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Subject: **Response to RAI Letter 130 Related to the ESBWR Design Certification – Radiation Protection – RAI Number 12.7-4**

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 December 31, 2007. GEH response to RAI Number 12.7-4 is addressed in Enclosure 1. The DCD Markup related to this response is provided in Enclosure 2.

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

Sincerely,

James C. Kinsey

James C. Kinsey
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 07-715, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 130 Related To ESBWR Design Certification Application*, dated December 31, 2007.

Enclosures:

1. Response to Portion of NRC Request for Additional Information Letter No. 130 Related to ESBWR Design Certification Application – Radiation Protection – RAI Number 12.7-4
2. DCD Markup

cc: AE Cubbage USNRC (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
eDRF 0000-0081-3903

Enclosure 1

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Response to Portion of NRC Request for Additional Information Letter No. 130 Related to ESBWR Design Certification Application

Radiation Protection

RAI Number 12.7-4

NRC RAI 12.7-4:

In DCD Tier 2, Revision 4, Section 12.6.1, the sixth bullet states that provisions will be made for epoxy-type wall and floor coverings. In DCD Tier 2, Revision 4, Section 12.2.1.4 states that, in the Radwaste Building, "The tank cubicle concrete is provided with a sealant and a tank cubicle steel liner". Justify this apparent discrepancy and provide a listing of areas where epoxy-type wall and floor coverings will be used and areas where steel liners will be used.

GEH Response:

As was stated in DCD Tier 2, Subsection 12.6.1, provisions will be made for epoxy-type wall and floor coverings to minimize contamination of concrete. The text in DCD Tier 2, Revision 4, Subsection 12.2.1.4 was added as a result of the response to RAI 2.4-29 S01 (MFN 06-226 Supplement 1, dated July 25, 2007). The Staff's concern in RAI 2.4-29 S01 was that Branch Technical Position (BTP) 11-6 states that "credit for liquid retention by unlined building foundations will not be given regardless of the building seismic category because of the potential for cracks. Credit is not allowed for retention by coatings or leakage barriers outside the building foundation." As a result, GEH incorporated the use of steel liners in the Liquid Waste Management System (LWMS) tank cubicles to prevent accidental releases from the liquid radwaste tanks to the environment.

Therefore, the steel liners will be used in the liquid radwaste tank cubicles in the Radwaste Building to comply with the guidance in BTP 11-6. In addition, the Spent Fuel Pool will employ the use of a steel liner, as discussed in the response to RAI 12.7-3 Supplement 1 (MFN 06-371, Supplement 1, dated May 30, 2007). Epoxy-type coatings will be applied to both steel surfaces and concrete areas appropriate for contamination control. A description of the coatings in containment is provided in the response to RAI 15.4-15 (MFN 07-588, dated November 2, 2007). Other areas (both concrete and steel) with potential for contamination will be coated with the epoxy-type coating. These areas consist of the walls and floors of the Reactor, Fuel, and Turbine Buildings, radwaste areas, rooms containing equipment with liquid radioactive sources, floor drain areas, washdown bays, and radwaste tunnels.

DCD Impact:

DCD Tier 2, Subsection 12.6.1 will be revised as noted on the attached markup.

Enclosure 2

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DCD Markup

12.6 MINIMIZATION OF CONTAMINATION AND RADWASTE GENERATION

This section discusses how the ESBWR design procedures for operation will minimize contamination of the facility and environment, facilitate decommissioning, and minimize the generation of radioactive waste, in compliance with 10 CFR 20.1406.

12.6.1 Minimization of Contamination to Facilitate Decommissioning

Examples of ESBWR design features that minimize contamination and facilitate decommissioning include the following:

- Design of equipment to minimize the buildup of radioactive material and to facilitate flushing of crud traps;
- Provisions for design features to plant systems such as the Reactor Water Cleanup/Shutdown Cooling System, liquid and solid radwaste systems and the condensate demineralizer to minimize crud buildup;
- Provisions for draining, flushing, and decontaminating equipment and piping;
- Penetrations through outer walls of a building containing radiation sources are sealed to prevent miscellaneous leaks to the environment;
- Equipment drain sump vents are piped directly to the radwaste HVAC system to remove airborne contaminants evolved from discharges to the sump;
- Appropriately sloped floor drains are provided in areas where the potential for a spill exists to limit the extent of contamination. The floor drains are designed to be of monolithic construction to minimize possibility of liquid penetrating at embedment boundaries. No grout is used in the installation of the floor drains. Periodic visual inspections of the installation around the floor drains will be performed to ensure that no bypass exists in these floor drain areas;
- Provisions for decontaminable epoxy-type wall and floor coverings which provide smooth surfaces to ease decontamination. Epoxy-type coatings will be applied to both steel surfaces and concrete areas appropriate for contamination control. These areas consist of the walls and floors of the Reactor, Fuel, and Turbine Buildings, radwaste areas, rooms containing equipment with liquid radioactive sources, floor drain areas, washdown bays, and radwaste tunnels;
- Equipment and floor drain sumps are stainless steel lined to reduce crud buildup and to provide surfaces easily decontaminated;
- For all areas potentially having airborne radioactivity, the ventilation systems are designed such that during normal and maintenance operations, airflow between areas is always from an area of low potential contamination to an area of higher potential contamination;
- The reactor building HVAC system is divided into two major components: the contaminated and clean areas. The clean area system conditions and circulates air through all the clean areas of the reactor building; the contaminated area system conditions and circulates air through the contaminated areas of the building;