

June 9, 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. 209 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 301-415-3025 or Chandu.Patel@nrc.gov, or you may contact Eric Oesterle at 301-415-1365 or Eric.Oesterle@nrc.gov.

Sincerely,

/RA/

Chandu Patel, 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. ML081580411

NRO-002

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 209 RELATED TO
ESBWR DESIGN CERTIFICATION APPLICATION DATED JUNE 9, 2008

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

RAI Number	Reviewer	Question Summary	Full Text
3.9-200	Scarborough T	GDCS check valve design and orientation	<p>Discuss the evaluation of potential impact of vertical orientation of check valves in the ESBWR Gravity-Driven Cooling System (GDCS). As described in Section 6.3, “Emergency Core Cooling Systems,” of the ESBWR Design Control Document (DCD) Tier 2, Revision 4, the GDCS is required to inject cooling water into the reactor by gravity flow following a loss of coolant accident (LOCA). In a presentation to the Advisory Committee on Reactor Safeguards (ACRS) on May 8, 2008, GEH indicated that the GDCS might include vertically mounted check valves. In a letter dated March 27, 2008 (MFN 08-084), GEH had indicated that the GDCS check valves might be horizontally or vertically mounted. Under specific LOCA depressurization scenarios, there could be significant reactor coolant pressure present when the GDCS squib valve actuates and reverse flow through the GDCS line might occur until the flow closes the check valve. In light of these possible GDCS design features, please provide the following information:</p> <ul style="list-style-type: none"> a) Discuss the design and analysis of applicable components for waterhammer loading due to the reverse acceleration and stoppage of the GDCS water column from the check valve closure, including performance of tests and analysis of affected pressure boundary and active system components. b) Discuss the design and analysis of applicable components for loading due to the formation of steam in the GDCS piping during depressurization of hot reactor coolant following a LOCA and the subsequent condensation-induced waterhammer during GDCS injection, including performance of tests and analysis of affected pressure boundary and active system components. c) Discuss the consideration of the force on the valve disk necessary for closure of the check valve in the vertically-mounted position under all conditions of reverse flow.

RAI Number	Reviewer	Question Summary	Full Text
			<p>d) Discuss the provisions to provide assurance that for all conditions of GDCS injection, the valve disk of the vertically mounted check valve will be stable and in the fully open position, without damage or wear caused by chatter or flutter of the disk.</p> <p>e) Discuss the potential for the GDCS check valves in vertical flow lines to remain partially open under slow pressure increase conditions of the reactor coolant system that could allow backflow to the cooling water pools.</p> <p>f) Discuss the specifications for the inservice testing program for the GDCS check valves in vertical flow lines to provide reasonable assurance of their operational readiness based on their application and performance requirements.</p>
3.9 -201	Scarborough T	Provisions for non-condensable gas in GDCS	<p>The collection of gas in the GDCS can cause binding or restriction of necessary injection flow, especially with only gravity head. In addition, gas might be released from the reactor coolant water as a result of depressurization following a LOCA and will coalesce at high points in the injection path. Discuss the provisions for high point vents in the GDCS lines, and address the need for Technical Specification surveillance requirements for monthly venting of the GDCS lines.</p>
3.9-202	Scarborough T	GDCS isolation of reactor coolant pressure boundary	<p>Describe how the GDCS configuration with a squib valve and a normally-open check valve meets regulatory requirements for isolation of the reactor coolant pressure boundary. The NRC regulations in 10 CFR 50.55a(c)(2) require that non-ASME Class 1 components be isolated from the reactor coolant pressure boundary with two closed valves or, if one or both valves are open, each valve must be capable of automatic isolation.</p>
3.9-203	Scarborough T	Check valves and other valve types in vertical lines in other safety-related or RTNSS systems	<p>Discuss any check valves or other valve types in vertical flow lines in ESBWR safety-related systems or those within the scope of regulatory treatment of nonsafety systems (RTNSS), and the provisions for functional design, qualification and inservice testing of those valves based on their application and performance requirements. Valve orientation can have a significant impact on functional design, qualification, and inservice testing of valves to provide reasonable assurance of the ability to perform their applicable safety functions.</p>

RAI Number	Reviewer	Question Summary	Full Text
3.9-204	Scarbrough	Applicable DCD changes to address valves in vertical lines	Specify appropriate changes to the DCD to ensure adequate functional design, qualification, and inservice testing for valves in vertical flow lines in the ESBWR.

DC GE - ESBWR Mailing List

(Revised 06/03/2008)

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