPRM) signals. SSES is an Option III plant, which relies on OPRMs to initiate scram. The LPRM signals feed into the OPRMs, and therefore the errors in the LPRM signals will also affect the OPRMs. We concur with the staff that errors in the LPRM signals caused by bypass voiding must be accounted for in the determination of the OPRM setpoint. The methodology proposed for determining OPRM setpoint values is acceptable.

PPL does not plan to undertake large transient tests, such as main steam isolation valve (MSIV) closure and generator load reject with bypass that would result in a reactor trip. Such tests would not directly address confirmation of the performance of systems claimed to support the proposed EPU. We concur with the staff's assessment that these large transient tests should not be required.

A potential EPU impact is a reduction in available operator action response times. Minor changes have been made in the emergency operating procedures to accommodate EPU modifications. We concur with the staff that the time available for critical operator actions is adequate.

EPU conditions require higher steam and feedwater flow rates that may lead to increases in flow-accelerated corrosion. Experience indicates that flow-accelerated corrosion rates at SSES are acceptably low. PPL has recently adopted the EPRI CHECWORKS program and plans to perform periodic inspections that should provide reasonable assurance that unacceptably high corrosion rates would be detected before the corroded components reach unsafe conditions.

The proposed EPU will also increase flow rates in certain components that could vibrate and lead to failure. Prior experience suggests that the steam dryer is the most likely component to be affected by such phenomena. Cracks have been detected in SSES steam dryers, and the licensee has elected to replace them with sturdier dryers. The Unit 1 and Unit 2 steam lines have been instrumented with external strain gauges to measure the pressure fluctuations in the steam lines. In addition, the new dryer for Unit 1 will be instrumented with strain gauges to determine stress levels in critical areas for comparison with calculated results. The strain gages on the dryer will be damaged during the refueling outage before the second EPU phase is implemented and thus will not be functional during actual full power operation and will permit monitoring only up to 107 percent uprate operation.

The applicant has developed a program for power ascension involving holds at a number of power levels and monitoring of steam line strain gauges, as well as steam dryer strain gauges, where possible. Direct measurements will be made of dryer stress/strain levels in Unit 1 at flow rates characteristic of 107 percent of CLTP with all four MSIVs open and up to 114 percent of CLTP (the EPU level) with three MSIVs open. Unexpected behavior would lead to power limitations until resolution. PPL has also committed to inspections of the steam dryers in the next two outages following the uprates for each of the units. We concur with the staff that the proposed program of monitoring power ascension and the proposed inspections provide

reasonable assurance that unacceptable stresses induced in the steam dryer will be identified during the power ascension before component failure.

We concur with the staff that the acceptance criteria for the design-basis loss-of-coolant accidents will be met after the proposed EPU. However, operation in the EPU domain will lead to conditions where core average exit void fractions are larger than those under CLTP conditions. These conditions may impact events such as an anticipated transient without scram (ATWS) and an ATWS with instability. We concur with the staff that the effects of the EPU would be bounded by the current uncertainty bounds associated with such events. These uncertainties, associated with difficulties in modeling such events and the paucity of data available to validate calculational methods, are tempered by the low frequency and the resulting low risk significance of these events. Should the EPU operation at SSES be extended to include the maximum extended load line limit analysis plus (MELLLA+) domain, conditions may arise during ATWSs that are more difficult to manage. We would like the opportunity to review methods and analyses for ATWS instability under such circumstances.

AREVA presented the results of thermal mechanical analyses addressing the performance of ATRIUM-10 fuel during operation at current and EPU conditions. The analyses addressed the standard regulatory limits, which are intended to ensure fuel integrity during steady-state operation and during AOOs. The PPL application is unique because the SSES units will be the first plants to operate full cores of fuel with non-barrier cladding at EPU conditions. During normal operation, the non-barrier fuel cladding is protected from PCI failure by the use of the power and power-ramp-rate operating restrictions developed by AREVA. Although non-barrier cladding has less built-in PCI resistance, these operating restrictions appear to be effective in preventing PCI fuel failures in the SSES units as evidenced by a good fuel performance history. In addition to the challenges of normal operation, there are upset sequences that can lead to fuel failure by the PCI mechanism. The applicant presented analyses to demonstrate that the peak clad stresses at EPU conditions under such conditions will be comparable to those calculated for the current operating conditions, although more of the cladding will be subjected to higher stresses.

The staff has applied RS-001 in the review of the SSES EPU. RS-001 provides a structured approach to the review. The RS-001 guidelines should continue to be improved, with cross-referencing between sections of the PUSAR and the staff's SEs.

We would like to have the opportunity to review the applicability of the AREVA methodology to MELLLA+ conditions before it is applied to any MELLLA+ application based on the AREVA fuel and core design.

Additional Comments by ACRS members Dr. Sam Armijo, Dr. Sanjoy Banerjee, and Dr. Dana Powers are provided.

Sincerely,



William J. Shack
Chairman

Additional comments by ACRS Members Dr. Sam Armijo, Dr. Sanjoy Banerjee, and Dr. Dana Powers

We agree with our colleagues that the PPL application for extended power uprate (EPU) of the Susquehanna units should be approved. However, we are concerned that the licensee's plan to operate the units with conventional (non-PCI-resistant) fuel has increased the risk of pellet-cladding-interaction (PCI) fuel failures during Anticipated Operational Occurrences (AOOs) at EPU conditions. This risk has not been assessed quantitatively by the licensee and the staff and is unnecessary since proven PCI-resistant fuel designs are available. Since conventional fuel has no built-in PCI resistance, prompt operator actions or automatic scrams will be the only defense against fuel failures during AOOs. The staff should develop qualified analytical tools to demonstrate that operator actions will assure an acceptably low number of failures. If this can be demonstrated by analysis, then the required operator actions should be incorporated into the regulatory process through commitments or inclusion in the updated FSAR.

The PPL application is unique because the Susquehanna units will be the first BWRs to operate at 20 percent above their originally licensed power levels with full cores of conventional fuel. Due to its susceptibility to PCI failure, conventional fuel must be protected during normal operation by the use of detailed power and power-ramp-rate operating restrictions. These operating restrictions, however, cannot protect the fuel during AOOs. During a Loss of Feed Water Heater (LOFWH) event, the Susquehanna core power can increase to 118 percent of the EPU power within 10 minutes. The core power can be reduced by operator action early in the transient or by an automatic scram when the core power exceeds the Average Power Range Monitor (APRM) flux scram setpoint. The Protection-Against-Power-Transients (PAPT) linear-heat-generation-rate (LHGR) limit is intended to protect fuel from failure during AOOs by limiting cladding strains to less than 1 percent. However, PCI is an aggressive stress corrosion mechanism that is capable of failing conventional BWR fuel cladding at strains far lower than 1 percent. For the Susquehanna Units, the maximum PAPT LHGR limit []¹ will be well above the PCI failure threshold []² reported by AREVA for ATRIUM-10 fuel.

During the December 7, 2007 Committee meeting, the licensee reported that Susquehanna plant procedures require immediate operator action in the event of a LOFWH transient, and that their operators are trained to recognize and respond to this event. They cited a LFWH event that occurred in Susquehanna Unit 2 in 2007. During the event operators reduced power in less than three minutes. These actions were effective since no fuel failures occurred. This plant experience is not conclusive for EPU conditions because the core power density will be 20% higher and fuel rod power transients will be more severe. The effectiveness of operator actions

¹ Deleted AREVA proprietary information

² Deleted AREVA proprietary information

in preventing PCI fuel failures during AOOs at EPU conditions will be dependant on fuel design, burnup, and the magnitude, rate and duration of power increases. This effectiveness cannot be assessed qualitatively. PCI is a stress corrosion phenomenon and time is required to nucleate and grow through-wall cracks. This time window is not well known but is in the range of minutes to hours depending on the severity of the transient.

During our reviews, AREVA reported that they are developing the XEDOR model to assess the risk of PCI failures during AOOs. Although the model has not been completed, AREVA concluded that cladding stresses and PCI risk at EPU conditions would be comparable to current cycles. These analyses are not adequate, because the XEDOR model is in development and has not been documented and submitted to the staff for review and approval. The staff reported that they were unable to address PCI risk without a robust methodology capable of differentiating PCI resistance for various fuel rod designs. Further, the staff indicated that PCI risk during AOOs was not a matter of regulatory concern. We believe this is an extraordinarily narrow interpretation of current regulations.

REFERENCES

1. Letter to ACRS from Catherine Haney, Director, Division of Operating Reactor Licensing, "Revised Safety Evaluation Related to Extended Power Uprate at Susquehanna Steam Electric Station Units 1 and 2," November 7, 2007 (Proprietary, ML073521156)
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