

Request for Supplemental Information
and Observation
for the
Model No. CR3MP Package
Docket No. 71-9393

This request for supplemental information (RSI) identifies information needed by the staff in connection with its acceptance review of the Crystal River 3 Middle Package (CR3MP). Orano Federal Services LLC (Orano FS) submitted an application for approval of the CR3MP package, as a Type B(U)-96 Package under 10 CFR 71.41(d). The CR3MP will transport a segment of the Crystal River 3 decommissioned reactor vessel to a disposal site.

Request for Supplemental Information

RSI-1 Provide the information that was used to determine the package's fixed and loose surface contamination activities reported in the application.

The premise of the containment analyses was a surface contamination value. SAR Section 1.2.2.3 and Section 5.2 indicated that surrogate data and empirical samples were used to estimate the surface contamination. A detailed discussion of the data and empirical samples that demonstrate the bounding nature of the dispersible activity (which includes fixed and loose surface contamination) was not provided.

This information is needed to determine compliance with 10 CFR 71.47(b), 71.51(a)(b).

RSI-2 Provide the supporting information that justifies the hydrogen concentration produced in the package and address relevant analyses that were not provided or considered.

The focus of the application's hydrogen generation calculation was the effect from grout, which is introduced into the RPV after it is drained of water, according to SAR Section 1.2.2.2. Specifically, Section 5.4.4 of the application stated that the analysis was based on the gas generated per energy absorbed parameter (G) for the cement-based grout. However, the radiolysis discussion did not address the following considerations:

- a. The application did not quantify free (unbound) water within the package or address that free water often forms during processes that use cement. The radiolysis analysis should consider the effects of unbound (free) water, recognizing that water (liquid, vapor) has a (G) value of approximately 0.45 molecules/100 eV (gamma), which is much higher than the SAR's stated (G) value for grout (0.02 molecules/100 eV (gamma)).
- b. The application referenced a paper (Dole and Friedman, 1986) when determining the grout's (G) value. However, other papers (see EPRI NP-5977, September 1988) have indicated (G) values ranging from 0.11 to 0.35 molecules/100 eV. There was no discussion that justified the use of the Dole and Friedman (G)

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value (0.02 molecules/100 eV) for the CR3MP grout rather than other values (e.g., 0.35 molecules/100 eV).

- c. According to Section 5.4.4 of the application, the radiolysis calculation only considered the effect of gamma energy because it represented the majority of the content's energy; other types of radiation energy (e.g., alpha) accounted for 4% of the total. The impact on the radiolysis calculation from the other energy components may not be negligible because the application's cited radiolysis document (Dole and Friedman, 1986) noted that the grout's (G) value for alpha energy potentially could be approximately 23 times greater than the gamma energy-related (G) value.

This information is needed to demonstrate compliance with 10 CFR 71.43.