

June 21, 2013

Dr. James M. Shuler, Manager
Packaging Certification Program
U.S. Department of Energy
Office of Packaging and Transportation
1000 Independence Ave., S.W.
Washington, D.C. 20585

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9330 FOR THE MODEL NO. ATR-FFSC
PACKAGE - REQUEST FOR ADDITIONAL INFORMATION

Dear Mr. Shuler:

This refers to your application dated December 20, 2012, as supplemented on March 20, 2013, requesting amendment of Certificate of Compliance No. 9330 for the Model No. ATR-FFSC package. By letter dated March 28, 2013, NRC staff accepted your application for technical review and issued a proposed schedule.

In connection with our review, we need the information identified in the enclosure to this letter. We request that you provide this information by July 22, 2013. If you are unable to meet this deadline, you must notify us in writing no later than July 8, 2013, of your new submittal date and the reasons for the delay. The staff will then assess the impact of the new submittal date and notify you of a revised schedule.

Please reference Docket No. 71-9330 and TAC No. L24709 in future correspondence related to this request. If you have any questions regarding this matter, I may be contacted at (301) 415-0929.

Sincerely,

/RA/ H. Akhavannik for

Jose R. Cuadrado, Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9330
TAC No. L24709
Enclosure: Request for Additional Information

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Request for Additional Information
U.S. Department of Energy
Docket No. 71-9330
Certificate of Compliance No. 9330
Model No. ATR FFSC

By application dated December 20, 2012, as supplemented March 20, 2013, the U.S. Department of Energy submitted an application for an amendment to the Model No. ATR FFSC transportation package. The application requested the addition of U-Mo demonstration elements as authorized contents of the package. This request for additional information (RAI) identifies information needed by the U.S. Nuclear Regulatory Commission (NRC) staff in connection with its review of the amendment. The requested information is listed by chapter number and title in the applicant's safety analysis report (SAR). NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material," was used by the staff in its review of the application.

Each individual RAI describes information needed by the NRC staff for it to complete its review of the application and/or the SAR and to determine whether the applicant has demonstrated compliance with the regulatory requirements.

CHAPTER 3.0 THERMAL

- 3-1 Clarify why the air thermal conductivity is not calculated using the curve fits provided in Table 3.2-4 of the SAR.

SAR page 3-7 states that because the thermal conductivity of air varies significantly with temperature, the computer model calculates the thermal conductivity across air spaces as a function of the mean film temperature. If the temperature is known at the node or cell location, the curve fits or other reliable air property tables should be used instead. Otherwise, the applicant should explain why using the mean film temperature will result in realistic air thermal conductivity values.

This information is needed to determine compliance with 10 CFR Part 71.71.

- 3-2 Clarify why for fire initial condition a uniform temperature distribution of 100°F based on a zero decay heat package at steady-state conditions with a 100°F ambient with no insolation is assumed.

SAR page 3-20 states that, for a fire initial condition, the applicant assumes an initial, uniform temperature distribution of 100°F based on a zero decay heat package at steady-state conditions with a 100°F ambient and no insolation. The SAR also states that this assumption complies with the requirement of 10 CFR 71.73(b) and NUREG-1609. Assuming this initial condition is unrealistic because the initial temperature distribution will be a function of the ambient temperature and insolation, the initial

package temperatures at the start of the fire will be higher than 100°F due to solar heating.

This information is needed to determine compliance with 10 CFR Part 71.71.

- 3-3 Clarify how it is determined that increasing the thermal conductivity associated with the air overpack nodes in the lower quadrant of the package by a factor of 2 from that for conduction would properly capture the enhanced heat transfer that convection would cause in this region.

SAR page 3-32 states that the thermal conductivity associated with the air overpack nodes in the lower quadrant of the package are increased by a factor of 2 from that for conduction as a means of simulating the type of enhanced heat transfer that convection would cause. However, there is no explanation on how this factor is determined. Also the application does not state if the increased values will result in realistic heat transfer characteristics in this region.

This information is needed to determine compliance with 10 CFR Part 71.71.

- 3-4 Compare the forced convection heat transfer coefficients applied during the hypothetical accident condition fire event computed using the relationships in Table 6-5 of Kreith (Kreith, Frank, Principles of Heat Transfer, 3rd edition, Harper & Row, 1973) for a flat surface with the values determined with the Sandia experiments described in "Thermal Measurements in a Series of Large Pool Fires," Sandia Report SAND85- 0196 TTC - 0659 UC 71, (August 1971).

SAR page 3-37 states that the forced convection heat transfer coefficients applied during the HAC fire event are computed using the relationships in Table 6-5 of Kreith (Kreith, Frank, Principles of Heat Transfer, 3rd edition, Harper & Row, 1973). However, the SAR does not explain why this correlation is valid or if it compares well with experimentally determined forced heat transfer coefficients during regulatory fires.

This information is needed to determine compliance with 10 CFR Part 71.73.