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MFN 06-301
Supplement 1

Docket No. 52-010

November 7, 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. 31 RAI Number 21.6-12 Supplement 1**

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 the reference 1 NRC letter. GEH response to RAI Number 21.6-12 Supplement 1 is addressed in Enclosure 1.

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

Sincerely,

Kathy Sedney for

James C. Kinsey
Vice President, ESBWR Licensing

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NRO

Reference:

1. MFN 06-203, Letter from U.S. Nuclear Regulatory Commission to David Hinds, Request for Additional Information Letter No. 31 Related to the ESBWR Design Certification Application, June 23, 2006

Enclosure:

1. MFN 06-301 Supplement 1 – Response to Portion of NRC Request for Additional Information Letter No. 31 – Related to ESBWR Design Certification Application – RAI Number 21.6-12 S01

cc:	AE Cubbage	USNRC (with enclosure)
	GB Stramback	GEH/San Jose (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	eDRF	0000-0076-7144

Enclosure 1

MFN 06-301 Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 31

Related to ESBWR Design Certification Application

RAI Number 21.6-12 S01

NRC RAI 21.6-12 S01

*In this request, the staff asked GE to explain how the time dependent FILL table was created for the TRACG model of the Standby Liquid Control System (SLCS) injection during an ATWS. GE gave the equations for which the table was developed. The staff has identified a possible error in the equation for Vj+1. The term inside of the second square root is a difference in pressures (i.e. between accumulator gas space pressure and RPV pressure) and includes the difference in gravity head between the RPV and the accumulator. If the units for the term h0*ρ/144 are correct, then units for Hj/144 are in error. h0 is an elevation usually measured in feet and Hj is a Reactor Pressure Vessel (RPV) water level, which is probably in feet. However, in order for these two terms to be consistent there must be a density included with Hj term (i.e. Hj* ρ j/144). Does Hj already include a density? According to the RAI response, it's a water level, which is typically in units of length. The staff would like for GE to address this possible error. In addition, the staff requests that GE justify their selection for the effective k loss in this equation. What is the uncertainty in the effective k loss for the accumulator line and nozzles? Given that uncertainty, what is the uncertainty in SLCS injection velocity? A perturbation of 10% in the SLCS injection velocity does not impact the suppression pool temperature; however does a perturbation of 10% bound the uncertainty associated with this model?*

GEH Response

It has been determined that the equation in question is correct. The H_j term represents RPV level and density combined, and the units are lb/ft^2.

An analytical study was used to develop the injection velocity requirements for the Standby Liquid Control (SLC) system. In the study, the effective k loss for the SLC system was calculated using the Crane method. Conservative assumptions were applied in the study to assure that the injection velocity requirements developed for the system are adequate. During initial testing, the as-built SLC system is tested to verify that the injection velocity requirements are achieved (see DCD Tier 1, Table 2.2.4-6, item 7). This approach eliminates uncertainty associated with the SLC system injection velocity.

DCD Impact

No DC or LTR changes will be made in response to this RAI.