East Building, PHH-23
1200 New Jersey Ave, SE
Washington, D.C. 20590

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

COMPETENT AUTHORITY CERTIFICATION FOR A TYPE B(U)F FISSILE RADIOACTIVE MATERIALS PACKAGE DESIGN CERTIFICATE USA/0847/B(U)F, REVISION 0

REVALIDATION OF JAPANESE COMPETENT AUTHORITY CERTIFICATE J/2043/B(U)F

The Competent Authority of the United States certifies that the radioactive material package design described in this certificate satisfies the regulatory requirements for a Type B(U)F package as prescribed in the regulations of the International Atomic Energy Agency[1] and the United States of America[2] The package design is approved for use within the United States for import and export shipments made in accordance with applicable international and domestic transport regulations.

1. Package Identification - JRF-90Y-950K.

2. Package Description and Authorized Radioactive Contents - as described in Japanese Certificate of Competent Authority J/2043/B(U)F dated July 29, 2022 (attached).

3. Criticality - The minimum criticality safety index is 0.0. The maximum number of packages per conveyance is determined in accordance with Table 11 of the IAEA regulations cited in this certificate.

4. General Conditions -

   a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.

   b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Engineering and Research, (PHH-23), Pipeline and Hazardous

[1] "Regulations for the Safe Transport of Radioactive Material, 2018 Edition, No. SSR-6" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

[2] Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

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Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.

c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

d. Records of Management System activities required by Paragraph 306 of the IAEA regulations[1] shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

5. Marking and Labeling - The package shall bear the marking USA/0847/B(U)F in addition to other required markings and labeling.

6. Expiration Date - This certificate expires on May 22, 2028.

This certificate is issued in accordance with paragraph(s) 810 and 816 of the IAEA Regulations and Section 173.472 and 173.473 of Title 49 of the Code of Federal Regulations, in response to the December 21, 2022 petition by Edlow International Company, Washington, DC, and in consideration of other information on file in this Office.

Certified By:

William Schoonover
Associate Administrator for Hazardous Materials Safety

June 27, 2023
(DATE)

Revision 0 - Issued to revalidate Japanese certificate J/2043/B(U)F dated July 29, 2022. This package is approved as meeting the requirements of the 2018 Edition of the IAEA regulations.

原規規発第 2207293 号
令和 4 年 7 月 29 日

国立研究開発法人日本原子力研究開発機構
理事長　小口　正範　殿

原子力規制委員会

核燃料輸送物設計承認英文証明書について

核燃料物質等の工場又は事業所の外における運搬に係る核燃料輸送物設計承認及び容器承認等に関する申請手続ガイド（令和 2 年 2 月 26 日付け原規規発第 2002264 号）2.4.に基づき、令和 4 年 7 月 19 日付け令 04 原機(環材)019 をもって申請のあった標記の件について、添付のとおり証明します。

IDENTIFICATION MARK
J/2043/B(U)F

COMPETENT AUTHORITY
OF
JAPAN

CERTIFICATE FOR APPROVAL OF PACKAGE DESIGN FOR THE TRANSPORT OF RADIOACTIVE MATERIALS

ISSUED BY

NUCLEAR REGULATION AUTHORITY
1-9-9, ROPPONGI MINATO-KU
TOKYO, JAPAN

CERTIFICATE FOR APPROVAL OF PACKAGE DESIGN FOR THE TRANSPORT OF RADIOACTIVE MATERIALS

This is to certify, in response to the application by Japan Atomic Energy Agency, that the package design described herein complies with the design requirements for a package containing Uranium Silicon Aluminum Dispersion Alloy, Uranium Aluminum Alloy and Uranium Aluminum Dispersion Alloy, specified in the 2018 Edition of the Regulations for the Safe Transport of Radioactive Material (International Atomic Energy Agency, Safety Standards Series No.SSR-6) and the Japanese rules based on the Act on Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.

This certificate does not relieve the consignor from compliance with any requirement of the government of any country through or into which the package will be transported.

COMPETENT AUTHORITY
IDENTIFICATION MARK: J/2043/B(U)F

Jul. 29 2022
Date

K. Hasegawa
Hasegawa Kiyomitsu

Director, Division of Licensing for
Nuclear Fuel Facilities

Secretariat of Nuclear Regulation Authority
Competent Authority of JAPAN
for Package Design Approval

1. The Competent Authority Identification Mark : J/2043/B(U)F

2. Name of Package : JRF-90Y-950K

3. Type of Package : Type B(U) package for fissile material

4. Specification of Package
(1) Materials of Packaging
(a) Main Body : Stainless steel, Balsa wood and Hard polyurethane foam
(b) Outer Lid : Stainless steel, Balsa wood and Hard polyurethane foam
(c) Inner Lid : Stainless steel and Silicone rubber
(d) Fuel Basket : Stainless steel and Silicone rubber
(2) Total Weight of Packaging : Approximately 860 kg
(3) Outer Dimensions of Packaging
(i) Outer Diameter : Approximately 840 mm
(ii) Length : Approximately 1,800 mm
(4) Total Weight of Package : 950 kg or less
(5) Illustration of Package : See Figure-1 (Bird's-eye view)

5. Specification of Radioactive Contents : See Table-1 and Table-2

6. Description of Containment System
Containment system consists of an inner shell and an inner lid (made of stainless steel). O-ring made of silicone rubber is used for the contact surface between the inner shell and the inner lid.

7. For Package Containing Fissile Materials,
(1) Restrictions on Package
(i) Restriction Number "N" : No restriction
(ii) Array of Package : No restriction
(iii) Criticality Safety Index (CSI) : 0
(2) Description of Confinement System

Confinement system consists of the basket which maintains the fuel elements contained in the package.

(3) Assumptions of Leakage of Water into Package

It is assumed in criticality analysis that water will leak into void space of the inner shell.

(4) Special Features in Criticality Assessment

Not applicable

8. For Type B (M) Packages, a Statement Regarding Prescriptions of Type B (U) Package that do not apply to this Package

Not applicable (This package is Type B(U))

9. Assumed Ambient Conditions

(i) Ambient Temperature Range : -40°C~38°C

(ii) Insolation Data : Table 12 of IAEA Regulation

10. Handling, Inspection and Maintenance

(1) Handling Instructions

(i) Package should be handled carefully in accordance with the schedule and procedures established properly taking all possible safety measures.

(ii) Package should be handled using appropriate lifting devices and cranes.

(iii) When packaging is stored outdoors, it should be covered with an appropriate waterproof sheet, avoiding the situation where it is placed directly on the ground.

(2) Inspections and Maintenance of Packaging

The following inspections should be performed not less than once a year (once for every ten times in a case where the packaging is used more than ten times a year) and defect of packaging should be repaired, if any, in order to maintain the integrity of packaging.

(i) Visual Appearance Inspection

(ii) Pressure Durability Inspection

(iii) Maintenance of O-ring Used for Containment System

(iv) Leakage Rate Measurement Inspection

(v) Subcriticality Inspection

(vi) Lifting Inspection

(3) Actions Prior to Shipment

The following inspections should be performed prior to shipment.

(i) Visual Appearance Inspection

(ii) Lifting Inspection
(iii) Weight Measurement Inspection
(iv) Surface Contamination Measurement Inspection
(v) Radiation Dose Rate Inspection
(vi) Subcriticality Inspection
(vii) Contents Specification Check Inspection
(viii) Leakage Rate Measurement Inspection

(4) Precautions for Loading of Package for Shipment
Package should be securely loaded to the conveyance at the designated tie-down portion of the package so as not to move, roll down or fall down from the loading position during transport.

11. Issue Date and Expiry Date
(i) Issue Date : May 23, 2022
(ii) Expiry Date : May 22, 2082

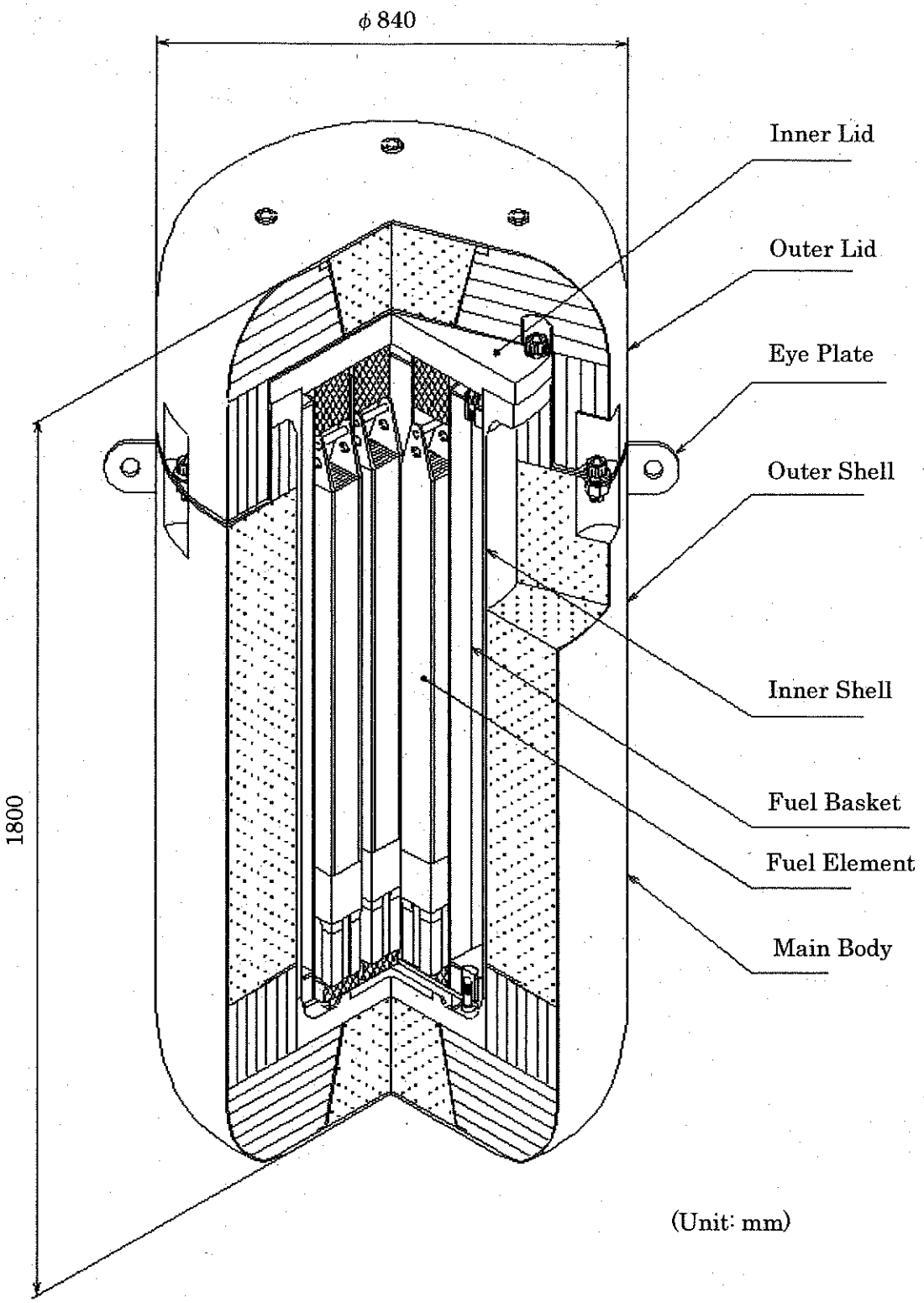

Figure-1 Illustration of JRF-90Y-950K Package (Bird's-eye view)

Table- 1 Specification of Contents (Fresh Fuel Element)

Type	Reactor	JRR-3		JMTR	
	Fuel Element	JRR-3 Standard	JRR-3 Follower	JMTR Standard	JMTR Follower
Number of Fuel Elements (element/Package)		10 or less			
Fuel Type		LEU fuel		LEU fuel	
Material of Nuclear Fuel		Uranium Silicon Aluminum Dispersion Alloy		Uranium Silicon Aluminum Dispersion Alloy	
Physical State		Solid			
Weight	^{235}U weight (g or less/package)	4,850	3,100	4,250	2,800
	U weight (g or less/package)	24,810	15,860	21,740	14,330
	^{235}U weight (g or less /element)	485	310	425	280
	U weight (g or less /element)	2,481	1,586	2,174	1,433
Enrichment(wt% or less)		19.95		19.95	
Activity of Contents	Total (GBq or less/package)	29.8			
	Principal Radionuclide (GBq or less/package)	^{234}U : 28.6 ^{235}U : 0.38 ^{236}U : 0.59 ^{238}U : 0.24			
Burn-up (% or less)		0 (Fresh fuel)			
Total Heat Generation Rate (W or less /Package)		0 (Fresh fuel)			
Cooling time (Day)		0 (Fresh fuel)			

·Loading a transport package with different types of fuel element is allowed for each reactor only when all the fuel elements contained are the same material of nuclear fuel having the same enrichment level.

· The values of weight and heat generation are calculated proportionally from the maximum weight and heat generation for each type of fuel element according to the number of assemblies contained.

Table-2 Specification of Contents (Low Irradiated Fuel Element)

Type	Reactor	JMTRC			
	Fuel Element	Special	Standard	Special	Follower
Number of Fuel Elements (element/Package)		10 or less			
Fuel Type		HEU fuel	MEU fuel		
Material of Nuclear Fuel		Uranium Aluminum Alloy	Uranium Aluminum Dispersion Alloy		
Physical State		Solid			
Weight	^{235}U weight (g or less/package)	2,850	3,170	2,860	2,100
	U weight (g or less/package)	3,180	7,210	6,500	4,780
	^{235}U weight (g or less /element)	285	317	286	210
	U weight (g or less /element)	318	721	650	478
Enrichment(wt% or less)		90.0	46.0		
Activity of Contents	Total (GBq or less/package)	17.3			
	Principal Radionuclide (GBq or less/package)	^{234}U : 16.2 ^{235}U : 0.25 ^{236}U : 0.29 ^{238}U : 0.05 Other : 0.52			
Burn-up (% or less)		7.23×10^{-5}	1.76×10^{-5}		
Total Heat Generation Rate (W or less /Package)		4.30×10^{-5}	3.29×10^{-5}		
Cooling time		5,475 Day or more	1,460 Day or more		

- Loading a transport package with different types of fuel element is allowed for each reactor only when all the fuel elements contained are the same material of nuclear fuel having the same enrichment level. However, loading with different types of fuel element is allowed even if fuel elements contained are different type or different enrichment level, in case of JMTRC fuel element.
- The values of weight and heat generation are calculated proportionally from the maximum weight and heat generation for each type of fuel element according to the number of assemblies contained.
- The absorbed dose rate to air at a position 1 m away from the surface of the package is 1 Gy/h or less.

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U.S. Department of
Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

CERTIFICATE NUMBER: USA/0847/B(U)F-96

ORIGINAL REGISTRANT(S):

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Washington, DC, 20009
USA