

August 1, 2006

Mr. David H. Hinds, Manager, ESBWR  
General Electric Company  
P.O. Box 780, M/C L60  
Wilmington, NC 28402-0780

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 46 RELATED TO  
ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Hinds:

By letter dated August 24, 2005, General Electric Company (GE) submitted an application for final design approval and standard design certification of the economic simplified boiling water reactor (ESBWR) standard plant design pursuant to 10 CFR Part 52. The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed design.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosures to this letter. We have prepared a non-proprietary version of the RAI (Enclosure 1) that does not contain proprietary information. Enclosure 2 includes proprietary information which is indicated by brackets and underlines.

This RAI concerns seismic and dynamic qualification of equipment as described in Section 3.10 of the ESBWR Design Control Document. These questions were sent to you via electronic mail on May 8, 2006, and were discussed with your staff during a telecon on July 20, 2006. You agreed to respond to this RAI on September 1, 2006.

If you have any questions or comments concerning this matter, you may contact me at (301) 415-2863 or [lwr@nrc.gov](mailto:lwr@nrc.gov) or you may contact Amy Cubbage at (301) 415-2875 or [aec@nrc.gov](mailto:aec@nrc.gov).

Sincerely,

**/RA/**

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

Docket No. 52-010

Enclosures: 1. Request for Additional Information (Non-Proprietary)  
2. Request for Additional Information (Proprietary)

cc: (with Non-Proprietary Enclosure 1 only) See next page

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ACCESSION NO. ML062080365

OFFICE	NESB/PM	NESB/BC(A)
NAME	LRossbach	JColaccino
DATE	07/28/2006	08/01/2006

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Distribution for DCD RAI Letter No. 46 dated August 1, 2006

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**Request for Additional Information (RAIs)**  
**ESBWR Design Control Document (DCD)**  
**3.10 SEISMIC AND DYNAMIC QUALIFICATION OF MECHANICAL AND ELECTRICAL EQUIPMENT**

RAI number	Reviewer	Question Summary	Full Text
3.10-1	Chen PY	Explain the absence of compliance to meet the requirements in Appendix S to 10 CFR Part 50 in DCD Section 3.10.	Explain the absence of compliance to meet the requirements in Appendix S to 10 CFR Part 50 in Section 3.10, "Seismic and Dynamic Qualification of Mechanical and Electrical Equipment," of ESBWR DCD/Tier 2.
3.10-2	Chen PY	Specifically state which parts ( chapters or sections) of each version of IEEE-344 guidelines that ESBWR DCD/Tier 2 will meet.	For seismic and dynamic qualification of mechanical and electric equipment in ESBWR, the Design Control Document (DCD)/Tier 2 listed the following three versions of IEEE-344 Standards as the guidelines to be followed: (1) IEEE-344-2004, (2) Regulatory Guide (RG) 1.100, Revision 2, 1988, which endorses the IEEE-344-1987 with some conditions, and (3) Section 4.4 of GE Environmental Qualification Program, NEDE-24326-1-P, January 1983, which used IEEE-344-1975 as its guidelines. Specifically state which parts ( chapters or sections) of each version of IEEE-344 guidelines that ESBWR DCD/Tier 2 will meet. Note that IEEE-344-2004 has not been endorsed by RG 1.100 (will be done in the near future) and the staff does not endorse Section 10 (Experience) of the IEEE-344-2004 in its entirety.

3.10-3	Chen PY	<p>Are the database documents described in NEDE-24326-1-P consistent with and do they satisfy the requirements in the IEEE-344 Standards. Discuss the level of documentation available. Is this documentation sufficiently complete for staff audit/review.</p>	<p>Subsection 4.4.3, <u>Operating Experience</u>, of Section 4.4 of GE Report, NEDE-24326-1-P (dated January 1983), provides a definition of “operating experience” for environmental qualification of equipment. The 1987 version and 2004 version of IEEE-344 Standards also provide guidelines for “Qualification by Experience,” including both earthquake experience data and test experience data. In the application, you made a commitment to meet the requirements of IEEE-344. Clarify, in sufficient detail, whether the database documents described in NEDE-24326-1-P are consistent with and satisfy the requirements in the IEEE-344 Standards. Discuss the level of documentation currently available for the cited experience database for seismic and dynamic qualification of mechanical and electrical equipment. Also, discuss whether such documentation is sufficiently complete for staff audit/review.</p>
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3.10-4	Chen PY	<p>Discuss the criteria and procedures for seismic and dynamic qualification of electric and mechanical equipment by experience including the experience database and all pertinent references. Is this documentation sufficiently complete for staff audit/review.</p>	<p>In Section 3.10.2.4 (Qualification by Experience) of the ESBWR DCD/Tier 2, the application states that the methods outlined in IEEE-344 are followed. Clarify which version of IEEE-344 you commit to follow. As indicated in RAI 3.10-2 above, some aspects of the criteria provided in Section 10 (Experience) of IEEE-344-2004 are not acceptable to the NRC staff. For examples, the staff does not agree with: (i) the use of median centered spectra to define the required response spectra for a candidate equipment, (ii) inadequate provisions for meeting the operating basis earthquake (OBE) requirements, (iii) the use of “mean” of test response spectra to define the test experience spectra (TES), (iv) inadequate provisions for meeting OBE TES requirements, and (v) inadequate provisions for the demonstration of operability during and after the safe shutdown earthquake loads and Service Level D reactor building vibration dynamic loads. Having noted some unacceptable criteria provided in IEEE-344-2004 as described above, (1) discuss, in detail, the criteria and procedures for seismic and dynamic qualification of electric equipment by experience for ESBWR, including the experience database and all pertinent references for the experience database; (2) state whether you intend to commit to particular industry standard guidelines for seismic qualification of ESBWR mechanical equipment by experience, and discuss the experience database and all pertinent references for the experience database; and (3) state at what stage the specific detailed experience database documents will be available for staff audit/review.</p>
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3.10-5	Chen PY	Discuss the availability of qualification records and reports for equipment included in Subsections 3.10.2.3 and 3.10.2.4, for the purpose of staff review/audit.	<p>In Section 3.10.4 (Combined Operation License Information) of the ESBWR DCD/Tier 2, the application states that the qualification records including reports for equipment included in Subsection 3.10.2.1 and 3.10.2.2 shall be maintained in a permanent file and shall be readily available for audit. However, the application did not address the qualification records for equipment included in Subsections 3.10.2.3 and 3.10.2.4, or their availability for audit. Please discuss the availability of qualification records and reports for equipment included in Subsections 3.10.2.3 and 3.10.2.4, for the purpose of staff review/audit.</p>
3.10-6	Chen PY	Discuss the basis for the estimated duration of SRV testing and the number of SRV actuations as it relates to the dynamic qualification testing of SRV for ESBWR.	<p>In Subsection 4.4.2.5.1, <u>General Requirements for Dynamic Testing</u>, of Section 4.4 of GE Report, NEDE-24326-1-P (dated January 1983), Item (d) stated that, [[</p> <p style="text-align: center;">]] Clarify (1) the applicability of the above statement with respect to ESBWR, and provide the basis for those numbers used, and (2) the last sentence of Item (d) which stated that, [[</p> <p style="text-align: right;">]]</p>

ESBWR

cc:

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