



U.S. Department
of Transportation
**Pipeline and
Hazardous Materials
Safety Administration**

East Building, PHH-23
1200 New Jersey Avenue Southeast
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION
FOR A TYPE FISSILE
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0542/AF-96, REVISION 5**

**REVALIDATION OF JAPANESE COMPETENT AUTHORITY
CERTIFICATE J/134/AF-96**

This certifies that the radioactive material package design described is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency¹ and the United States of America².

1. Package Identification - NFI-V.
2. Package Description and Authorized Radioactive Contents - as described in Japan Certificate of Competent Authority J/134/AF-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 Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous 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.

¹ "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," 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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- d. This certificate provides no relief from the limitations for transportation of plutonium by air in the United States as cited in the regulations of the U.S. Nuclear Regulatory Commission 10 CFR 71.88.
 - e. Records of Quality Assurance activities required by Paragraph 310 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. Package design and authorized contents are restricted to those detailed in Japanese Certificate of Approval No. J/134/AF-96, Revision 2, which was signed on December 14, 2015 (attached).
 - b. Each fuel assembly is enclosed within a polyethylene sheath which may not extend beyond the ends of the fuel assembly. The ends of the sheath may not be folded or taped in any manner that would prevent the flow of liquids into or out of the sheathed fuel assembly.
 - c. The package is not authorized for air transport.
 - d. For shipments entering, exiting or transiting 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 commencement of transport.
6. Marking and Labeling - The package shall bear the marking USA/0542/AF-96 in addition to other required markings and labeling.
7. Expiration Date - This certificate expires on October 31, 2018.

CERTIFICATE USA/0542/AF-96, REVISION 5

This certificate is issued in accordance with paragraph 814 of the IAEA Regulations and Section 173.472 and 173.473 of Title 49 of the Code of Federal Regulations, in response to the January 05, 2017 petition by Westinghouse, Columbia, SC, and in consideration of other information on file in this Office.

Certified By:



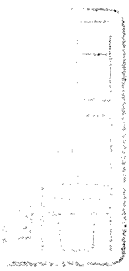
Jan 18 2017

(DATE)

 William Schoonover

Acting Associate Administrator for Hazardous Materials Safety

Revision 5 - Issued to endorse Japanese Certificate of Approval No. J/134/AF-96, Revision 2, dated December 14, 2015.



IDENTIFICATION MARK
J/134/AF-96(Rev.2)

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 Nuclear Fuel Industries, Ltd., that the package design described herein complies with the design requirements for a package containing fissile uranium dioxide fuel assemblies, specified in the 2009 Edition of the Regulations for the Safe Transport of Radioactive Material (International Atomic Energy Agency, Safety Standards Series No.TS-R-1) 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/134/AF-96(Rev.2)

December 14, 2015

Date

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Yukinori Maekawa

Director, Division of Regulation for
Radioactive Waste, Storage and Transport
Secretariat of Nuclear Regulation Authority
Competent Authority of JAPAN
for Package Design Approval

1. The Competent Authority Identification Mark : J/134/AF-96(Rev.2)
2. Name of Package : NFI-V
3. Type of Package : Type A Fissile package
4. Specification of Package
 - (1) Materials of Packaging : See the attached Table-1
 - (2) Total Weight of Packaging : Approximately 2400kg
 - (3) Outer Dimensions of Packaging
 - (i)Length : Approximately 5180 mm
 - (ii)Width : Approximately 1120 mm
 - (iii)Height : Approximately 1140 mm
 - (4) Total Weight of Package : 3800kg or less
 - (5) Illustration of Package : See the attached Figure (Bird's-eye view)
5. Specification of Radioactive Contents : See the attached Table-2
6. Description of Containment System

There are no component parts 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, strong-back including borated stainless plates and arched cramps) and outer shells of both upper case and lower case.

(3) Assumptions of Leakage of Water into Package

The subcriticality calculation is evaluated upon the assumption that the container is immersed in water under the normal conditions and accident conditions in transport except inside of the fuel rods.

(4) Special Features in Criticality Assessment

There is no special device.

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) Insulation Data : Table 13 of IAEA Regulation (No. TS-R-1)

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 such as forklift or crane.

(iii) When packaging is stored outdoors, appropriate measures should be taken, avoiding the direct exposure to the weather.

(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 inspection

(ii) Subcriticality inspection

(iii) Lifting inspection

(3) Actions prior to Shipment

The following inspections should be performed prior to shipment.

- | | |
|--|---------------------------|
| (i) Visual Inspection | (ii) Contents Inspection |
| (iii) Surface Contamination Inspection | (iv) Dose Rate Inspection |
| (v) Subcriticality Inspection | (vi) Weight Inspection |
| (vii) Lifting 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

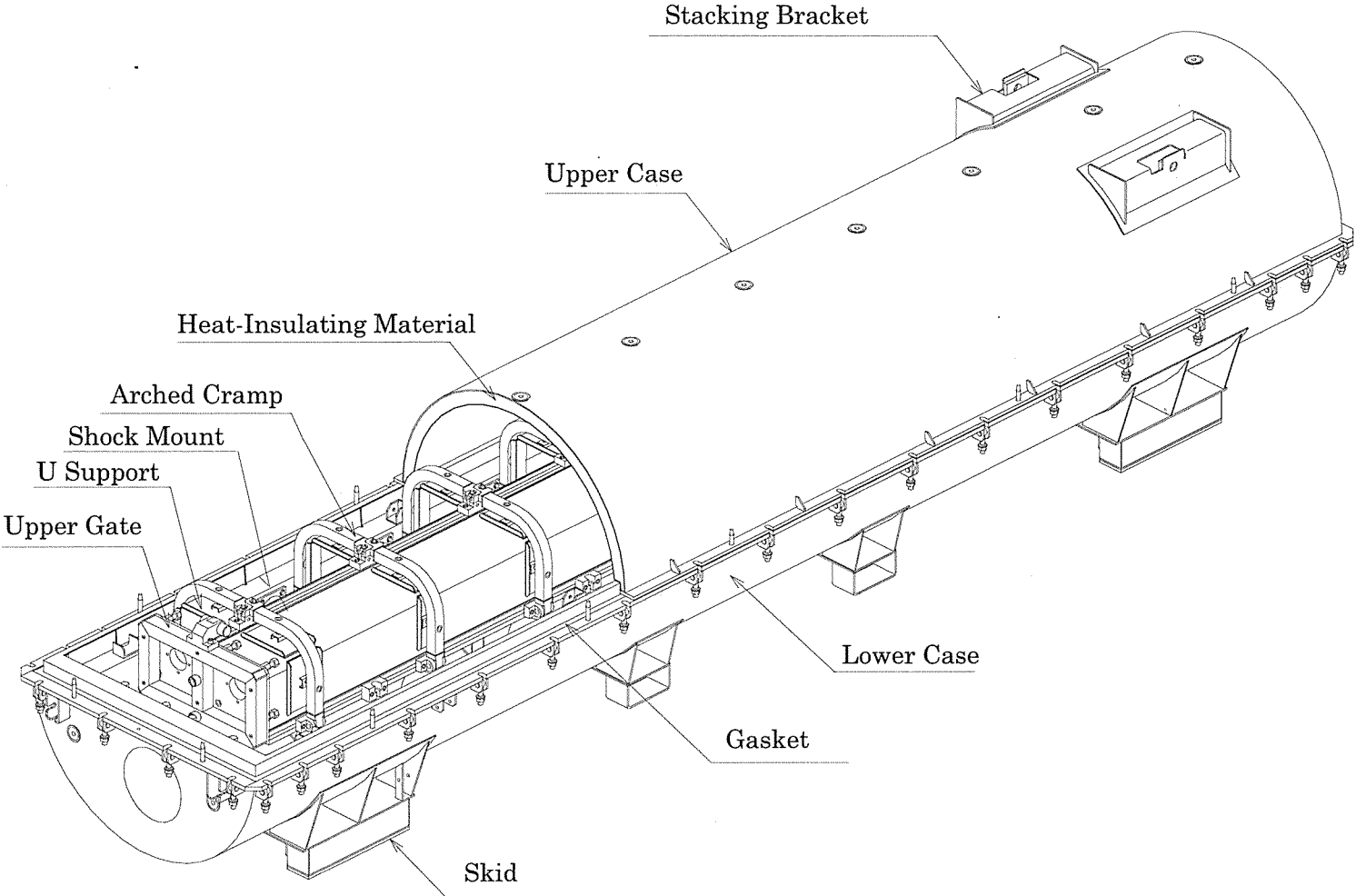
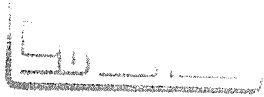
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|------------------|-----------------|
| (i) Issue Date | : Nov. 1, 2013 |
| (ii) Expiry Date | : Oct. 31, 2018 |

Table 1. Material of Packaging

Component	Material
Stacking Bracket	Stainless Steel (SUS 304)
Upper Case, Lower Case	Stainless Steel (SUS 304)
Heat Insulating material	Ceramic Fiber
Arched Cramp	Stainless Steel (SUS 304)
Shock Mount	Synthetic Rubber (Butyl Rubber)
U support	Stainless Steel (SUS 304)
Upper Gate	Stainless Steel (SUS 304)
Gasket	Synthetic Rubber (Silicon Rubber)
Skid	Synthetic Rubber (Urethane Rubber)
Bolt and Nut	Stainless Steel (SUS304, SUS310S) and Chromium Molybdenum Steel (SCM435)

Table 2. Description of Nuclear Fuel Materials and so on

Fuel Type		Fuel Assembly				Fuel rod Bundle (10×10)
		14×14	15×15	17×17		
				Type 64	Type 57	
(Per Packaging)						
Description		Fuel Assembly for PWR or Fuel Rod Bundle				
Physical State		Solid (UO ₂ Pellet or Gadolinia - UO ₂ Pellet)				
Weight	Number of Fuels	2 assemblies or less				2 bundles or less
	Weight of Fuels	1390kg or less				
	Weight of UO ₂	1090kg or less				
Activity		Total	1.540×10 ¹¹ Bq or less			
		²³² U	5.527×10 ⁸ Bq or less			
		²³⁴ U	1.111×10 ¹¹ Bq or less			
		²³⁵ U	7.692×10 ⁹ Bq or less			
		²³⁶ U	5.753×10 ⁸ Bq or less			
		²³⁸ U	3.405×10 ¹⁰ Bq or less			
		⁹⁹ Tc	6.029×10 ⁶ Bq or less			
Initial Enrichment		5wt% or less				
Burn up Rate		Not Applicable				
Total Heat Generation Rate						
Cooling Time						
(Per Fuel Assembly)						
Weight	Weight of Fuel	About 595 kg	About 680 kg	About 670 kg	About 695 kg	About 400 kg
	Weight of UO ₂	About 465 kg	About 530 kg	About 515 kg	About 545 kg	About 260 kg
Impurity Specification of Enriched Uranium		²³² U	≤0.0001 μg/gU			
		²³⁴ U	≤10×10 ³ μg/g ²³⁵ U			
		²³⁶ U	≤250 μg/gU			
		⁹⁹ Tc	≤0.01 μg/gU			
		If the ²³⁶ U measurement result is less than 125 μg/gU, measurements of ²³² U and ⁹⁹ Tc are not required.				



General View of Type NFI-V Package



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**Pipeline and
Hazardous Materials
Safety Administration**

CERTIFICATE NUMBER: USA/0542/AF-96, Revision 5

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