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MFN 06-059, Supplement 1

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U.S. Nuclear Regulatory Commission  
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**Subject: Response to Portion of NRC Request for Additional Information Letter No.  
3 Related to ESBWR Design Certification Application ESBWR  
Probabilistic Risk Assessment RAI Number 19.0.0-3 S01**

The purpose of this letter is to supplement 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 December 8, 2005 and responded to on February 16, 2007. This letter provides further discussion as requested by an NRC email. The GEH response to RAI Number 19.0.0-3 is addressed in the Enclosure.

Should you have any questions about the information provided here, please contact me at 910-675-5057 or at jim.kinsey@ge.com.

Sincerely,



James C. Kinsey  
Project Manager, ESBWR Licensing

References:

1. MFN 05-156, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 3 for the ESBWR Design Certification Application*. December 8, 2005.
2. MFN 06-059, Letter from David H. Hinds to U.S. Nuclear Regulatory Commission, Response to NRC Request for Additional Information Letter No. 3 for the ESBWR Design Certification Application – PRA – RAI Numbers 19.0.0-2, 19.0.0-3, 19.1.0-3 (Partial Response). February 16, 2006.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 3 Related to ESBWR Design Certification Application ESBWR Probabilistic Risk Assessment RAI Number 19.0.0-3S01.

cc:	AE Cubbage	USNRC (with enclosure)
	GB Stramback	GEH/San Jose (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	eDRF Section:	0000-0072-5374

**Enclosure 1 of MFN 06-059 Supplement 1**

**Response to Portion of NRC Request for  
Additional Information Letter No. 3 Related to  
ESBWR Design Certification Application  
ESBWR Probabilistic Risk Assessment  
RAI Number 19.0.0-3 S01**

**NRC RAI # 19.0.0-3 S01**

*PRA Table 7.2-5, as modified in response to RAI 19.0.0-3, and Table A.8-1 provide only a qualitative description of the LDW water level, and not the computed water level. Provide the computed water level in the LDW at the time of reactor vessel breach for those sequences where supporting MAAP analyses are available, and for the MAAP cases discussed in PRA Section 8.3.2. Address the impact of the non-safety containment spray system, since the spray system may be operated after the operators have entered the severe accident guidelines, provided the water level in the LDW is less than 0.7m.*

**GEH Response**

The core damage sequences that have available supporting MAAP analyses are described in NEDO-33201 Sections 8 and 9, Revision 2. Graphs of LDW water levels for these sequences are included in Appendices 8.B and 9.A, Revision 2. The following table provides the computed water level in the LDW at the time of reactor vessel breach for the MAAP cases discussed in PRA Section 8.3.2.

<b>Results of Severe Accident Sequence Analysis – LDW Levels</b>			
<b>Sequence Descriptor</b>	<b>Onset of Core Damage (hours)*</b>	<b>RPV Failure (hours)</b>	<b>LDW Level at Rx Vessel Breach (meters)</b>
T_nIN_TSL_R1	0.8	7.8	0.3375
T_nIN_nCHR_FR_R1	0.9	7.7	0.3189
MLi_nCHR_R1	>72	>72	18.9 @ 72 hrs
T_nDP_nIN_TSL_R1	1.4	6.2	0.0238
T_nDP_nIN_nCHR_FR_R1	1.4	6.7	0.0271
T_AT_nIN_TSL_R1	0.3	5.7	0.2045
T_AT_nIN_nCHR_FR_R1	0.3	5.8	0.2382
<b>Key:</b> MLi: Medium Liquid break (injection line) T: Transient T_AT: Transient without negative reactivity insertion nCHR: No containment heat removal nDP: No depressurization nIN: No injection FR: Filtered release (controlled vent) TSL: Technical Specification Leakage NA: Not Applicable *Time of peak clad temperature > 2200°F (1478°K)			

The severe accident guidelines for the ESBWR have not been developed at this time. The ESBWR containment design includes the BiMAC and deluge system; therefore, it is assumed that the sprays will not be operated unless either core coverage is assured or after the reactor vessel is breached. This assumption will be included in the development of the severe accident guidelines for the ESBWR. The severe accident guidelines for the ESBWR will be developed in accordance with the Human Factors Engineering process.

**DCD/NEDO-33201 Impact**

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

NEDO-33201, Rev 2 will be revised to include graphs in Appendices 8.B and 9.A as described above.