August 21, 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. 244 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Brown:

By letter dated August 24, 2005, GE Hitachi Nuclear Energy 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 301-415-2375 or leslie.perkins@nrc.gov, or you may contact Eric Oesterle at 301-415-1365 or eric.oesterle@nrc.gov.

Sincerely,

/RA/

Leslie Perkins, 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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Leslie Perkins, Project Manager
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Distribution: See next page

ADAMS ACCESSION NO. ML082330272 NRO-002

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO.244 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED AUGUST 21, 2008

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

RAI Number	Reviewer	Question Summary	Full Text
8.3-59	Rhow S	Ancillary Diesel Protection	Ancillary diesel generator provides post accident power to loads connected to 480V Ancillary Diesel bus and the safety-related UPS loads through regulating transformer and isolation devices by manually closing the feeder breakers. The staff requests that GEH provide (1) protective relaying schemes on the 480V Ancillary Diesel bus to protect (isolate) the safety-related UPS system from faults on nonsafety-related 480V Ancillary Diesel bus; and (2) alarm and indication of the ancillary diesel generator.
14.3-414	Lee A	Revise text and tables in Tier 1, Section 2	DCD Tier 1, Rev. 5, Section 2, provides component ITAAC on a system basis. In reviewing these ITAAC, the staff identified a number of errors, both in the text and in the tables. The staff requests GEH to correct the errors as identified in the following, and others that may exist throughout the entire Section 2 component ITAAC programs. a) Table 2.2.2-7, for Control Rod Drive System, the description of Inspections, Tests, and Analyses (ITA) for as-built ITAAC in Item 2.a2 is not consistent with the intended revision. And the description of the entire fabrication and installation ITAAC is missing in Item 2.a3. b) Section 2.4.1, for Isolation Condenser System, the description of as-built ITAAC in item (2)a2 is not consistent with the intended revision. c) Table 2.6.2-2, for Fuel and Auxiliary Pools Cooling Cleanup System, the description of the entire fabrication and installation portion of the ITAAC is missing in Item 2.a3. d) Section 2.11.1, for Turbine Main Steam System, no description of component ITAAC is provided.

Enclosure

RAI Number	Reviewer	Question Summary	Full Text
			e) Table 2.11.1-1, for Turbine Main Steam System, no component ITAAC is included in the table. f) Table 2.15.1-2, for Containment System, the descriptions of ITA and Acceptance Criteria for the fabrication and installation portion of the ITAAC in Item 2.c.1 are not consistent with the intended revisions.
14.3-131 S03	Li R	Revise ITAAC Table 3.1-1	In RAI 14.3-131 S02, Question 4, the staff requested the applicant to provide modification to the ITAAC Table 3.1-1. Specifically, the ITAAC, as provided in the GEH's response to RAI 14.3-131 S01 dated March 20, 2008, should state, "as-designed pipe break analysis results," as opposed to "pipe analysis." This change should also be made under Inspections, Tests, and Analysis to refer to the report call out in Section 3.6.2.5 of the DCD. Further, Item 6 of ITAAC Table 3.1-1 should remain and be modified to address reconciliation with the report called out in Section 3.6.2.5. By a letter dated July 9, 2008, GEH provided its response to RAI 14.3-131 S02. Based on its review of that RAI response as well as the information provided in Revision 5 of the DCD, the staff found that the "as-built" was changed to "as-designed" in Revision 5 of the DCD ITAAC Table 3.1-1. In addition, the staff found that Item 6 has been included in that table. However, the staff identified that GEH did not address the staff's concern pertaining to the wording, "pipe analysis", of the ITAAC table. As written, the new ITAAC calls for a report that documents that the as-designed pipe analysis concludes that for each postulated piping failure, the reactor can be shut down safely and that the reports document the results of the analyses to determine where protection features are necessary to mitigate the consequences of a pipe break. The COL Information Item required that the applicant provide the information identified in DCD Subsection 3.6.2.5. DCD Subsection 3.6.2.5 called for a pipe break evaluation report that will be completed in conjunction with closure of ITAAC 3.1-1. The report was to include:

RAI Number	Reviewer	Question Summary	Full Text
			● A summary of the dynamic analyses applicable to high-energy piping systems in accordance with Subsection 3.6.2.5 of RG 1.70 including sketches of applicable piping systems showing the location, size and orientation of postulated pipe breaks and the location of pipe whip restraints and jet impingement barriers and a summary of the data developed to select postulated break locations including calculated stress intensities, cumulative usage factors and stress ranges as delineated in BTP 3-4. ● For failure in the moderate-energy piping systems, descriptions showing how safety-related systems are protected from the resulting jets, flooding and other adverse environmental effects. ● Identification of protective measures provided against the effects of postulated pipe failures for protection of each of the systems listed in Tables 3.6-1 and 3.6-2. ● The details of how the MSIV functional capability is protected against the effects of postulated pipe failures. ● Typical examples, if any, where protection for safety-related systems and components against the dynamic effects of pipe failures include their enclosure in suitably designed structures or compartments (including any additional drainage system or equipment environmental qualification needs). ● The details of how the feedwater line check and feedwater isolation valves functional capabilities are protected against the effects of postulated pipe failures.

RAI Number	Reviewer	Question Summary	Full Text
			The ITAAC should call for the same level of detail as the deleted COL information item. Therefore, the staff determined that the wording of the current ITAAC fails to fully address the COL Information Item and the applicant is requested to provide modification to the ITAAC Table to address the above staff's concern.
14.3-213 S02	Davis R	Include piping ITAAC number 2 in Table 2.11.1-1	In reviewing DCD Revision 5, Tier 1, Table 2.11.1-1, the staff noticed that ITAAC number 2 related to hydrostatic testing only references components and does not reference piping. In order to be consistent with ITAAC for other ASME Code class systems in Tier 1 such as the Nuclear Boiler System, the staff requests that the applicant include piping to ITAAC number 2 in Table 2.11.1-1 for the Turbine Main Steam System.
14.2-98	Pal A	Include additional items in the initial test program or provide justification for exclusion	DCD, Tier 2, Rev. 5, Section 14.2.8.1.36 states that "Performance shall be observed and recorded during a series of individual component and integrated system tests to demonstrate the following: (1) Proper operation of initiating, transfer, and trip devices; (2) Proper operation of relaying and logic; (3) Proper operation of equipment protective devices, including permissive and prohibit interlocks; (4) Proper operation of instrumentation and alarms used to monitor system and equipment status; (5) Proper operation and load carrying capability of breakers, switchgear, transformers, and cables; (6) The capability of transfer between onsite and offsite power sources as per design; (7) The ability of emergency and vital loads to start in the proper sequence and to operate properly under simulated accident conditions; and (8) The adequacy of the plant emergency lighting system." Include the following additional items in the initial test program or provide justification for exclusion: (a) Verification of analytically derived voltage values from voltage analyses of the onsite distribution system against actual measurements (PSB 1) and (b) Proper operation of the automatic transfer capability of normal preferred power source to the alternate preferred power source is verified.

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