October 16, 2007

Mr. Robert E. Brown
Senior Vice President, Regulatory Affairs
GE-Hitachi Nuclear Energy Americas, LLC
3901 Castle Hayne Rd MC A-45
Wilmington NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 113 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Brown:

By letter dated August 24, 2005, GE-Hitachi Nuclear Energy Americas, LLC (GEH) 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 enclosure to this letter.

To support the review schedule, you are requested to provide the requested additional information within 45 days of the date of this letter.

If you have any questions or comments concerning this matter, you may contact me at 301-415-6256 or djg3@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or aec@nrc.gov.

Sincerely,

/RA/

Dennis Galvin, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure: Request for Additional Information

cc: See next page

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Distribution: See next page

ACCESSION NO: ML072880064

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October 16, 2007

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Requests for Additional Information (RAIs)
ESBWR Design Control Document (DCD), Revision 3

RAI Number	Reviewer	Question Summary	Full Text
18.5-5 Supplement 1 (NEDO-33221 Rev-1, March 31, 2007; MFN 06-401, October 28, 2006; MFN 07-334, June 27, 2007)	Bongarra J	Clarify human factors engineering task analysis methodology.	NEDO-33221, Rev 1, is an extensive revision of Rev 0. However, the methodology is presented in outline form with little explanation of how the task analysis is actually performed. Most of the implementation sections are limited to bullet lists (see Section 4). This does not provide sufficient information to evaluate the methodology to be used. Also NEDO-33221, Rev 1 does not appear to describe the actual methodology being used that was demonstrated during the July 2007 Design Process Audit. The methodology discussed by GEH in the July 2007 Audit included many considerations that cannot be found in the implementation plan, such as the evaluation of critical steps. Many of the terms used to describe the methodology and the example shown cannot be found in the plan. While this apparent difference may in part be due to differences in level of detail, it does provide an example of the staff's concern that an engineer using the plan would not clearly produce the type of results shown during the audit. Clarification is needed of (1) the relationship between the plan and the actual task analysis, and (2) how an engineer makes the transition from the plan to the actual conduct of the analysis.
18.5-19 Supplement 1 (NEDO-33221 Rev-1, March 31, 2007; MFN 06-401, October 28, 2006; MFN 07-334, June 27, 2007)	Bongarra J	Clarify evaluation of risk-important tasks.	NEDO-33221, Rev 1, on page 3 makes the commitment to perform task analysis for "task identified as risk-important as determined by the HRA/PRA" NEDO-33267, the PRA/HRA Integration Plan, should be referenced since that is where the criteria for risk-important actions are identified.

Enclosure

RAI Number	Reviewer	Question Summary	Full Text
18.5-26 Supplement 1 (NEDO-33221 Rev-1, March 31, 2007; MFN 06-401, October 28, 2006; MFN 07-334, June 27, 2007)	Bongarra J	Clarify the treatment of task integration.	NEDO-33221, Rev 1 Sections 4.1.3.6 and 4.2.3.6 provide information regarding workload assessments that list workload, crewmember skills, and work allocation; however no information about how such considerations are made is provided. Please clarify how these considerations are addressed
18.5-27 Supplement 1 (NEDO-33221 Rev-1, March 31, 2007; MFN 06-401, October 28, 2006; MFN 07-334, June 27, 2007)	Bongarra J	Explain how minimum inventory is identified.	In the original RAI, staff requested additional information as to how the minimum inventory will be identified and what criteria will be used in the selection process. The GEH response to RAIs 18.8-13, 18.8-23 and 18.5-27 all address minimum inventory. While they are not all the same, GEH clearly indicates that the minimum inventory will be developed and is not done yet. The response to 18.5-27 sounds very broad and seems to include all the task requirements identified through task analyses in the minimum inventory. This response needs further explanation. GEH's tasks analysis methodology in NEDO-33221, Rev. 1 also does not fully address minimum inventory. Provide a discussion and clarification on how minimum inventory is identified consistent with DI&C-ISG-05, "Digital Instrumentation and Controls Interim Staff Guidance on Highly-Integrated Control Rooms – Human Factors Issues (HICR-HF)," dated September 28, 2007.
18.5-30 Supplement 1 (NEDO-33221 Rev-1, March 31, 2007; MFN 06-401, October 28, 2006; MFN 07-334, June 27, 2007)	Bongarra J	Clarify how changes to implementation plan will be reflected in the DCD.	The task analysis methodology presented in NEDO-33221, Rev. 1 is not consistent with the methodology summarized in DCD Section 18.5, Rev 3. For example, the implementation plan discusses two major levels of analysis, plant and system. This is not addressed in the DCD. Please revise DCD, Section 18.5 to ensure consistency with the NEDO-33221, Rev. 1 and any modifications made to address other 18.5 RAIs.

RAI Number	Reviewer	Question Summary	Full Text
18.5-31 Supplement 1 (NEDO-33221 Rev-1, March 31, 2007; MFN 06-401, October 28, 2006; MFN 07-334, June 27, 2007)	Bongarra J	Clarify how changes to implementation plan will be reflected in the DCD/Tier 1 Design Commitments and ITAAC.	The Tier 1 ITAAC for Task Analysis is in Table 3.3-1, Design Commitment 3. The commitment states that the task analyses will be performed in accordance with the MMIS and HFE Implementation Plan. The commitment should reference NEDO-33221.

RAI Number	Reviewer	Question Summary	Full Text
RAI 19.1-150, Supplement No. 1 (MFN 07-455, August 23, 2007)	Radlinski R	Clarify the DCD statements on fire-induced spurious actuations.	The GEH response to RAI 19.1-150 includes seemingly contradictory statements. The response first states that "The ESBWR is designed to prevent spurious actuations that could adversely affect the capability to achieve and maintain safe shutdown" (emphasis added). Following this statement, GEH wrote that "The ESBWR design features described in DCD Tier 2 Section 7.1.3 help minimize the adverse effect on safe shutdown caused by fire-induced spurious actuations" (emphasis added). The response continues with two statements that begin with the word "Typically" and concludes that a fire in a single area cannot cause spurious actuations. This leaves open the question of what spurious actuations can occur where the typical design is not implemented. The DCD should clearly identify and address all potential fire-induced spurious actuations that could adversely affect safe shutdown or include a statement that none exist. If multiple spurious actuations can occur from a fire in a single fire area, the DCD should address how these multiple spurious actuations will be evaluated in the post-fire, safe-shutdown circuit analysis, including any assumptions with respect to mitigating the impact of each actuation. The GEH response also states that "Since the main control room communicates with the DCIS rooms via fibers, no spurious actuation will be originated from a MCR fire." The DCD should confirm that these communication links do not include any copper or other wire conductors that could potentially cause fire-induced spurious actuations that could adversely affect safe shutdown. It should also confirm that exposure of the distributed control and information system (DCIS) equipment to heat and smoke cannot cause spurious actuations that could adversely affect safe shutdown, including the bases for that confirmation.

RAI Number	Reviewer	Question Summary	Full Text
RAI 19.1-151, Supplement No. 1 (MFN 07-455, August 23, 2007)	Radlinski R	Clarify post-fire operator manual actions required for safe shutdown.	The GEH response to this RAI states that “The performance of the compensatory manual actions for safe shutdown is not credited in the ESBWR fire PRA model for a postulated fire in the main control room.” However, the GEH response to RAI 15.5-4 states that “After the operator regains the control in the remote shutdown panel (RSP), the manual action may be necessary to control Isolation Condenser System (ICS) to ensure the maximum cool down rate not exceeding 100 ºF/hr.” GEH should address the possible contradiction between these two statements, and the DCD should clearly identify any post-fire operator manual actions required for safe shutdown and state the design bases with respect to crediting specific operator manual actions.

cc:

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