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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 218 Related to ESBWR Design Certification Application – Radiation Protection – RAI Number 12.4-36**

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

If you have any questions about the information provided here, please contact me.

Sincerely,

Richard E. Kingston

Richard E. Kingston
Vice President, ESBWR Licensing

Reference:

1. MFN 08-561, Letter from the U.S. Nuclear Regulatory Commission to Robert E. Brown, Request for Additional Information Letter No. 218, Related To ESBWR Design Certification Application, dated July 1, 2008

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 218, Related to ESBWR Design Certification Application – Radiation Protection – RAI Number 12.4-36

cc:	AE Cubbage	USNRC (with enclosure)
	RE Brown	GEH/Wilmington (with enclosure)
	DH Hinds	GEH/Wilmington (with enclosure)
	eDRF	0000-0095-4896/R1

Enclosure 1

MFN 09-080

Response to Portion of NRC Request for

Additional Information Letter No. 218

Related to ESBWR Design Certification Application

Radiation Protection

RAI Number 12.4-36

NRC RAI 12.4-36:

Provide the justification for modifying the values for accumulated activity in HVAC filters in Table 12.3-9.

Table 12.3-9 provides a listing of the accumulated activity in the HVAC filters for Reactor Building and Control Building in Accident Conditions. In Rev. 5 of the DCD, all of the values for accumulated activity were changed. Most of these values increased, some by a factor of 100 or more. Provide the reasons for the increase in the estimated activity levels in the filters listed for the two building in this table and describe what affect the increase in estimated filter activity levels will have on the estimated dose rates near these filters. Verify that any increase in dose rates resulting from these changes were reflected in the appropriate text or radiation zone drawings in Chapter 12.

GEH Response:

The increase in the accumulated radioactivity in the Reactor Building HVAC filter due to a LOCA between DCD revision 4 and 5 was caused by the revised LOCA radionuclide inventory and a decrease in dilution volume for the Reactor Building. The effect of increasing the accumulated activity on the Reactor Building HVAC filter is an increase in the dose rates from the filter units at the end of 30 days.

The differences in the accumulated radioactivity in the Control Building Emergency Filter Unit (EFU) due to a LOCA between DCD revision 4 and 5 are due to the fact that the LOCA inventory in the environment in revision 5 was revised and there was also a decrease in the atmospheric dispersion factors between DCD revision 4 and 5. The effect of decreasing the accumulated activity on the Control Building Emergency Filter Unit is a decrease in the dose rates from the filter units at the end of 30 days.

As discussed in the response to RAI 12.4-23 S02, design refinements and improvements in the ESBWR source term necessitated a recalculation of the accumulated radioactivity in the Reactor Building HVAC filters and Control Building EFU and the associated external dose rates from those filter units.

The new calculations did not change any of the existing post-accident radiation zone classifications. No other post-accident radiation zone changes are needed based on these recalculations other than when the shielded enclosure for the Reactor Building filters is designed and added to the general arrangement drawings, the enclosure will need a zone J designation for post-accident conditions on DCD Tier 2 Figure 12.3-48. The dose rates in the other rooms are bounded by the existing radiation zone designations.

DCD Impact:

See response to RAI 12.4-23 S02 for DCD changes, submitted by MFN 09-070. No DCD changes will be made in response to this RAI.