December 27, 2007

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 130 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 301-415-3179 or ixb3@nrc.gov or you may contact Thomas Kevern at (301) 415-0224 or tak@nrc.gov.

Sincerely,

/RA/

Ilka Berrios, 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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Senior Vice President, Regulatory Affairs
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3901 Castle Hayne Road MC A-45
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Dear Mr. Brown:

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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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ACCESSION NO. ML073550176

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 130 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED DECEMBER 27, 2007

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Request for Additional Information (RAI)
ESBWR Design Control Document (DCD), Revision 4
Chapter 12 "Radiation Protection"
REVISED – CORRECTION IS BOLDED.

RAI Number	Reviewer	Question Summary	Full Text
12.1-1	Hinson, C	Editorial changes	Editorial changes: (S12.3.1.2.3) In the second line in this subsection, delete the word "ALARA". (S12.3.3.1) In the third line for the second bullet, change the word "radioactive" to "radioactivity". (Table 12.3-5) The uppercase number "1" after the word "transfer" for area monitor number 18 appears to be a typo. **(S12.4.2)** In the fourth line of the eighth paragraph in this section, add the words "for each of the listed tasks in the Reactor Building" after the words "dose rate". (S12.6.1) In the sixth bullet, replace the words "Appropriately sloped floor drains" with "Appropriately sloped floors around floor drains".
12.2-25	Dehmel, J	DCD Tier 2, Revision 4, Section 12.2.2.1 does not present the basis or appropriate references for the atmospheric dispersion and deposition parameter values used to calculate offsite doses from gaseous effluents.	DCD Tier 2, Revision 4, Section 12.2.2.1 does not present the basis or appropriate references for the atmospheric dispersion and deposition parameter values used in calculating offsite doses from gaseous effluents. The staff noted that this information had been previously included in Revision 3, but has now been removed in Revision 4. Accordingly, revise DCD Tier 2, Section 12.2.2.1 to include this information either in this section of the DCD or in DCD Tier 2, Table 12.2-15 where the values are given for the atmospheric dispersion and deposition parameters.

RAI Number	Reviewer	Question Summary	Full Text
12.2-26	Dehmel, J	DCD Tier 2, Revision 4, Table 12.2-15 lists an inconsistent conversion factor in determining the annual I-133 release rate for a given concentration in primary coolant.	DCD Tier 2, Revision 4, Table 12.2-15 lists an inconsistent conversion factor in determining the annual I-133 release rate for a given concentration in primary coolant. The factor for I-133 is expressed in term of I-131 concentration in primary coolant when it should be in term of I-133. The correct citation of the conversion factor should read instead as: 0.22 Ci/yr per µCi/g of I-133 in coolant. Revise this entry in DCD Tier 2, Table 12.2-15 accordingly.
12.3-13	Hinson, C	In DCD Tier 2, Revision 4, Section 12.2.1.4, reinsert the deleted paragraph and relocate the new paragraph to the appropriate section of the DCD.	In DCD Tier 2, Revision 4, it is not clear why the opening paragraph to Section 12.2.1.4 was deleted since it describes the material addressed in Section 12.2.1.4 and is consistent with the opening paragraph for Section 12.2.1.3. Reinsert the deleted opening paragraph (beginning with "This section provides a summation…"). It is also unclear why the new paragraph, which describes the use of a sealant and a tank cubicle steel liner to prevent water releases to the environment, was added to Section 12.2.1.4, which describes radwaste building source terms. Provide justification as to why the added paragraph should not be inserted in another section of the DCD which describes building design features to minimize dose/leakage, such as Section 12.3 and/or Section 12.6.
12.4-24 S01	Hinson, C	In DCD Tier 2, Revision 4, 12.3 a) Add the ALARA design features described in response to RAI 12.4-24 to Section 12.3.1.4.1 and 12.3.1.4.2 of the DCD. b) Add a new COL item in Section 12.3	The following RAI, which contains two separate parts, is based on the applicant's response to the staff's RAI 12.4-24 concerning the location and associated dose rates of the filtration units for the Reactor Building, Fuel Building, and Radwaste Building. a) In DCD Tier 2, Rev. 4, references to figures and tables were added to Sections 12.3.1.4.1 and 12.3.1.4.2 in response to RAI 12.4-24 concerning maximum dose rates from filtration units in the Reactor and Fuel Buildings. In the response to RAI 12.4-24, the applicant listed several ALARA design features and provisions associated with these filtration units to ensure that radiation exposures resulting from maintenance of these systems are ALARA. Modify the text in Sections 12.3.1.4.1 and 12.3.1.4.2 to include a listing of those ALARA design features

RAI Number	Reviewer	Question Summary	Full Text
		to have the COL applicant describe the location and dose rates of the filtration units in the Radwaste Building.	(specifically the ALARA features described by the third and fourth bullets) which are not currently described in these sections. b) In the applicant's response to RAI 12.4-24, the applicant stated that information concerning the location of and the maximum dose rates from the filtration units (radwaste stream demineralizers) in the Radwaste Building would be available at a later stage of the project because these demineralizers will be included in the skid mounted station. Describe the COL applicant's responsibility to address the staff's concern with respect to the location of and the maximum dose rates from the filtration units in the Radwaste Building when this information becomes available.
12.4-34	Hinson, C	In the footnotes to Tables 12.3-2 and 12.3-5, describe what is meant by auxiliary units.	In DCD Tier 2, Revision 4, Tables 12.3-2 and 12.3-5, describe what is meant by the footnotes which state that some of the listed area radiation monitors utilize auxiliary units.
12.5-9	Hinson, C	In Section 12.4.6, justify the Revision 4 change in reactor water cleanup percentage from 2% to 1%.	In DCD Tier 2, Revision 4, Section 12.4.6, justify your reasoning for changing the percentage cleanup of the reactor water cleanup program from 2% to 1% (in line 6 of the second paragraph). Your justification for making this change, as listed in the Revision 3 to Revision 4 change table, was to be consistent with Table 11.1-3. However, Table 11.1-3 lists the fraction of radio-nuclides in steam treated by the condensate demineralizer as being as 100% (fraction of 1), not 1% as shown in the Revision 4 version of Section 12.4.6.
12.7-4	Hinson, C	Identify those areas where epoxy-type coatings will be used and where steel liners will be used.	In DCD Tier 2, Revision 4, Section 12.6.1, the sixth bullet states that "provisions will be made for epoxy-type wall and floor coverings". In DCD Tier 2, Revision 4, Section 12.2.1.4 states that, in the Radwaste Building, "The tank cubicle concrete is provided with a sealant and a tank cubicle steel liner". Justify this apparent discrepancy and provide a listing of areas where epoxy-type wall and floor coverings will be used and areas where steel liners will be used.

RAI Number	Reviewer	Question Summary	Full Text
12.7-5	Hinson, C	In the appropriate sections of the DCD Tier 2, Revision 4, address how the applicant will comply with the requirements of 10 CFR 20.1406.	10 CFR 20.1406(b) requires license applications falling within its scope to describe "how facility design will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste. Minimizing the generation of radioactive waste during operations is explicitly contemplated by the regulatory text. Although the description required by § 20.1406(b) comes at the application stage, the description pertains to facility design. In response to RAI No. 12.7-1 (dated May 4, 2007), the applicant has described in DCD Tier 2 subsections of Chapters 11 and 12 in general terms how the ESBWR design would minimize the contamination of the facility and the environment. The other specific design reference included in the applicant's response to this RAI is in DCD Tier 2 Subsection 3.8.4 referring to the spent fuel pool leak detection system and concrete block wall construction. In addition, numerous plant systems contain, collect, transfer, and filter radioactive liquids and gases as part of their basic design function for the ESBWR. While it is recognized that the information presented in DCD Tier 2, Revision 4, Section 12.6, in part, identifies design features that would minimize the contamination of the facility and environment, the descriptions do not address plant systems beyond those described in DCD Tier 2, Chapters 11 and 12, do not address design features that are unique to system designs or their locations in the plant warranting more technical details, and do not identify those that should be addressed as COL action items. At a minimum, describe in DCD Tier 2 for the systems listed below, and any other systems that may generate radioactive waste, design features used to minimize the contamination of the facility and environment (to the extent practicable) to facilitate eventual decommissioning, and minimize to the extent practicable the generation of radioactive waste: Nuclear Steam Supply Isolation Condenser System Fuel Storage and Handling Condensate Storage and Transfer System Process Sampling System

RAI Number	Reviewer	Question Summary	Full Text
			Equipment, Floor, Chemical, and Detergent Drain Systems Standby Liquid Control System Building heating, ventilating and air conditioning systems used to process radioactive process and effluent streams Turbine Main Steam System Other Features of Steam and Power Conversion System Revise and update the appropriate DCD subsections accordingly. Include a reference to each of the DCD subsections modified in response to this RAI in Chapter 12, Section 12.7.

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