

February 7, 2008

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 151 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.

If you have any questions or comments concerning this matter, you may contact me at 301-415-3207 or saw8@nrc.gov or you may contact Amy Cabbage at 301-415-2875 or aec@nrc.gov.

Sincerely,

/RA/

Shawn Williams, 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

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ESBWR DESIGN CERTIFICATION APPLICATION DATED FEBRUARY 7, 2008

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**Requests for Additional Information (RAIs)
ESBWR Design Control Document (DCD), Revision 4**

RAI Number	Reviewer	Question Summary	Full Text
RAI 6.2-138 Supplement No. 1 (MFN 07-383, 8/8/07)	Goel R	Provide additional information concerning the PARS	<p>Staff requested in RAI 6.2-138 that GEH describe and justify a mixed containment atmosphere during design-basis and significant beyond design-basis accidents.</p> <p>GEH response to RAI 6.2-138 stated that adequate mixing within the ESBWR containment system is assured based on the configuration of the ESBWR containment coupled with the dynamics of the design basis loss-of-coolant accident and the mitigation components within the containment volume. GEH also stated that another consideration with respect to the mixing process is the incorporation of Passive Autocatalytic Recombiners (PARs) into both the ESBWR drywell and wetwell.</p> <p>Based on the analysis assumptions provided in the DCD, Revision 4 and in response to RAI 6.2-138, an initial containment oxygen concentration of 4% was assumed with an allowable containment concentration of 5%. To keep the oxygen concentration below 5%, a certain recombination rate must be assumed. The recombination rate of a PAR is dependent on the concentration of hydrogen and oxygen, the size of the PAR, and possible poisons.</p> <p>Please provide the following additional information about the PARs:</p> <p>A. What was the concentration of hydrogen and oxygen assumed? Is the adequate mixing assumption appropriate for PAR sizing because oxygen from radiolysis could be disproportionably distributed between the drywell and the wetwell? State the number, size and location PARS in the drywell and wetwell. If PARS locations have not been determined, state the criteria that will be used to locate the PARs. Include the above requested information in the DCD.</p> <p>B. What margin was included to account for possible poisoning effect of the PAR catalyst? What was the basis for the margin used to account for possible poisoning? Include the information in the DCD.</p>

RAI Number	Reviewer	Question Summary	Full Text
			<p>C. Provide the modeling of energy generated from the PAR exothermal reaction in the containment performance analysis.</p> <p>D. Include in the DCD a surveillance to verify the assumed recombination rate.</p>
RAI 6.2-59, Supplement No. 2 (MFN 06-364 Supplement 3, 12/3/2007)	Wagage H	Include response information in a licensing report	<p>In response to RAI 6.2-59, Supplement No. 1, GEH stated the following:</p> <p>The response to RAI 6.2-59 (MFN 06-364, October 3, 2006) provides input error corrections and model enhancement for the approved TRACG model (Reference 1). . . The input error corrections are the time step size sensitivity, vacuum breaker flow area, standby liquid control system (SLCS) flow input table, and axial power input for the part-length rod. Sensitivity studies were performed and the impact of these input errors on the key output parameters was small (Response to RAI 6.2-59, MFN 06-364, October 3, 2006). The large negative loss coefficient at the top horizontal vent exit to reduce the high vent flow oscillations was later removed from the input decks for both the emergency core cooling system (ECCS)/loss-of-coolant accident (LOCA) and containment/LOCA analyses (for analyses performed after DCD Tier 2, Revision 3).</p> <p>However, GEH stated that no DCD changes will be made in response to this RAI.</p> <p>Identify input error corrections and model enhancements for the approved TRACG model in an appropriate licensing document (topical report revision or supplement) to be referenced in the DCD.</p>

DC GE - ESBWR Mailing List

(Revised 01/29/2008)

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