

IDENTIFICATION MARK

J/2037/AF-96

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 assemblies for pressurized water reactor (hereafter called "PWR"), specified in the 2012 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

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May. 6. 2021
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/2037/AF-96
2. Name of Package : MX-6P
3. Type of Package : Type A Package containing Fissile Material
4. Specification of Package
 - (1) Materials of Packaging
 - (i) Body : Stainless steel, Copper, Alloy steel, Resin
 - (ii) Lid parts : Titanium alloy, Alloy steel, Resin
 - (iii) Basket : Aluminum alloy, Borated stainless steel, Stainless steel
 - (iv) Shock absorbing cover : Wood, Stainless steel, Alloy steel
 - (2) Total Weight of Packaging : 14.7 tons or less
 - (3) Outer Dimensions of Packaging
 - (i) Outer diameter : Approximately 2.1 m
 - (ii) Length : Approximately 6.0 m
(including top and rear shock absorbing covers)
 - (4) Total Weight of Package : 19.5 tons or less
 - (5) Illustration of Package : See the attached Figure
5. Specification of Radioactive Contents : See the attached Table-1
6. Description of Containment System

The containment system of the package consists of the body, the lid, the quick connection cover and the gaskets for the lid and the quick connection cover.
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 the fuel rods, the fuel assemblies, the basket and the inner shell of the body.
 - (3) Assumptions of Leakage of Water into Package

In the criticality safety analysis for the package, water is assumed to leak into the void spaces of the packages which are arrayed infinitely.
 - (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

9. Assumed Ambient Conditions

- (i) Ambient Temperature Range : $-40^{\circ}\text{C}\sim 38^{\circ}\text{C}$
- (ii) Insolation Data : Table 12 of IAEA Regulation

10. Handling, Inspection and Maintenance

Packages must be handled, inspected and maintained in the manner described in the safety analysis report for the package.

11. Issue Date and Expiry Date

- (1) Issue Date : March 11, 2021
- (2) Expiry Date : March 10, 2026

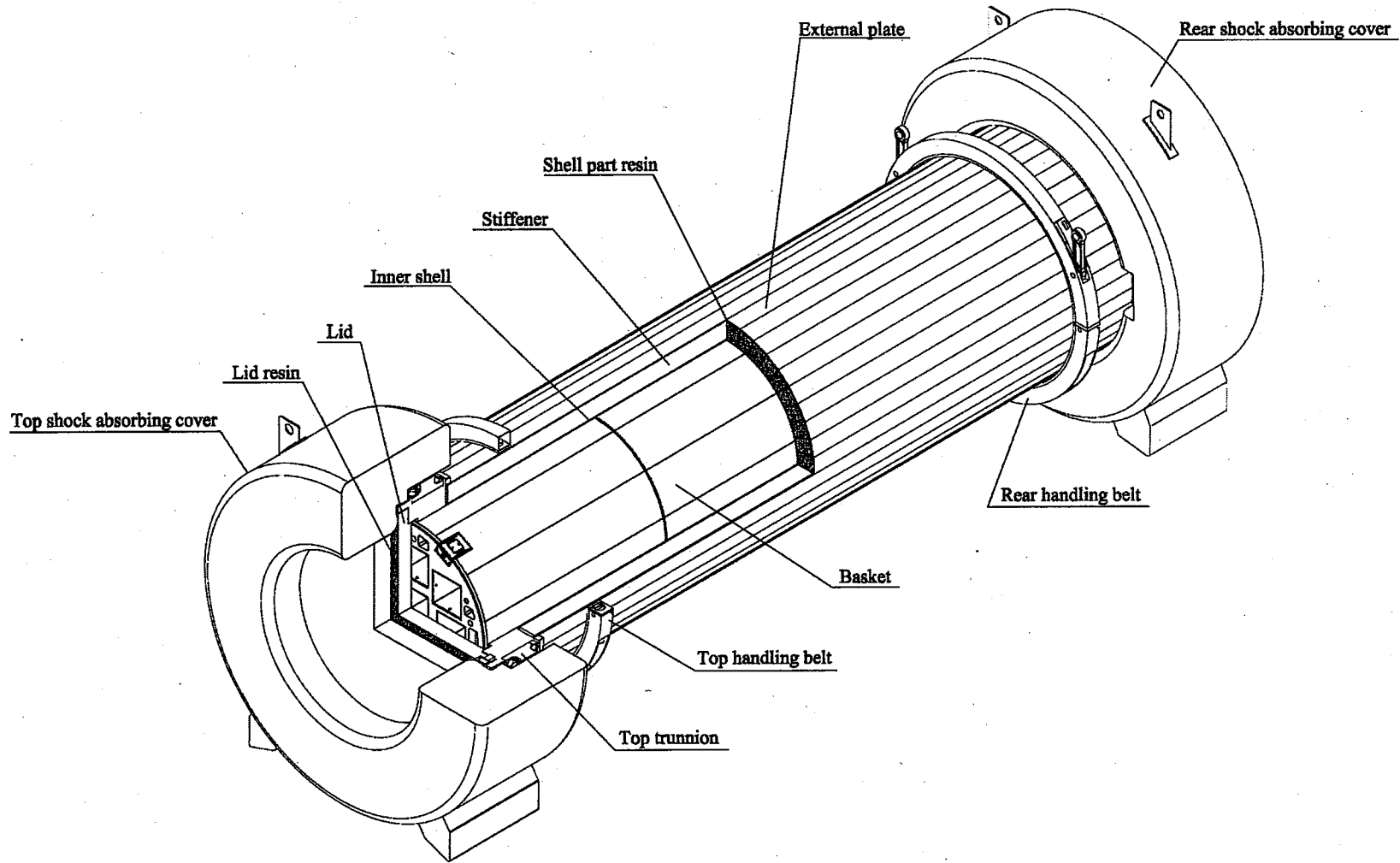


Figure MX-6P Packaging

Table-1 Specifications of Radioactive Content

Items		Type of Fuel Assembly	14 x 14 (10 Feet)	14 x 14 (12 Feet)	
Description		Fresh Fuel Assembly for PWR ¹⁾			
Physical State		Solid (UO ₂ Pellet or Gadolinia - UO ₂ Pellet)			
Per Packaging	Weight of Content (kg)		4800 or less		
	Number of Assemblies		8 or less		
	Weight of Fuel Assemblies (kg)		3920 or less	4720 or less	
	Activity	Total Activity (GBq)		5.85 x 10 ² or less (Total Major Nuclides: 4.89 x 10 ² or less)	7.05 x 10 ² or less (Total Major Nuclides: 5.90 x 10 ² or less)
		Major Nuclides ²⁾ (GBq)	²³² U	2.70 x 10 ⁻¹	3.25 x 10 ⁻¹
			²³⁴ U	4.33 x 10 ²	5.22 x 10 ²
			²³⁵ U	1.36 x 10 ¹	1.64 x 10 ¹
			²³⁶ U	2.04 x 10 ⁰	2.46 x 10 ⁰
			²³⁸ U	4.02 x 10 ¹	4.85 x 10 ¹
			⁹⁹ Tc	2.14 x 10 ⁻²	2.58 x 10 ⁻²
Heat Generation Rate		N/A (Fresh Fuel Assembly)			
Enrichment (wt%)		5.0 or less			
Per Fuel Assembly	Weight	Fuel Assembly (kg)	490 or less	590 or less	
		Uranium Oxide (kg)	390 or less	470 or less	
		Uranium (kg)	340 or less	410 or less	
	Burn up Rate		N/A (Fresh Fuel Assembly)		
	Cooling Time		N/A (Fresh Fuel Assembly)		
Impurity Specification of Enriched Uranium		²³² U	≤ 0.0001 µg/gU (Not applicable in case of ²³⁶ U < 125µg/gU)		
		²³⁴ U	≤ 1.10 x 10 ⁴ µg/g ²³⁵ U		
		²³⁶ U	≤ 250 µg/gU		
		⁹⁹ Tc	≤ 0.01 µg/gU (Not applicable in case of ²³⁶ U < 125µg/gU)		

Note 1) Fresh fuel assemblies stored in spent fuel pool are included.

Note 2) For enrichment of 5.0 wt%