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		

CERTIFIED

Date Issued: 04/15/08
Date Certified: 04/09/08

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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.

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.

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.

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~~ 10:20 A.M. Final Review of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant (Open) (MVB/MB)
   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~~ 10:20 - 10:45 A.M. ***BREAK***

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.

ML080450443

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
550TH FULL COMMITTEE MEETING

March 6-8, 2008

PLEASE PRINT

TODAY'S DATE: March 6, 2008

	NAME	NRC ORGANIZATION
1	Glenn Meyer	Region I
2	~~Arturo~~ Smith	
3	PETER WEN	ACRS
4	DAN HOANG	NRR/DLR
5	JAMES MEDOFF	NRR/DLR
6	DUC NGUYEN	NRR/DLR
7	On Yee	NRR/DLR
8	B T KUO	NRR/DLR
9	RANI FRANOVICH	NRR/DLR
10	Ken Chang	NRR/DLR
11	Bill Rogers	NRR/DLR
12	JOHN TSAO	NRR/DCI
13	Lambros Lois	NRR/DSS/SRXB
14	ANGELO STUBBS	NRO/DSRA/SBPA
15	Roy MATHEW	NRR/DE
16	Hansray ASHAR	NRR/DG
17	Raj Auluck	NRR/DLR
18	Ganesh Cheruvenki	NRR/DCI
19	Tam Tran	NRR/DLR
20	MAURICE HEATH	NRR/DLR
21	Jonathan Rowley	NRR/DLR
22	Tommy Le	NRR/DLR
23	~~Gary L. Stevens~~	~~Structural Eng~~
24	Ted Hensan	SEIU
25	Joe Kabourek	SEIU
26	Farideh Emami Saba	NRR/DORL
27	Stacie Sakai	NRR/DLR
28		

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
550TH FULL COMMITTEE MEETING

March 6-8, 2008

PLEASE PRINT

TODAY'S DATE: March 6, 2008

	NAME	NRC ORGANIZATION
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	JIFF Pohlin	NRO/DE/CIB1
8	Jorge Hernandez	NRO/DSRA/SBPB
9	DAVID SHUM	NRO/DSRA/SBPB
10	AMAR PAL	NRO/DE/EEB
11	KEITH HOFFMAN	NRO/DE/CIB2
12	Yamir Diaz	NRO/DCIP/CRVB
13	John Segala	NRO/DSRA/SBPA
14	Chang-Yang Li	NRO/DSRA/SBPB
15	Kim Gruss	NRO/DE/CIB2
16	Hulbert Li	NRO/DE/ICE2
17	ERIC OESTERLE	NRO/DNRL/NGE1
18	Mike Snodderly	NRO/DSRA/SBCV
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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 7, 2008

NAME	NRC ORGANIZATION
Jocelyn Mitchell	RES
Sud Basu	RES
John N. Ridgely	RES
Tom Bergman	NRO
Mohammed Shuaibi	NRO

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
549TH FULL COMMITTEE MEETING

March 6-8, 2008

PLEASE PRINT

TODAY'S DATE: March 6, 2008

	NAME	AFFILIATION
1	Arturo Smith	Entergy Nuclear
2	Thomas Moskalyk	Entergy Nuclear
3	Lawrence Leiter	Entergy Nuclear
4	Jon Hornbuckle	Souther Nuclear
5	Chalmer Myer	Southern Nuclear
6	Richard Schaller	STARS (APS)
7	Jim Costedio	Entergy Nuclear
8	Pete Dietrich	Entergy Nuclear
9	Steve Bono	Entergy Nuclear
10	Joe Pechacek	Entergy Nuclear
11	Brian Finn	Entergy Nuclear
12	Michael Fallin	Constellation Energy
13	Rick Plasse	Entergy
14	Garry G. Young	Entergy
15	Duane L. Filchner	PPL Susquehanna
16	A. Michael Metell	Entergy VY
17	David J. Loch	Entergy
18	Brian Finn	Entergy
19	Dawn Mannai	Entergy
20	Nelm Polensch	Entergy
21	~~[illegible]~~	~~[illegible]~~
22	Jennifer Jones	Legin Group Inc.
23	Alan Cox	Entergy
24	Beth Bristol	Entergy
25	Scott Gradum	Entergy
26	Ted Sullivan	Entergy
27	Gary L. Stevens	Structural Integrity Associates
28	James C. Fitzpatrick	Entergy

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
549TH FULL COMMITTEE MEETING

March 6-8, 2008

PLEASE PRINT

TODAY'S DATE: March 6, 2008

	NAME	AFFILIATION
1	HUGH UPTON	GEH
2	J. Allen Beard	GEH
3	Tom Caine	GEH
4	George Wadkins	GEH
5	Rick WACHOWIAK	GEH
6	Larry J. Tucker	GEH
7	MIKE ARCARO	GEH
8	MICHAEL SULVA	GEH
9	JERRY BEAVER	GEH
10	DAVE DAVENPORT	GEH
11	Jack Noonan	GEH
12	JAMES KINSEY	GE-HITACHI
13	Wayne MARQUINO	GEH
14	PETER JORDAN	GEH
15	~~JEFF FORHAIR~~	—
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. ***BREAK***

   - 2.1) Remarks by the Subcommittee Chairman
   - 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:

2:45 – 3:00 P.M.
*****Break*****

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)**

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)
Continue discussion of proposed ACRS reports listed under Item 10.

10:30 – 10:45 A.M.
*****BREAK*****

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

AGENDA ITEM **MEETING HANDOUTS,** LISTED IN ORDER

1. Opening Remarks by the ACRS Chairman

2. Final Review of the License Renewal Application for the James A. FitzPatrick Nuclear Power Plant
   1. Entergy License Renewal Presentation (Slides)
   2. James A. FitzPatrick Nuclear Power Plant License Renewal Safety Evaluation Report (Slides from NRC/NRR)

3. Final Review of the License Renewal Application for the Vermont Yankee Nuclear Power Station
   3. Proposed Schedule for the Session
   4. Entergy License Renewal Presention (Slides)
   5. Vermont Yankee Nuclear Power Station Safety Evaluation Report (Environmental Fatigue), (Slides from NRC/NRR)

4. Selected Chapters of the SER Associated with the ESBWR Design Certification Application
   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. Preparation of ACRS Reports

7. Opening Remarks by Chairman

8. Meeting with Commissioner Lyons

9. Future ACRS Activities/Report of the Planning and Procedures Subcommittee

10. Reconciliation of ACRS Comments and Recommendations
    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

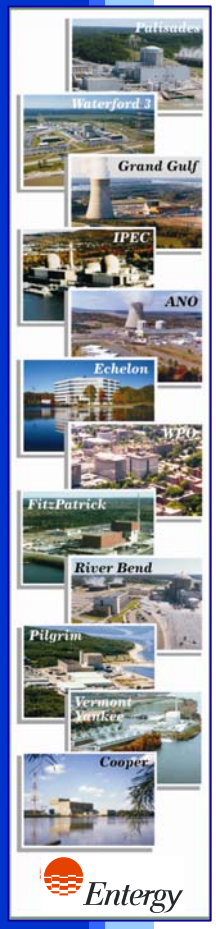
11. – 13. Preparation of ACRS Reports

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

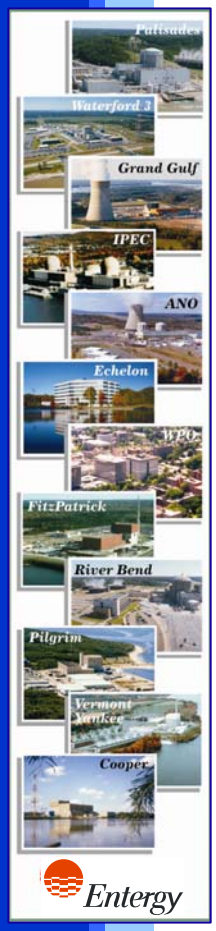
[Note: Some documents listed herein may have been provided or prepared for the Committee use only. These documents must be reviewed prior to release to the public.]

James A. FitzPatrick Nuclear Power Plant

ACRS License Renewal Presentation
March 6, 2008

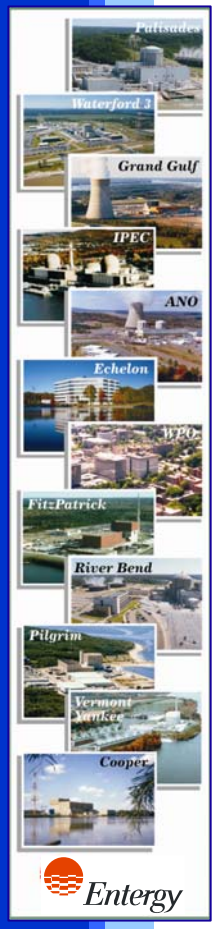


James A. FitzPatrick
Personnel in Attendance



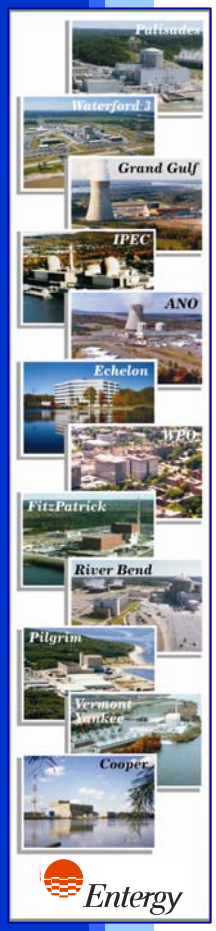
Pete Dietrich	Site Vice President
Brian Finn	Site NSA Director
Garry Young	Manager, Business Development
Steve Bono	Director of Engineering
Joe Pechacek	Manager, Programs & Components Engineering
Alan Cox	Technical Manager
James Costedio	Licensing Manager
Rick Plasse	Licensing Lead
Larry Leiter	Technical Lead
Tom Moskalyk	Structural Lead
Aturo Smith	ISI Engineer

Agenda



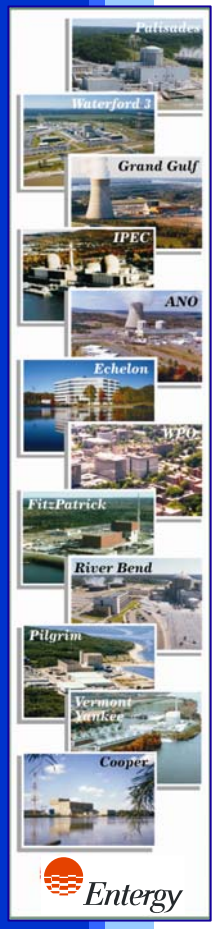
- Background
  - Site Description
  - Licensing History
  - Major Plant Improvements
  - Plant Performance
  - License Renewal Project
- Presentation Topics
  - Torus Monitoring
- Questions

JAFNPP Site Description



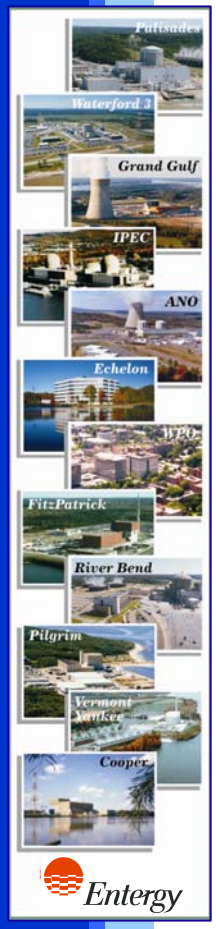
- General Electric (NSSS & TG), Stone & Webster (AE and Constructor)
- BWR-4, Mark I Containment
- 2536 MWt Thermal Power; ~ 881 MWe
- Once-through Cooling from Lake Ontario
- Staff Complement: Approximately 650

JAFNPP Licensing History



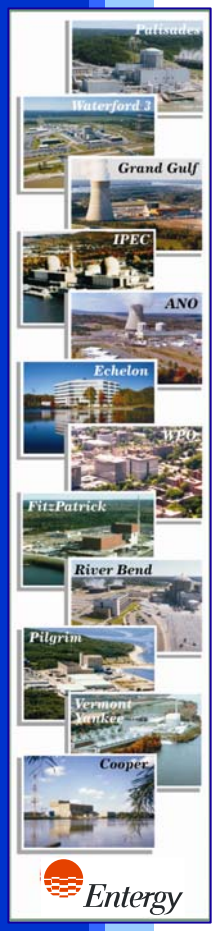
Construction Permit	May 20, 1970
Operating License	October 17, 1974
Commercial Operation	July 28, 1975
Uprated Power License (4%)	December 6, 1996
License Transfer to Entergy	November 21, 2000
LR Application Submitted	July 31, 2006
Operating License Expires	October 17, 2014

Major Improvements



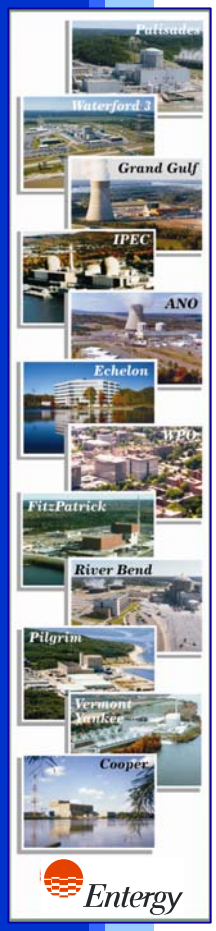
1978 – 1983	Mark I Containment Modifications
1988	Hydrogen Water Chemistry
1989	Zinc Injection
1990	Power Uprate Equipment Upgrades
1998	ECCS Suction Strainers Replaced
1999	Noble Metals Application
2004	LP Turbine Rotor Replacement
2004	Noble Metals Application 2
2006	HP Turbine Rotor Replacement
2006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

JAFNPP Plant Status



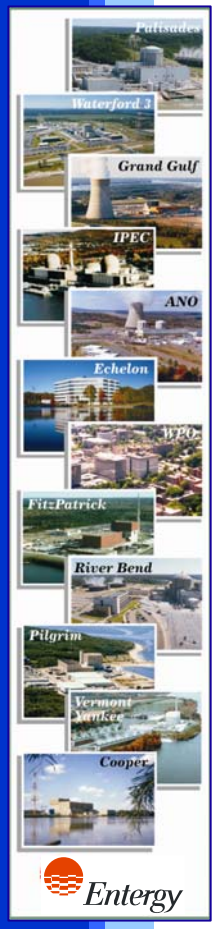
- Current Plant Status
- Outage Summary – Sept 2008
  - Outage items of interest
    - Main Transformer Replacement
    - Core Spray Motor Replacement
    - 345KV Breaker Replacement
    - Screenhouse Upgrades

JAFNPP License Renewal Project



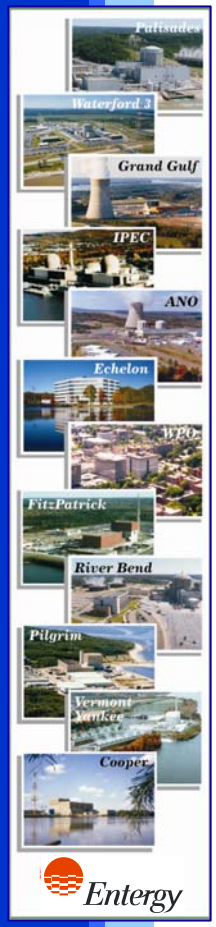
- LRA prepared by experienced, multi-discipline Entergy team (utilized corporate and on-site resources)
- Incorporated lessons learned from previous applications
- Peer review conducted
- LRA internal reviews (Safety Review Committees and QA)
- All comments resolved prior to submittal

JAFNPP License Renewal Project



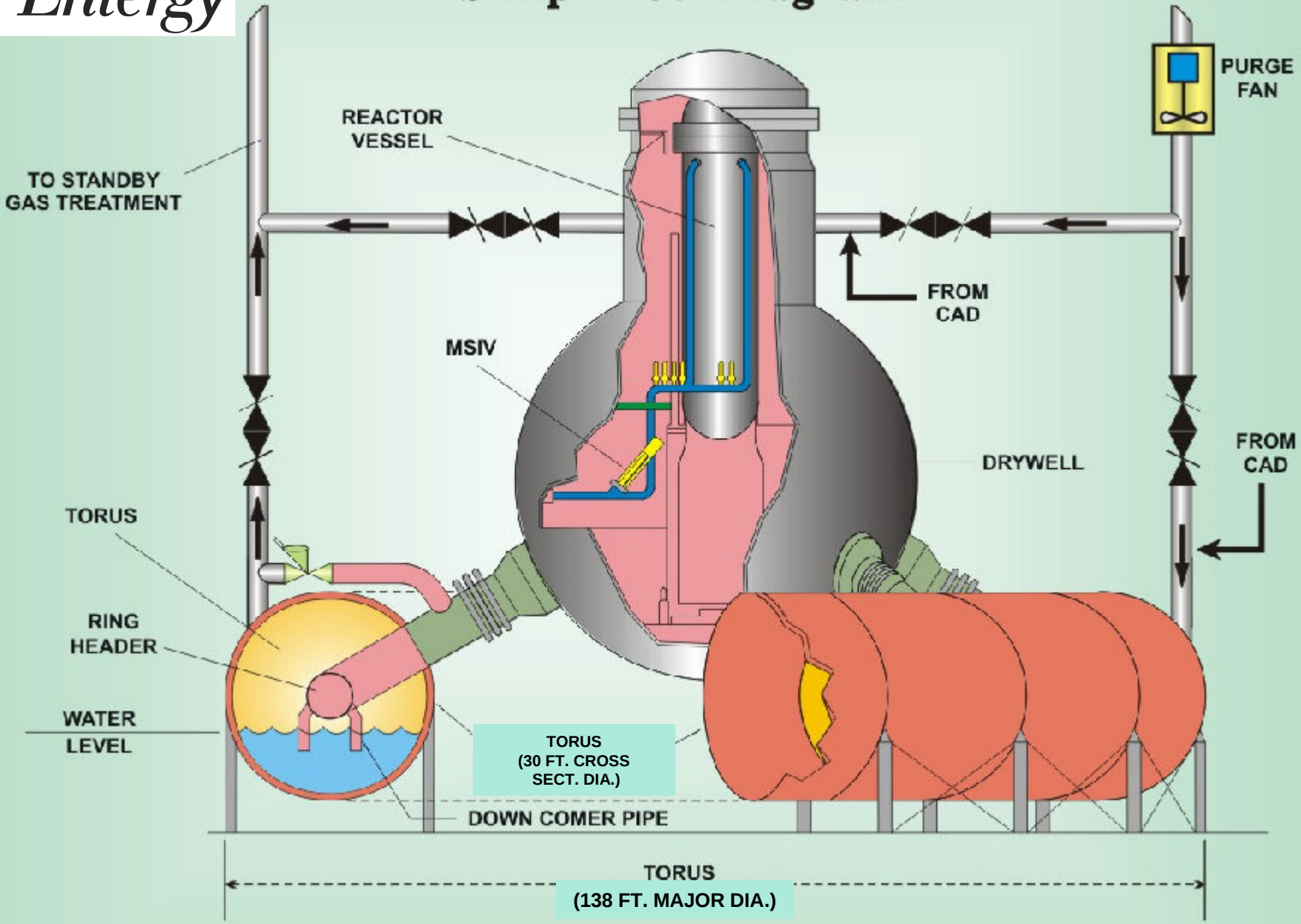
- Application Evaluated with GALL Revision 1
- License Renewal Commitments
- 36 Aging Management Programs

JAFNPP License Renewal Project

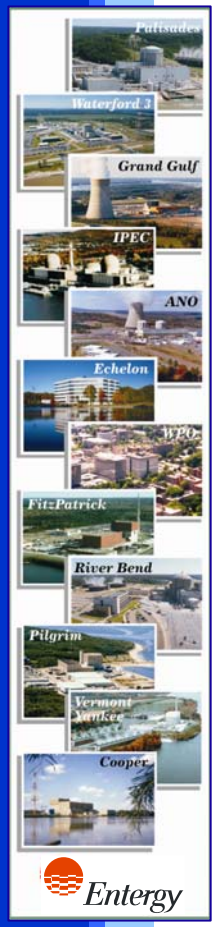


- Draft SER Issued July 2007 with 2 Open Items
  - Open Items – 2
    - Reactor Vessel Fluence
    - Environmentally Assisted Fatigue
  - Confirmatory Items – None
- Final SER Issued January 2008
  - All open items resolved

Primary Containment System Simplified Diagram

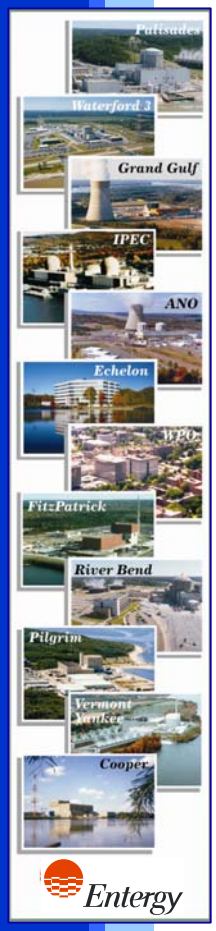


James A. FitzPatrick



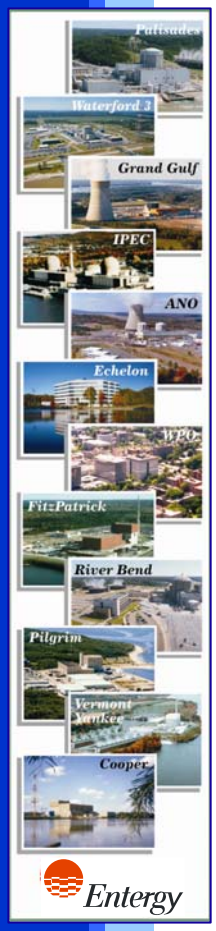
Torus Monitoring

Torus Monitoring



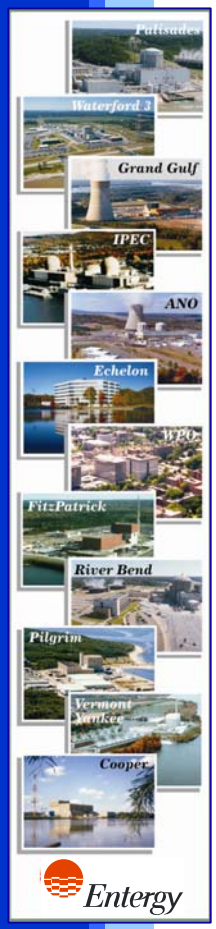
- JAF Containment Inservice Inspection (CII) Program implements IWE provisions
- ASME Code Category E-A Requirements (Containment Surfaces)
  - CII Program is performed in accordance with ASME Section XI 2001 Edition / 2003 Addendum

Torus Monitoring



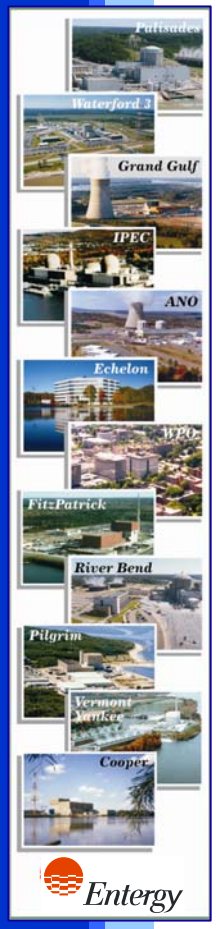
- Inspection scope and frequency is in accordance with Table IWE-2500-1
  - Accessible Surface Areas – General Visual
    - Once Every Period
  - Wetted Surfaces of Submerged Areas – General Visual
    - 100% Once Every Interval
  - BWR Vent System – Accessible Surface Areas
    - 100% Once Every Interval

Torus Monitoring



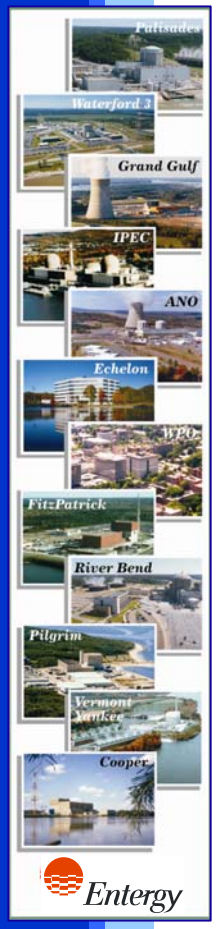
- Inspection scope and frequency is in accordance with Table IWE-2500-1
  - Moisture Barriers – General Visual
    - 100% During Each Inspection Period
  - Containment Surface Areas – Detail Visual
    - Visible Surfaces 100% of surface areas Identified by IWE-1242
  - Surface Area Grid – Ultrasonic 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



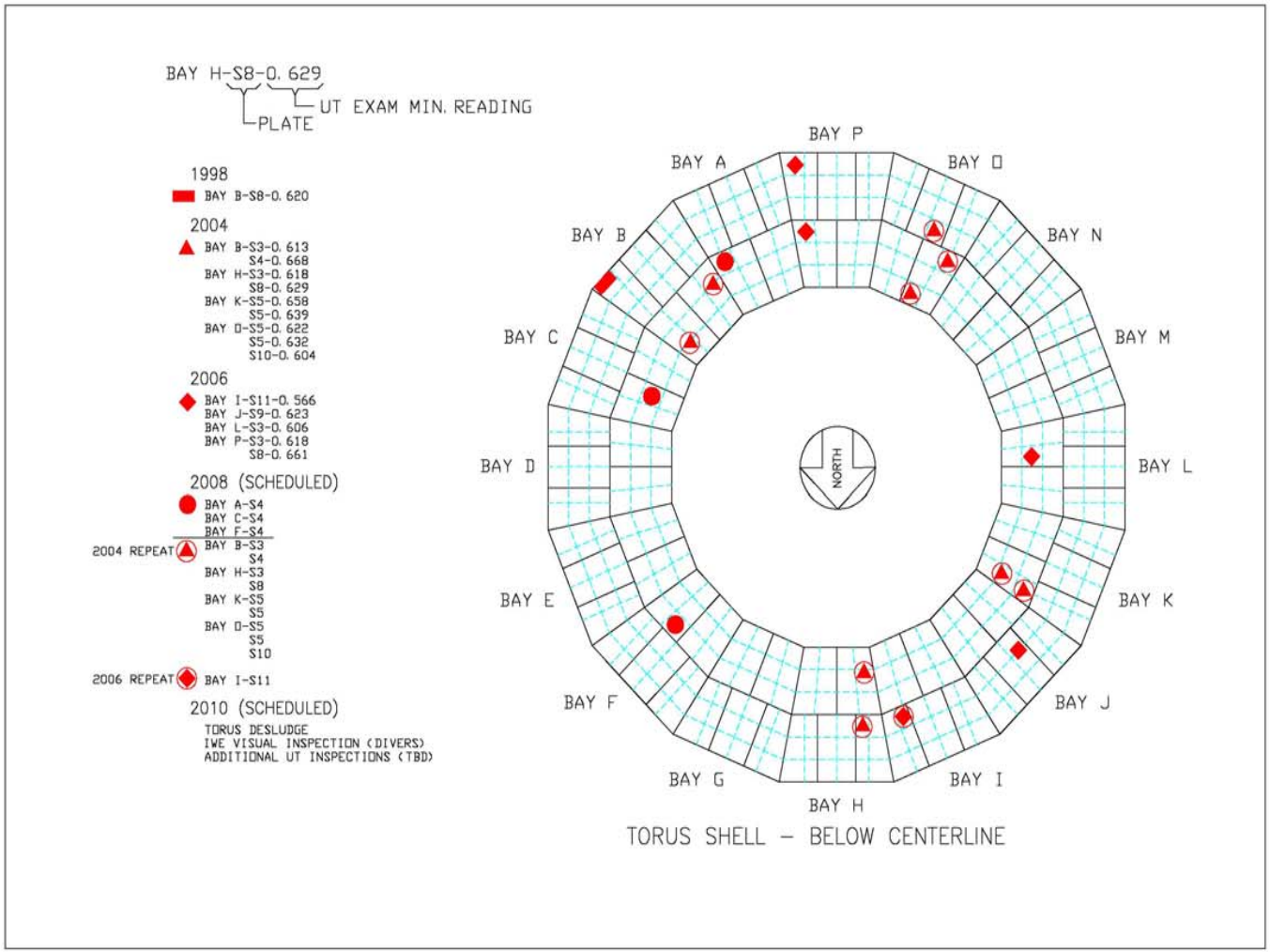
- JAF Program
  - No identified interior/exterior containment surface areas that have substantial corrosion and/or pitting.
  - No identified interior/exterior containment surface areas that are subject to excessive wear from abrasion or erosion that causes a loss of protective coatings, deformation,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

Torus Monitoring

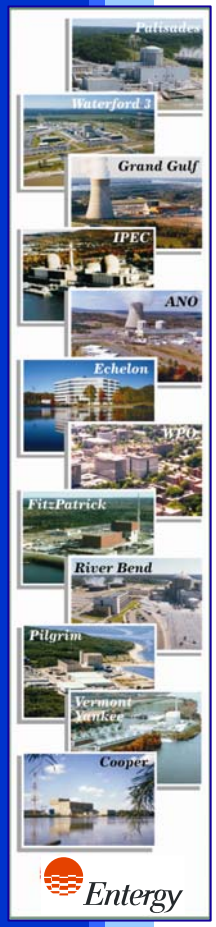


- JAF Program
  - JAF has identified 29 locations on the interior surface of the torus (suppression pool) that have minor pitting.
  - JAF monitors these locations through the CII Inspection Program which requires more frequent examinations than augmented examinations required by IWE-1241.

Torus Monitoring

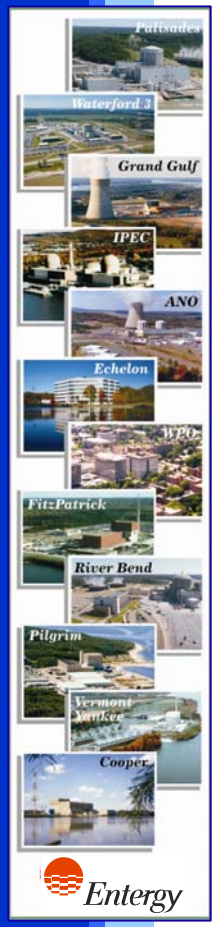


Torus Monitoring



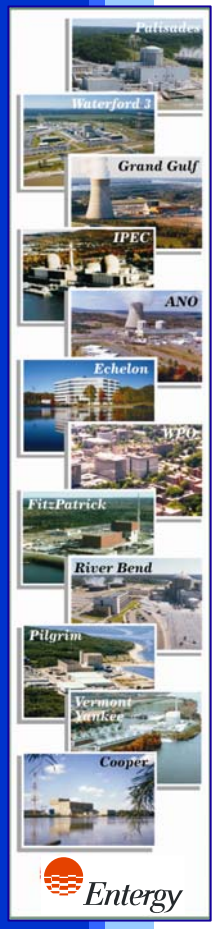
- Ongoing Actions to Ensure Structural Integrity
  - Primary Containment system is inerted with nitrogen and provides atmosphere that is not conducive to corrosion of containment interior surfaces.
  - Torus Preservation and monitoring of interior surfaces identifies and mitigates Torus interior degradation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

Comments and Questions



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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

Introduction

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

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

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Protecting People and the Environment

License Renewal Inspections

Glenn Meyer

Inspection Team Leader, Region I

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

Regional Inspection

- Spatial interaction
- Structural interaction
- Scoping and screening

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

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**

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)

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**

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**

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

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)

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

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.

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.

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Protecting People and the Environment

Questions

Section 3: Aging Management Review Results [backup slide]

- **Examples: Two Aging Management Programs**

  Containment Inservice Inspection Program - B.1.16.1

  Containment Leak Rate Program – B.1.8

SER 3.0.3.3.2 - Containment Inservice Inspection Program:

- Interior Torus Suppression pool area above and below the water line are inspected via IWE program during refueling outages
- Torus was drained / cleaned in 1998, identified areas of pitting
- Over 5 years performed UT and found pitted areas remain acceptable per Code requirements
- During RFO-16 (2004), UT results shown 3 pitted depths 0.019”, 0.010”, and 0.014”, below design (0.632”) – Vs 0.503” Code minimum

SER 3.0.3.1.1 - Containment Leak Rate Program:

- The Staff finds program elements consistent with the GALL Report. Provides assurance leakage through Primary containment will not exceed Allowable TS value

Section 3: Aging Management Review Results [backup slide]

- **Examples: Two Aging Management Programs**

  Containment Inservice Inspection Program
  Containment Leak Rate Program

  Consistent with the Staff Interim Guidance LR-ISG-2006-01

  No leakage identified in the vicinity of the sand cushion drain line

  Water leakage monitoring (each refueling)

  refueling seal bellows
  drywell air gap drains
  sand pocket drains
  functional checks on the alarm system

  – **The staff finds the AMPs consistent with the GALL report, will manage loss of material, an aging effect caused by corrosion of drywell and torus material**

Vermont Yankee Nuclear Power Station

ACRS License Renewal Full Committee Presentation on Environmentally Assisted Fatigue

March 06, 2008

Entergy

Entergy Personnel in Attendance

Executives

Ted Sullivan	Vermont Yankee Site Vice President

Corporate Management

Garry Young	Manager, License Renewal

Presentation Panel

John Dreyfuss	Director of Nuclear Safety Assurance
Norm Rademacher	Director of Engineering
Jim Fitzpatrick	Design Engineering - Structural
Gary Stevens	Structural Integrity - Consultant
Scott Goodwin	Design Engineering - Structural
Alan Cox	Technical Manager

Support Management

Dave Mannai	Licensing Manager
Mike Metell	Project Manager

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Agenda

Environmentally Assisted Fatigue (EAF)

- EAF Overview
- EAF Timeline
- Basis for Evaluation
- EAF Evaluation
- Reanalysis of FW, CS, and RR Outlet Nozzles
- Conservatisms in Nozzle Re-analyses
- Chemistry Effects on EAF
- EAF Summary
- NRC Audit of EAF Calculations
- Confirmatory Calculation
- License Condition

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EAF Overview

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EAF Overview

- Scope included the fatigue-sensitive component locations identified in NUREG/CR-6260
  - RPV Shell and Lower Head
  - Feedwater Nozzle (FW)
  - Reactor Recirculation (RR) piping (including RR inlet and RR outlet nozzles)
  - Core Spray (CS) Nozzle and associated piping
  - Residual Heat Removal (RHR) return piping
  - FW piping

- Piping originally designed and analyzed to USAS B31.1-1967; therefore, no original ASME Class 1 piping Cumulative Usage Factor (CUF) calculations

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EAF Timeline

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EAF Timeline

- Completed VY Plant Specific EAF calculations (September 2007)
- Staff audited calculations and raised questions at blend radius for three nozzles (October 2007 – January 2008)
- Public meeting held on EAF calculations (January 8, 2008)
- Completed confirmatory analysis and addressed reactor water chemistry effects (January 30, 2008)
- Completed audit of confirmatory analysis for limiting FW Nozzle (February 14, 2008)
- Submitted LRA Amendment 36 providing chemistry data and supplemental information (February 21, 2008)

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Basis for Evaluation

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Basis for Evaluation

- Consistent with GALL Report
- Evaluated locations specified in NUREG/CR-6260
- Utilized EAF relationships (F_{en} methodology)
  - NUREG/CR-6583 for carbon and low alloy steels
  - NUREG/CR-5704 for stainless steels

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Basis for Evaluation

- Fabrication / As-Built drawings used
- Design vs. Actual Transient Severity used
- Projected cycles to 60 years
- EPU conditions applied for entire 60 year period

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EAF Evaluation

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EAF Evaluation

Site specific analyses for NUREG/CR-6260 locations at VY

- Used existing design analyses for RPV Shell, Lower Head & Recirculation Inlet Nozzles and applied F_{en} (all evaluated using NB-3200 rules)
- Reanalyzed the FW, RR Outlet, & CS Nozzles per ASME NB-3200
- New ASME Class 1 fatigue calculations for RR, RHR and FW piping per ASME NB-3600

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Reanalysis of FW, CS, and RR Outlet Nozzles

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Reanalysis of FW, CS, and RR Outlet Nozzles

- 60 year projected cycles and design transient severity based on VY Design Specification and updated BWR-4 thermal cycle definitions
- Finite element models (FEMs) developed from as-built drawings and material specifications
- Heat transfer coefficients and FEM boundary conditions based on the RPV Certified Design Specification and RPV Stress Report
- Thermal stress response (i.e., Green's Function) developed for a step change in temperature

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Reanalysis of FW, CS, and RR Outlet Nozzles

- Thermal transient component stresses calculated using Green's Function integration for each thermal transient
- Pressure stress intensities directly from FEM for unit pressure load case scaled to account for nozzle corner effects and transient pressure time history
- Stress intensities due to attached piping loads conservatively calculated and scaled based on RPV temperature for each transient

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Reanalysis of FW, CS, and RR Outlet Nozzles

- Maximum stress differences from temperature transients and stress intensities from pressure and attached piping loads were combined per transient definitions

- ASME NB-3200 fatigue calculation performed for the collected thermal transients stress histories

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Reanalysis of FW, CS, and RR Outlet Nozzles

- Bounding fatigue life correction factors (F_{en} multipliers) calculated for water chemistry conditions expected to occur over 60 year operating period

- Environmental fatigue effects calculated by multiplying the CUF for 60 years by the F_{en}

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Conservatisms in Nozzle Re-analyses

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Conservatisms in Nozzle Re-analyses

- Number of projected transient cycles for 60 years greater than expected cycles based on experience to date
- Used design basis transient severity definitions
- Assumed bounding values for pressure and temperature (at power up-rate conditions) for the entire 60 year period of plant operation
- Calculated bounding F_{en} multiplier using values for temperature, strain rate and sulfur content to maximize the F_{en} multiplier
- Applied bounding F_{en} multiplier to all transient stress pairs

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Chemistry Effects on EAF

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Chemistry Effects on EAF

- Used F_{en} factors specified per NUREG/CR-6583 and NUREG/CR-5704

- Selected inputs to maximize contribution
  - Sulfur content maximum of 0.015 used
  - Strain rate less than 0.001%/sec for all transients
  - Temperature – 550°F used for all locations
  - Dissolved oxygen (DO) based on Plant measured data including excursions
  - DO inputs represent mean plus 1 standard deviation of measured data

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EAF Summary

- EAF CUFs for Vermont Yankee remain below the allowable value of 1.0 for 60 years of operation

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NRC Audit of EAF Calculations

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NRC Audit of EAF Calculations

- NRC questioned VY nozzle reanalysis at FW, CS, and RR Outlet nozzle corners (blend radius)
  - Use of component (i.e., radial, tangential, hoop) stress difference vs. maximum stress intensity (neglects shear stresses)
  - LRA Amendment 33 (VY response to RAI 4.3.3-2) documents evaluation using maximum stress intensity vs. component stress difference
  - Results in maximum 0.003 increase in EAF CUF for FW, CS and RR Outlet nozzles

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Confirmatory Calculation

Confirmatory Calculation

- Feedwater Nozzle analyzed
  - Controlling nozzle with most severe design transients and highest fatigue usage
    - Where cold return enters hot vessel
    - 2-3 times number of design transients vs. other nozzles
    - Industry experience
  - Same FEM model, transients, cycles and water chemistry as used in previous nozzle reanalysis
  - All 6 stress components combined per NB-3216.2 (i.e., shear stresses were included)

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Confirmatory Calculation

- ASME fatigue analysis per NB-3222.4(e) (same as reanalysis)
- Confirmatory calculation used maximum F_{en} factor for each transient pair
- Results reconfirm EAF CUF <1.00 for 60 years

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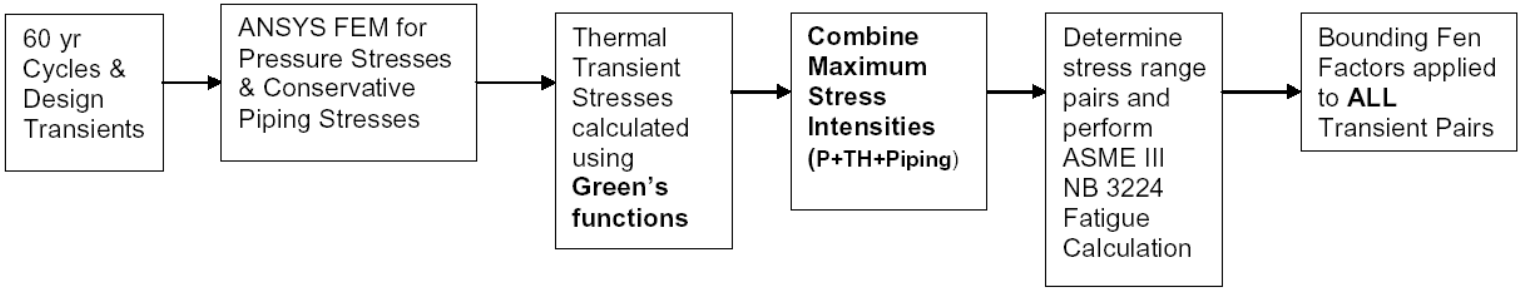
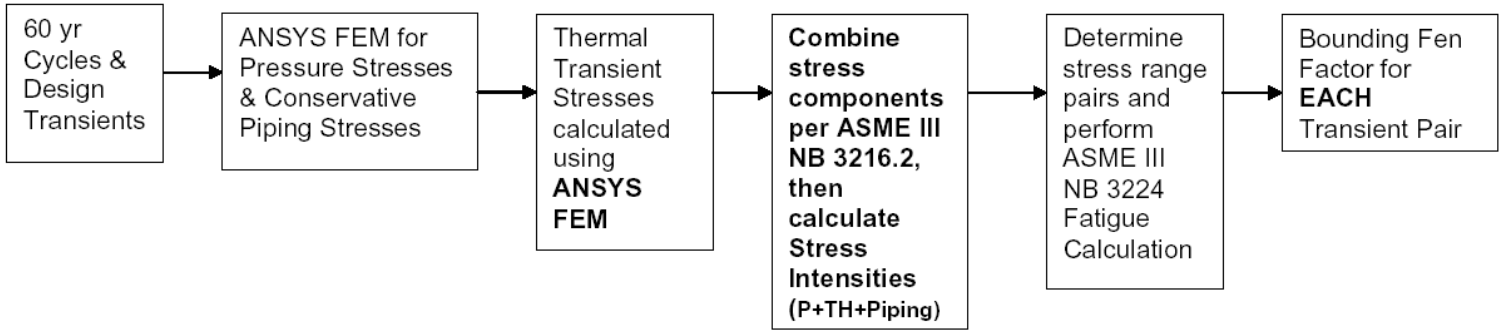
Comparison of Reanalysis with Confirmatory Calculation

Reanalysis



Confirmatory Calculation



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Calculation Results

- EAF Analysis results <1.00 (with margin)
- Confirmatory Calculation supports EAF Reanalysis results

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**

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License Condition

License Condition

- FW nozzle confirmatory calculation complete
- Reanalysis for CS and RR Outlet show:
  - CS EAF CUF = 0.17
  - RR Outlet EAF CUF = 0.08
- License condition: Perform ASME analysis for CS and RR Outlet Nozzles no later than two years prior to entering the period of extended operation

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Comments and Questions

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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.

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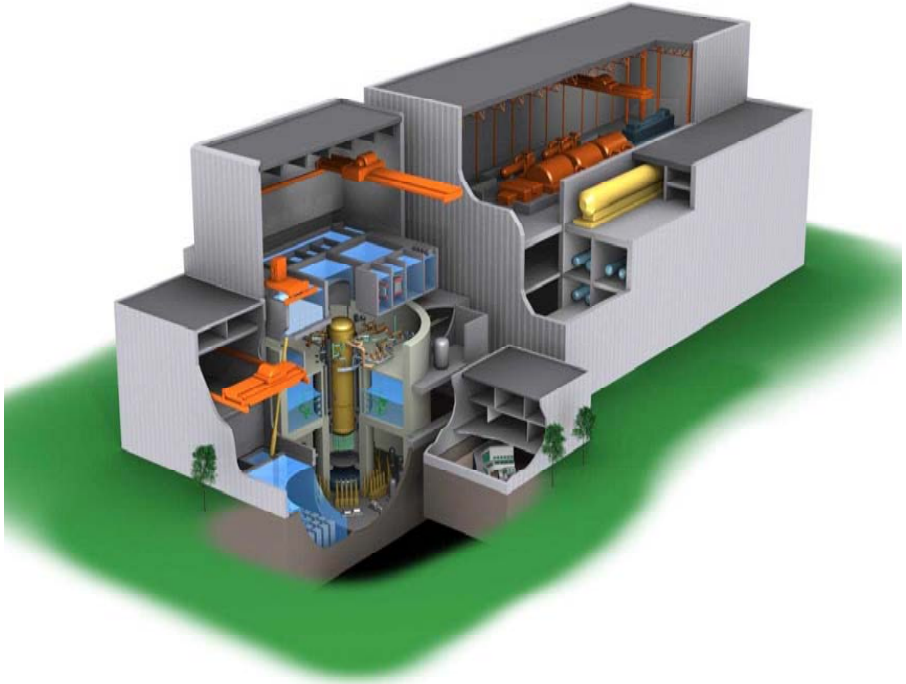
Protecting People and the Environment

Questions

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

Advisory Committee on Reactor Safeguards



March 6, 2008

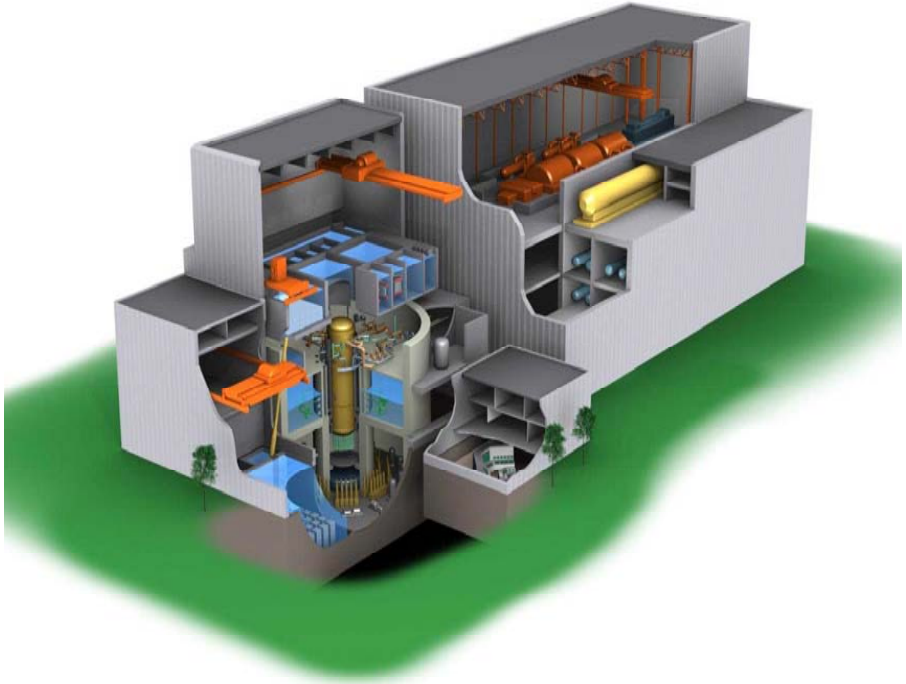
GE Hitachi Nuclear Energy

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

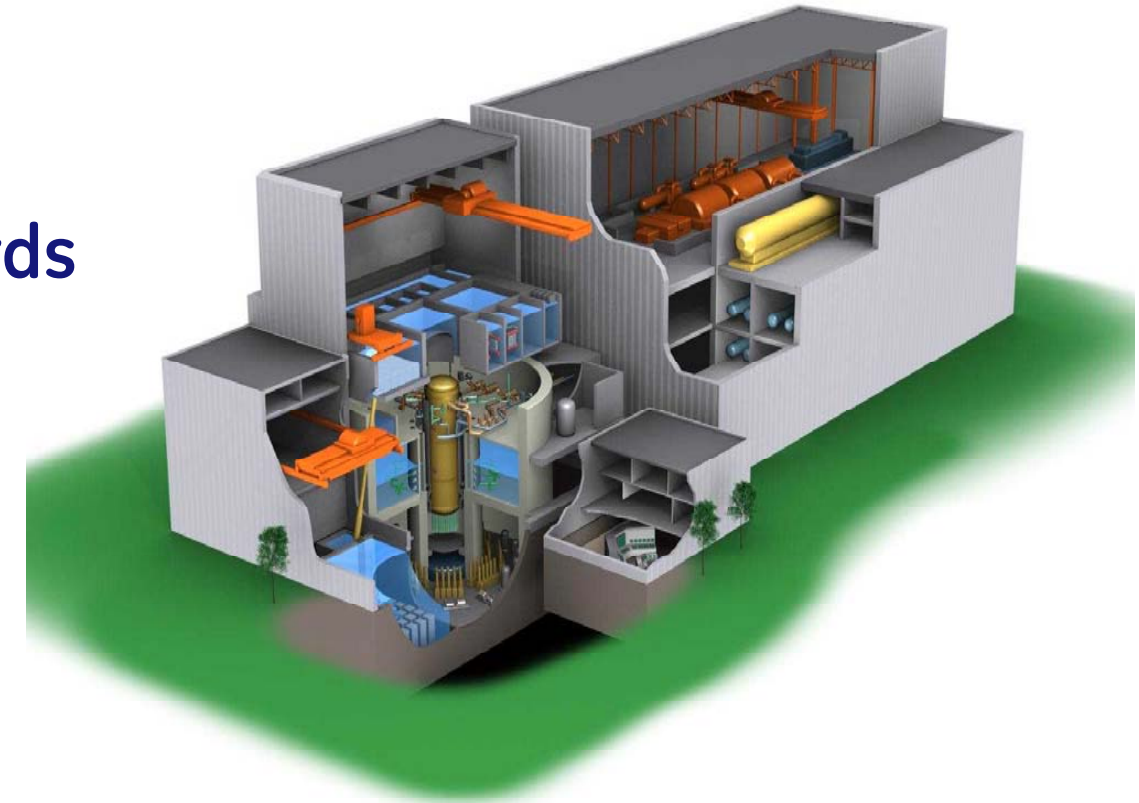
- Section 9.1– Fuel Storage and Handling Systems
  - New Fuel Storage
  - Spent Fuel Storage
  - Fuel and Auxiliary Pools Cooling System
  - Light Load Handling System (Related to Refueling)
  - Overhead Heavy Load Handling Systems
- Section 9.2– Water Systems
  - Plant Service Water, Reactor Components 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

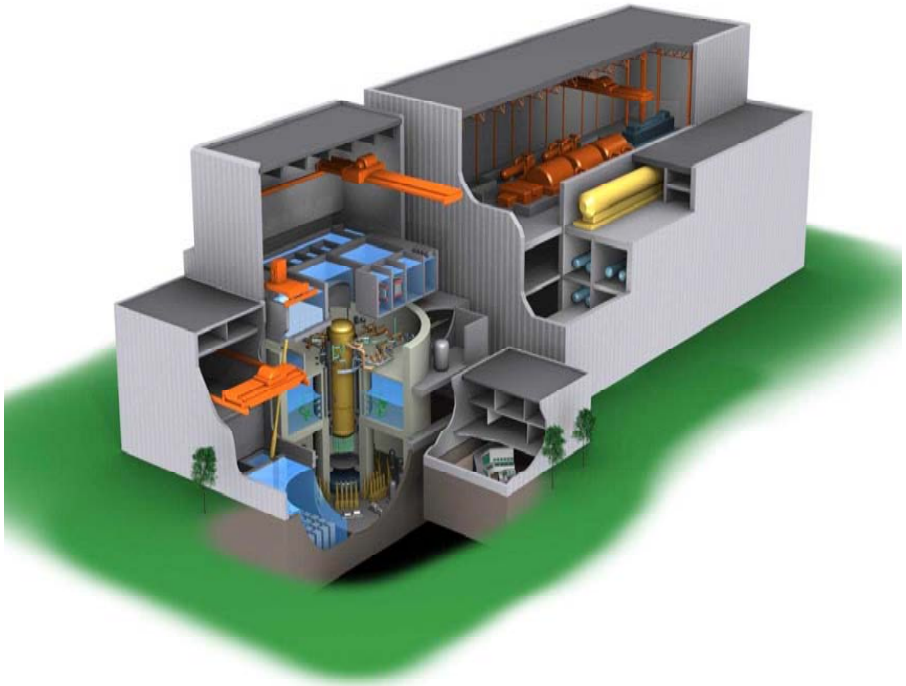
- Turbine Missile Considerations
  - > Integral Forgings (Monoblock)
  - > Favorable Orientation
- Adjustable Speed Motor-Driven Feedwater Pumps
- Elimination of Gland Seal Steam Evaporator
  - > Improved Reliability
  - > Reduce Maintenance Dose
- Fully Electronic, Redundant, Fail-Safe, and Testable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

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.
  - 3,512 bundles = SFP @ full capacity + 1 full core with closed gates
  - 1,690m^3 (equivalent to 8.85 m) lost in 72hrs
  - ~2.0m remain above TAF @ 72 hours
- 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, GDCS, ICS, PCCS, IC/PCC Pools
  - Inservice Testing
    - Squib valve testing
    - ICS return line valve testing
    - GDCS 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

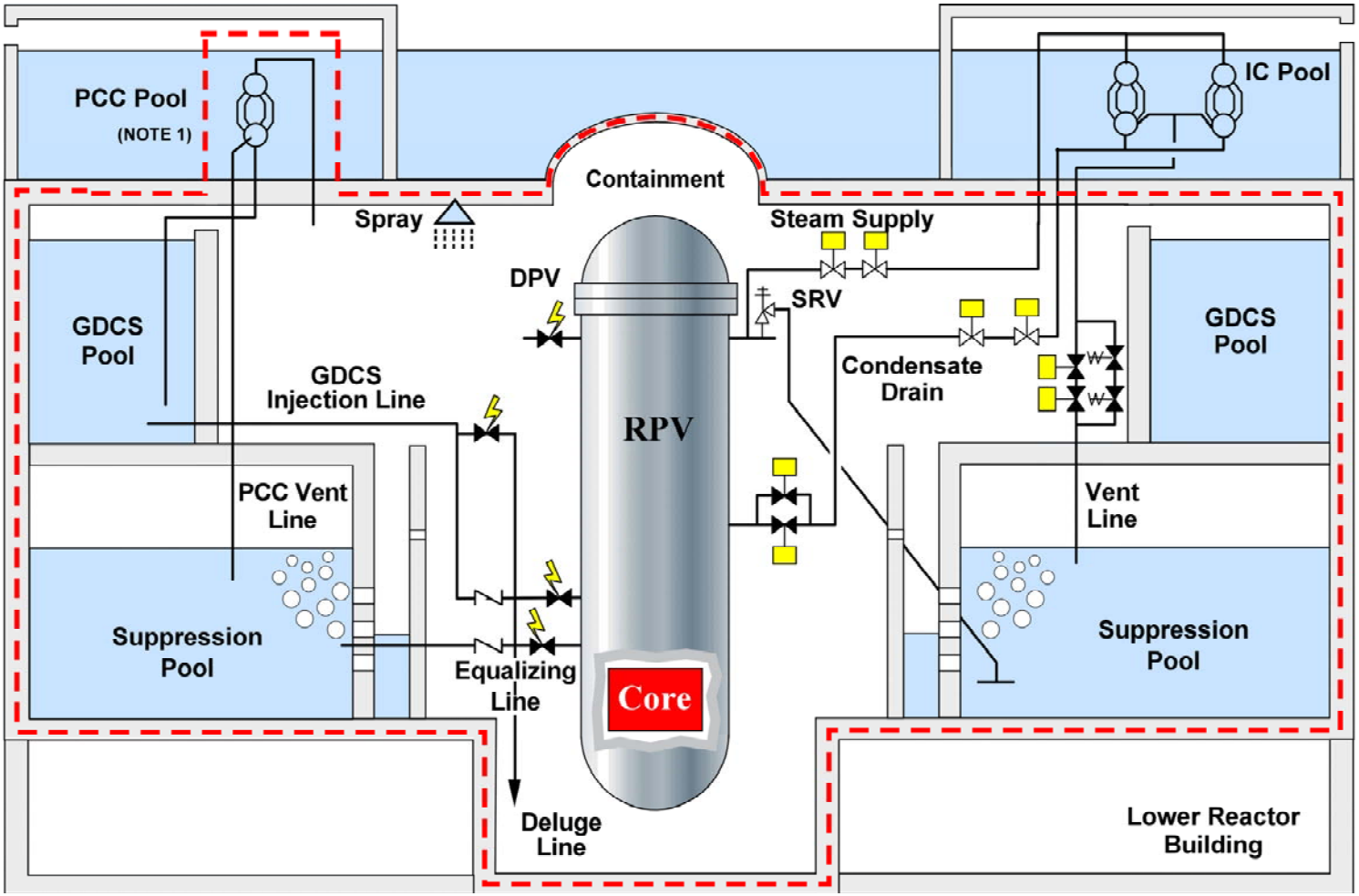
Chapter 16 – Technical Specifications

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

Discussion/Committee Questions

BACKUP



Schematic of ESBWR ECCS