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 06-226
Supplement 2

Docket No. 52-010

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

Subject: **Response to Portion of NRC Request for Additional Information Letter No. 32 – Hydrological Engineering – RAI Number 2.4-3 S01**

Enclosure 1 contains GEH's supplemental response to the subject NRC RAI transmitted via the Reference 1 letter. This supplemental response provides confirmatory information as discussed in the May 9, 2007, telecon between GEH and NRC. The original RAI response was submitted to the NRC in Reference 2.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

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NRO

Reference:

1. MFN 06-174, Letter from U.S. Nuclear Regulatory Commission to David H. Hinds, *Request for Additional Information Letter No. 32 Related to the ESBWR Design Certification Application*, June 6, 2006.
2. MFN 06-226, Letter from GE to U.S. Nuclear Regulatory Commission, *Response to NRC Request for Additional Information Letter No. 32 Related to ESBWR Design Certification Application – Hydrological Engineering – RAI Numbers 2.4-3 through 2.4-31*, July 31, 2006.

Enclosure:

1. MFN 06-226, Supplement 2 – Response to Portion of NRC Request for Additional Information Letter No. 32 – RAI Number 2.4-3 S01.

cc: AE Cubbage USNRC (with enclosure)
BE Brown GEH/Wilmington (with enclosure)
LE Fennern GEH/San Jose (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
eDRF: 0000-0068-4721

Enclosure 1

MFN 06-226
Supplement 2

Response to Portion of NRC RAI Letter No. 32
Related to ESBWR Design Certification Application

Hydrological Engineering

RAI Number 2.4-3 S01

Original Response previously submitted under MFN 06-226 without DCD updates is included to provide historical continuity during review.

NRC RAI 2.4-3

ESBWR design control document (DCD) Tier 2, Table 2.0-1 and DCD Tier 1, Table 5.1-1 show the maximum ground water level at 0.61 m (2.0 ft) below grade and the probable maximum flood (PMF) to be at 0.3m (1.0 ft) below grade. Therefore, during incidences of flooding, the ground water level will exceed the maximum ground water level specified in the ESBWR DCD. The applicant should clarify that the maximum hydrostatic head of the groundwater has been used in their computation of lateral pressure and buoyancy effects in the subsequent analysis of foundations in DCD Tier 2, Section 3.8.5. It is also necessary to incorporate the highest groundwater level for leak tightness of all accesses and openings below grade.

GE Response

Design flood level and design ground water levels are provided in DCD Table 3.4-1 based on parameters from DCD Table 2.0-1. The design basis flood level is 0.3 m (1 ft) below plant grade, and the design groundwater level is 0.61 m (2 ft) below plant grade. They are also included in DCD Table 3G.1-2 for the foundation analysis.

Buoyancy effect takes into account the maximum flood level, 0.3 m (1 ft) below plant grade, for load combinations in DCD Appendix 3G, Subsections 3G.1.5.3, 3G.2.5.3 and 3G.3.5.3.

DCD Figures 3G.1-19 and 3G.2-10 in Appendix 3G show that the maximum hydrostatic head of the groundwater is considered for computation of lateral pressure.

See DCD Subsection 3.4.1.2, where the criteria for flood protection and leak tightness below flood and groundwater levels are provided, as well as the details for flood protection of Seismic Category I buildings.

DCD Impact

Markups of DCD Tier 2 Table 2.0-1 Item 2.4.10 and DCD Tier 2 Subsection 2.4.10 were provided in MFN 06-226.

NRC RAI 2.4-3, Supplement 1
GEH/NRC May 9, 2007 Telecon

NRC requested DCD1 & DCD2 be revised to provide a list (or a reference to that list if it already is presented in the DCD) of water-tight doors that would be challenged by site flooding. NRC also requested GEH provide a list of the doors to be an ITAAC item and for these doors to be verified under as-built conditions since the exterior stair towers could possibly be flooded and the lower doors could then see a hydraulic head of around 20 m (depth of embedment).

GEH Response

Watertight doors are called out in DCD Tier 2, Revision 3, Figures 1.2-1, 1.2-2 and 1.2-3. No stair tower doors are identified as being watertight. The stair towers are Seismic Category II; therefore, they are postulated not to collapse as a result of being subjected to external flooding. There are water-stops at all construction joints and waterproofing for all of the embedded portions of the building.

Since the Reactor Building, Fuel Building and Control Building and their dimensions are in ITAAC, the associated door openings and attachments within that geometry are part of it, and it is not deemed necessary to include them separately.

Table 2.4-3 (1) lists the location and type for watertight doors called out in DCD Tier 2, Revision 3, Figures 1.2-1, 1.2-2 and 1.2-3:

Table 2.4-3 (1) Watertight Door Information

GA Elevation	Location-Building[1]	Location-Room No./ Room No.		Type
-11500	RB	1100	1103	Single Door
-11500	RB	1102	1101	Single Door
-11500	RB	1130	1196	Single Door
-11500	RB	1140	1198	Single Door
-11500	RB/FB	1102	2100	Double Door
-7400	CB	3110	3100	Single Door
-7400	CB	3110	3100	Single Door
-7400	CB	3120	3101	Single Door
-7400	CB	3120	3101	Single Door
-7400	CB	3130	3101	Single Door
-7400	CB	3130	3101	Single Door
-7400	CB	3140	3100	Single Door
-7400	CB	3140	3100	Single Door
-2000	CB/AT	3190	9101	Single Door
-2000	CB/AT	3200	9101	Single Door
-1000	RB/AT	1311	9101	Single Door
-1000	RB/AT	1331	9101	Single Door

Note:
1. AT-Access Tunnel; CB-Control Building; FB-Fuel Building; RB-Reactor Building

Most of the watertight doors listed in Table 2.4-3 (1) are located inside the building to take care of the internal flooding possibility in certain rooms.

Since watertight doors are called out in DCD Tier 2, Revision 3, Figures 1.2-1, 1.2-2 and 1.2-3, no change to DCD Tier 1 is necessary.

DCD Impact

No DCD change is required in response to this RAI Supplement.