

August 8, 2006

APPLICANT: General Electric Company

PROJECT: Economic Simplified Boiling Water Reactor (ESBWR) Design Certification

SUBJECT: SUMMARY OF JUNE 8, 2006, MEETING WITH GENERAL ELECTRIC,  
REGARDING AUDIT OF ESBWR SEISMIC DESIGN AND ANALYSIS

On June 8, 2006, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of General Electric Company (GE) at GE Nuclear Energy, 1989 Little Orchard Road, San Jose, California. The purpose of the meeting was to discuss the results of an audit of the ESBWR seismic design and analysis conducted June 5- 8, 2006, at the GE Nuclear Energy facilities in San Jose, California. A list of attendees at the June 8, 2006, public meeting is provided as Enclosure 1.

An audit plan is provided in Enclosure 2. A list of the topics to be discussed, the reports to be available during the audit, and the information needed for a confirmatory analysis by NRC is provided in Enclosure 3. These two documents were given to GE. During the audit, GE's responses to NRC requests for additional information (RAIs) in the seismic area were discussed. NRC's RAIs in the seismic area, as well as GE's responses, are available in the Agencywide Documents Access and Management System (ADAMS) under Accession Numbers ML061040533 and ML061510547, respectively. A handout distributed by GE describing the status of RAI responses that GE was continuing to prepare is also in ADAMS (ADAMS Accession Number ML061700069).

Detailed discussions on each RAI response are summarized in the RAI table, and is provided as Enclosure 4. The responses to RAI 3.7-4, 9, 21, 23, and 28 were acceptable, and responses to 3.7-1, 2, 3, 10, 15, 17, 18, 19, 20, 22, 31, 41, 42, 43, 45, 46, 47, 51, and 53 were considered acceptable, but each requires a Design Control Document (DCD) revision to reflect the agreed changes.

Responses to the remaining RAIs remain open pending receipt of acceptable revised responses. GE agreed to provide revised responses. GE also agreed to provide model input data to the NRC. Three of these RAI responses involved a postponed submittal date of June 30, 2006. These were responses to RAI 3.7-7, 11, and 12. Two of these RAI responses involved a postponed submittal date of August 18, 2006. These were responses to RAI 3.7-5, and 29.

Also presented in the RAI table is draft RAI 3.7-58, which was developed following discussions on GE's response to 3.7-44 at the audit.

One member of the public, representing William Lettis & Associates, was in attendance. No public meeting feedback forms or comments were received.

Please direct any inquiries to James Gaslevic at 301-415-2776, or [jeg1@nrc.gov](mailto:jeg1@nrc.gov).

*/RA/*

Lawrence Rossbach, Project Manager  
ESBWR/ABWR Projects Branch  
Division of New Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 52-0010

Enclosures:    1. List of Attendees  
                  2. NRC Audit Plan  
                  3. Topics and Requested Reports  
                  4. RAI table

cc w/encls: See next page

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**/RA/**

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cc w/encls: See next page

ACCESSION NO. ML062060414

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DATE	07/27/2006	08/02/2006	08/08/2006

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ESBWR

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Distribution for June 8, 2006, Meeting Summary dated August 8, 2006

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## MEETING ATTENDEES

**Subject:** ESBWR Seismic design and analysis

**Date:** June 8, 2006

Name	Title	Organization
Larry Roszbach	Project Manager	NRC/NRR/NESB
Rebecca Karas	Branch Chief	NRC/NRR/DE
Rich Morante	Engineering Consultant	Brookhaven National Laboratory, NRC consultant (BNL)
Thomas Cheng	Senior Structural Engineer	NRC/NRR/DE
David Hinds (by phone)	ESBWR Engineering Mgr.	GE Nuclear Energy (GENE)
John Leatherman	Principal Engineer	GE Reg Services
Jim Gaslevic	Project Manager	NRC/NRR/DNRL
Kathy Sedney	Principal Engineer	GENE
Zahira Cruz	Civil Engineer	NRC/NRR/DE
William Lettis	Principal Geologist	William Lettis & Assoc.
Donald Henrie	Seismic Technical Lead	GENE
Ai-Shen Liu	Principal Engineer	GENE
George Strambach	Mgr, Regional Services	GENE
Hugh Upton	Lead Plant Layout/Design	GENE
Henry Solorzano	Civil Engineer	GENE
Wayne Massie	Licensing Engineer	GENE
Carl Constantino	Engineering Consultant	BNL
Prakash Shah	Principal Engineer	GENE
Yasuo Nitta	Civil Engineer	Shimizu Corp
Tetsuya Nagata	Chief Engineer	Hitachi, Ltd.
Hirokuhi Ishigaki	Engineer	Hitachi, Ltd.

**ESBWR SEISMIC AUDIT  
June 5 through 8, 2006**

**Audit Plan for  
ESBWR Seismic Analysis and Design  
(DCD Sections 3.7.1 through 3.7.3)  
June 5 through 8, 2006**

**NRC Audit Team**

Rebecca Karas (RK-Branch Chief), Thomas Cheng (TMC-Team Leader), Zahira Cruz Perez (ZCP-Reviewer), Larry Rossbach (LR-Project Manager), Richard Morante (RJM-Consultant), and Carl Costantino (CJC-Consultant)

**Areas to be audited and/or Discussed**

- Discuss GE's response to RAIs, and audit seismic analysis reports and design calculations.
- Identify additional RAIs (if any) from the audit of analysis reports and design calculations.
- Discuss structural modeling of the RB/FB and site conditions selected by GE. (GE's structural model will be used for the staff's confirmatory analyses.)
- Discuss and obtain additional information from GE.

**Agenda**

**06/05 (Monday), 8:30am - 5:00pm\***

1. Initiate Task 1: Discuss GE's response to RAIs and review related analysis reports and design calculations. (TMC, RJM, and CJC)
2. Initiate Task 2: Review additional (sample) seismic analysis reports and design calculations, as needed. (TMC, RJM, and CJC)
3. Discuss the staff's findings (from the RAI response discussion, and review of analysis reports and design calculations) with GE, at the end of day. (TMC, RJM, and CJC)

**06/06 (Tuesday), 8:30am - 5:00pm\***

1. Conduct an informal "Entrance Meeting" at 8:30am. (RK, TMC, ZCP, RJM, LR and CJC)
2. Continue Tasks 1 and 2 from Monday. (TMC, ZCP, RJM and CJC)
3. Initiate Task 3: Conduct a review of GE's fixed-base structural model of the RB/FB and modeling techniques for soil foundation (site conditions). (TMC, ZCP and CJC)

4. Discuss the staff's findings (from the RAI response discussion, and review of analysis reports and design calculations) with GE, at the end of day. (RK, TMC, ZCP, RJM, LR and CJC)

06/07 (Wednesday), 8:30am - 5:00pm\*

1. Continue Tasks 1 and 2 from Monday. (TMC, ZCP, RJM and CJC)
2. Continue Task 3 from Tuesday. (TMC, ZCP and CJC)
3. Discuss the staff's findings (from the RAI response discussion, and review of analysis reports and design calculations) with GE, at the end of day. (RK, TMC, ZCP, RJM, LR and CJC)

06/08 (Thursday), 8:30am - 5:00pm\*

1. Continue Tasks 1 and 2 from Monday. (TMC, ZCP, RJM and CJC)
2. Conduct "Exit Meeting" at 2:pm. (RK, TMC, ZCP, RJM, LR and CJC)
3. Continue Task 1 above, as needed. (TMC, ZCP, RJM and CJC)

**Audit Report**

The audit report will be in the form of a table, summarizing: (1) resolution of the RAIs, (2) review results of GE's fixed-base structural model and soil foundations models, (3) new issues identified and resolution of these new issues if possible, and (4) additional information to be obtained GE.

- \* Review schedule may be extended beyond 5:00pm, if needed.

NRC Audit at GE Office, San Jose, CA  
June 5-8, 2006

Topics to be Discussed and Reports to be Audited

C Status of RAI Responses - Not Received from GE

21 due later

3 not received as scheduled (3.7-7, 3.7-11, 3.7-12)

C Minor Clarifications and Discussion

RAIs 3.7-2, -18, -19, -22, -41, -45, and -47

C Additional Review and/or Discussion To Be Conducted During Audit

RAIs-4, -6, -9, -10, -13, -14, -15, -17, -20, -21, -23, -28, -31, -36, -40, -44, -48, -49, -51, -53, and -56

(4) Technical reports/data Need to be available for Audit:

RAI-4 3 readable CDs of drawings

RAI-6 Technical Reports/Calculations for (2), (3), (4)

RAI-9 Technical Reports/Calculations for (a), (b)

RAI-10 Implementation Documentation

RAI-13 Technical Basis for Revised Cable Tray Damping Values

RAI-14 Technical Basis for note (6)

RAI-15 Technical Reports/Calculations for (3)

RAI-17 Technical Reports/Calculations for (1)

RAI-20 Technical Reports/Calculations for Stick Model Development

RAI-21 Technical Reports/Calculations for Addressing Torsional Effects

RAI-23 Technical Reports/Calculations for Water Loads

- RAI-28 DCD Ref. 3.7-6; Technical Reports/Calculations for (c); Quantitative Basis for (d)
- RAI-31 Technical Reports/Calculations for (1); Technical Basis for (2).
- RAI-36 See -17.
- RAI-40 ERSIN Verification Package; **(1) Examples for seismic loading; (2) Examples for in-equipment Required Response Spectra (RRS) in subsystems such as piping systems, equipment control panels, local racks, etc.; (3) Examples of superposed un-broadened spectra from SAP TH, ERSIN TH, and ERSIN Direct Generation; (4) ERSIN Applications previously accepted by the staff; (5) Theoretical basis document.**
- RAI-44 Technical Reports/Calculations for +/- 15% broadening
- RAI-48 Bechtel Topical Report; Technical Basis for SRSS of ground velocity and relative velocity.
- RAI-49 In electronic digitized format, data needed for confirmatory analysis, per (2), (3), (4), (6), (7). Output response spectra at critical locations, in electronic digitized format.
- RAI-51 Example showing how criteria is implemented when spectral acceleration peak is at a higher frequency than the span frequency.
- RAI-53 Technical basis for selecting damping value if SSI is included in the tank analysis; references for tank analysis methodology; sample tank analysis.
- RAI-56 See -40.