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 FISSILE RADIOACTIVE MATERIALS PACKAGE DESIGN CERTIFICATE USA/0535/AF, REVISION 7

REVALIDATION OF JAPANESE COMPETENT AUTHORITY CERTIFICATE J/105/AF

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 AF 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 - MFC-1.

2. Package Description and Authorized Radioactive Contents - as described in Japanese Certificate of Competent Authority J/105/AF, dated September 13, 2023 (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, Revision 1" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

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

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. Special Conditions -

a. Transport by air is prohibited.

6. Marking and Labeling - The package shall bear the marking USA/0535/AF in addition to other required markings and labeling.

7. Expiration Date - This certificate expires on May 2, 2031. Previous editions which have not reached their expiration date may continue to be used.

This certificate is issued in accordance with paragraph(s) 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 September 10, 2025 petition by TN Americas LLC, Columbia, MD, and in consideration of other information on file in this Office.

Certified By:

September 11, 2025

William Quade
Acting Associate Administrator for
Hazardous Materials Safety

(DATE)

Revision 7 - Issued to endorse the Japanese Certificate of Approval No. J/105/AF dated September 13, 2023.

IDENTIFICATION MARK
J/105/AF

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 Mitsubishi Nuclear Fuel Co., Ltd., that the package design described herein complies with the design requirements for a package containing Fuel Assembly for PWR, 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/105/AF

Sep. 13, 2023
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/105/AF

2. Name of Package : MFC-1

3. Type of Package : Type A, Fissile Material Package

4. Specification of Package
   (1) Materials of Packaging : See the attached Table-1
   (2) Total Weight of Packaging : 2,804kg or less
   (3) Outer Dimensions of Packaging
      (i) Length : Approximately 5.4m
      (ii) Outer diameter : Approximately 1.2m
      (iii) Height : Approximately 1.3m
   (4) Total Weight of Package : 4,340 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

6. Description of Containment System
   There are no components as the containment device in this packaging, and the containment boundary consists of cladding tube and end plugs of fuel rod.

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
      The confinement system of the package consists of fuel rods, fuel assemblies, cradle assembly (consists of shock mount frame, cross frame including skin plates (neutron absorber) and clamping frames) and outer shells of both upper cover and lower container.
   (3) Assumptions of Leakage of Water into Package
      In order to derive higher neutron multiplication, in criticality assessment, it is assumed that water whose density is 1.0(g/cm^3) exists both inside and outside the package and the accommodated fuel assemblies are completely flooded with the water but no water is leaked into the fuel rods.
   (4) Special Features in Criticality Assessment
      In inspection before each shipment and annual periodical inspection, appearance check of the confinement system is performed to confirm to maintain integrity of the confinement system.

8. For Type B(M) Packages, a statement regarding prescriptions of Type B(U) Package that do not apply to this Package

   This is not applicable to this type MFC-1 package.

9. Assumed Ambient Conditions

   (i) Ambient Temperature Range : −20°C to 38°C

   (ii) Insolation Data : Table 12 of IAEA Regulation

10. Handling, Inspection and Maintenance

    Execute handling, the periodic inspection and maintenance of the packaging by the method indicated in the safety analysis report of this package.

11. Issue Date and Expiry Date

    (1) Issue Date : August 15, 2023

    (2) Expiry Date : August 14, 2083

However, if this certificate no longer meets the technical standards (limited to those related to the design of package) due to a revision of the regulations*[1,2], this certificate will be expired.

*[1] The NRA Ordinance on Off-Site Transportation of Nuclear Fuel Materials, etc. (Ministerial ordinance issued by the Prime Minister's Office No. 57 of 1978)

*[2] The Notification on Technical Details for Off-Site Transportation of Nuclear Fuel Materials, etc. (Notice issued by Science and Technology Agency No. 5 of 1990)

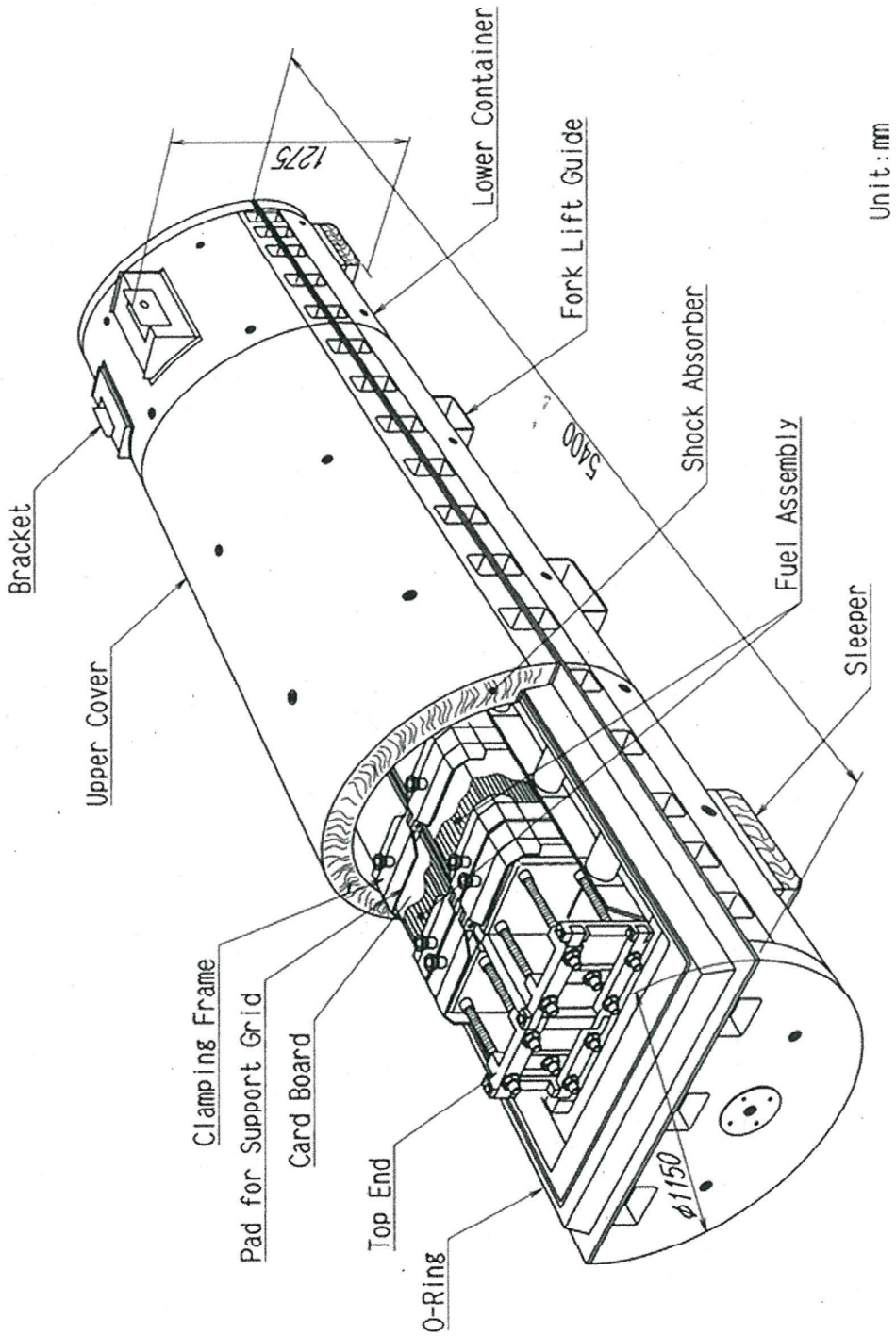

Figure-1 Illustration of Package (Bird's-eye view)

Table-1 Material of Packaging

Construction	Material
a. External Shell	Carbon Steel
b. Shock Absorber	Wood
c. Cradle Assembly	Carbon Steel, and Boronated Stainless Steel
d. O-Ring	Rubber
e. Shock Mount	Rubber

Table-2 Specification of Radioactive Content

Fuel Assembly Type			14×14 (10ft)	14×14 (12ft)	15×15 (12ft)	17×17 (12ft)
(Per one package)						
Description			Fuel Assembly for PWR			
Physical State			Solid (UO_2 Pellet or Gadolinia-UO_2 Pellet)			
Weight	Number of contents		Two assemblies or less			
	Fuel assembly		1,400kg or less			
	UO_2		1,080kg or less			
Activity	Total		1.65×10^{11} Bq or less			
	Major Nuclide (*1)	^{232}U	7.60×10^{7} Bq			
		^{234}U	1.22×10^{11} Bq			
		^{235}U	3.84×10^{9} Bq			
		^{236}U	5.74×10^{8} Bq			
		^{238}U	1.13×10^{10} Bq			
		^{99}Tc	6.02×10^{6} Bq			
Initial enrichment	UO_2		5wt% or less			
	Gadolinia-UO_2		3.3wt% or less (Gadolinia concentration: 10.2wt% or less)			
(Per one fuel assembly)						
Weight	Fuel assembly		490kg or less	600kg or less	680kg or less	700kg or less
	UO_2		390kg or less	470kg or less	540kg or less	540kg or less
Radio-nuclides		^{232}U	≦0.0001 μg/gU			
		^{234}U	≦11,000 μg/g^{235}U			
		^{236}U	≦5,000 μg/g^{235}U			
		^{99}Tc	≦0.01 μg/gU			
			If the ^{236}U measurement result is less than 125 μg/gU, then measurement of ^{232}U and ^{99}Tc is not required.			

(*1) Reference value.

U.S. Department of
Transportation

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

CERTIFICATE NUMBER: USA/0535/AF-96

ORIGINAL REGISTRANT(S):

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