

原規規発第 2309133 号

令和 5 年 9 月 13 日

三菱原子燃料株式会社

代表取締役社長 大和矢 秀成 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 5 年 8 月 30 日付け三原燃第 23-0318 号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/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

  
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 :  kg or less
  - (3) Outer Dimensions of Packaging
    - (i) Length : Approximately  m
    - (ii) Outer diameter : Approximately  m
    - (iii) Height : Approximately  m
  - (4) Total Weight of Package :  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  $1.0(\text{g}/\text{cm}^3)$  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 :  $-20^{\circ}\text{C}$  to  $38^{\circ}\text{C}$

(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\*<sup>1,2</sup>, this certificate will be expired.

\*<sup>1</sup> 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)

\*<sup>2</sup> 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)

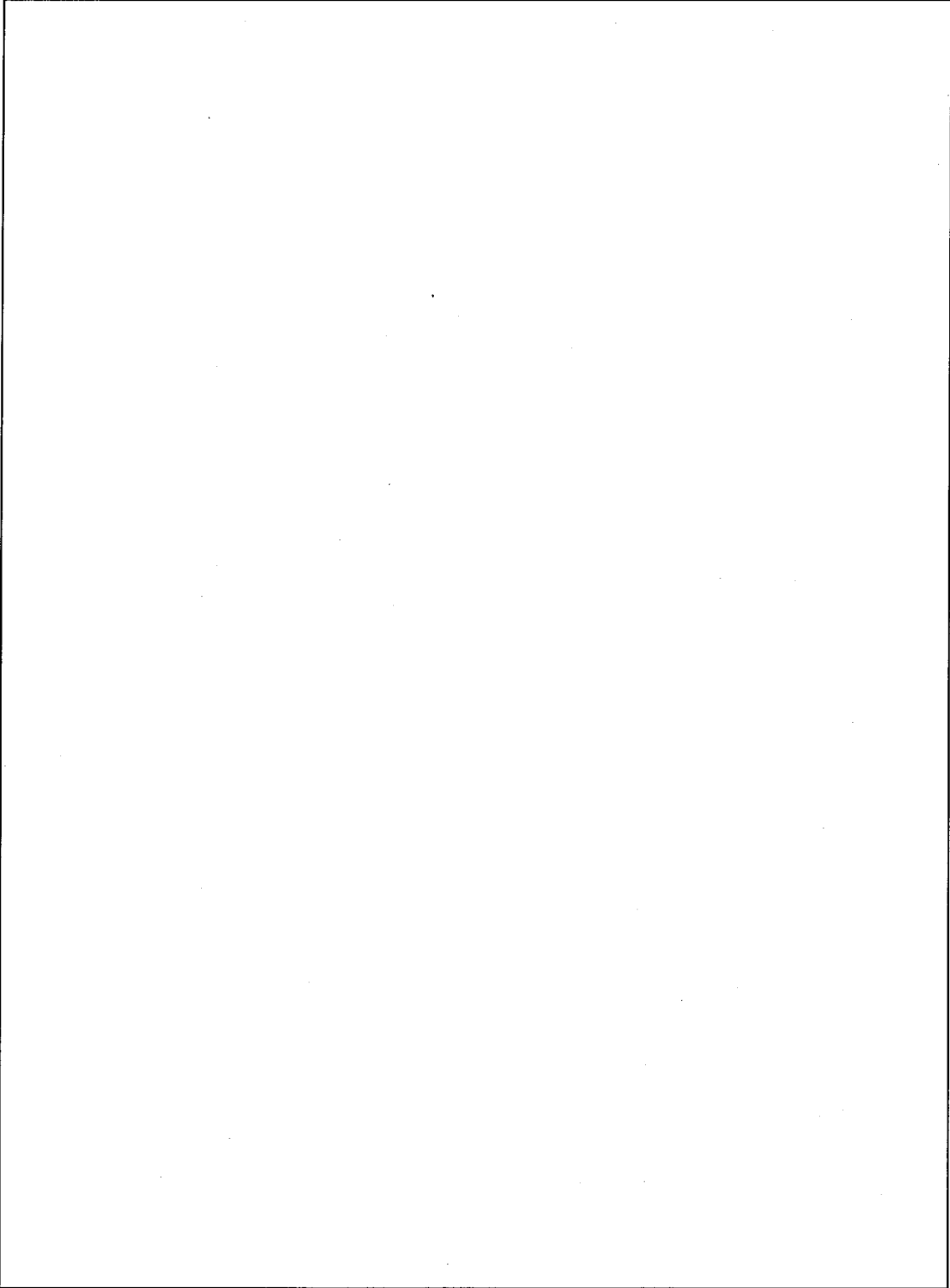


Figure-1 Illustration of Package (Bird's-eye view )

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 <sub>2</sub> Pellet or Gadolinia-UO <sub>2</sub> Pellet)				
Weight	Number of contents	Two assemblies or less				
	Fuel assembly	□ kg or less				
	UO <sub>2</sub>	□ kg or less				
Activity	Total	□ Bq or less				
	Major Nuclide (*1)	<sup>232</sup> U	□ Bq			
		<sup>234</sup> U	□ Bq			
		<sup>235</sup> U	□ Bq			
		<sup>236</sup> U	□ Bq			
		<sup>238</sup> U	□ Bq			
		<sup>99</sup> Tc	□ Bq			
Initial enrichment	UO <sub>2</sub>	5wt% or less				
	Gadolinia-UO <sub>2</sub>	3.3wt% or less (Gadolinia concentration: □ wt% or less)				
(Per one fuel assembly)						
Weight	Fuel assembly	□ kg or less	□ kg or less	□ kg or less	□ kg or less	
	UO <sub>2</sub>	□ kg or less	□ kg or less	□ kg or less	□ kg or less	
Radio-nuclides	<sup>232</sup> U	≦ □ μg/gU				
	<sup>234</sup> U	≦ □ μg/g <sup>235</sup> U				
	<sup>236</sup> U	≦ □ μg/g <sup>235</sup> U				
	<sup>99</sup> Tc	≦ □ μg/gU				
	If the □ measurement result is less than □ μg/gU, then measurement of <sup>232</sup> U and <sup>99</sup> Tc is not required.					

(\*1) Reference value.