January 27, 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. 300 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 is contained in the enclosure to this letter.

If you have any questions or comments concerning this matter, you may contact me at 301-415-6590 or David.Misenhimer@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or Amy.Cubbage@nrc.gov.

Sincerely,

/RA/

David Misenhimer, 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 w/encl: See next page

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David Misenhimer, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
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Enclosure:
Request for Additional Information

cc w/encl: See next page

ADAMS ACCESSION NO.: ML090260152 NRO-002

OFFICE	PM:NRO:DNRLNGE1	LA:NRO:DNRL:NGE1	PM:NRO:DNRL: NGE1
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DATE	01/26/09	01/26/09	01/27/09

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 300 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED JANUARY 27, 2009

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RAI Number	Reviewer	Question Summary	Full Text
19.2-95, S01	Fuller E	Provide realistic estimates of water inventory and height of the water pool necessary for the BiMAC to function properly.	GEH has responded that the quantity of water necessary for BiMAC functionality is equal to that required to cover the downcomer inlets. It is recognized that this is the minimum amount of water required. However, this minimum quantity may not be sustainable for continuous BiMAC operation due to the potential for depletion because of evaporation (especially during the initial melt quenching period). The GEH response alluding to the water level in the lower drywell region assumes a full water inventory in the GDCS reservoirs. In reality under accident conditions, the GDCS water inventory is in the form of steam and condensation inside PCCS and may not be sufficient to replenish the GDCS inventory. Therefore, the GDCS pools may not necessarily be at its maximum when the deluge lines into the lower drywell region are actuated. 1. Please provide the height of the water pool inside the drywell floor that would be considered adequate for the sustained operation of BiMAC accounting for the partial depletion of the GDCS inventory (and without complete replenishment)? Provide the GDCS inventory required to achieve this height? 2. Please provide the upper and lower bounds and the basis for these estimates for: (a) The available GDCS inventory at the time of actuation of the deluge lines, and (b) The height of the water pool in the lower drywell region when the BiMAC system begins operation.
19.2-100, S01	Fuller E	Provide details of CFD modeling, and the supporting benchmarking studies, used to establish the thermal load boundary conditions for the BiMAC experiments.	GEH's response does not address the second part of the RAI ("Please justify the thermal load boundary conditions used in the experiments and ESBWR BIMAC design."). The thermal load boundary conditions will depend on a number of factors including the melt condition, crust formation (its thickness and physical condition), and the split in the heat flux (upward versus downward). These aspects of the melt pool affect the pool thermal state, which will in turn affect the rate of heat transfer into BiMAC. It is recognized that the boundary conditions for the experiments were guided by the results of the CFD simulation; however, the details of the CFD model, assumptions, and

			its experimental validation basis, have not been provided. These are essential if the CFD simulations are to be the sole basis for the heat flux boundary conditions. Please provide the details of the CFD model, assumptions, numerical solution technique, and the supporting experimental validation basis that justify its use to arrive at the thermal boundary conditions for the experiments. Also, please provide the supporting experimental benchmarking studies, including the uncertainties in the CFD-based predictions of the thermal boundary conditions.

cc:

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