

Enclosure 2 Contains Sensitive Proprietary Information

November 9, 2009

Mr. Jerald G. Head
Senior Vice President, Regulatory Affairs
GE Hitachi Nuclear Energy
3901 Castle Hayne Road MC A-18
Wilmington, NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 391 RELATED TO
DESIGN CONTROL DOCUMENT (DCD) REVISION 6

Dear Mr. Head:

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.

Pursuant to 10 CFR 2.390, we have determined that the enclosed RAIs contain proprietary information. We have prepared a non-proprietary version of the RAIs (Enclosure 1) that does not contain proprietary information. The proprietary information is indicated in brackets and underlined in Enclosure 2. We will delay placing this document in the public document room for a period of ten (10) working days from the date of this letter to provide you with the opportunity to comment on the proprietary aspects only. If you believe that any additional information in the enclosure is proprietary, please identify such information line by line and define the basis pursuant to the criteria of 10 CFR 2.390 before the public release date.

Enclosure 2 Contains Sensitive Proprietary Information

J. Head

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If you have any questions or comments concerning this matter, you may contact me at 301-415-6256 or Dennis.Galvin@nrc.gov or you may contact Amy Cabbage at 301-415-2875 or Amy.Cabbage@nrc.gov.

Sincerely,

/RA/

Dennis Galvin, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure:

1. Request for Additional Information (Non-Proprietary)
2. Request for Additional Information (Proprietary)

cc: See next page (w/o enclosure 2)

J. Head

- 2 -

If you have any questions or comments concerning this matter, you may contact me at 301-415-6256 or Dennis.Galvin@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or Amy.Cubbage@nrc.gov.

Sincerely,

/RA/

Dennis Galvin, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

- Enclosure: 1. Request for Additional Information (Non-Proprietary)
 2. Request for Additional Information (Proprietary)

cc: See next page (w/o enclosure 2)

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NRO-002

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**Requests for Additional Information (RAIs):
ESBWR Design Control Document (DCD) Revision 6**

RAI Number	Reviewer	Question Summary	Full Text
8.3-67	Pal A	Address the use of underground cables or cables in a wetted environment	DCD Section 8.3.3.2 does not address the use of underground cables or cables in a wetted environment. Operating experience has shown that cross-linked polyethylene (XLPE) or high-molecular-weight polyethylene insulation materials are most susceptible to water tree formation. Cable failures have a variety of causes: manufacturing defects, damaged caused by shipping and installation and exposure to electrical transients or abnormal environmental conditions during operation. Electrical cables in nuclear power plants are usually located in dry environments, but some cables are exposed to moisture from condensation and wetting in inaccessible locations such as buried conduits, cable trenches, cable troughs, above ground and underground duct banks, underground vaults, and direct buried installations. Since underground cables are susceptible to moisture, identify the cables that are inaccessible or routed underground that support equipment and other systems that are within the scope of 10 CFR 50.65 (the Maintenance Rule). Indicate whether there are any plans to implement a program for inaccessible or underground power, control, and instrumentation cables for testing and inspection in accordance with Generic Letter 2007-01; and indicate the frequency for such testing and inspection or provide justification for not developing such program.
9.1-144	Xu J	ASME Service Level D load combination should include accident temperature effect.	LTR NEDE-33373P, rev. 3 states that the load combinations shall be per Appendix D to SRP 3.8.4 and the stress limits shall be in accordance with ASME B&PV Code, Section III, Division I, Subsection NF and Appendix F corresponding to the design by analysis for Class 3 plate and shell type supports. []

RAI Number	Reviewer	Question Summary	Full Text
			II
9.1-145	Xu J	Provide an evaluation of rack plates subjected to compressive loads induced during Service Level D load combination against buckling limits per F-1331.5 (a) of Appendix F to ASME B&PV Code, Section III, Division I.	<p>Section 1.4.7 of NEDE-33373P, rev. 3 provides that the stress limits for Service Level D were based on F-1332 of Appendix F to ASME B&PV Code, Section III, Division I, and provides the stress limits for various stress conditions except for compressions. Requirements for compressive stresses are provided under F-1332.5 which then refers to the rules of F-1331.5 (a). Without an evaluation of the racks subject to compressive stresses in accordance with the rules of F-1331.5 (a), the staff considers the applicant's Service Level D analysis is incomplete.</p> <p>The staff requests that the applicant provide an evaluation of rack plates subjected to compressive loads induced during the Service Level D load combination against buckling limits per F-1331.5 (a) of Appendix F to ASME B&PV Code, Section III, Division I.</p>
9.1-20 S05	Kelly G	Address the RTNSS C suppression pool cooling functions of FAPCS in the DCD.	<p>The design specifications provided in the ESBWR DCD, Tier 1 Table 2.6.2 and Tier 2 Table 9.1-8 appear to only pertain to the fuel and auxiliary pool cooling system (FAPCS) heat exchangers being able to remove 8.3 MW of heat from the suppression pool, while the probabilistic risk assessment (PRA) credits FAPCS with being able to remove approximately 34 MW of heat under accident conditions. In previous RAI responses, the applicant has indicated that MAAP runs have shown that if the differential temperature were high enough across the heat exchanger primary to secondary boundary and if the flow was sufficiently high on the secondary side, then 34 MW could be removed by a heat exchanger. While this is true mathematically, it does not assure that the heat exchanger physically can withstand the effects of such high temperatures (e.g., voiding, seal failure, water hammer, thermal expansion) or that the associated FAPCS pumps can handle the thermal effects (e.g., net positive suction head (NPSH) issues).</p>

RAI Number	Reviewer	Question Summary	Full Text
			<p>Provide a write up in the DCD (Chapter 9.1 and Chapter 19, Tier 2) that provides reasonable assurance that the FAPCS heat exchangers and pumps will be capable of removing the assumed heat load credited in the ESBWR PRA, NEDO-33201, Rev. 4. The writeup should address the 34 MW (and its associated MAAP runs) and the maximum temperatures (including differential temperature) calculated for the FAPCS heat exchanger. DCD Section 9.2 should also address how the 34 MW FAPCS heat load is handled by the FAPCS support systems. For example, the write-up should address revisions to DCD Table 9.2-3, "RCCWS Nominal Heat Loads," Table 9.2-5, "RCCWS Configuration by Mode," and Table 9.2-1, "PSWS Heat Loads." The Tier 1 PSWS interface requirements should be evaluated and modified as appropriate to be consistent with the changes made to DCD Section 9.2 in response to this RAI.</p>

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(Revised 10/01/2009)

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