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MFN 08-430
Supplement 1

Docket No. 52-010

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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: Revised Response to Portion of NRC Request for Additional Information Letter No. 124 Related to ESBWR Design Certification Application -- Passive Containment Cooling System (PCCS) -- RAI Number 3.8-117

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) revised response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) received from the NRC via Reference 1 (RAI 3.8-117).

Enclosure 1 contains the GEH response to NRC RAI 3.8-117 that was received from the NRC on January 14, 2008 via MFN 08-029 (NRC Letter 124) (Reference 1). The original response to this RAI was submitted on April 29, 2008 via MFN 08-430 (Reference 2).

If you have any questions or require additional information, please contact me.

Sincerely,

Richard E. Kingston

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Vice President, ESBWR Licensing

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NRO

References:

1. MFN 08-029, Letter from U.S. Nuclear Regulatory Commission to Mr. Robert E. Brown, Senior Vice President, Regulatory Affairs, GE-Hitachi Nuclear Energy Americas, LLC, *Request For Additional Information Letter No. 124 Related To ESBWR Design Certification Application*, dated January 14, 2008.

2. MFN 08-430 James C. Kinsey to the U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter Number 124 Related to ESBWR Design Certification Application – Passive Containment Cooling System -- RAI Number 3.8-117*, dated April 29, 2008

Enclosure:

1 Response to Portion of NRC Request for Additional Information Letter No. 124 Related to ESBWR Design Certification Application – Passive Containment Cooling System -- RAI Number 3.8-117

cc:	AE Cubbage	USNRC (with enclosures)
	RE Brown	GEH/Wilmington (with enclosures)
	GB Stramback	GEH/San Jose (with enclosures)
	DH Hinds	GEH/Wilmington (with enclosures)
	eDRF	0000-0082-3674 (RAI 3.8-117)

Enclosure 1

MFN 08-430
Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 124

Related to ESBWR Design Certification Application

Passive Containment Cooling System

RAI Numbers 3.8-117

NRC RAI 3.8-117

NRC Summary:

Provide a comprehensive description of Passive Containment cooling System (PCCS) in view of the rules for Class MC containment vessels in ASME Code Section III.

NRC Full Text:

DCD Revision 4, Section 3.8.2.1 has been revised to add the PCCS condensers as steel components of the concrete containment vessel. DCD Revision 4, Section 3.8.2.4.1.5 has also been added, to provide a description of the PCCS condensers. The fourth paragraph states "The PCCS condenser parts conform to the design requirements of Subarticles NE-3200 and NE-3300 of ASME Code, Section III, Subsection NE (Class MC). The PCCS condenser support is evaluated in accordance with the ASME Code, Section III, Subsection NF."

In order to complete its review, the staff requests the applicant to address the following:

a. ASME Code Section III, Subsection NE (Class MC), Subarticle NE-1120 states "Only containment vessels and their appurtenances shall be classified as Class MC. Piping, pumps, and valves which are part of the containment system (NE-1130) or which penetrate or are attached to the containment vessel shall be classified as Class 1 or 2 by the Design Specification and meet the requirements of the applicable Subsection." It appears to the staff that the PCCS condensers and the piping between the condensers and the drywell would be more appropriately classified as Class 1 or Class 2. These sections of the ASME Code (NB- 3200 and 3300 or NC-3200 and 3300) provide design and analysis procedures that the staff considers more applicable to piping and components. Explain the exact meaning of the statement "The PCCS condenser parts conform to the design requirements of Subarticles NE-3200 and NE-3300 of ASME Code, Section III, Subsection NE (Class MC)." Were the condensers and piping initially designed to NE, NB, or NC? If NB or NC, were any design modifications necessary to conform with NE? If NE, would any design modifications be necessary to conform with NB or NC?

b. The PCCS condensers are designated as part of the containment pressure boundary. This appears to be a unique application of condensers. In order to develop reasonable assurance that the containment has been adequately designed, the staff requests the applicant to provide a comprehensive description of the condenser and connecting piping. The description should include details and figures showing the individual parts of the condenser and how they are connected; dimensions; materials; the piping and pipe supports between the containment top slab and condenser; and the supporting elements from the condenser to the top slab and lateral supports to the pool walls.

c. Since the PCCS condensers and piping are part of the containment pressure boundary, include in the DCD a description of the analysis and design evaluation (including results) comparable to the information provided for other steel components of containment.

d. Provide a detailed description of how the preoperational pressure tests will be performed for the PCCS condenser and associated piping in accordance with the requirements of the applicable subsection of ASME Code Section III, including discussion of the provisions of the Code where it is not obvious the Code provisions can be met. As an example, how is examination for leakage accomplished after application of test pressure?

e. Provide a detailed description of how the preservice and inservice inspection requirements of ASME Code Section XI, Subsection IWE, will be effectively implemented for the PCCS condensers and associated piping. The staff notes that the IWE requirements are applicable primarily to accessible shell type structures.

GEH Response

a. The statement "The PCCS condenser parts conform to the design requirements of Subarticles NE-3200 and NE-3300 of ASME Code, Section III, Subsection NE (Class MC)" means that the PCCS components above the drywell are classified as part of the containment boundary.

   Previous revisions of the DCD have indicated these were Class 2 components (Subsection NC), but it has always been GEH's intention that these components function as part of the containment boundary. No design modifications are necessary to conform with Subsection NE other than to perform the appropriate analyses described in the other parts of this RAI.

b. The PCCS Condensers are described in DCD Tier 2 Subsection 6.2.2. Two figures showing the PCCS Condenser and supports will be added in DCD Tier 2 Appendix 3G for details of the overall configuration including individual components and their supports, key dimensions and associated materials. DCD Tier 2 Figure 3.8-7 shows typical detail for the PCCS passages through the RCCV Top Slab.

c. A finite-element analysis model supplemented with hand calculation is used to determine the stresses in the different components of the PCCS Condenser and supports. A description of the analysis and main results for the PCCS Condenser and supports is included in DCD Tier 2 Appendix 3G.

d. The preoperational pressure tests of the PCCS Condensers shall be done in accordance with ASME Section III Article NE-6000. The specific testing procedure will be developed as part of the detailed design, and there do not appear to be any parts of the Code that cannot obviously be met. The PCCS Condensers can remain open to the containment during the ILRT, or can be flanged off and tested

independently as described in DCD Tier 2 Subsection 6.2.2.4. All joints and connections in the PCCS Condensers are accessible for examination of leakage during the test.

e. The preservice and inservice inspections of the PCCS Condensers shall be done in accordance with ASME Section XI Article IWE-6000. The specific inspection procedure will be developed as part of the detailed design, and there do not appear to be any parts of the Code for which the PCCS will require any special treatment.

GEH Revised Response

GEH has prepared to following correction to part e of the above response. All other parts remain as-is.

e. The preservice and inservice inspections of the PCCS Condensers shall ~~be done in accordance with~~conform to all portions of ASME Section XI ~~Article~~ Subsection IWE-~~6000~~. The specific inspection procedure will be developed as part of the detailed design, and there do not appear to be any parts of the Code for which the PCCS will require any special treatment.

DCD Impact

No DCD changes will be made in response to this revised response.