GE-Hitachi Nuclear Energy Americas LLC

James C. Kinsey
Project Manager, 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 07-013 Supplement 3

Docket No. 52-010

August 13, 2007

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. 40 Related to ESBWR Design Certification Application ESBWR Probabilistic Risk Assessment RAI Numbers 19.2-7 S01 and 19.2-25 S01.**

The purpose of this letter is to submit the GE-Hitachi Nuclear Energy Americas LLC (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC letter dated July 5, 2006 and responded to on January 10, 2007. GEH response to RAI Number RAI Numbers 19.2-07S01 and 19.2-25S01 is addressed in the Enclosure.

Should you have any questions about the information provided here, please contact me.

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

D068

NRO

References:

1. MFN 06-222, Letter from U.S. Nuclear Regulatory Commission to David Hinds, Request for Additional Information Letter No. 40 Related to ESBWR Design Certification Application, July 5, 2006.

2. MFN 07-013. Response to Portion of NRC Request for Additional Information Letter No. 43 Related to ESBWR Design Certification Application - ESBWR Probabilistic Risk Assessment - RAI Numbers 19.1-11, 19.1-12, 19.1-19, 19.2-7, 19.2-25, 19.2-32, and 19.2-36. January 10, 2007.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 40 Related to ESBWR Design Certification Application ESBWR Probabilistic Risk Assessment RAI Numbers 19.2-7S03 and 19.2-25S01.

cc:	AE Cubbage	USNRC (with enclosure)
	GB Stramback	GEH/San Jose (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	eDRF Section	0000-0072-2644
		0000-0072-8906

Enclosure 1 of MFN 07-013 Supplement 3

Response to Portion of NRC Request for Additional Information Letter No. 40 Related to ESBWR Design Certification Application ESBWR Probabilistic Risk Assessment RAI Numbers 19.2-7 S01 and 19.2-25 S01

NRC RAI 19.2-7 S01

Received by e-mail from T. Kevern.

The probability of vacuum breaker failure can be characterized as the probability of failure on the initial demand (due to failure modes such as maintenance errors, corrosion, embrittlement) plus the probability of failure on a subsequent demand (due to repeated cycling). Based on the response to RAI 19.2-7, the probability of vacuum breaker failure used in the ESBWR PRA (1.0E-4/demand) does not account for these various potential failure modes. The value is low relative to that used in the SBWR PRA (3E-4/demand based on Bayesian analysis of 3000 cycles without a failure), and could be much higher if the probability of failure on the initial demand and on the subsequent demands were explicitly treated (e.g., considering multiple cycles alone, the failure probability would be about 0.01 to 0.001.) Provide additional justification for the probability value. Explicitly consider the potential impact of maintenance errors, corrosion, and embrittlement, as well as the impact of repeated cycling. Consider any operating experience with valves similar to the ESBWR vacuum breaker design

GEH Response

The SBWR vacuum breaker prototype test did in fact account for embrittlement and corrosion with artificial aging processes as described on pages 6 and 7 of "MFN-155-94 – Vacuum Breaker Test Report". This report was provided to the NRC in December 1994 as part of the response to SBWR RAI 900.62. Additionally, maintenance errors regarding the primary vacuum breakers are not considered a credible failure mode because DW to WW pressure differential is continuously monitored and leaks are isolated as necessary with back-up valves. The 1E-4 number is based on an update of the generic value of 1.25E-5/N due to a 24-month test interval instead of the generic 3 months (increased by a factor of 8). According to the response for RAI 19.2-7, the maximum number of anticipated vacuum breaker cycles is 23, which would lead to a maximum failure probability of 1E-4+(22*1.25E-5) = 3.75E-4. A sensitivity to assess the impact of increased numbers of cycles on the primary vacuum breakers and their associated back-up valves will be performed and documented in Section 11 of NEDO-33201.

DCD/NEDO-33201 Impact

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

Section 11 of NEDO-33201, Rev 2 will be revised as described in the above response.

NRC RAI 19.2-25 S01

Received by e-mail from T. Kevern.

Based on the response to RAI 19.2-25, it appears that the detailed design of the LDW sumps and the specially-shaped piping jacket protecting the sumps, as well as the BiMAC piping configuration, remain to be completed. Describe the following: (a) the schedule for completing the detailed design of the BiMAC piping, (b) the respective responsibilities of the vendor and, if applicable, the COL applicant for completing the design, (c) any COL action items related to completion of the design, and (d) any ITAAC related to construction/verification of the BiMAC system.

GEH Response

The detailed design will be completed 6 months after completion of BiMAC testing. There will be no COL applicant responsibilities, because the detailed design will be incorporated into DCD Tier 2 Chapter 6. ITAAC items will be added to verify the constructed BiMAC meets the required configuration to perform as intended.

BiMAC test results will be submitted in September 2007 in NEDO-33201 Section 21 as previously discussed in the response to RAI 19.2-23S01 (MFN 06-313, Supplement 5), dated May 17, 2007.

DCD/NEDO-33201 Impact

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

No changes will be made to NEDO-33201 as a result of this RAI.