



# Research Reactor Center

University of Missouri

1513 Research Park Drive  
Columbia, MO 65211

PHONE 573-882-4211

FAX 573-882-6360

WEB <http://web.missouri.edu/~murrwww>

September 15, 2008

ATTN: Document Control Desk  
Director, Division of Spent Fuel Storage and Transportation  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-001

RE: Request for Extending the Use of an Expiring Type B Transportation Package

Dear Director:

The University of Missouri Research Reactor (MURR) is requesting the extended use of the BMI-1 package on a limited basis. The supporting information for such a request, using the guidance provided by U.S Nuclear Regulator Commission (NRC) Regulatory Issue Summary (RIS) 2008-18, "Information on Requests for Extending Use of Expiring Transportation Packages," dated August 14, 2008, is included below.

(1) Package Information

BMI-1 Package ID Number USA/5957/B(F); Certificate of Compliance Number 5957; Docket Number 71-5957.

(2) Identification of Shipments

MURR requests the limited use of this package for the period of October 1, 2008 to October 1, 2009, in order to perform three (3) spent fuel shipments from our university research reactor. There would be one package per shipment. The BMI-1 package has a dedicated trailer that is designed specifically for shipping this package as an exclusive use, highway route controlled quantity shipment.

The proposed shipments using this package would originate from the Missouri University Research Reactor (MURR), in Columbia, Missouri. The destination for all shipments would be the U.S. Department of Energy (DOE) Savannah River Site as part of the DOE's Research Reactor Infrastructure Program (formerly the University Reactor Fuels Assistance Program).

The mode of transportation for the BMI-1 package is by highway conveyance using a flatbed trailer specifically designed for this package. These shipments have strict security measures as required by NRC Orders regarding safeguards and security compensatory measures for the transportation of spent nuclear fuel.

The general timeframe would be three (3) shipments between October 1, 2008 and October 1, 2009. The date of the last shipment would be before October 1, 2009, or when the new package that is currently being designed and manufactured by the DOE contractor is approved and available for use.

(3) Reasons for Requesting Extended Use

MURR requests the extended use of the BMI-1 package, in part, to assist the DOE to meet its mission with respect to the return of spent nuclear fuel from operating university research reactors. This is the package that the DOE has provided for research reactors for the return of spent research reactor fuel

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for the past 15 years. It is imperative that spent fuel from these operating reactors, including MURR, be returned in a timely manner to DOE possession in order to minimize the spent fuel inventory at these university research reactors.

The U.S. DOE, the BMI-1 package owner, is making good faith efforts through their contractor at the Idaho National Laboratory (INL) to design, fabricate and license a package to replace the BMI-1 packaging. The procurement activity to design and fabricate a replacement package is now in place. However, the new packaging will not be approved and fabricated before the "sunset" date, which is October 1, 2008, for the use of the BMI-1 package.

The only alternative package capable of shipping spent research reactor fuel, the GE-2000 package, is not available for use by the DOE Research Reactor Infrastructure Program because this package is dedicated to programmatic requirements at the DOE National Laboratories. The transportation schedule for the return of spent research reactor fuel cannot be adjusted to allow these shipments to be made prior to October 1, 2008, because spent research reactor fuel is generated over the ongoing period of reactor operation that we require in order to meet our mission.

The limited extended use of the BMI-1 package is necessary to allow the MURR to maintain minimum inventories of spent fuel on site. This is consistent with recent NRC directives for enhanced security at research reactor facilities. If the current schedule for the availability of the new package to replace the BMI-1 is delayed, the operating status of our research reactor could be seriously impaired. MURR operates a significant portion of the year in support of our university's research, education and service mission.

If MURR was unable to ship spent fuel for an extended period of time, it would result in a severe impact on the domestic supply of radioisotopes for medical uses, industrial applications and research. MURR is the sole domestic source for several radioisotopes (Sm-153, Cs-131 and Yb-169) needed for cancer treatment. MURR's relatively high flux and reliable operating schedule allow it to be the weekly source for the high-activity radionuclides needed for medical, industrial and research use.

#### (4) Safety Justification for Continued Use and Proposed Compensatory Measures

The BMI-1 package has had an impressive safety record and for the past 15 years has been the primary package used by the DOE for the return of spent fuel from university-operated research reactors to the DOE as part of the University Reactor Fuels Assistance Program (now the Research Reactor Infrastructure Program). During this 15 year period the package has been used safely and securely to make approximately 50 shipments from university reactor facilities to the Savannah River Site.

The BMI-1 package appears to be a package design categorized in Federal Register/Vol. 69, No.16, January 26, 2004, page 3731, as one that may meet current safety designs but is impractical to recertify or one for which the safety performance of the package design under the new standards is not known. This package is the only one of its kind and has a limited, but very important use.

The NRC and Department of Transportation (DOT) recognized in their responses to questions in the Final Rules implementing regulation to harmonize with International Atomic Energy Agency (IAEA) standards (Federal Register/Vol. 69, No. 16, dated January 26, 2004) that there were no imminent safety hazards posed by the use of packages, like the BMI-1, that would preclude their safe use during the transition period unless a safety issue with the package was identified. In this case, no new safety issues with the use of the BMI-1 package have arisen.

The BMI-1 package has been well maintained under the NRC Quality Assurance Program Approval for Radioactive Packages, No. 0108, issued to MURR. This maintenance includes both annual and biennial inspections and testing to verify package integrity. These inspections include non-

destructive testing of welds, which must be sound for safe operation, leak tightness tests in accordance with ANSI N14.5, "Radioactive Materials - Leakage Tests on Packages for Shipment," and the replacement of sealing gaskets at least every 12 months or if any evidence of deterioration is detected. The operational tests include temperature stabilization tests and leak tightness tests after loading for each use of the package.

The following compensatory measures will be implemented for the limited number of shipments specified if the request to extend the use of the BMI-1 package is approved:

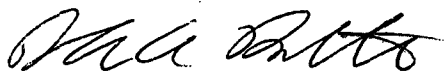
1. The shipments using this package are required to be exclusive use, highway route controlled quantity shipments. These shipments are coordinated with all relevant government entities in the package route so that if an emergency situation were to occur immediate response is available. This package is shipped using a trailer designed specifically for this package. Before each shipment a Level 6 Department of Transportation (DOT) inspection will be performed on the tractor and trailer.
2. Special package inspections will be incorporated before each use of the BMI-1 package. This will include:
  - a. Replacement of sealing gaskets prior to each shipment, rather than the current 12 month interval.
  - b. Comprehensive inspection of all sealing gasket seating surfaces.

(5) A Plan and Schedule to Acquire Replacement Packages or Complete Necessary Shipments

The DOE is replacing the BMI-1 package with a new package currently being procured by INL. This package will be designed and licensed for the shipment of MTR spent fuel [specifically the University of Missouri Research Reactor (MURR) and the Massachusetts Institute of Technology Reactor (MITR)], for various types of TRIGA spent fuel, and for Advanced Test Reactor (ATR) spent fuel types.

A competitive bid proposal process has been followed to procure the new package. On February 22, 2008, the contract was awarded to AREVA Federal Services (AFS). An internal design review was held on April 10, 2008, and the design team and INL project manager met with the NRC on May 7, 2008 to discuss the proposed design and schedule. An operations review meeting was conducted with MURR staff on July 15, 2008. Half-scale impact limiter testing is scheduled for completion in October 2008. The final design review meeting is scheduled for November 2008. The Safety Analysis Report (SAR) will be submitted to the NRC the first week of December. The duration of the NRC review is dependant upon work load and reviewer availability. Some package fabrication will proceed at risk during the NRC review period, including the procurement of long lead items. Dependant on the questions and comments received from the NRC, the decision will be made whether to proceed at risk with completion of the fabrication of the package. It is anticipated that the package Certificate of Compliance (CoC) will be awarded in summer 2009, and the package will be then available to use for MURR spent fuel shipments."

Sincerely,



Ralph A. Butler, PE  
Director, University of Missouri Research Reactor

Xc: Associate Administrator for Hazardous Material Safety  
Pipeline and Hazardous Materials Safety Administration  
U. S. Department of Transportation