March 9, 2009

Mr. Robert E. Brown
Senior Vice President, Regulatory Affairs
GE Hitachi Nuclear Energy
3901 Castle Hayne Road MC A-50
Wilmington, NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 313 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Brown:

By letter dated August 24, 2005, GE-Hitachi Nuclear Energy (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 U. S. 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.

GEH provided initial information on the minimum inventory list in response to RAI 18.8-47, Supplement 3 (in MFN 09-024, dated January 26, 2009) and RAI 18.5-27, Supplement 3 (in MFN 09-094, dated February 12, 2009). For ease of tracking purposes, RAI 18.5-27, Supplement 3 and RAI 18.8-47, Supplement 3 have been closed and RAIs on the information provided have been identified as 18.5-33 thru 18.5-40.

If you have any questions or comments concerning this matter, you may contact me at 301-415-6256 or Dennis.Galvin@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or Amy.Cubbage@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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Sincerely,
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Dennis Galvin, Project Manager
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Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010
Enclosure:
Request for Additional Information
cc: See next page
Distribution: See next page
ACCESSION NO.: NRO-002

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DATE	03/05/09	03/09/09

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 313 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED MARCH 9, 2009

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Requests for Additional Information (RAIs):
ESBWR Design Control Document (DCD) Revision 5

RAI Number	Reviewer	Question Summary	Full Text
18.5-33	Pieringer P	Clarify those items not continuously displayed or one touch accessible.	MFN 09-024, Att. A, Page 2 states that the fixed position alarms, displays and controls that are not continuously displayed are quickly and easily retrievable, typically accessible by one operator action (one touch accessible). Please explain what criteria GEH will use to determine whether a minimum inventory (MI) item is continuously displayed, one touch accessible, or more than one touch accessible.
18.5-34	Pieringer P	Clarify list of risk important human actions	The MI may not be based on an appropriate list of risk important human actions (HAs). The ESBWR list of risk important human actions is determined in accordance with the NEDO-33267, ESBWR Human Factors Engineering Human Reliability Analysis Implementation Plan (HRA IP), Revision 3. However, the list of risk important HAs used for MI determination is specified in MFN 09-024, Att. A, Page 3 as DCD Chapter 19 Table 19.2-3. This appears to be an abbreviated list that doesn't meet the commitments of the HRA IP. It also doesn't contain all of the risk important HAs in the probabilistic risk assessment (PRA) tables (e. g., PRA Rev. 3, Table 17.1-3, ESBWR Risk Significant Operator Actions). Also pertinent to this RAI is Supplement 4 to RAI 18.7-7 (and the related GEH response) which raises the issue of what is the correct list of risk important HAs. Please clarify and/or correct the list of risk important HAs used for the MI determination.
18.5-35	Pieringer P	Clarify corresponding ESBWR systems	MFN 09-024, Enclosure 2 (the ESBWR Design Comparison to BWROG [BWR Owners' Group] EPG [Emergency Procedure Guidelines] (Delta Document)), Page 2-3 contains a table titled "Reference Plant Systems for EPG Comparison." The BWR Reference Plant systems are listed in Col. 1 and the corresponding ESBWR systems listed in Col. 2. However, the apparent corresponding systems don't always lineup properly and there are some BWR systems with no notation next to them in Col. 2. This needs to be clarified so one can, without ambiguity, tell which BWR system corresponds to which ESBWR system. Adding rows to the table, and the use of "none" when there is no corresponding system, would be one way to clarify this.

RAI Number	Reviewer	Question Summary	Full Text
18.5-36	Pieringer P	Clarify completeness of MI Delta Document	The Delta Document in MFN 09-024, Enclosure 2 appears to not be completed. Examples are given here: 1. Pages 4-4 and 4-5, Step RC/L-2, under ESBWR Design Differences states that "The list of injection systems <u>will be changed</u> to meet the design- specific attributes of the ESBWR." 2. Page 11-8, Step C4-2.2, under ESBWR Design Differences states that "ESBWR design- specific set points, elevations, <u>and systems will be used</u> as the reference plant for the ESBWR guidance." In these cases, the ESBWR-specific systems were not provided for these steps. This information is needed for the MI determination but is not given here. Please explain why this was not done and how it impacts the MI determination.
18.5-37	Pieringer P	Clarify MI process	A discrepancy was identified between the MI process (MFN 09-024, Att. A) and the Delta Document (MFN 09-024, Enclosure 2). On Page 5-5, Step SP/T-1, of the Delta Document the ESBWR Design Differences states that "The ESBWR active LPCI [low pressure coolant injection] system function, and suppression pool cooling function is provided by FAPCS [fuel and auxiliary pool cooling system] not RHR [reactor heat removal]." The MI process would seem to imply that controls and displays for FAPCS components should be on the MI list (new DCD Tier 1 Table 3.3-2 and DCD Tier 2 Table 18.1), but they are not there. Please explain.
18.5-38	Zhao J	Provide bases for parameters without alarms	The MI list (new DCD Tier 1 Table 3.3-2 and DCD Tier 2 Table 18.1) does not provide alarms for some 4-20mA analog signals such as containment water level, wet well pressure, containment radiation, gravity driven pool level and standby liquid control accumulator level. Please provide the basis for why alarms are not required.
18.5-39	Zhao J	Resolve inconsistency	As described in MFN 09-024, Enclosure 3, "Isolation Condenser System" with alarm, display, and control functions is included in the MI Tier 1 Table 3.3-2b for

RAI Number	Reviewer	Question Summary	Full Text
		between RSS and MCR table.	the remote shutdown system (RSS), but it's not included in the MI Tier 1 Table 3.3-2a for the main control room (MCR) which instead lists "Isolation Condenser Valves" with display and control functions. The same difference also occurs in similar tables in section 18.1. Please explain this difference.
18.5-40	Wang W	Justify why no difference for step RC/L1, which is to initiate ECCS	In Page 4-2 of ESBWR Design Comparison to BWROG EPG, Rev 0 (MFN 09-024, Enclosure 2), The document has the following steps: **BWROG EPG/SAG Step: RC/L-1** RC/L-1 Initiate each of the following which should have initiated but did not: • Isolation • ECCS [• Emergency diesel generator] **ESBWR Design Differences** None ESBWR Emergency Core Cooling System (ECCS) is a passive system, which includes the Gravity-Driven Cooling System (GDCS), the Isolation Condenser System (ICS), the Standby Liquid Control System (SLCS) and the Automatic Depressurization System (ADS). Once the ECCS initiates, no operator actions are needed and GDCS will recover the reactor pressure vessel (RPV) level and you do not need the next step (RC/L-2) to restore and maintain RPV water level. ESBWR design philosophy is different than the operating BWR. Justify why ESBWR Design Differences are “None” as you stated for the above step RC/L1.
7.7-12 Supplement 1 (MFN 09-45 February 4, 2009)	Eagle E	Revise DCD Tier 2 Section 7.7.4.3 to add missing DCD Tier 2 DCD references for SB&PC control	In response to RAI 7.7-12 GEH proposed to revise several DCD Tier 2 Section 7.7 subsections to provide subsection locations in DCD Tier 2 Chapter 15 where various failure modes were considered for the non-safety systems in Section 7.7. In the proposed DCD Revision 6 for Subsection 7.7.4.3 the expected and abnormal transients and accident events analyzed involving

RAI Number	Reviewer	Question Summary	Full Text
		failures caused by a PAS failure or justify their exclusion	potential failures of the PAS listed only DCD Chapter 15 subsections involved with control rod position errors (15.2.3.1, 15.2.3.2, 15.3.8, and 15.3.9) that potentially could result from a failure in PAS providing a bad output signal to RC&IS that might result in an control rod position error. DCD Revision 5 Section 7.7.4.2 states, “The output demand request signals from the PAS are sent to the RC&IS to position the control rods, to the SB&CS [Note: typo in DCD; should be “SB&PC”] for pressure setpoints, and to the TGCS for load following operation. DCD Subsection 7.7.5.3 was also revised to provide subsection locations in DCD Chapter 15 where SB&PC control failures were considered. If the PAS failure resulted in an error in the pressure setpoint signal sent to the SB&PC, then it would seem one or more references to analysis of SB&PC control failures from DCD Chapter 15 should have been included in the Subsection 7.7.4.3? Add the missing DCD Chapter 15 references to DCD Subsection 7.7.4.3 for SB&PC control failures caused by potential PAS failures or justify why there are no DCD Chapter 15 references under PAS for a potential error in signals to SB&PC.

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