

August 20, 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. 245 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 (RAI) is contained in the enclosure to this letter.

If you have any questions or comments concerning this matter, you may contact me at 301-415-8484 or Tom.Tai@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or Amy.Cubbage@nrc.gov.

Sincerely,

/RA/

Tom M. Tai, Senior 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

ADAMS ACCESSION NO. ML082320417

NRO-001

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 245 RELATED TO
ESBWR DESIGN CERTIFICATION APPLICATION DATED AUGUST 20, 2008

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

RAI Number	Reviewer	Question Summary	Full Text
RAI 6.2-194	Krotiuk W Wagage H	Shield wall annulus pressurization analysis (see also RAI 6.2-23 S03)	The staff reviewed GEH response to RAI 6.2-23 S02 in GEH letter MFN 08-270 and conducted an independent ESBWR shield wall annulus pressurization analysis. The staff developed the shield wall annulus model for the TRACE computer code. The staff performed analyses for double ended pipe breaks in the FW and RWCU lines. The staff used TRACE to calculate transient break mass and energy releases and the shield wall annulus pressurization. Based on its review of GEH's response to RAI 6.2-23 S02 and TRACE analyses, the staff makes the following requests which need to be addressed for the staff to complete its review: A. Justify the use of a 0.5 multiplier on the FW break flow from the RSW side of the break indicated in the GEH's response to RAI 6.2-23 S02. Reference to a report or a technical paper is insufficient. Provide specific calculations which support this multiplier and specifically discuss how any reference supports the use of the multiplier. B. Justify the RWCU break flow calculation from the RSW side of the break including the use of a 0.5 multiplier on break flow indicated in the GEH response to RAI 6.2-23 S02. GEH should provide specific calculations which compare the Moody choked flow values to other critical flow calculation methods for subcooled flow such as the Henry-Fauske calculation method. Provide specific calculations which support the 0.5 multiplier and specifically discuss how any reference supports the use of the multiplier. Reference to a report or a technical paper is insufficient. C. Revise the TRACG model to include obstructions to flow in the shield wall annulus, such as pipe penetrations or provide an analysis which specifically shows that the impact of not including these features on the final figures of merit, such as pressure in the shield wall annulus, is negligible.

Enclosure

RAI Number	Reviewer	Question Summary	Full Text
			D. Confirm that the pressure drop due to wall roughness was included in the TRACG shield wall annulus model. If not, provide specific analyses that the impact on the final figures of merit, such as shield wall annular pressure, is negligible.
RAI 6.2-195	Miller E	Differences between Figure 6.2-7 and Figure 6B-2.	1. In reviewing TRACG nodalization for the ESBWR in Chapter 6 of the DCD/Tier 2, the following differences were noted between Figure 6.2-7 and Figure 6B-2: A. The definition of Levels is different. Why does Figure 6B-2 begin at L0 and end at L18; while Figure 6.2-7 begins at L21 and ends at L42? B. Why has the radius nodalization been labeled differently between Figure 6.2-7 and Figure 6B-2? C. The Dryer/Separator Storage Pool is shown in Figure 6.2-7 but not in Figure 6B-2. Please explain why. D. Why are 2 PCCs in R3 & R4 labeled in Figure 6.2-7 but not shown in Figure 6B-2? E. Why are 4 PCCs in R6 & 7 shown in Figure 6.2-7 and not in Figure 6B-2? F. Why are PIPES 81 and 82 horizontal in Figure 6.2-7 but vertical in Figure 6B-2? G. Where has the Heat Exchanger labeled by PIPE91, PIPE95, TEE21, and TEE25 been accounted for in Figure 6.2-7? H. What is the significance of not including PUMP 520, PUMP 850, TEE 52, and TEE 85 in Figure 6B-2? I. Why is the GDCS outlined on the left side between L32 and L35 of Figure 6.2-7 but not outlined in Figure 6B-2?

RAI Number	Reviewer	Question Summary	Full Text
			J. What are the differences between DPV12 in Figure 6.2-7 and VLVE12, 13, 19 in Figure 6B-2? K. What is the difference between SRV192 and SRV193 located between L24 and L26 in Figure 6.2-7 and VLVE24, 28 located between L1 and L0 in Figure 6B-2? L. Why is the direction of VLVE07 changed between Figures 6.2-7 and Figure 6B-2? M. Why are TEE62 and TEE63 and associated PIPES and VLVEs placed on both sides of Figure 6B-2 but are not included in Figure 6.2-7? N. Why is TEE35 located on the bottom of Figure 6B-2, but not in Figure 6.2-7? O. Explain the differences in labeling the RPV nodalization (i.e. DW HEAD AIR SPACE vs. STEAM DOME). P. VSSL is not labeled in the bottom left corner of Figure 6.2-7 while it is labeled in the bottom left corner of Figure 6B-2. Please explain the reason for its placement and its necessity between each figure. 2. In reviewing TRACG nodalization for the ESBWR in Chapter 6 of the DCD/Tier 2 the following differences were noted between Figures 6.2-7 and 6B-3: A. The definition of Levels is different. Why does Figure 6B-3 begin at L21 and end at L39; while Figure 6.2-7 begins at L21 and ends at L42? B. Why is the radius nodalization labeled differently between Figure 6.2-7 and 6B-3? C. The Dryer/Separator Storage Pool is shown in Figure 6.2-7 but not in Figure 6B-3. Please explain why.

RAI Number	Reviewer	Question Summary	Full Text
			D. Why are 2 PCCs in R3 & R4 labeled in Figure 6.2-7 but not shown in Figure 6B-3? E. Why are 4 PCCs in R6 & 7 shown in Figure 6.2-7 and not in Figure 6B-3? F. Why are PIPES 81 and 82 horizontal in Figure 6.2-7 but vertical in Figure 6B-3? G. Why are heat exchangers labeled PIPE91 and TEE25 shown in Figure 6B-3 but not in Figure 6.2-7? H. Why is the labeling of the RPV different between Figures 6B-3 and 6.2-7? I. What are the differences between DPV12 in Figure 6.2-7 and VLVE12, 13, 19 in Figure 6B-3? J. What is the difference between SRV192 and SRV193 located between L24 and L26 in Figure 6.2-7 and VLVE24, 28 located between L22 and L24 in Figure 6B-3? K. Why is the RPV labeled below 0.00m in Figure 6B-3 from L1 to L21? L. Valve 282 and 281 have been labeled in Figure 6.2-7, please explain why they are not labeled in Figure 6B-3. M. What are the differences between VLVE7 in Figure 6B-3 and Figure 6.2-7? N. Why is TEE35 labeled on L21 in Figure 6B-3, however not in Figure 2.2-7?

RAI Number	Reviewer	Question Summary	Full Text
			3. In reviewing TRACG nodalization for the ESBWR in Chapter 6 of DCD/Tier 2, the following differences were noted between Figures 6.2-7 and 6B-4: A. The Dryer/Separator Storage Pool is shown in Figure 6.2-7 but not in Figure 6B-4. Please explain why. B. Why are heat exchangers labeled PIPE 91, TEE21, PIPE 95, and TEE25 included in Figure 6B-4 but not in Figure 6.2-7? C. Pump 850 and TEE85 are labeled in Figure 6.2-7, however they are not shown in Figure 6B-4. Please explain the reasoning for these differences. D. Pump 520 and TEE52 are also labeled in Figure 6.2-7, however they are not shown in Figure 6B-4. Please explain the reasoning for these differences. E. Why are PIPES 81 and 82 horizontal in Figure 6.2-7 and vertical in Figure 6B-4? F. What are the differences between the representations of the RPV in Figure 6B-4 and Figure 6.2-7? Why is the RPV below L21 as well? G. What is the difference between SRV192 and SRV193 located between L24 and L26 in Figure 6.2-7 and the unlabeled valve located between L24 and L26 in Figure 6B-4? H. What are the differences between VLVE7 in Figure 6B-4 and Figure 6.2-7. I. What are the differences between the VLVE 12, 13, 19 labeled in Figure 6B-4 and DPV 12 labeled in Figure 6.2-7.

RAI Number	Reviewer	Question Summary	Full Text
6.2-196	Thomas G	Inadvertent LPCI operation	During a LOCA, the suppression pool may contain debris which may be injected into the reactor by the inadvertent and premature actuation of the LPCI by the operator before 72 hours. In the event the FAPCS pumps suction strainers are not designed to meet Regulatory Guide 1.82, Revision 3, describe the consequences of the premature operation of the LPCI mode of the FAPCS and the impact on long term post-LOCA cooling of the reactor.

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(Revised 08/13/2008)

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