November 25, 2008

James M. Shuler
U. S. Department of Energy
EM-63, CLV-2047
1000 Independence Avenue, SW
Washington, DC 20585

SUBJECT: ES-3100 REVIEW TELEPHONE CALL

Dear Dr. Shuler:

By letter dated October 11, 2007, the Department of Energy (DOE) submitted a revised application in accordance with 10 CFR Part 71 for an amendment to Certificate of Compliance (CoC) No. 9315 for the Model No. ES-3100 package to request various changes.

The U. S. Nuclear Regulatory Commission (NRC) staff reviewed the information provided and requested additional information (RAI) by letter dated April 28, 2008, as supplemented July 14, 2008. DOE responded to the RAIs by letter dated September 8, 2008. On October 14, 2008, a telephone call was held with DOE to discuss the RAI responses and to let the applicant know that there will be a second round of RAIs. Staff discussed some of the RAIs and presented a portion of the questions as described below.

Thermal Review

3-1 The original RAI 3-4 requested the applicant to justify the 1500 g limit of off-gassing material per CVA. The applicant added Appendix 3.6.7, "Estimates of Hydrogen Buildup in the ES-3100 Package Containing Highly Enriched Uranium." Section 3.6.7.5 of this appendix states that the polyethylene contributes very little to the hydrogen generation. Therefore, explain and justify the basis for the limit of 1500 g of off-gassing material and add this information to the SAR.

This information is needed to ensure compliance with 10 CFR 71.43(d).

3-2 Revise the MNOP analysis to include partial pressure from the radiolysis gas generation.

The applicant provided a gas generation model and basis to justify the compliance of the hydrogen concentration limit in the new Appendix 3.6.7. However, the original MNOP analysis does not include the partial pressure due to the generated hydrogen. A maximum partial pressure from hydrogen during the transportation period should be estimated and included in the MNOP evaluation.

This information is needed to ensure compliance with 10 CFR 71.31(a)(2) and 71.43(d).

3-3 Provide the basis for hydrogen generation model contained in Appendix 3.6.7.

(A) Provide justification for the applicability of the ORNL model.

The applicant uses a G value of 0.28 in the gas generation model to derive the gas generation rate and the time to reach the concentration limit, which is based on ORNL's

report. This value is significantly lower than the bounding value (1.6) provided in staff's guidance report NUREG-CR6673. The licensee should provide justification of the applicability of using ORNL results, which includes the material composition, operating conditions, and package geometry.

(B) Provide the experimental validation of the gas generation model.

The applicant should provide experimental validation to support the gas generation model since the G value used is a best-estimate value in contrast to the conservative bounding value. Validation is needed to address uncertainty in the analysis, such as effectiveness factor GF, void volume calculation, weight measurement, and the ideal gas law.

(C) Justify the margin for the compliance of the hydrogen concentration limit.

The applicant provides Appendix 3.6.7 as the hydrogen generation model and evaluates the time span for the package to reach the 5% hydrogen concentration limit. For CVA 7, the required time is one year, which has no margin toward the concentration limit. In light of the great uncertainty involved in the analysis and the best-estimated G value is used, the applicant should provide enough margin (time span) for the results in terms of material weight.

(D) Provide the operating procedures in handling potential flammable gas generation.

The applicant needs to provide a complete operating procedure in handling potential flammable gas generation. The procedures include venting, gas sampling, and shipping time control.

This information is needed to ensure compliance with 10 CFR 71.31(a)(2) and 71.43(d).

Staff plans to issue the rest of the second round of RAIs by the end of December 2008. You may contact me at 301-492-3339 if you have any questions regarding our review of the amendment request.

Sincerely,

/RA/

Kimberly J. Hardin, Senior Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9315
TAC No. L24141

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Kimberly J. Hardin, Senior Project Manager
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