

October 14, 2008

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. 266 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 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 301-415-2890 or andrea.johnson@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or Amy.Cubbage@nrc.gov.

Sincerely,

/RA/

Andrea M. Johnson, 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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ESBWR DESIGN CERTIFICATION APPLICATION DATED OCTOBER 14, 2008

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

RAI Number	Reviewer	Question Summary	Full Text
2.5-10	Li Y	Minimum Shear Wave Velocity definition in ESBWR DCD Rev. 5	<p>In ESBWR DCD Revision 5, the minimum shear wave velocity was defined in site parameter Table 5.1-1 (Tier 1 of ESBWR DCD) and Table 2.0-1 (Tier 2 of ESBWR DCD) as 300 m/s (1000 ft/s). In the footnote, however, minimum shear wave velocity was further clarified as equivalent uniform shear wave velocity (V_{eq}) over the entire soil column at seismic strain. V_{eq} can be calculated over the depth equal to the embedment depth plus 2 times the largest foundation plan dimension below the foundation,</p> $V_{eq} = \frac{\sum d_i}{\sum \frac{d_i}{V_i}}$ <p>where d_i and V_i are the depth and shear wave velocity, respectively, of the ith layer. In addition, the ratio of the largest to the smallest shear wave velocity over the mat foundation width at the foundation level does not exceed 1.7.</p> <p>This ESBWR DCD definition allows shear wave velocity averaged over the depth (embedment depth + 2 times of the largest foundation plan dimension) below the foundation. Based on this averaging, the shear wave velocity at around the foundation depth can be extremely low because a deeper hard rock layer with a large shear wave velocity can lift the average above 1000 ft/s for the soil column under consideration. In addition, “the ratio of the largest to the smallest shear wave velocity over the mat foundation width at the foundation level does not exceed 1.7” did not provide any constraint on the minimum shear wave velocity on the profile because the ratio is evaluated “over the mat foundation width at the foundation level.” This definition deviates from the staff’s position indicated in SRP 3.7.1. SRP 3.7.1 specifies that the soils immediately below the foundation have a shear wave velocity of at least 1000 fps. If the minimum shear wave velocity of the supporting foundation material is less than 1,000 ft/s, additional studies need to be performed which consider the average shear wave velocity, and its degree of variability addressing potential impact on soil-structure interaction, potential settlements and design of foundation elements.</p> <p>Please justify your definition for V_{eq} and comment on the potential for low velocity material and its implications for settlement, soil response and foundation design. Also, clarify if the ratio of 1.7 between the largest and smallest shear wave velocity is intended to constrain soil horizontal heterogeneity. If not, explain where the ratio 1.7 came from and why it was defined over the mat foundation width and at the foundation level.</p>

DC GE - ESBWR Mailing List

(Revised 09/29/2008)

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