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MFN 06-264 Supplement 2

Docket No. 52-010

August 14, 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. 18 - Containment Systems - RAI Numbers 6.2-13 S01,
6.2-25 S01, and 6.2-30 S01**

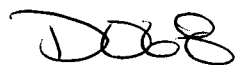
Enclosure 1 contains GEH's response to the subject NRC RAIs originally transmitted via the Reference 1 letter and supplemented by NRC requests for clarification.

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

Sincerely,



James C. Kinsey
Project Manager, ESBWR Licensing



Reference:

1. MFN 06-113, Letter from U.S. Nuclear Regulatory Commission to David Hines, *Request for Additional Information Letter No. 18 Related to ESBWR Design Certification Application*, April 24, 2006

Enclosure:

1. MFN 06-264 Supplement 2 - Response to Portion of NRC Request for Additional Information Letter No. 18 - Related to ESBWR Design Certification Application - Containment Systems - RAI Numbers 6.2-13 S01, 6.2-25 S01, and 6.2-30 S01

cc: AE Cubbage USNRC (with enclosures)
BE Brown GEH/Wilmington (with enclosures)
GB Stramback GEH/San Jose (with enclosures)
eDRF 0000-0069-7194

Enclosure 1

MFN 06-264 Supplement 2

Response to Portion of NRC Request for

Additional Information Letter No. 18

Related to ESBWR Design Certification Application

Containment Systems

RAI Number 6.2-13 S01, 6.2-25 S01, and 6.2-30 S01

NRC RAI 6.2-13 S01:

The information provided in this response is necessary to support the basis for a reasonable assurance finding. Thus, please update DCD, Tier 2, Section 6.2.1.2.3 to include information provided in response to RAI 6.2-13.

GEH Response:

Additional sentences will be inserted into DCD, Tier 2, Section 6.2.1.2.3, to include the information necessary to evaluate ESBWR containment subcompartment loads.

DCD Impact:

DCD, Tier 2, Subsection 6.2.1.2.3, will be revised as shown in the attached markup.

6.2.1.2.3 Design Evaluation

FWL or RWCU line break within the Reactor Shield Annulus are identified to be the accident with most severe consequences. Steady Mass and Energy releases from the postulated pipe breaks are based on the reactor operating condition prior to the break. It was assumed that the reactor is operating at full power and the containment is filled with dry air at atmospheric pressure and 100°C when the postulated pipe break occurs. The mass release rates are determined with Moody's Frictionless Critical Flow Model (Reference 6.2-5). The break locations have been selected to maximize the mass and energy release into the subcompartment. Since instantaneous double-end guillotine breaks were postulated for all pipe breaks, Leak-Before-Break was not used to limit the break area. The mass and energy release rates are held constant for the analyses. For a feedwater line break, the critical flux for is $9.389 \times 10^4 \text{ kg/(s} \cdot \text{m}^2)$ from either end of the guillotine break, and the mass release rate is 2629 kg/s from the RPV end and 6159 kg/s from the RSW end. Smaller flow from the RPV end due to flow restriction at sparger nozzles. For a RWCU line break, the critical flux for is $4.868 \times 10^4 \text{ kg/(s} \cdot \text{m}^2)$ for either end of the guillotine break, and the mass release rate is 3193 kg/s from either end. Analyzed with TRACG, the peak subcompartment pressure responses were found to be below the design pressure for all postulated pipe break accidents.

NRC RAI 6.2-25 S01:

In RAI 6.2-25 the staff requested for mass and energy release data for postulated pipe breaks. In GE's response, MFN 06-159, GE provided methodology used for calculating mass and energy release rates but not the release rate values. Please provide the release rate values and include them in DCD, Tier 2.

GEH Response:

Refer to the response to RAI 6.2-13 S01 for a description of the changes proposed to DCD Tier 2, Subsection 6.2.1.2.3, which also address this RAI.

DCD Impact:

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

NRC RAI 6.2-30 S01:

Please update DCD, Tier 2 to include information provided in response to RAI 6.2-30 that instantaneous guillotine break is postulated for feedwater and RWCU line breaks analyzed.

GEH Response:

Refer to the response to RAI 6.2-13 S01 for a description of the changes proposed to DCD Tier 2, Subsection 6.2.1.2.3, which also address this RAI.

DCD Impact:

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