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MFN 07-016

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U.S. Nuclear Regulatory Commission
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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 84 – Radioactive Waste Management Systems – RAI Numbers 11.5-34 and 11.5-35**

Enclosure 1 contains GE's response to the subject NRC RAIs transmitted via the Reference 1 letter.

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

Reference:

1. MFN 06-517, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 84 Related to the ESBWR Design Certification Application*, December 7, 2006

Enclosures:

1. MFN 07-016 – Response to Portion of NRC Request for Additional Information Letter No. 84 – Radioactive Waste Management Systems – RAI Numbers 11.5-34 and 11.5-35

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0063-2419

Enclosure 1

MFN 07-016

Response to Portion of NRC Request for

Additional Information Letter No. 84

Related to ESBWR Design Certification Application

Process Radiation Monitoring System

RAI Numbers 11.5-34, 11.5-35

NRC RAI No. 11.5-34:

Description in subsection 11.5.3.2.15 states that there are four channels to monitor the radiation level of the air entering the Exhaust Air Handling Unit (AHU). However, Table 11.5-1 lists only two channels under Fuel Building Ventilation Exhaust AHU. Please update DCD to reflect the correct number at both places.

GE Response:

For the Fuel Building, there are 3 subsystems in the Process Radiation Monitoring System used for monitoring radioactive exhaust as shown on DCD Tier 2, Revision 2, Drawing 22A6642 BH. These subsystems are as follows:

Subsection 11.5.3.1.6, Fuel Building General Area HVAC RMS

As shown in Section A of Table 11.5-1, this four channel safety-related subsystem monitors gross radiation levels in the general area of the Fuel Building HVAC exhaust duct. Please note that this subsystem was previously specified in DCD Revision 1 as Fuel Building Main Area HVAC RMS.

Subsection 11.5.3.1.7, Fuel Building Fuel Pool HVAC RMS

As shown in Section A of Table 11.5-1, this four channel safety-related subsystem monitors the radiation level of the air exiting the Fuel Building Spent Fuel Storage Pool and equipment

This subsystem was previously specified in DCD Revision 1 as the nonsafety-related Fuel Building Ventilation Exhaust Air Handling Unit (AHU) RMS. This subsystem has been upgraded to a safety-related system since the exhaust damper closes on high radiation.

Subsection 11.5.3.2.15, Fuel Building Combined Ventilation Exhaust RMS

Fuel Building Combined Ventilation Exhaust RMS is a nonsafety-related system that monitors halogens, particulates and noble gas releases. There are 3 channels provided to monitor each of the parameters as shown in Section B of Table 11.5-1.

The description of this subsystem was previously specified in DCD Revision 1, as Subsection 11.5.3.2.16.

The subsystems, sample line or detector location, number of channels and displayed channel range are of the Process Radiation Monitoring subsystems are clearly described in Revision 2 to DCD Tier 2, Table 11.5-1.

DCD Impact:

No DCD changes will be made in response to this RAI.

NRC RAI 11.5-35:

DCD, subsection 11.5.4.1, Basis for Monitor Location Selection lists measurement, monitoring, display and recording functions but not the alarm functions. The alarm function should be included in the DCD. Please update DCD to reflect generation of alarms.

GE Response:

DCD Tier 2, Subsection 11.5.4.1 will be revised to include a reference to the alarm function.

DCD Tier 2, Subsection 11.5.4.4 was also reviewed and corrected as shown on the attached markup.

DCD Impact:

Revision 3 to DCD Tier 2, subsections 11.5.4.1 and 11.5.4.4 will reflect the changes as noted on the attached markup.

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11.5.4 Regulatory Evaluation

The system design for radiation monitoring is in conformance with the relevant requirements and criteria that are stipulated in the codes and standards that are identified in Subsection 11.5.2. Radiation monitoring is provided during reactor operation and under post-accident conditions. Specifically, the following requirements are evaluated for compliance.

11.5.4.1 Basis for Monitor Location Selection

The detector locations are selected, per RG 1.21 and Standard Review Plan 11.5, to monitor ~~all~~ the major and potentially significant paths for release of radioactive material during normal reactor operation including anticipated operational occurrences, **and to provide alarms and necessary isolations**. The radioactivity levels in liquid and gaseous effluent releases are monitored, measured, displayed and recorded.

11.5.4.2 Expected Radiation Levels

Expected radiation levels are provided in Tables 11.5-1 and 11.5-2.

11.5.4.3 Instrumentation

Grab samples are analyzed to identify and quantify the specific radionuclides in effluents. The results from the sample analysis are used to establish relationships between the gross gamma monitor readings and concentrations or release rates of radionuclides in continuous effluent releases. **Tables 11.5-4 through 11.5-8 provide summary information concerning the frequency, analysis, sensitivity and purpose for both liquid and gaseous process and effluent extracted samples that are analyzed in the health physics laboratory. Table 11.5-9 provides information concerning the selection of dynamic ranges for monitoring.**

11.5.4.4 Setpoints

The trip setpoints for ~~certain~~ **effluent and release** safety-related radiation monitors are specified in the Offsite Dose Calculation Manual required by plant Technical Specifications. Trip setpoints for nonsafety-related radiation monitors are specified in the plant Operating Procedures.

11.5.5 Process Monitoring and Sampling

11.5.5.1 Implementation of General Design Criterion 19

The Main Control Building is provided with detectors that sense radiation in the intake air supply to the control building and provide warning and initiate actions to protect operating personnel for access and occupancy of the control room under accident conditions.

In addition, the Technical Support Center ventilation air intake is provided with radiation detection to initiate actions to protect personnel.

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