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MFN 06-437

Docket No. 52-010

November 6, 2006

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

Subject: **Response to Portion of NRC Request for Additional Information Letter No. 60 – Radiation Protection – RAI Numbers 12.4-26, 12.4-28, 12.4-29 and 12.4-30**

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

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

Sincerely,

Kathy Sedney for

David H. Hinds
Manager, ESBWR

D068

Reference:

1. MFN 06-342, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 60 Related to ESBWR Design Certification Application*, September 18, 2006

Enclosure:

1. MFN 06-437 – Response to Portion of NRC Request for Additional Information Letter No. 60 – Radiation Protection – RAI Numbers 12.4-26, 12.4-28, 12.4-29 and 12.4-30

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0060-4677

ENCLOSURE 1

MFN 06-437

Response to Portion of NRC Request for

Additional Information Letter No. 60

Related to ESBWR Design Certification Application

Radiation Protection

RAI Numbers 12.4-26, 12.4-28, 12.4-29 and 12.4-30

NRC RAI No. 12.4-26:

What is the "Aux. Units" column on DCD Tier 2, Tables 12.3-2 through 12.3-6? Is that the same as the "Local Alarms" column on Table 12.3-7? If not indicate which ARM is provided with a local alarm. Section 12.3.4.1 of the DCD states that ARMs with local alarms are provided in "selected" areas. Describe the selection criteria for providing a local alarm and why each ARM not provided with a local alarm is justified.

GE Response:

All ARM channels are provided with local alarms and indication. In some cases, additional readouts and alarms are provided for specific channels. The criteria for assigning additional readouts is based on engineering judgment and addresses instances where a room or area is configured such that it is felt that additional visual and audible alarms would be justified to ensure personnel protection. Thus, where an "Auxiliary Unit" is indicated, those channels will utilize additional readouts and alarms to enhance the functionality of the channel.

The sentence in Subsection 12.3.4.1, i.e., "The ARMS consists of gamma sensitive detectors, digital area radiation monitors, and local auxiliary units with indicators and local audible alarms." will be changed to "Every ARM channel consists of a gamma sensitive detector and a digital area radiation processor; all channels are provided with local visual and audible alarms and local readouts. Where appropriate, additional readouts and alarms, provided by local auxiliary units, will be utilized."

In addition, in Tables 12.3-2 through 12.3-6, the column labeled "Auxiliary Units" will be removed and in its place (where appropriate) a note will be added for those radiation monitors that are indicated as utilizing Auxiliary Units.

Revisions to DCD Tier 2, Subsection 12.3.4.1 and Tables 12.3-2 through 12.3-6 will be reflected in Revision 3 of DCD Tier 2, Chapter 12.

NRC RAI No. 12.4-28:

DCD Tier 2, Section 12.3.4, second bullet, indicates that two redundant high range monitors are provided in the drywell and two in the wetwell "as required by RG 1.97." Verify that these monitors meet the criteria of NUREG-0737, Item II.F.1, as required by 10 CFR 50.34(f)(xvii)(D). Indicate the location of these monitors on the plant layout drawings.

GE Response:

The containment high range post accident radiation monitors are actually part of the Containment Monitoring System (CMS) and are described in DCD Subsections 7.5.1.3(2)(l), 7.5.2.1, 7.5.2.2, 7.5.2.3 & 7.5.2.5.

The radiation monitors have been designed in accordance with NUREG-0737, Item II.F.1.

At this stage of the design, the exact locations have not been identified on plant layout drawings. However, the monitors will be located such that they are widely separated to provide independent measurements, with a large fraction of the containment volume considered in both the wetwell and drywell. Further, the selection of the location will consider reasonable access for personnel to allow for replacement, maintenance and calibration of equipment. It is anticipated that these high range gamma radiation detectors will probably be inserted into wells that partially penetrate the drywell and wetwell walls and which will view the appropriate airspace.

The locations of these transmitters will be identified on plant layout drawings in Revision 3 to the Tier 2 DCD.

NRC RAI No.12.4-29:

DCD Tier 2, Section 12.3.4, third bullet, indicates that the description of radiation instrumentation to monitor airborne radioactivity is left to the COL applicant. Although the concentrations of airborne radionuclides in each room or cubicle is to be determined by ITAAC, the rooms and cubicles that have a potential for becoming significant airborne areas should be known at this design stage. Provide a description of the in-plant airborne radiation monitoring system. Monitors should be able to detect the time integrated change of the most limiting particulate and iodine species equivalent to those concentrations specified in Appendix B of 10 CFR Part 20 (one derived air concentration (DAC) in each monitored plant area within 10 hours (i.e., monitors should be sensitive enough to measure 10 DAC-hours)).

GE Response:

An additional bullet will be added to Subsection 12.3.4 in Revision 3 of DCD Tier 2, Chapter 12 as follows:

"The in-plant airborne radiation monitoring instrumentation will be located so that selected local areas and ventilation paths are monitored. Each location monitored will be supplied with a local audible alarm and the monitor will have variable alarm set points. When appropriate, selected airborne radioactivity sampling points are located upstream of any ventilation filter trains to monitor representative radioactivity concentrations from the areas being sampled. Plant operating personnel will be supplied with continuous information about the airborne radioactivity levels throughout the plant. The instruments used for monitoring airborne radioactivity are specified to detect the time integrated change of the most limiting particulate and iodine species equivalent to those concentrations specified in Appendix B of 10 CFR Part 20 (one derived air concentration (DAC)) in each monitored plant area within 10 hours)."

NRC RAI No. 12.4-30:

DCD Tier 2, Section 12.3.4.3 indicates that "[c]riticality detection monitors are not needed to satisfy the criticality accident requirements..." Provide a description of the radiation monitors that either meet the requirements of 10 CFR 70.24(a)(1) or 10 CFR 50.68(b)(6).

GE Response:

Both Process Radiation Monitors and Area Radiation Monitors, are located in the fuel storage and associated handling areas in order to detect excessive radiation levels, and are used to demonstrate compliance with 10 CFR 50.68(b)(6).

Process Radiation Monitors, described in Subsection 11.5.3, monitor ventilation paths from the fuel storage area and, in addition to isolating the appropriate ventilation path upon receipt of high radiation, provide indication and alarms to the operator. Area Radiation Monitors, listed in Table 12.3-2, are provided in fuel storage areas to detect high radiation levels and provide visual and audible indication to operating personnel.

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