December 9, 2010

Dr. James Shuler, Manager
Packaging Certification Program
Safety Management and Operations
Office of Environmental Management
U.S. Department of Energy
Washington, DC 20585

SUBJECT: REVISION NO. 3 OF CERTIFICATE OF COMPLIANCE NO. 9330 FOR THE MODEL NO. ATR FFSC PACKAGE

Dear Dr. Shuler:

As requested by your application dated December 7, 2010, enclosed is Certificate of Compliance No. 9330, Revision No. 3, for the Model No. ATR FFSC package. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's Safety Evaluation Report is also enclosed.

This approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471.

If you have any questions regarding this certificate, please contact me or Chris Staab of my staff at (301) 492-3321.

Sincerely,

/RA/
Robert K. Johnson, Acting Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9330
TAC No. L24495

Enclosures:
1. Certificate of Compliance No. 9330, Rev. No. 3
2. Safety Evaluation Report
3. Registered Users

cc w/encls. 1& 2: R. Boyle, Department of Transportation
Registered Users

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Closes TAC No. L24495
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G:\SFST\PART 71 CASEWORK\9330.R3.LETTER&SER.doc **ADAMS Package No.: MLxxxxxxxxx**

OFC:	SFST	E	SFST		SFST		SFST		SFST	
NAME:	CStaab		Zli		MDeBose		MRahimi		RJohnson	
DATE:	12/09/2010		12/09/2010		12/09/2010		12/09/2010		12/9/2010	

C = COVER **E = COVER & ENCLOSURE** **N = NO COPY**

SAFETY EVALUATION REPORT

Model No. ATR FFSC Package
Certificate of Compliance No. 9330
Revision No. 3

SUMMARY

By application dated December 7, 2010, the U.S. Department of Energy requested approval of an amendment to the Model No. ATR FFSC (Advanced Test Reactor Fresh Fuel Shipping Container) to support an upcoming shipment of three unirradiated fuel elements to the Massachusetts Institute of Technology (MIT) Research Reactor with three different fuel element channel widths: 0.0812 inch, 0.0822 inch, and 0.0829 inch. Each package will contain one MIT research reactor fuel element. The applicant requested during a conference call on December 8, 2010, that the allowed maximum channel width be 0.083 inch in order to account for possible measurement uncertainties in the fuel element with a channel width of 0.0829 inch. The structural design of the packaging remains as previously approved.

The staff reviewed the information provided in the application letter and the Safety Analysis Report (SAR) to determine whether the request meets regulatory requirements for fissile materials transportation packages. The package was evaluated against the regulatory standards as defined in 10 CFR Part 71, including the general standards for all packages, and performance standards for fissile material packages under normal conditions of transport and hypothetical accident conditions.

The staff reviewed the application using the guidance provided in NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material." Based on the statements and representations provided in the application, and the conditions listed below, the staff concludes the proposed amendment meets the requirements of 10 CFR Part 71.

EVALUATION

The applicant requested to authorize shipment of three MIT research reactor fuel elements with slightly different channel widths that do not meet the contents authorized by the previous Certificate of Compliance (CoC) No. 9330, dated September 7, 2010. Specifically, the previous CoC restricts the MIT research reactor fuel element to 0.082 inch as the maximum allowable fuel element channel width. The channel widths of the three fuel elements required for shipment to the MIT research reactor are 0.0812, 0.0822, and 0.0829 inch. The fissile materials loads in these fuel elements remain the same, i.e., 515 grams per element at 94% ^{235}U enrichment. The applicant states in the application letter that the variations in fuel element channel widths have been analyzed in the SAR and requests the Nuclear Regulatory Commission to approve the shipment of MIT research reactor fuel elements with maximum channel width up to 0.094 inch.

The staff reviewed the statements, presentations, and safety analysis results presented in the SAR as amended on July 29, 2010, and found that the criticality safety analysis results bound the three fuel elements as manufactured with fuel element channel widths of 0.0812, 0.0822, and 0.0829 inch respectively. Although the reactivity exhibits a trend to increase as the fuel

element channel width increases, the maximum channel width of 0.083 inch is within the range of the nominal dimension plus the manufacture tolerances as analyzed in the SAR. The ATR FFSC MIT research reactor fuel element packages with these three channel widths are bounded by the studies presented in the SAR as amended on July 29, 2010. Based on the information presented in the SAR as amended and its evaluation, the staff determined that there is a reasonable assurance that the MIT research reactor fuel element packages with these three new fuel element channel widths meet the criticality safety requirements of 10 CFR 71.55 and 10 CFR 71.59. No additional safety analysis is warranted for these packages.

Regarding the request to extend the allowable fuel element channel width to up to 0.094 inch, the staff reviewed the current SAR and found the information is not sufficient for the staff to determine that the package meets the criticality safety requirements of 10 CFR 71.55 and 10 CFR 71.59. The results presented in Table 6.10-6 of the SAR regarding the channel width of 0.094 inch for the MIT research reactor fuel elements are intended as a parametric study of the sensitivities of reactivity to channel width variation rather than analyses for fuel element channel width of 0.094 inch. If a MIT fuel element has a 0.094 inch channel width, a safety analysis should be performed and data similar to that presented in Table 6.10-6 should be provided. A sensitivity study of the fuel element channel width itself does not establish a technical basis for the staff to make a safety finding. A separate safety analysis is needed for each new design.

The staff reviewed the application using the guidance in NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material." Based on the statements and representations in the application, and the conditions listed below, the staff concluded that the packages with the MIT fuel elements having the three different channel widths, namely 0.0812, 0.0822, and 0.0829 inch, continues to meet the requirements of 10 CFR Part 71 and the CoC is revised to allow a maximum channel width of 0.083 inch.

CONDITIONS

Condition No. 5(b)(1) was modified to clarify the maximum channel thickness between fuel plates is 0.083 inch for MIT fuel elements.

Condition No. 10 allows the previous revision of the certificate to be used for a period of approximately one year.

The expiration date of the certificate was not changed. The References section was modified to include the application dated December 7, 2010.

CONCLUSION

Based on the statements and representations contained in the application, and the conditions listed above, the staff concluded that the Model No. ATR FFSC package meets the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9330, Revision No.3
on December 9, 2010.