



U.S. Department
of Transportation

Pipeline and
Hazardous Materials
Safety Administration

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

COMPETENT AUTHORITY CERTIFICATION FOR A
TYPE B(U)F FISSILE
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0452/B(U)F-96, REVISION 14
REVALIDATION OF JAPANESE COMPETENT AUTHORITY
CERTIFICATE J/119/B(U)F-96

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 Agency¹ and the United States of America².

1. Package Identification - JRF-90Y-950K.
2. Package Description and Authorized Radioactive Contents - as described in Japanese Certificate of Competent Authority J/119/B(U)F-96, Revision 2 (attached).
3. Criticality - The minimum criticality safety index is 0.0. The maximum number of packages per conveyance is determined in accordance with Table X 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 Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.

¹ "Regulations for the Safe Transport of Radioactive Material, 2012 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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- 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 regulations¹ 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. Special Conditions -

- a. For shipments which enter into or transit the United States, all international approvals and revalidations, including Approval of Packaging and Confirmation of Packaging certificates issued by the government of Japan, shall be issued prior to the commencement of transport.
- b. The package is not to be transported by air.

6. Marking and Labeling - The package shall bear the marking USA/0452/B(U)F-96 in addition to other required markings and labeling.

7. Expiration Date - This certificate expires on December 7, 2022. Previous editions which have not reached their expiration date may continue to be used.

CERTIFICATE USA/0452/B(U)F-96, REVISION 14

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 March 5, 2018 petition by Edlow International Company, Washington, DC, and in consideration of other information on file in this Office.

Certified By:



April 04, 2018

(DATE)

 William Schoonover
Associate Administrator for Hazardous
Materials Safety

Revision 14 - issued to endorse Japanese Certificate of Competent Authority No. J/119/B(U)F-96 (Rev. 2), dated January 31, 2018.



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 fresh fuel elements and low irradiated fuel elements in research reactors, specified in the 2012 Edition of the Regulations for the Safe Transport of Radioactive Materials (International Atomic Energy Agency, Safety Standards Series No.SSR-6) and the Japanese rules based on the Act on the 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

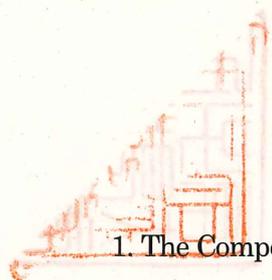
IDENTIFICATION MARK : J/119/B(U)F-96(Rev.2)

January 31, 2018
Date

青木 一哉
Kazuya Aoki

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/119/B(U)F-96 (Rev. 2)
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 : See the attached Table-1
 - (2) Total Weight of Packaging : Approximately 860 kg
 - (3) Outer Dimensions of Packaging
 - (i) Outer Diameter : Approximately 840 mm
 - (ii) Height : Approximately 1800 mm
 - (4) Total Weight of Package : 950 kg or less
 - (5) Illustration of Package : See the attached Figure-1(Bird's-eye view)

5. Specification of Radioactive Contents : See the attached Table-2, Table-3

6. Description of Containment System

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

- (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 the crane.
 (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 not less 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) Action prior to Shipment

The following inspections should be performed prior to shipment.

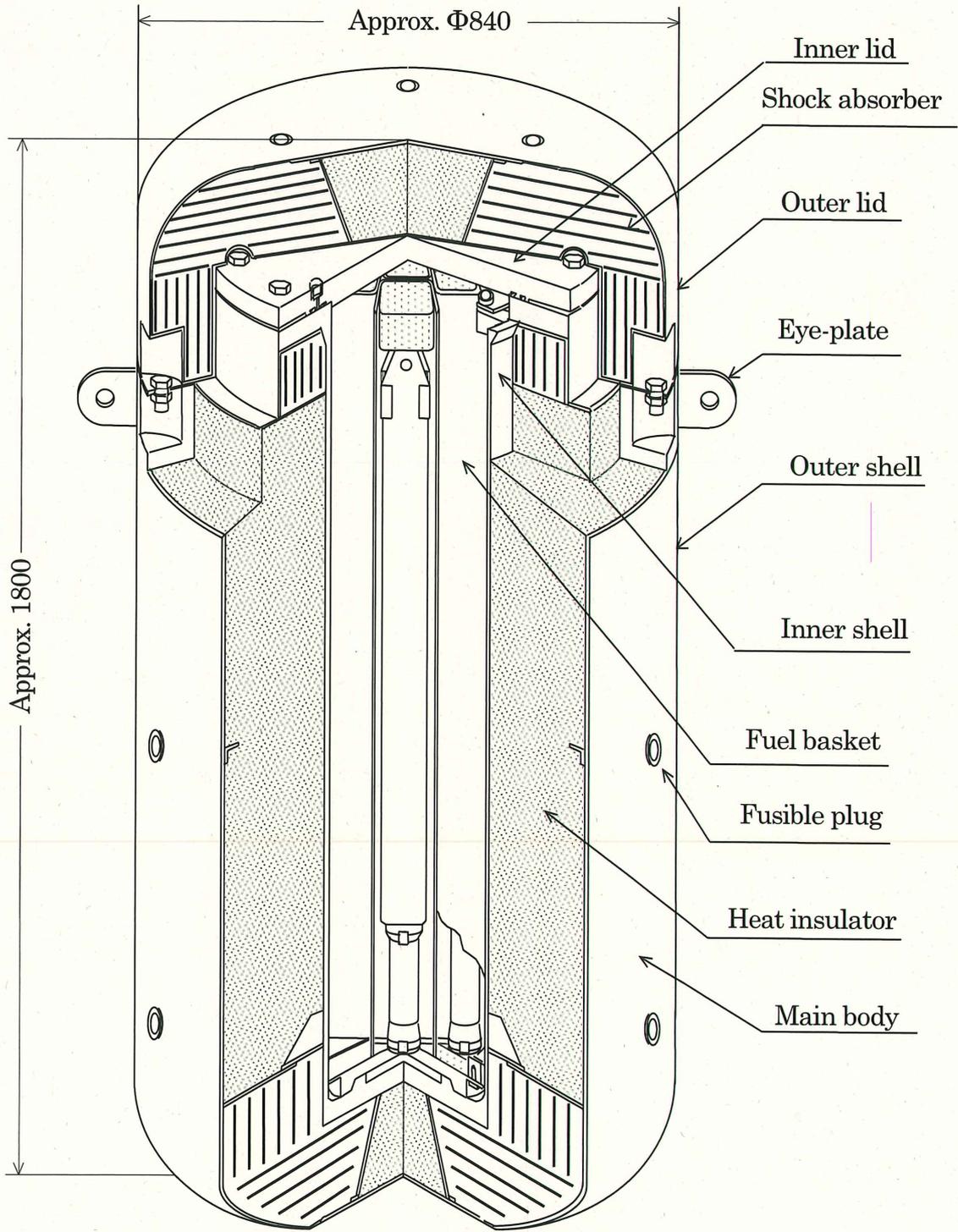
- (i) Visual Appearance Inspection (ii) Lifting Inspection
 (iii) Weight Measurement Inspection (iv) Surface Contamination Measurement Inspection
 (v) Radiation Dose Rate Inspection (vi) Subcriticality Inspection
 (vii) Contents Specification Check Inspection (viii) Leakage Rate Measurement Inspection

(4) Precautions for Loading of Package for Shipment

Package should be securely loaded to the conveyance at the designated tie-down portion of the packaging 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 : Dec.08, 2017
 (ii) Expiry Date : Dec.07, 2022



(Unit:mm)

Figure-1 Illustration of Package

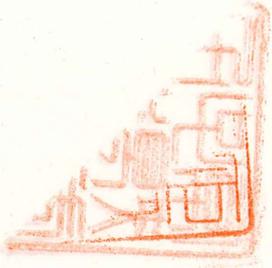


Table-1 Materials of Packaging

	Part	Material
Main Body	Outer shell	Stainless steel
	Inner shell	Stainless steel
	Eye-Plate	Stainless steel
	Boss	Stainless steel
	Heat insulator	Hard polyurethane foam
	Shock absorber	Balsa wood
	O-ring	Silicone rubber
	Fusible plug	Solder, Stainless steel
	Gasket	Ethylene propylene rubber
Inner Lid	Inner Lid	Stainless steel
Fuel basket	Rectangular pipe	Stainless steel
	Upper flange	Stainless steel
	Lower flange	Stainless steel
	Cushion rubber	Silicon rubber
Outer Lid	Outer cover plate	Stainless steel
	Inner cover plate	Stainless steel
	Heat insulator	Hard polyurethane foam
	Shock absorber	Balsa wood
	Fusible plug	Solder, Stainless steel

Table-2 Specification of contents(Fresh Fuel Element)

Fuel Basket Type		Box					
Type	Reactor	JRR-3		JRR-4		JMTR	JMTR
Fuel Element		JRR-3 Standard	JRR-3 Follower	JRR-4B	JRR-4L	JRR-4	JMTR Standard
Type		Plate fuel					
Number of fuel elements (Element/Package)	Kind	LEU fuel		HEU fuel	LEU fuel		LEU fuel
Nuclear spec.	²³⁵ U enrichment (wt%)	19.95 or less		93.3 or less	19.95 or less		46.0 or less
	²³⁵ U contained (g/element)	485 or less	310 or less	170 or less	230 or less	210 or less	320 or less
	U contained (g/element)	2481 or less	1586 or less	183 or less	1177 or less	1075 or less	728 or less
Burnup (%)		0 (Fresh fuel)					
Total heat generation (W/Package)		0 (Fresh fuel)					
Cooling time (Day)		0 (Fresh fuel)					
Total activity of contents (GBq/Package)		29.8 or less					
Material	Core material	Uranium silicon aluminum dispersion alloy	Uranium silicon aluminum dispersion alloy	Uranium aluminum dispersion alloy	Uranium silicon aluminum dispersion alloy	Uranium silicon aluminum dispersion alloy	Uranium silicon aluminum dispersion alloy
	Clad material	Aluminum alloy					
	Side plate, Attached plate etc.	Aluminum alloy					
	Burnable absorber	Cadmium wire					
Fuel cross section shape		Square					
Fuel weight(kg/element)		9.2	6.0	6.3	7.9	6.5	7.6
						8.4	
						5.8	

Table-3 Specification of contents(Low Irradiated Fuel Element)

Fuel Basket Type		Box				
Type	Reactor	JMTRC				
	Fuel Element Type	Standard	Special	Standard	Special	Follower
Number of fuel elements (Element/Package)		Plate fuel				
Kind		HEU fuel			MEU fuel	
Nuclear spec.	²³⁵ U enrichment (wt%)	90.0 or less				
	²³⁵ U contained (g/element)	285 or less	285 or less	199 or less	317 or less	210 or less
	U contained (g/element)	318 or less	318 or less	222 or less	721 or less	478 or less
Burnup (%)		7.23×10 ⁻⁵ or less			1.76×10 ⁻⁵ or less	
Total heat generation (W/Package)		4.30×10 ⁻⁵ or less			3.29×10 ⁻⁵ or less	
Cooling time (Day)		5475 or more				
Total activity of contents (GBq/Package)		17.3 or less				
Material	Core material	Uranium aluminum alloy	Uranium aluminum alloy	Uranium aluminum alloy	Uranium aluminum dispersion alloy	Uranium aluminum dispersion alloy
	Clad material	Aluminum alloy				
Side plate, Attached plate etc.	Burnable absorber	Aluminum alloy				
		—				
Fuel cross section shape		Square				
Fuel weight(kg/element)	6.3	6.6	2.0	6.9	6.7	4.4
Holder weight(kg/element)	—	1.4	2.6	1.4	—	—



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CERTIFICATE NUMBER: USA/0452/B(U)F-96

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