Second Request for Additional Information
Docket No. 72-1042
Model No. NUHOMS® EOS System

By letter dated June 16, 2015 (Agencywide Document Access and Management System (ADAMS) Accession No.: ML15173A379), as supplemented July 30, 2015 (ADAMS Accession No.: ML15223A204), and December 18, 2015 (ADAMS Accession No.: ML15364A399), AREVA submitted an application for approval of a spent fuel storage cask design, developed by AREVA and designated the NUHOMS EOS System. This second request for additional information (RAI) identifies information needed by the U.S. Nuclear Regulatory Commission staff (the staff) in connection with its review of the application. The requested information is listed by chapter number and title in the applicant's safety analysis report (SAR). NUREG-1536, "Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility — Final Report," was used by the staff in its review of the application.

Each question describes information needed by the staff for them to complete their review of the application and to determine whether the applicant has demonstrated compliance with regulatory requirements.

Chapter 3 – Structural Evaluation

1. Clarify the use of "Limit Load Analysis" as a sensitivity study to supplement the stress categorization evaluation of the top cover plates-to-shell welds.

   By removing the two sentences, "Figure 3.9.1-24 and Figure 3.9.1.1-25…The last converged solution …" from page 3.9.1-10, there appears no basis for making a conclusion in Section 3.9.1.6 of the SAR, which states, "The results of the limit load analysis show that there is sufficient margin compared to the design loads." If the applicant intends to continue using the limit load analysis in addition to the "strain criteria" to supplement the welds evaluation, sufficient evaluation results should be presented in the SAR for staff review.

   This information is needed to demonstrate compliance with 10 CFR 72.236.

2. Clarify the design criteria for the trunnion weld.

   Section 3.9.5.4.1 of the SAR states that the trunnions are designed in accordance with the allowable stress defined by ANSI N14.6 for a non-redundant lifting device. Section 4.2.1.1 of ANSI N14.6-1993 states that the acceptance criteria shall apply to the load-bearing members of the special lifting device. ANSI N14.6 further defines load-bearing members as any part in the load path of the special lifting device in which the induced stress is directly affected by the weight of the container connected to it. Based on this definition and the description in the SAR, the trunnion welds should be evaluated against the same design criteria as the trunnions.

   This information is needed to demonstrate compliance with 10 CFR 72.236(l).

3. Justify the seismic inertial loads used in the EOS-HSM stability calculations.

   In Section 3.9.7.1.8.3 of the SAR, seismic load values of 0.3g horizontal and 0.2g vertical are used to compute the factor of safety against HSM overturning and sliding as well as DSC stability. These values are different from the stated design basis values of 0.5g horizontal and 0.33g vertical. The staff substituted the design basis values into the equations used in Section 3.9.7.1.8.3 of the SAR and computed factors of safety of 1.02, 1.04 and 1.00 against overturning, sliding, and DSC stability. For the Horizontal Storage Module stability, Table 3-3 of NUREG-1536 requires the factor of safety to be greater than 1.1. Additionally, for the DSC stability calculation, the term "margin of safety" is used while the factor of safety is presented. The staff notes that the margin of safety is calculated as follows:

   $$Margin\ of\ Safety = \frac{Allowable\ Value}{Calculated\ Value} - 1$$

   This information is needed to demonstrate compliance with 10 CFR 72.236(l).

4. Provide the values used in the stability calculation of the Transfer Cask (TC) against overturning due to a seismic event.

   In the stability determination for the EOS-TC in Section 3.9.7.2.6.4 of the SAR, only the equations are presented. The values for the variables in the equations are not shown for the staff to evaluate to verify the factor of safety.

   This information is needed to demonstrate compliance with 10 CFR 72.236(l).

5. Revise, as appropriate, the page 3.9.1-29 conclusion statement, "The results of the strain criteria analysis show that there is sufficient margin compared to the uniform and maximum strain criteria limits," by also noting that a "strain safety margin of 2.6" would be calculated for the subject welds.

   The maximum strain evaluation results as summarized in Table 3.9.1-15 should properly be captured in the SAR to make a substantive conclusion in the SAR.

   This information is needed to demonstrate compliance with 10 CFR 72.236.

Chapter 4 – Thermal Evaluation

1. See Enclosure 2.

Chapter 8 - Materials Evaluation

1. See Enclosure 2.

2. See Enclosure 2.

3. See Enclosure 2.