GE Hitachi Nuclear Energy

James C. Kinsey
Vice President, ESBWR Licensing

PO Box 780 M/C A-55
Wilmington, NC 28402-0780
USA

T 910 675 5057
F 910 362 5057
jim.kinsey@ge.com

MFN 08-086, Supplement 35

Docket No. 52-010

April 25, 2008

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

Subject: **Response to Portion of NRC Request for Additional Information Letter No. 126 Related to ESBWR Design Certification Application RAI Number 14.3-387**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) Response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC letter dated December 20, 2007 (Reference 1).

Enclosure 1 contains the GEH response to RAI Number 14.3-387. The enclosed changes will be incorporated in the upcoming DCD Revision 5 submittal.

Verified DCD changes associated with this RAI response are identified in the enclosed DCD markups by enclosing the text within a black box. The marked-up pages may contain unverified changes in addition to the verified changes resulting from this RAI response. Other changes shown in the markups may not be fully developed and approved for inclusion in DCD Revision 5.

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

Sincerely,

James C. Kinsey
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 07-718, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 126 Related To ESBWR Design Certification Application*, December 20, 2007.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 126 Related to ESBWR Design Certification Application – RAI Number 14.3-387.

cc:

AE Cubbage	USNRC (with enclosure)
GB Stramback	GEH/San Jose (with enclosure)
RE Brown	GEH/Wilmington (with enclosure)
DH Hinds	GEH/Wilmington (with enclosure)
eDRF	0000-0080-4821 – RAI 14.3-387

MFN 08-086, Supplement 35

Enclosure 1

Response to Portion of NRC Request for Additional Information Letter No. 126 Related to ESBWR Design Certification Application

RAI Numbers 14.3-387

VERIFIED DCD CHANGES ASSOCIATED WITH THIS RAI RESPONSE ARE IDENTIFIED IN THE ENCLOSED DCD MARKUPS BY ENCLOSING THE TEXT WITHIN A BLACK BOX. THE MARKED-UP PAGES MAY CONTAIN UNVERIFIED CHANGES IN ADDITION TO THE VERIFIED CHANGES RESULTING FROM THIS RAI RESPONSE. OTHER CHANGES SHOWN IN THE MARKUP(S) MAY NOT BE FULLY DEVELOPED AND APPROVED FOR INCLUSION IN DCD REVISION 5.

NRC RAI 14.3-387

NRC Summary:
Reactor building HVAC seismic qualification

NRC Full Text:
For ITAAC Table 2.16.2-2, Item 3b, the staff requests that the applicant clarify or clearly identify that in the ITA the "testing or analyzed conditions bound the design requirements" so that the AC as written is applicable (i.e., the AC acceptance criteria is to the tested or analyzed condition but there is no correlation or requirement for the tested or analyzed condition to bound the seismic Category I design requirements for the system).

GEH RESPONSE

DCD Tier 1 Tables 2.16.2-2, 2.16.2-4, 2.16.2-6 and 2.16.2-9 have been marked-up to verify that the testing and analyzed conditions bound the design requirements.

DCD IMPACT

DCD Tier 1 will be revised as shown in the attached mark-ups.

Table 2.16.2-2

ITAAC For The Reactor Building HVAC

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the RBVS is as described in Subsection 2.16.2.1 and is as shown in Figures 2.16.2-1, 2.16.2-2 and 2.16.2-3.	Inspections of the RBVS configuration will be conducted.	Inspection report(s) document that the as-built RBVS conforms to the description in Subsection 2.16.2.1 and is as shown in Figures 2.16.2-1, 2.16.2-2 and 2.16.2-3.
2. The RBVS isolation dampers automatically close upon receipt of a high radiation signal or loss of AC power.	Testing of the RBVS isolation dampers will be performed using simulated signals to close the RBVS isolation dampers.	Test report(s) document that upon receipt of a simulated high radiation signal or a simulated loss of AC power signal, the as-built RBVS isolation dampers automatically close.
3. The safety-related components identified in Table 2.16.2-1 can withstand Seismic Category I loads without loss of safety-related function.	a) Type tests, analyses, or a combination of type tests and analyses of Seismic Category I equipment will be performed using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b) Inspection and analyses will be performed ~~for the existence of a report verifying~~to verify that the as-built ~~equipment~~ components identified in Table 2.16.2-1, including anchorage, ~~is~~ are ~~seismically~~ bounded by the testing or analyzed conditions.	a) A report exists and concludes that the ~~equipment~~ components identified in Table 2.16.2-1 can withstand ~~seismic~~ design basis loads without loss of safety-related function. b) A report exists and ~~concluded~~ concludes that the as-built ~~equipment~~ components identified in Table 2.16.2-1, including anchorage have been tested or analyzed under the conditions necessary to ensure compliance with Seismic Category I design requirements.~~, conforms to tested or analyzed conditions necessary to ensure functioning following a SSE.~~

Table 2.16.2-4

ITAAC For The Control Building Habitability HVAC Subsystem

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3. The safety-related components identified in Table 2.16.2-3 can withstand Seismic Category I loads without loss of safety-related function.	a. Type tests, analyses, or a combination of type tests and analyses of safety-related Seismic Category I equipment will be performed using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. Inspection and analyses will be performed ~~for the existence of a report verifying~~to verify that the as-built ~~equipment~~ components identified in Table 2.16.2-3, including anchorage, ~~is~~ are ~~seismically~~ bounded by the testing or analyzed conditions.	a) A report exists and concludes that the ~~equipment~~ component identified in Table 2.16.2-3 can withstand ~~seismic~~ design basis loads without loss of safety-related function. b) A report exists and concludes that the as-built ~~equipment~~ components identified in Table 2.16.2-3, including anchorage, ~~conforms to tested or analyzed conditions necessary to ensure functioning following a SSE~~have been tested or analyzed under the conditions necessary to ensure compliance with Seismic Category I design requirements.
4. The CRHAVS provides cooling to the CRHA. a) In the CRHA, temperature rise on a loss of normal cooling will not exceed 8.3°C (15°F) for 72 hours. b) The CRHA heat sink is maintained at or below 25.56°C (78°F).	a) The temperature rise in the CRHA will be analyzed. The internal heat loads will be verified to be less than that assumed in the analysis. b) The CRHA air temperature will be calculated and shown to be maintained at or below the maximum assumed initial air and heat sink temperature.	Analysis demonstrates that: a) In the CRHA, the temperature rise on a loss of normal cooling will not exceed 8.3°C (15°F) for 72 hours. b) The average ambient air temperature in the CRHA is calculated to be ≤ 25.56°C (78°F).

Table 2.16.2-6

ITAAC For Emergency Filter Units

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the EFU is as described in Subsection 2.16.2.3 and is as shown in Figure 2.16.2-4.	Inspections of the EFU configuration will be conducted.	Inspection report(s) document that the as-built EFU system conforms with the description in Subsection 2.16.2.3 and is as shown in Figure 2.16.2-4.
2. The selected redundant EFU dampers open upon receipt of a control room habitability envelope isolation signal.	Testing of the EFU dampers will be performed using simulated control room habitability envelope isolation signal to open the EFU dampers.	Test report(s) document that upon receipt of a simulated control room habitability envelope isolation signal, the as-built EFU dampers automatically open.
3. The safety-related EFU components identified in Table 2.16.2-5 can withstand Seismic Category I loads without loss of safety-related function.	a) Type tests, analyses, or a combination of type tests and analyses of safety-related Seismic Category I equipment will be performed using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b) Inspection and analyses will be performed ~~for the existence of a report verifying~~ to verify that the as-built ~~equipment~~ components identified in Table 2.16.2-5, including anchorage, ~~is~~ are ~~seismically~~ bounded by the testing or analyzed conditions.	a) A report exists and concludes that the ~~equipment~~ components identified in Table 2.16.2-5 can withstand ~~seismic~~ design basis loads without loss of safety-related function. b) A report exists and ~~concluded~~ concludes that the as-built ~~equipment~~ components identified in Table 2.16.2-5, including anchorage~~, conforms to tested or analyzed conditions necessary to ensure functioning following a SSE~~ have been tested or analyzed under the conditions necessary to ensure compliance with Seismic Category I design requirements.

Table 2.16.2-9

ITAAC For The Fuel Building HVAC

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the FBVS is as described in Subsection 2.16.2.5 and is as shown in Figures 2.16.2-7 and 2.16.2-8.	Inspections of the Fuel Building HVAC configuration will be conducted.	Inspection report(s) document that the as-built FBVS system conforms to the description in Subsection 2.16.2.5 and is as shown in Figures 2.16.2-7 and 2.16.2-8.
2. The Fuel Building HVAC isolation dampers automatically close upon receipt of a high radiation signal.	Using a simulated high radiation signal, tests will be performed on the (Fuel Building HVAC isolation dampers) isolation logic.	Upon receipt of a simulated high radiation signal, the Fuel Building HVAC isolation dampers automatically close.
3. The safety-related components identified in Table 2.16.2-8 can withstand Seismic Category I loads without loss of safety-related function.	a) Type tests, analyses, or a combination of type tests and analyses of safety-related Seismic Category I equipment will be performed using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b) Inspection and analyses will be performed ~~for the existence of a report verifying~~ to verify that the as-built ~~equipment~~ components identified in Table 2.16.2-8, including anchorage, ~~is~~ are ~~seismically~~ bounded by the testing or analyzed conditions.	a) A report exists and concludes that the ~~equipment~~ components identified in Table 2.16.2-8 can withstand ~~seismic~~ design basis loads events without loss of safety-related function. b) A report exists and ~~concluded~~ concludes that the as-built FBVS ~~equipment~~components, including anchorage~~, conforms to tested or analyzed conditions necessary to ensure functioning following a SSE~~ have been tested or analyzed under the conditions necessary to ensure compliance with Seismic Category I design requirements.