

September 16, 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. 249 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

September 16, 2008

Mr. Robert E. Brown
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GE Hitachi Nuclear Energy
3901 Castle Hayne Road MC A-45
Wilmington, NC 28401

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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.

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Leslie Perkins, Project Manager
ESBWR/ABWR Projects Branch 1
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Request for Additional Information

cc: See next page

Distribution: See next page

ADAMS ACCESSION NO. ML082470471

NRO-002

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO.249 RELATED TO
ESBWR DESIGN CERTIFICATION APPLICATION DATED SEPTEMBER 16,
2008

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

RAI Number	Reviewer	Question Summary	Full Text
3.2-67	McNally R	Table 3.2-1 does not specifically identify the seismic classification of the Dryer/Separator Pools	DCD Table 3.2-1 does not specifically identify the seismic classification of the Dryer/Separator Pools, however, both the Reactor Building Structure and the Containment Vessel are identified as Seismic Category I. As stated in DCD Appendix 3G.1, the Reactor Building (RB) encloses the concrete containment and its internal structures and components. In addition the RB contains the Isolation Condenser/Passive Containment Cooling (IC/PCC) pools and the service pools for storage of Dryer/Separator on the top of the concrete containment. Further, DCD subsection 3.8.1.1.1 describes the top slab of the containment as an integral part of the Isolation Condenser/Passive Containment Cooling (IC/PCC) pools and the services pools for the storage of Dryer/Separator and other uses. The applicant is requested to confirm that the Dryer/Separator pools are seismic Category I and are either considered part of the Reactor Building and Containment or include the Dryer/Separator pools as a separate item in Table 3.2-1.
3.2-68	McNally R	The definition of seismic Category II in DCD subsection 3.2.1 and 3.7 do not account for long term functionality for RTNSS Criterion B SSCs	The definition of seismic Category II in DCD subsections 3.2.1 and 3.7 do not account for long term functionality for RTNSS Criterion B SSCs. Subsection 19A.8.3 identifies that RTNSS B components are required to function following a seismic event and they are designed to Seismic Category II, at a minimum. However, the definition of Seismic Category II in DCD subsection 3.2.1 and 3.7 do not include functionality requirements and identify that their operational performance is not required. For RTNSS B Category II SSCs, such as the CRHAVS air handling units, that are required to function following a seismic event, explain how the classification as Seismic Category II ensures that the SSCs will be functional following a seismic event. The applicant is requested to identify an augmented seismic classification and/or revise the definition of Seismic Category II in DCD 3.2.1 and 3.7 accordingly.

3.8-28 S04	Chakrabarti S	Need to include containment penetrations in DCD Tier 1, Table 2.15.1-1a; explain why suppression pool liner is included as part of containment mechanical equipment listed in Table 2.15.1-1b; & revision needed to refer to "Design Report" in ITAAC.	<p>The response transmitted in GEH letter MFN 06-407, Supplement 8, dated August 8, 2008, addressed some of the items raised previously by this RAI. However, as indicated during the audit at the GEH office during the week of June 23, 2008, ITAAC in Table 2.15.1-2 and the referenced components in Table 2.15.1-1 have been substantially revised. As a result, the information in the new ITAAC and Table 2.15.1-1 is not clear related to containment penetrations. GEH is requested to address the following items:</p> <ul style="list-style-type: none"> a) Table 2.15.1-1 in DCD Tier 1, Rev. 4 identified all of the penetrations of the containment as well as the associated piping and valves. The revised Table 2.15.1-1a of DCD Tier 1, Rev. 5, which is entitled "Containment System Penetrations and Equipment," only identifies valves and piping, not penetrations. GEH is requested to include the designation of containment penetrations as part of this table as implied in the title. Without including this information in Table 2.15.1-1, no ITAAC could be identified that addresses the design, fabrication, erection, and inspection/testing of the penetrations. b) Table 2.15.1-1b, entitled Containment Mechanical Equipment, lists the suppression pool stainless steel liner along with six vacuum breaker valves. GEH is requested to explain why the suppression pool stainless steel liner is considered to be containment mechanical equipment, rather than part of the reinforced concrete containment vessel (RCCV). If there is some valid reason for doing this, then what about all of the other containment steel liners? c) For the design of the containment and mechanical components, Table 2.15.1-2 identifies ITAAC using "An ASME Code Design Data Report (certified when required by ASME Code)." This should be revised, because for design purposes the ASME requires a certified "Design Report" not a "Design Data Report." A similar table for the PCCS, Table 2.15.4-2, correctly refers to "ASME Code Design Reports." The information presented in the DCD should be consistent for all applicable tables.
14.3-394 S01	Pal A	Interface requirements for offsite power	In response to RAI 14.3-394, GEH revised DCD, Tier 1, Section 4, "Interface Material," to add a new Section 4.2, "Offsite Power," which included requirements for COL applicant to develop an ITAAC to verify by inspection that two physically independent circuits will supply electric power from transmission network to the onsite electric distribution system. GEH stated that "In the ESBWR, which is a passive plant, the offsite power system

			<p>provides no safety-related function and there is no direct interface with any safety-related component.” GEH concluded that there is no need for an interface requirement for demonstrating the capacity and capability of the offsite power system. The NRC staff disagrees. The offsite power system has a direct interface with safety-related battery chargers and UPS components as it supplies them power during normal, abnormal and accident conditions. Since ESBWR design is committed to the requirements of GDC 17, the capacity and capability of the offsite power source must be demonstrated. Based on the above, the COL applicant needs to assure the NRC staff that adequate voltages are available at the input terminals of safety-related UPS, battery chargers and at the 120 volt load terminals for proper operation of the safety-related equipments by performance of analyses of the onsite distribution system when powered from offsite power sources. Therefore, an interface requirement for demonstrating the capacity and capability of the offsite power system should be provided. Revise DCD, Tier 1, Section 4.2 accordingly.</p>
14.3-415	Hardin R	Confirm of the use of project specific plans.	<p>It is understood that the SMPM (NEDE-33226P) and SQAPM (NEDE-33245P) provide guidance for completion of the overall system design. The system is expected to consist of multiple projects—each which may consist of a combination of commercial off-the-shelf (COTS), previously developed software (PDS) and/or custom software and hardware. Separate plan sets are expected for each project. These plan sets will encompass all the life cycle information required to fully implement a specific project, although system wide information may be included by reference to the SMPM and SQAPM. Note that throughout this RAI, the term project can refer to a system, platform, or whatever the applicant determines is a reasonable unit for organizing the software development activities (SDA). Please confirm or clarify staff’s understanding and clearly identify the manner in which the plans sets are organized—system, platform, etc.</p>

14.3-416	Hardin R	A system or top level DAC/ITAAC is needed	A top level or system DAC/ITAAC is expected to cover items that have scope beyond a single project. These items could be such as top level requirements, interface specifications, system integration and test issues, etc. The staff understands that much of this material may be covered in project specific plan sets and/or DAC/ITAAC (as appropriate depending upon if the item is design related.) However, this material should be covered in some location. Please provide top level DAC/ITAAC if needed and/or provide your evaluation as to why it is not required.
14.3-417	Hardin R	DAC/ITAAC should be organized in a manner that agrees with the concept of multiple projects and plan sets	Current SDA DAC/ITAAC is organized along individual SDA plans. This will not be in agreement with project specific plan sets. If the use of project specific plan sets is confirmed, please revise DAC/ITAAC to be in agreement with the multiple projects and plan sets concept.
14.3-418	Hardin R	The DAC closure process needs clarification	It is not clear if closure activities will take place on a project basis, a life cycle phase basis, or system wide. As discussed above, it is anticipated that there will be an overall DAC for the system, with project specific DAC provided for each constituent project. Alternately, a single DAC can incrementally be closed as the development activities progress. One of these options or something in between will be needed. Please explain the closure process and DAC setup as it relates to the overall system (if used) and/or individual projects.
14.3-419	Hardin R	Differentiation between DAC and ITAAC tasks.	The current DAC/ITAAC does not clearly delineate between design and inspection tasks. It is not clear where the DAC stage ends and the ITAAC stage begins. In meetings, the applicant has discussed where they assert design is complete for the DAC process and this should be more clearly explained in each DAC/ITAAC item. The current items are too vague and generally stated to allow for proper evaluation. Please provide clearer detail as to the task allocation and descriptions for each DAC and/or ITAAC task.

14.3-420	Hardin R	The use of SMPM and SQAPM in DAC/ITAAC acceptance criteria.	In staff discussions with the applicant, the concept of using the SMPM and SQAPM to identify and provide greater detail for the DAC/ITAAC acceptance criteria was considered. This concept seems to have much merit, but if it is to be implemented, the SMPM and SQAPM should be Tier 2*. It is already understood that these documents will be Tier 2* but this needs to be confirmed. Please confirm that the SMPM and SQAPM are Tier 2*. In addition, please provide further details on the use of references to the SMPM and SQAPM in DAC/ITAAC acceptance criteria – such as by providing examples of proposed DAC.
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(Revised 08/25/2008)

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