REQUEST FOR ADDITIONAL INFORMATION (RAI)
Volume 3—Postclosure Chapter 2.2.1.4.1, 1st Set (Demonstration of Compliance with the Post Closure Individual Protection Standard)
(RAIs 1 through 3)
(DEPARTMENT OF ENERGY'S SAFETY ANALYSIS REPORT SECTION 2.4.2)

RAI 1

For the combined seismic and nominal model case provide the fraction of waste packages breached, and the area damaged area by (i) stress corrosion cracking, (ii) puncture and rupture, and (iii) general corrosion. Provide all these waste package fractions and damaged areas as functions of time for both commercial spent nuclear fuel and co-disposal packages. This information is needed to determine compliance with 10 CFR 63.114.

Basis: The SAR includes statistics on the total fraction of waste packages breached in the combined seismic and nominal processes model case, without distinguishing crack or patch failure (e.g., SAR Figure 2.1-12). More detailed information is needed on the expected fraction of waste packages exhibiting crack failure, punctures and ruptures, and general corrosion to provide a comparison of the magnitude of the various waste package breach modes.

RAI 2

SAR Section 2.1.2.2 states that, "Sorption of dissolved radionuclides on corrosion products in the waste package… is a beneficial process of the EBS when the waste packages are breached." Discuss the performance aspects of stationary corrosion products in terms of their impact on the timing and magnitude of plutonium release from the corrosion product domain. The discussion should include:

- The factors that control plutonium release from the stationary corrosion products and corrosion product domain. Controlling factors may include precipitation/dissolution reactions, solubility limits, sorption to colloids, pH, ionic strength, water flux, and mass of corrosion products
- A quantitative description of the timing and magnitude that these factors impact radionuclide release from the corrosion product and corrosion product domain
- Intermediate TSPA results corroborating the discussion of these interactions
- Release statistics/masses/concentrations for sorption to the corrosion products, release from the corrosion products and release from the corrosion product domain on a per waste package basis
- Consideration of the various scenarios (e.g. early failure, seismic, igneous, human intrusion)

This information is needed to better understand the role of corrosion products in limiting radionuclide release of plutonium in determining compliance with 10 CFR 63.114.

RAI 3
Clarify the technical basis for the values used to represent the tephra volume for the volcanic eruption modeling case.

Basis: The SAR provides an estimated range for the total volume of past eruptive events of 0.004 to 0.12 cubic kilometers (Table 2.3.11-2). The SAR also states that the tephra volume is expected to be significantly less than the total volume (i.e., tephra volume estimated for the Lathrop Wells is 0.07 cubic kilometers versus 0.12 cubic kilometers for the total volume – page 2.3.11-50). Implementation of the eruptive modeling case in the TSPA has minimum and maximum values of 0.004 and 0.14 cubic kilometers for use in developing inputs for the ASHPLUME code. These minimum and maximum values reflect the total volume not the tephra volume. Only the latter is significant to the dispersal of radionuclides entrained in tephra. This information is needed to determine compliance with 10 CFR 63.114.