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MFN 08-934

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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. 247 Related to ESBWR Design Certification Application - Containment Systems - RAI Number 6.2-197

Enclosure 1 contains the GE Hitachi Nuclear Energy (GEH) response to the subject NRC RAI transmitted via the Reference 1 letter.

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

Sincerely,

Charles W. Bagwell for

Richard E. Kingston
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 08-665, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 247 Related to ESBWR Design Certification Application*, August 22, 2008

Enclosure:

1. MFN 08-934 - Response to Portion of NRC Request for Additional Information Letter No. 247 Related to ESBWR Design Certification Application - Containment Systems - RAI Number 6.2-197

cc:	AE Cubbage	USNRC (with enclosure)
	DH Hinds	GEH/Wilmington (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	eDRF	0000-0092-0435

Enclosure 1

MFN 08-934

Response to Portion of NRC Request for Additional Information Letter No. 247 Related to ESBWR Design Certification Application

Containment Systems

RAI Number 6.2-197

NRC RAI 6.2-197:

In ESBWR DCD Tier 2, Rev. 05, Section 6.2.3.3, GEH appears to under predict the peak compartment pressure following a high energy line break. The pressure time history shown in DCD Figure 6.2-24 does not follow the mass and energy release data provided in DCD Figures 6.2-18a and 6.2-18c. The results of staff's calculations using COMPARE computer program show a pressure profile including a peak pressure at 30 s that resembles the mass and energy profiles of DCD Figures 6.2-18a and 6.2-18c. DCD Figure 6.2-24 shows pressure histories only for a period of 5 seconds, while mass and energy releases occur over 60 seconds.

A. *Provide a plot of Pressure vs. Time for up to 60 seconds for RWCU Line Break, Break Case 3 in NRHX & RHX Room B (Cell 6).*

B. *Explain why the compartment pressure decreases early (at about 0.5 s) while mass and energy flow rates continue at significantly high rates.*

C. *Explain the reason for spikes in the mass and energy flow rates at 30 seconds for Case 3.*

D. *Based on a teleconference held on September 11, 2008, GEH agreed to provide the information on the modeling of the door.*

GEH Response:

A. Pressure profile for the Reactor Water Cleanup (RWCU) Line Break, Break Case 3 in Non-Regenerative Heat Exchanger (NRHX) and Regenerative Heat Exchanger (RHX) Room B (Cell 6) is presented in Figure 6.2-197-1.

B. The early decrease in compartment pressure is a typical phenomenon for the compartment pressurization. This is due to the sudden discharge of sub-cooled water into the compartment, which is initially filled with dry air/non-saturated air. Subsequently, room pressure increases rapidly following the early pressure drop.

C. The break flow consists of two sources, one from the reactor pressure vessel (RPV) side and the other one from the feedwater (FW) side. The spike at 30 seconds is due to the mixture of liquid/steam discharging from the FW side, which is caused by the heatup in the regenerative heat exchanger.

D. Similar to the blowout panel, the door opens instantaneously once the pressure setpoint is reached. There is no time delay assumed on the opening of door/blowout panel. The blowout pressure setpoint is provided in DCD Tier 2, Table 6.2-12, Revision 5.

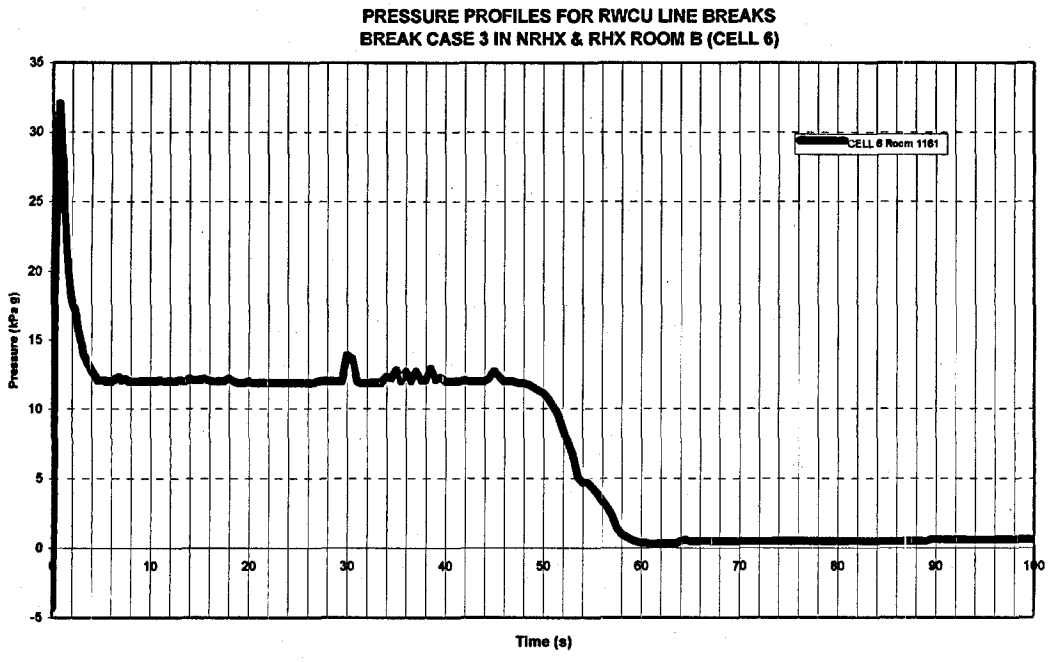

Figure 6.2-197-1. Pressure Profile for Case 3 in NRHX & RHX Room B (Cell 6)

DCD Impact:

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