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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 74 – Radioactive Waste Management Systems – RAI Number 11.1-4**

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 06-386, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 74 Related to the ESBWR Design Certification Application*, October 11, 2006

Enclosures:

MFN 06-543 – Response to Portion of NRC Request for Additional Information Letter No. 74– Radioactive Waste Management Systems – RAI Number 11.1-4

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0053-9374

Enclosure 1

MFN 06-543

Response to NRC Request for
Additional Information Letter No. 74
Related to ESBWR Design Certification Application

Radioactive Waste Management Systems

RAI Number 11.1-4

NRC RAI No. 11.1-4:

DCD Section 11.1 describes ESBWR coolant source term. Comparing this information with ANS 18.1, most nuclides have been adjusted in a conservative manner with the exception of the noble gases and Zn-65. Please clarify if this is due to the power vs. steam flow for the noble gases and DZO (depleted zinc oxide) that adds for the Zn-65. Update the DCD to document clarification.

GE Response:

The adjustment factor for Zn-65 used in calculating the ESBWR source term is as follows:

$$Zn-65_{adj} = \frac{P \cdot WP_n \cdot (R_{n6} + \lambda)}{WP \cdot P_n \cdot (R_6 + \lambda)} \cdot 10$$

Table 10 of ANSI/ANS-18.1-1999 specifies an adjustment factor of 10 or less for Zn-65 for BWR plants incorporating a zinc addition program. Using the formula above for ESBWR results in a Zn-65 adjustment factor of 8.951, which is bounded by the values recommended in Table 10 of ANSI/ANS-18.1-1999.

As for the noble gases, the concentration of the noble gas isotopes was performed by multiplying the ANS-18.1-1999 Table 5 concentrations by the steam flow rate to yield noble gas isotope leakage rates in μCi/sec. The leakage rates for all the noble gases were summed to yield a total noble gas leakage rate. The noble gas concentration for each isotope was then determined by multiplying the ANS-18.1 Table 5 concentration by the ratio of the GE design basis noble gas leakage rate (100,000 μCi/sec – cited in DCD Tier 2, Subsection 11.1.1) and the total noble gas leakage rate summed earlier. This is a conservative approach in calculating the noble gas steam concentrations.

DCD Impact:

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