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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 69 Related to ESBWR Design Certification Application – Safety Analyses – RAI Number 15.2-5**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC letter dated October 11, 2006. GEH response to RAI Number 15.2-5 is addressed in Enclosure 1.

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

Sincerely,

James C. Kinsey

James C. Kinsey
Vice President, ESBWR Licensing

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NRO

Reference:

1. MFN 06-381, Letter from U.S. Nuclear Regulatory Commission to David H. Hinds, GEH, *Request For Additional Information Letter No. 69 Related To ESBWR Design Certification Application*, dated October 11, 2006.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 69 Related to ESBWR Design Certification Application - Safety Analyses – RAI Number 15.2-5

cc:	AE Cubbage	USNRC (with enclosure)
	GB Stramback	GEH/San Jose (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	eDRF	0000-0076-3815

Enclosure 1

MFN 07-642

Response to Portion of NRC Request for
Additional Information Letter No. 69
Related to ESBWR Design Certification Application

Safety Analyses

RAI Number 15.2-5

NRC RAI 15.2-5:

DCD Tier 2, Rev. 1, Figure 15.2-1e demonstrates the importance of the selected control rod run-in (SCRRI) insertion for mitigation of this transient. The ESBWR is physically a very large core. If a partial failure of SCRRI were to occur, how would ESBWR avoid violating local thermal limits or creating a core instability without shutting down the core? See DCD Tier 2, Figure 15.2-1a.

GEH Response:

In DCD Tier 2 Revision 3, the Select Rod Insert (SRI) function was added to the Selected Control Rod Run-in (SCRRI) function. SRI is the hydraulic insertion of selected control rods and is used to augment the SCRRI function. The combined function is referred to as SCRRI/SRI. DCD Tier 2 Revision 4 Subsection 7.1.5.2.3.10 describes the instrumentation and control features that constitute the SCRRI/SRI function. DCD Subsection 15.2.1.1.1 describes the timing of the SCRRI/SRI function assumed in the AOO analysis. Subsection 15.2.1.1.2 describes the failure assumed in the SRI function in the AOO analysis.

Because the SRI function moves rods into the core hydraulically using the Hydraulic Control Unit (HCU) (same method used in the scram function) the SRI rods move into the core much more quickly than the SCRRI rods. SRI rods are much more effective in suppressing power than SCRRI alone (see DCD Tier 2 Revision 4 Figure 15.2-1e). This analysis includes failure of an HCU to insert two rods into the core. The failed rods were selected to maximize the effect of the failure on the CPR in the channels analyzed. Even with this partial failure of SRI, ΔCPR is much less than with SCRRI alone and changes in power distribution are not significant with regard to local thermal limits given the decrease in core average power. With the SRI function to complement the SCRRI function, partial failures in the SCRRI feature is not significant because SRI provides sufficient core average power suppression.

Because the SRI function (even with a partial failure) quickly reduces the core average power, and core flow increases slightly during the event, and changes in power distribution are not significant, the core wide, channel and regional oscillation decay ratios are expected to decrease during the event. In the event that SCRRI/SRI fails in a way that is not anticipated, the Oscillation Power Range Monitor (OPRM) trip system would detect thermal hydraulic instability (flux oscillation with unacceptable amplitude and frequency) and provide a reactor trip signal to the RPS.

DCD Impact:

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