



HITACHI

GE Hitachi Nuclear Energy

Richard E. Kingston
Vice President, ESBWR Licensing

PO Box 780 M/C A-65
Wilmington, NC 28402-0780
USA

T 910 675 6192
F 910 362 6192
rick.kingston@ge.com

Security Notice

This letter forwards Security-Related information in accordance with 10CFR2.390. Upon the removal of Enclosure 2, the balance of this letter may be considered non-Security-Related.

MFN 09-568

Docket No. 52-010

August 28, 2009

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: Submittal of Response to NRC Request for Additional Information Letter No. 359 Related to ESBWR Design Certification - Radiation Protection - RAI Number 12.4-23 S03

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 No. 359, dated July 13, 2009 (Reference 1).

Enclosure 2 contains a GEH Security-Related Figure identified by the designation “{{{Security-Related Information – Withhold Under 10 CFR 2.390}}}.” GEH hereby requests this information be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390. No public version of this security-related DCD Markup is provided in this response since it would be a blank page with only figure title and figure number.

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

Doc 8
NRO

References:

1. MFN 09-492 - Letter from U.S. Nuclear Regulatory Commission to Jerald G. Head, *Request For Additional Information Letter No. 359 Related To ESBWR Design Certification Application*, dated July 13, 2009

Enclosures:

1. Response to NRC Request for Additional Information Letter No. 359 Related to ESBWR Design Certification Application - Radiation Protection - RAI Number 12.4-23 S03
2. Response to NRC Request for Additional Information Letter No. 359 Related to ESBWR Design Certification Application - Radiation Protection - RAI Number 12.4-23 S03 – DCD Markup – Security-Related Information – Withhold Under 10 CFR 2.390

cc: AE Cabbage USNRC (with enclosures)
JG Head GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
eDRF Section 0000-0106-2788 (RAI 12.4-23 S03)

Enclosure 1

MFN 09-568

Response to NRC Request for

Additional Information Letter No. 359

Related to ESBWR Design Certification Application

Radiation Protection

RAI Number 12.4-23 S03

NRC RAI 12.4-23 S03

The following questions pertain to the dose rates in the Control Building during accident conditions.

1. *In the revised Table 12.3-10a which is provided as part of the response to supplement S01 to RAI 12.4-23, the listing of the area and the corresponding dose rate outside of the Control Building (to the west of Rooms 3406 and 3407) was deleted. Justify why this information was deleted from this Table.*

2. *Table 12.3-10a lists the post-accident dose rate inside Rooms 3406 and 3407 (30 cm below the EFU) as 3.39 mSv/hr. Describe the physical location of the EFUs in Rooms 3406 and 3407 and describe where the dose point of "30 cm below the EFU" is located with respect to a person located in either of these rooms. State the expected occupancy of these rooms during accident conditions.*

The following questions pertain to the dose rates in the Reactor Building near the HVAC filter during accident conditions.

3. *In the revised Table 12.3-9, the footnote for the single asterisk (for the Reactor building-HVAC filter activity data listed in the first column of this table) appears to have been deleted. Modify the table footnotes so that footnote currently listed for the second column (Control Building EFU activity) applies to both columns.*

4. *The first row in the revised Table 12.3-10b lists a post-accident dose rate of $1.67E+5$ mSv/hr (16,700 R/hr) for a position "inside, 30 cm below filter". Specify what location in Room 1600 this table entry is referring to (i.e., is it referring to a location inside the HVAC filter?) and describe where this dose point is located with respect to a person located near the Reactor Building HVAC filter in Room 1600.*

5. *If the post-accident dose rate 30 cm below the HVAC filter in Room 1600 is expected to be $1.67E+5$ mSv/hr, this area would be classified as a very high radiation area. If this is the case, specify what controls would be implemented (in accordance with 10 CFR 20.1601) in the vicinity of the Reactor Building HVAC filters to ensure that access to this area is restricted and personnel dose minimized.*

6. *In the response to RAI 12.4-23 S02 item 5, the applicant states that the activities from the isotopes Xe-131m and Xe-133m were added to the LOCA inventory to maximize radionuclides that contributed to external radiation fields in the Reactor*

Building. If Xe-131m and Xe-133m were added to the LOCA inventory, justify why these two isotopes are not included in the list of isotopes shown in Table 12.3-9.

GEH Response

The following questions pertain to the dose rates in the Control Building during accident conditions.

Request for Additional Information 1. In the revised Table 12.3-10a which is provided as part of the response to supplement S01 to RAI 12.4-23, the listing of the area and the corresponding dose rate outside of the Control Building (to the west of Rooms 3406 and 3407) was deleted. Justify why this information was deleted from this Table.

GEH Response

The information is deleted because it is not relevant, because the location outside building at the filter elevation is about 4.4 m (14 ft) above ground, there will be no personnel at that location.

Request for Additional Information 2. Table 12.3-10a lists the post-accident dose rate inside Rooms 3406 and 3407 (30 cm below the EFU) as 3.39 mSv/hr. Describe the physical location of the EFUs in Rooms 3406 and 3407 and describe where the dose point of "30 cm below the EFU" is located with respect to a person located in either of these rooms. State the expected occupancy of these rooms during accident conditions.

GEH Response

The dose rate in each room is computed for the EFU position 50 cm (20 in) above floor, and 150 cm (59 in) from the exterior wall. The dose point of 30 cm (12 in) below the EFU is under the EFU (consistent with a person located under the EFU). However these rooms are not normally occupied.

The following questions pertain to the dose rates in the Reactor Building near the HVAC filter during accident conditions.

Request for Additional Information 3. In the revised Table 12.3-9, the footnote for the single asterisk (for the Reactor building-HVAC filter activity data listed in the first column of this table) appears to have been deleted. Modify the table footnotes so that footnote currently listed for the second column (Control Building EFU activity) applies to both columns.

GEH Response

A single asterisk was added to the Table 12.3-9 in the Preliminary DCD Revision 6 version, such that both the Reactor Building and Control Building column headings have the footnote.

Request for Additional Information 4. The first row in the revised Table 12.3-10b lists a post-accident dose rate of $1.67E+5$ mSv/hr (16,700 R/hr) for a position "inside, 30 cm below filter". Specify what location in Room 1600 this table entry is referring to (i.e., is it referring to a location inside the HVAC filter?) and describe where this dose point is located with respect to a person located near the Reactor Building HVAC filter in Room 1600.

GEH Response

The dose rate is computed for the HVAC filter position 50 cm (20 in) above the floor. The dose point location is 30 cm (12 in) below the HVAC filter (20 cm (8 in) above the floor). The dose point 30 cm (12 in) below the HVAC filter is consistent with a person located under the HVAC filter. However these rooms are not occupied during the design basis LOCA event.

Request for Additional Information 5. If the post-accident dose rate 30 cm below the HVAC filter in Room 1600 is expected to be $1.67E+5$ mSv/hr, this area would be classified as a very high radiation area. If this is the case, specify what controls would be implemented (in accordance with 10 CFR 20.1601) in the vicinity of the Reactor Building HVAC filters to ensure that access to this area is restricted and personnel dose minimized.

GEH Response

Figure 12.3-48. "Nuclear Island Post Accident Radiation Zones - Elevation 13570 mm" will be revised to add this note: "Areas in Room 1600 around the Reactor Building HVAC filter are Zone J, > 5 Sv/h (500 Rem/h), Inaccessible Area, (Very High Radiation Zone)".

Request for Additional Information 6. In the response to RAI 12.4-23 S02 item 5, the applicant states that the activities from the isotopes Xe-131m and Xe-133m were added to the LOCA inventory to maximize radionuclides that contributed to external radiation fields in the Reactor Building. If Xe-131m and Xe-133m were added to the LOCA inventory, justify why these two isotopes are not included in the list of isotopes shown in Table 12.3-9.

GEH Response

Cm-242 and Cm-244 were deleted from the LOCA inventory and Xe-131m and Xe-133m were added, as the external radiation fields from Cm-242 and Cm-244, which are used in the mission doses, are insignificant for the purpose of computing the radiation fields in the reactor building rooms and corridors for LOCA. Xe-131m and Xe-133m are not included in the source Table 12.3-9, because the filter does not accumulate noble gases.

DCD Impact

DCD Tier #2, Figure 12.3-48 will be revised as shown in the attached markup.