

September 28, 2009

Mr. Ralph A. Butler
Director, Research Reactor
University of Missouri
1513 Research Park Drive
Columbia, MO 65211

SUBJECT: AUTHORIZATION FOR LIMITED SHIPMENTS IN THE MODEL
NO. BMI-1 PACKAGE, CERTIFICATE OF COMPLIANCE NO. 5957

Dear Mr. Butler:

As requested by your application dated August 4, 2009, and pursuant to 10 CFR Part 71, Certificate of Compliance No. 5957 for the Model No. BMI-1 package is amended to authorize the following limited shipments, subject to the conditions listed below.

1. The container is constructed in accordance with Framatome Cogema Fuels Drawing Nos. 1273422, Rev. 0; 1273423, Rev. 0; 1273424, Rev. 0; 1273425, Rev. 0; 1273426, Rev. 0; and 1273427, Rev. 0.
2. Contents
 - (a) Type and form of material

Intact irradiated MTR- or BRR-type fuel assemblies containing not more than 200 grams U-235 per assembly prior to irradiation. Uranium may be enriched to a maximum 93.5 w/o in the U-235 isotope. Active fuel length shall be approximately 25 inches. Or, other contents as allowed by Certificate of Compliance No. 5957.
 - (b) Maximum quantity of material per package

As specified in Certificate of Compliance No. 5957.
3. Shipment must be by truck and dedicated trailer specifically designed for shipment of BMI-1, as exclusive use shipment.
4. All shipments will be to U.S. Department of Energy (DOE), Savannah River Site, as part of the DOE's Research Reactor Infrastructure Program.
5. Special package inspections are required before each use of BMI-1. Replacement of sealing gaskets prior to each shipment are required, rather than

every twelve months. A comprehensive inspection of all sealing gasket seating surfaces is required prior to each shipment.

6. Authorization is for a maximum of three shipments, and expires October 1, 2010.

All other conditions of Certificate of Compliance No. 5957 remain the same. The University of Missouri has been issued a Quality Assurance Program Approval for Radioactive Material Packages No. 0108, under the provisions of 10 CFR Part 71.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

/RA/

Steven L. Baggett, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-5957
TAC No. L24362

Enclosure: Safety Evaluation Report

cc w/encl: J. Shuler, Department of Energy
R. Boyle, Department of Transportation

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**SAFETY EVALUATION REPORT
DOCKET NO. 71-5957
MODEL NO. BMI-1 PACKAGE
UNIVERSITY OF MISSOURI RESEARCH REACTOR CENTER**

SUMMARY

By application dated August 4, 2009, University of Missouri Research Reactor Center (MURR) requested authorization to use Model No. BMI-1 package beyond the package authorization expiration date of October 1, 2008.

Based on the statements and representations in the application, staff agrees that the extension of use of the package, with the additional conditions stated below, meets the requirements of 10 CFR Part 71.

BACKGROUND

NRC amended the regulations in 10 CFR Part 71, effective October 1, 2004, to be compatible with the 1996 edition of the International Atomic Energy Agency (IAEA), "Regulations for the Safe Transport of Radioactive Material" (TS-R-1, as amended in 2000). As a result, certain transportation packages that are compatible to the IAEA 1967 edition were no longer authorized for use under the 10 CFR Part 71 general license after October 1, 2008.

In their application dated September 15, 2008, MURR requested authorization to use the Model No. BMI-1 package beyond the package authorization expiration date of October 1, 2008. MURR submitted supplemental information by email dated November 6, 2008. MURR provided the information as described in U.S. Nuclear Regulatory Commission, Regulatory Issue Summary (RIS) 2008-18, "Information on Requests for Extending Use of Expiring Transportation Packages." The package was authorized for transport by NRC letter dated November 6, 2008 [ML083120416], as supplemented on November 25, 2008 [ML083300161], allowing continued use of the Model No. BMI-1 package until October 1, 2009. MURR, in the September 15, 2008, application, anticipated that the packaging which would replace the Model No. BMI-1 package would be available for use prior to October 1, 2009.

EVALUATION

By application dated August 4, 2009, MURR requested authorization for an extension to their approval for use of the Model No. BMI-1 package beyond the package authorization expiration date of October 1, 2008. The packaging design intended to replace the Model No. BMI-1 package, was submitted to the NRC for review and approval under Docket No. 71-9341, by application dated March 25, 2009. MURR requested continued use of the Model No. BMI-1 package until October 1, 2010, to support spent fuel shipments from the university-operated research reactor until the replacement packaging is authorized and available for use.

In the application to extend use of the Model No. BMI-1, MURR provided the information as described in RIS 2008-18. Staff reviewed the reasons provided for requesting extended use. MURR's application identifies that the Model No. BMI-1 package is required to allow MURR to maintain minimum inventories of spent fuel on site. Limiting on site inventories is consistent with NRC directives for enhanced security at research reactor facilities, and supports the Department of Energy's (DOE) mission with respect to the return of spent nuclear fuel from operating university research reactors. MURR is the sole domestic source for several radioisotopes used for cancer treatment (samarium-153, cesium-131, and ytterbium-169), and failure to manage the spent fuel inventory could negatively impact the availability of these radioisotopes.

Staff also reviewed the safety justification for continued use and MURR's proposed compensatory measures. MURR identifies that the BMI-1 package has been maintained under NRC Quality Assurance Program Approval for Radioactive Packages No. 0108. In addition to the annual inspections and testing, MURR has implemented compensatory measures to verify the condition of the package prior to each shipment under this approval. The enhanced maintenance and inspection will include replacement of sealing gaskets prior to each shipment, and a comprehensive inspection of all sealing gasket seating surfaces prior to each shipment.

The BMI-1 package is provided to MURR by DOE for spent fuel shipments. MURR is relying on the DOE to develop the replacement package for the BMI-1. MURR's application identifies the replacement packaging and proposed schedule for placing the replacement packaging into service. Staff reviewed the proposed replacement packaging submittal, Docket No. 71-9341, and confirmed the dates and schedule indicated in MURR's application.

CONDITIONS

Based on the statements and representations in the application, authorization is given for the transport of Type B quantities of radioactive material by MURR using the Model No. BMI-1 package with the following conditions:

1. The cask is constructed in accordance with the following Battelle Memorial Institute (BMI) Drawing Nos.: 43-6704-0001, Rev. B; and 41-4409-0003, Rev. B.
2. Contents
 - (a) Type and form of material

Intact irradiated MTR- or BRR-type fuel assemblies containing not more than 200 grams U-235 per assembly prior to irradiation. Uranium may be enriched to a maximum 93.5 w/o in the U-235 isotope. Active fuel length shall be approximately 25 inches. Or, other contents as allowed by Certificate of Compliance No. 5957.
 - (b) Maximum quantity of material per package

As specified in Certificate of Compliance No. 5957.

3. Shipment must be by truck and dedicated trailer specifically designed for shipment of BMI-1, as exclusive use shipment.
4. All shipments will be to U.S. Department of Energy (DOE) Savannah River Site as part of the DOE's Research Reactor Infrastructure Program.
5. Special package inspections are required before each use of BMI-1. Replacement of sealing gaskets prior to each shipment are required, rather than every twelve months. A comprehensive inspection of all sealing gasket seating surfaces is required prior to each shipment.
6. Authorization is for a maximum of three shipments, and expires October 1, 2010.

All other conditions of Certificate of Compliance No. 5957 remain the same.

CONCLUSIONS

Based on the statements and representations in the MURR application dated August 4, 2009, the staff agrees that the use by MURR of the Model No. BMI-1 package meets the requirements of 10 CFR Part 71, subject to the conditions listed above.

Issued with letter to Mr. Ralph A. Butler,
on September 28, 2009.