

November 15, 2007

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 116 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.

To support the review schedule, you are requested to provide the requested additional information within 45 days of the date of 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 Cubbage 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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Docket No. 52-010
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cc: See next page
Distribution: See next page

ADAMS ACCESSION NO. ML073030109

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|---------------|------------|------------|------------|
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| DATE | 11/14/2007 | 11/14/2007 | 11/15/2007 |

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 116 RELATED TO
ESBWR DESIGN CERTIFICATION APPLICATION

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

| RAI Number | Reviewer | Question Summary | Full Text |
|--|--|---|---|
| 6.2-18, Supplement No. 2 (MFN 06-159 Supplement 1, September 12, 2007) | Wagage H | Respond to part (B) using the correct mass flow rates | GEH's response to parts (A) and (C) are acceptable. Response to part (B) is unacceptable because incorrect mass flow rates were used (See RAI 6.2-23, Supplement No. 2). Please respond to part (B) using the correct mass flow rates. |
| 6.2-23, Supplement No. 2 (MFN 06-159 Supplement 1, September 12, 2007) | Wagage H Notafrancesco A Krotiuk W | Correct the velocity input errors and resubmit the corrected shield wall pressurization analyses for the feedwater and RWCU line breaks | In GEH's response to RAI 6.2-23, Supplement No. 1, Attachment 3, provided detailed calculations of the break boundary conditions for the feedwater line and RWCU/SDC line breaks. For the feedwater line break, page 2 of this attachment indicates that the calculated break velocity is 55.207 m/s for the feedwater line break. Similarly, page 3 of this attachment indicates that the calculated break velocity for the RWCU/SDC line break is 31.764 m/s. The velocity calculations used half the break flow to accommodate the 180° model of the shield wall annulus; however, the full break area, instead of half the break area, was used in the velocity calculations. Consequently, the calculated break velocities were in error by a factor of 2. The correct feedwater break velocity is 110.414 m/s and the correct RWCU/SDC break velocity is 63.528 m/s. These break velocities were directly used in the inputs for the shield wall pressurization analyses provided in Attachments 1 and 2. Please correct the velocity input errors and resubmit the corrected shield wall pressurization analyses for the feedwater and RWCU line breaks. |
| 6.2-102, Supplement No. 2, (MFN 06-466 Supplement 1, August 17, 2007) | Goel R | Provide the risk analysis to support no CIV's in the PCCS system | In RAI 6.2-102, Supplemental No. 1, Staff had restated the original RAI 6.2-102 and position: "In RAI 6.2-102, the staff stated that the PCCS must have CIVs, and, supported its position with extensive citations from the regulations (10 CFR Part 50, Appendix A, General Design Criterion 56) and the applicable official NRC guidance (Standard Review Plan 6.2.4, Rev. 2, "Containment Isolation System, " and Regulatory Guide 1.141, "Containment Isolation Provisions for |

Enclosure

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| | | | <p>Fluid Systems," dated April 1978, which endorses national standard ANS-56.2/ANSI N271-1976, "Containment Isolation Provisions for Fluid Systems" (national standard)). Staff provided a quotation from the national standard that stated that even if the closed system outside containment is treated as an extension of containment, at least one CIV per line is still necessary."</p> <p>GEH's response to Supplement No. 1 clarified and corrected many discrepancies in the DCD to support their original position that the system is considered an extension of the containment boundary, meaning that there are no containment penetrations in the PCCS, and therefore GDC 56, the SRP, the RG, and the national standard do not apply. The applicant uses the Mark I containment as a precedent example for which the wetwell design is a contiguous part of the containment (not an extension or closed system outside of containment.). GEH states that "the ESBWR containment can be understood as an extrapolation beginning from the Mark 1 containment."</p> <p>In a conference call, dated October 19, 2007, Staff restated its position that the national standard applies to the PCCS design and that GEH did not provide sufficient justification to deviate from the National Standard as endorsed in RG 1.141.</p> <p>During the conference call, GEH responded with new information. GEH stated that from a risk perspective, it was safer <u>not</u> to have CIVs in the PCCS.</p> <p>Please provide the risk analysis performed to support GEH's conclusion that from a risk perspective it is safer not to have CIV's in the PCCS. Include a comparison of the probability of CIV failure to the probability of a leak in the PCCS.</p> |

| RAI Number | Reviewer | Question Summary | Full Text |
|---|-----------------|---|---|
| 21.6-63, Supplement No. 1 (MFN 07-448, August 20, 2007) | Gilmer J | Provide the RAI response in the DCD or Topical Report | As discussed in a conference call on November 9, 2007, please provide the information in GEH's original RAI response to RAI 21.6-63 in MFN 07-448, dated August 20, 2007, in the DCD or as a supplement to the Topical Report NEDE-33083P, Section 4, "Transient Analysis." |
| 21.6-65, Supplement No. 2 (MFN 07-347, June 21, 2007) | Gilmer J | Provide the RAI response in the DCD or Topical Report | As discussed in a conference call on November 9, 2007, please provide the information in GEH's original RAI response to RAI 21.6-57 in MFN 07-347, dated June 21, 2007, in the DCD or as a supplement to the Topical Report NEDE-33083P, Section 4, "Transient Analysis." This request is in addition to RA 21.6-65, Supplement No. 1, dated 9/6/07, (ML072410422) which has not been responded to as of the date of this letter. GEH should consider incorporating the response to Supplement No. 1 also into the DCD or supplement to the Topical Report NEDE-33083P, Section 4, "Transient Analysis." |
| 21.6-91, Supplement No. 1, (MFN 07-256, May 17, 2007) | Gilmer J | Provide the TRACG output results in spreadsheet format corresponding to the input decks provided in the original RAI response | As discussed in a conference call on November 9, 2007, please provide the TRACG output results in spreadsheet format corresponding to the input decks provided in the original RAI response (MFN 07-256, dated May 15, 2007) for the following Anticipated Operational Occurrences (Equilibrium Core): <ul style="list-style-type: none"> - Load Rejection with Single Failure of Bypass - MSIV Closure The results required are for the Null Transient (steady state) cases. Staff needs the above information to complete the TRACE code confirmation of TRACG. |

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