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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 98 Related to ESBWR Design Certification Application – Radiation Protection – RAI Numbers 12.2-21 and 12.2-22**

Enclosure 1 contains GE-Hitachi Nuclear Energy Americas (GEH) response to the subject NRC RAIs transmitted via Reference 1. Enclosure 2 contains the DCD markups associated with the response.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

D068

NRO

Reference:

1. MFN 07-370 – Letter from US Nuclear Regulatory Commission (NRC) to R E Brown, *Request for Additional Information Letter No. 98 Related to ESBWR Design Certification Application,* dated May 29, 2007

Enclosures:

1. Response to NRC Request for Additional Information Letter No. 98 Related to ESBWR Design Certification Application – Radiation Protection, RAI Numbers 12.2-21 and 12.2-21
2. DCD Markups

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GEH /San Jose (with enclosures)
RE Brown GEH /Wilmington (with enclosures)
eDRF 0072-3098

Enclosure 1

MFN 07-427

Response to Portion of NRC Request for Additional Information Letter No. 98 Related to ESBWR Design Certification Application

Radiation Protection

RAI Numbers 12.2-21 and 12.2-22

NRC RAI No. 12.2-21:

In Revision 3 of the DCD Tier 2, Section 12.2.4.2, the COL action item is incomplete in demonstrating compliance with NRC regulations for airborne effluents. In addition to demonstrating compliance with the dose objectives of Sections II.B and II.C of Appendix I to 10 CFR Part 50, the COL applicant needs to also demonstrate compliance with Section II.D of Appendix I to Part 50; airborne effluent concentration limits of Appendix B (Table 2, Column 1) to 10 CFR Part 20; and dose limits of Parts 20.1301 and 20.1302 to members of the public. Accordingly, update this COL action in the DCD for the purpose of fully reflecting all applicable NRC regulations.

GEH Response:

DCD Tier 2, Section 12.2.4.2 will be updated to reflect the applicable regulations for airborne effluents as noted on the attached markup.

DCD Impact:

DCD Tier 2, Section 12.2.4.2 will be revised as noted on the attached markup.

NRC RAI No. 12.2-22:

In Revision 3 of the DCD Tier 2, Section 12.2.4.3, the COL action item is incomplete in demonstrating compliance with NRC regulations for liquid effluents. In addition to demonstrating compliance with the dose objectives of Section II.A of Appendix I to 10 CFR Part 50, the COL applicant needs to also demonstrate compliance with Section II.D of Appendix I to Part 50; liquid effluent concentration limits of Appendix B (Table 2, Column 2) to 10 CFR Part 20; and dose limits of Parts 20.1301 and 20.1302 to members of the public. Accordingly, update this COL action in the DCD for the purpose of fully reflecting all applicable NRC regulations.

GEH Response:

DCD Tier 2, Section 12.2.4.3 will be updated to reflect the additional NRC regulations for liquid effluents as noted on the attached markup.

DCD Impact:

DCD Tier 2, Section 12.2.4.3 will be revised as noted on the attached markup.

Enclosure 2

MFN 07-427

Radiation Protection

DCD Markups

The assumptions and parameters used to determine the airborne activity levels in the Turbine Building are listed in Table 12.2-23a. The airborne concentrations are provided in Table 12.2-23d. Even though the values presented were obtained in a very conservative manner, they are below the limits established in 10 CFR 20 Appendix B table 1 column 3.

12.2.3.5 Radwaste Building

The Radwaste Building HVAC system is discussed in Section 9.4.3. Subsection 12.3.3.2.4 discusses the radiation control aspects of the HVAC system.

Corridors and routine access operating areas within the Radwaste Building are not expected to have significant airborne radioactivity levels. Equipment cubicles are infrequently accessed and may contain low levels of airborne radioactivity, but design provisions are provided to minimize the release of radioactivity.

Radwaste Building tanks are filled from the top and as the water splashes into the tanks, dissolved and entrained radioactivity may become airborne. This activity is not released into the atmosphere in the rooms because the tank vents are connected directly to the building ventilation system. Pumps and valves for radioactive systems in the Radwaste Building are located in separate compartments that are not normally occupied. The Radwaste Building ventilation design provides airflow from areas of low potential for airborne contamination to areas of increasing potential. This insures that any leakage from radwaste pumps and valves is not directed into normally occupied areas of the building, but is exhausted from the building.

The assumptions and parameters used to determine the airborne activity levels in the Radwaste Building are listed in Table 12.2-23a. The airborne concentrations are provided in Table 12.2-23e. Even though the values presented were obtained in a very conservative manner, they are below the limits established in 10 CFR 20 Appendix B table 1 column 3.

12.2.4 COL Information

12.2.4.1 As discussed in Subsection 12.2.1.1.2, the COL holder will determine exact placement and duration of residence for the Cf-252 startup source and holder in the SFP.

12.2.4.2 As discussed in Subsection 12.2.2.2, the COL applicant is responsible for ensuring that offsite dose (using site-specific parameters) due to radioactive airborne effluents complies with the regulatory dose limits in **Sections II.B and II.C of** 10 CFR 50, Appendix I. **In addition, the COL applicant is responsible for compliance with Section II.D of 10 CFR 50, Appendix I; airborne effluent concentration limits of 10 CFR 20 Appendix B (Table 2, Column 1); and dose limits of 10 CFR Parts 20.1301 and 20.1302 to members of the public.**

12.2.4.3 As discussed in Subsection 12.2.2.4, COL applicant is responsible for ensuring that offsite dose (using site-specific parameters) due to radioactive liquid effluents complies with the regulatory dose limits in **Section II.A of** 10 CFR 50, Appendix I. **In addition, the COL applicant is responsible for compliance with Section II.D of 10 CFR 50, Appendix I; liquid effluent concentration limits of 10 CFR 20 Appendix B (Table 2, Column 2); and dose limits of 10 CFR Parts 20.1301 and 20.1302 to members of the public.**