REQUEST FOR ADDITIONAL INFORMATION
Volume 2 – Preclosure
Chapter 2.1.1.7 - Design of Structures, Systems and Components Important to Safety and Safety Controls
Set 7 (RAI #1 - #5)

RAI #1

Provide (a) input/output files used for determining the minimum required enriched boron concentrations to maintain sub-criticality under normal and off-normal handling operations in the Wet Handling Facility (WHF) pool (SAR Section 1.14.2.3.3.4), and (b) information used for the WHF pool criticality analysis including geometry and proposed material specifications, type of fuel, soluble poison composition (for different cases), isotopic content, and all associated errors and uncertainties.

In the SAR Section 1.14.2.3.3.4, the applicant states that, subcriticality is maintained during normal and off-normal handling operations, while crediting no more than 30% of the minimum required boron concentration. However, the analyses information and input files have not been provided. This information is needed to demonstrate compliance with 10 CFR 63.112(e)(6).

RAI #2

Provide a description of the inspection program that the applicant plans to use to enforce Procedural Safety Control (PSC) PSC-9, as per ANSI/ANS 8.14-2004 "*Use of Soluble Neutron Absorbers in Nuclear Facilities outside Reactors*," which the applicant claimed to follow in SAR Section 1.14.3.1. Include a description of the type of equipment that may be used.

In SAR Table 1.9-10, PSC-9, the applicant states the minimum concentration and enrichment in ^{10}B to be maintained in the WHF pool. However, the applicant has not provided any information on how it plans to enforce the PSC-9, and, as a standard practice, reactor pools use natural boron rather than enriched boron. This information is needed to demonstrate compliance with 10 CFR 63.112(e)(6).

RAI #3

Explain how the double contingency principle is used to maintain sub-criticality during the GROA preclosure operations (SAR Section 1.14). In addition, provide justification that the design of the surface facilities is based on the double contingency principle. Explain why the design of the subsurface facilities was not based on this principle (SNL, 2008, *Preclosure Criticality Analysis Process Report,* p. 20).

SAR Section 1.14.2.2 refers to the preclosure criticality safety analysis documented in (SNL 2008, *Preclosure Criticality Analysis Process Report*) for the detailed preclosure safety analysis

process. In Section 2.1.2 of that report, DOE states that the design of the GROA surface facilities is based on the double contingency principle, as defined by ANSI/ANS-8.1-1998. However, DOE has not provided information on how, and the extent to which, this principle is used in the design of the GROA facilities. This information is needed to demonstrate compliance with 10 CFR 63.112(e)(6).

RAI #4

Provide documentation detailing the applicant's MCNP (Monte Carlo N-Particle) code validation, including the critical experiments benchmarked against, for CSNF and DOE SNF, as per Reg. Guide 3.71. Ensure that the effects of using high concentrations of enriched boron are considered in the range of applicability of the benchmark experiments used in validation (SAR Section 1.14.2.3.4.1). This information is needed to demonstrate compliance with 10 CFR 63.112(e)(6).

RAI #5

Justify that the values for fissile material concentrations reported in SAR Table 1.14-1 for Savannah River site HLW are those that are actually used by the vitrification plant staff for criticality control. This information is needed to demonstrate compliance with 10 CFR 63.112(e)(6).