April 16, 2009

Mr. Jerald G. Head
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. 334 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Head:

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.

If you have any questions or comments concerning this matter, you may contact me at 301-415-3179 or Ilka.Berrios@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or Amy.Cubbage@nrc.gov.

Sincerely,

/RA/

Ilka Berrios, 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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Ilka Berrios, Project Manager
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Distribution: See next page

ADAMS ACCESSION NO. ML091050243

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 334 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED APRIL 16, 2009

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

RAI Number	Reviewer	Question Summary	Full Text
RAI 2.3-4 S05	Harvey B/ Chakrabarti S	Calculate the value of extreme frozen winter precipitation and demonstrate how it is enveloped by other loading combinations.	In its response to RAI 2.3-4 S04 (MFN 08-919 dated December 8, 2008), GEH assumed weight of 4 inches of water in addition to snow load on roof due to normal winter precipitation for computing extreme winter precipitation roof load. Based on the pictorial layout of the roof drain and the scuppers, the staff could not conclude if the roof scuppers would be available for draining water from roof in case of rain after an antecedent snow fall. In that case, the combined snowpack and water on roof may be as high as the height of the solid parapet, and may be more critical. Also, while justifying possible roof load due to frozen precipitation during an extreme winter precipitation event, GEH compared the roof design having been done for 345.6 psf load due to tornado pressure drop, and concluded that "the extreme frozen winter precipitation event is not controlling in the ESBWR design." Since load due to pressure drop acts in a direction opposite to the roof live load, and since dead load of roof is available to offset load due to tornado pressure drop, a direct comparison of these two loads without considering effect due to dead load was not understood. GEH needs to calculate the value of extreme frozen winter precipitation and demonstrate how it is enveloped by other loading combinations. Accordingly, the staff requests GEH to address the following in the DCD: 1. Identify the normal roof load considering normal winter precipitation event which should be treated as live load in all loading combinations. 2. Identify the extreme roof load considering extreme winter precipitation event. 3. Include in the DCD a loading combination for consideration of the extreme roof load for design, or provide justification why it is not necessary.
RAI 6.2-201 S01	Krotiuk B/ Wagage H	Provide details of modeling insulation in the annulus	The staff needs additional information on parts (A) and (E) of the GEH's response to RAI 6.2-201, Supplement 1.

RAI Number	Reviewer	Question Summary	Full Text
		pressurization analysis; provide LTR for staff's review.	Part (A): • Explain what is meant by the statement that the "reactor vessel insulation is not modeled in the current annulus pressurization analysis." • Confirm whether the analysis assumed that the insulation remains in place or it would crush during pressurization. • Confirm whether the calculated volumes of the control volumes used in the GE pressurization analysis accounted for the volume of the insulation. • Confirm whether the calculated volumes of the control volumes include the regions inside and outside the mirror insulation, or they represent the regions only inside or only outside of the insulation. • The annulus pressurization analysis should reflect the responses to all the bulleted items. Part (E): The response references GEH's response to RAI 6.2-23 in MFN 06-159, which states that "Sensitivity study of geometric input has been performed as described in the response to RAI 6.2-19. This information will be provided in a proprietary licensing topical report for reference in the DCD." Provide report for the staff's review and incorporate in by reference in the ESBWR DCD.
RAI 11.3-15	Dvir A	Explain if back pressure was taken into consideration in the design, since excessive back pressure in the condenser can affect relief setting and relieving capacity.	A review of DCD Tier 2, Rev. 5, Section 11.3.2.6.2 indicates that radioactive gaseous pressure relief discharge is piped to the main condenser. The staff is concerned about back pressure effects on relief setting and capacity. Specifically, the DCD should explain if back pressure was taken into consideration in the design, since excessive back pressure in the condenser can affect relief setting and relieving capacity. The DCD should confirm that back pressure spikes will not compromise pressure relief setting and relieving capacity. Note: The response to this RAI and any proposed changes to DCD Rev. 6 should confirm whether corresponding changes need to be made to newly proposed DCD Rev. 6, Table 12.3-18 (see page 12.3-95 of MFN 09-076, dated February 4, 2009).

RAI Number	Reviewer	Question Summary	Full Text
RAI 11.3-16	Dvir A	Section 11.3.2.6.8 indicates that channeling is prevented by a high charcoal bed height-to-particle diameter ratio. The staff believes that the word “particle” should be changed to “bed”.	A review of DCD Tier 2, Rev. 5, Section 11.3.2.6.8 indicates that channeling is prevented by a high charcoal bed height-to-particle diameter ratio. The word "particle" is deemed to be incorrect in the proposed context. Specifically, "particle" should be changed to read "diameter" since flow channeling is affected by bed-height to bed-diameter ratio of the vessel. The applicant should clarify this point in the DCD. The word “particle” should be changed to “bed” instead. Note: The response to this RAI and any proposed changes to DCD Rev. 6 should confirm whether corresponding changes need to be made to newly proposed DCD Rev. 6, Table 12.3-18 (see page 12.3-96 of MFN 09-076, dated February 4, 2009).

cc:

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Enclosure

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