



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/0535/AF-96, REVISION 3**

**REVALIDATION OF JAPANESE COMPETENT AUTHORITY
CERTIFICATE J/105/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 - MFC-1.
2. Package Description and Authorized Radioactive Contents - as described in Japan Certificate of Competent Authority J/105/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.

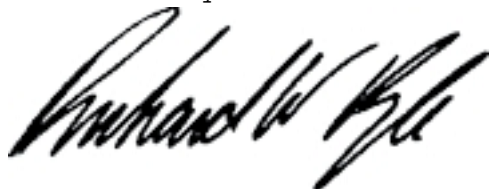
² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/0535/AF-96, REVISION 3

- d. 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 Condition - Transport by air is prohibited.
6. Marking and Labeling - The package shall bear the marking USA/0535/AF-96 in addition to other required markings and labeling.
7. Expiration Date - This certificate expires on November 10, 2014.

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 October 18, 2011 petition by Areva - TN Inc, Columbia, MD, and in consideration of other information on file in this Office.

Certified By:



Dr. Magdy El-Sibaie
Associate Administrator for Hazardous Materials Safety

Jan 06 2012

(DATE)

Revision 3 - Issued to endorse the Japanese Certificate of Approval No. J/105/AF-96, Revision 2.

IDENTIFICATION MARK

J/105/AF-96 (Rev.2)

COMPETENT AUTHORITY

OF

JAPAN

CERTIFICATE FOR APPROVAL OF

PACKAGE DESIGN

FOR THE TRANSPORT OF

RADIOACTIVE MATERIALS

ISSUED BY

MINISTRY OF ECONOMY, TRADE AND INDUSTRY

1-3-1, KASUMIGASEKI, CHIYODA-KU,

TOKYO, JAPAN

CERTIFICATE OF APPROVAL OF PACKAGE DESIGN
FOR THE TRANSPORT OF RADIOACTIVE MATERIAL

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 fissile uranium dioxide fuel assemblies, specified in the 2005 Edition of the Regulations for the Safe Transport of Radioactive Materials (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 Materials, Nuclear Fuel Materials 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-96 (Rev.2)

December 1, 2009
Date

Izuru Hanaki
Izuru Hanaki

Director

Nuclear Fuel Transport and Storage

Regulation Division

Nuclear and Industrial Safety Agency

Ministry of Economy, Trade and Industry

Competent Authority of Japan

for Package Design Approval

1. The Competent Authority Identification Mark : J/105/AF-96 (Rev 2)
2. Name of Package : MFC-1
3. Type of Package : Type A, Fissile Material Package
4. Specification of Package
 - (1) Material of Packaging : See the attached Table-1
 - (2) Total Weight of Packaging : Approximately 2,804kg
 - (3) Outer Dimensions of Packaging :
 - (i) Length : Approximately 5,400mm
 - (ii) Width : Approximately 1,150mm
 - (iii) Height : Approximately 1,275mm
 - (4) Total Weight of Package : 4,320 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 $1.0(\text{g}/\text{cm}^3)$ is existed 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

(1) Ambient Temperature Range : $-20^{\circ}\text{C} \sim 38^{\circ}\text{C}$

(2) Insolation Date : Table XI of IAEA Regulation

10 Handling, Inspection and Maintenance

Execute a handling, the periodic inspection and maintenance of the packaging used for the transportation of this package by the method indicated in safety analysis report of this package

11. Issued Date and Expiry Date

(1) Issue Date : November 11, 2009

(2) Expiry Date : November 10, 2014

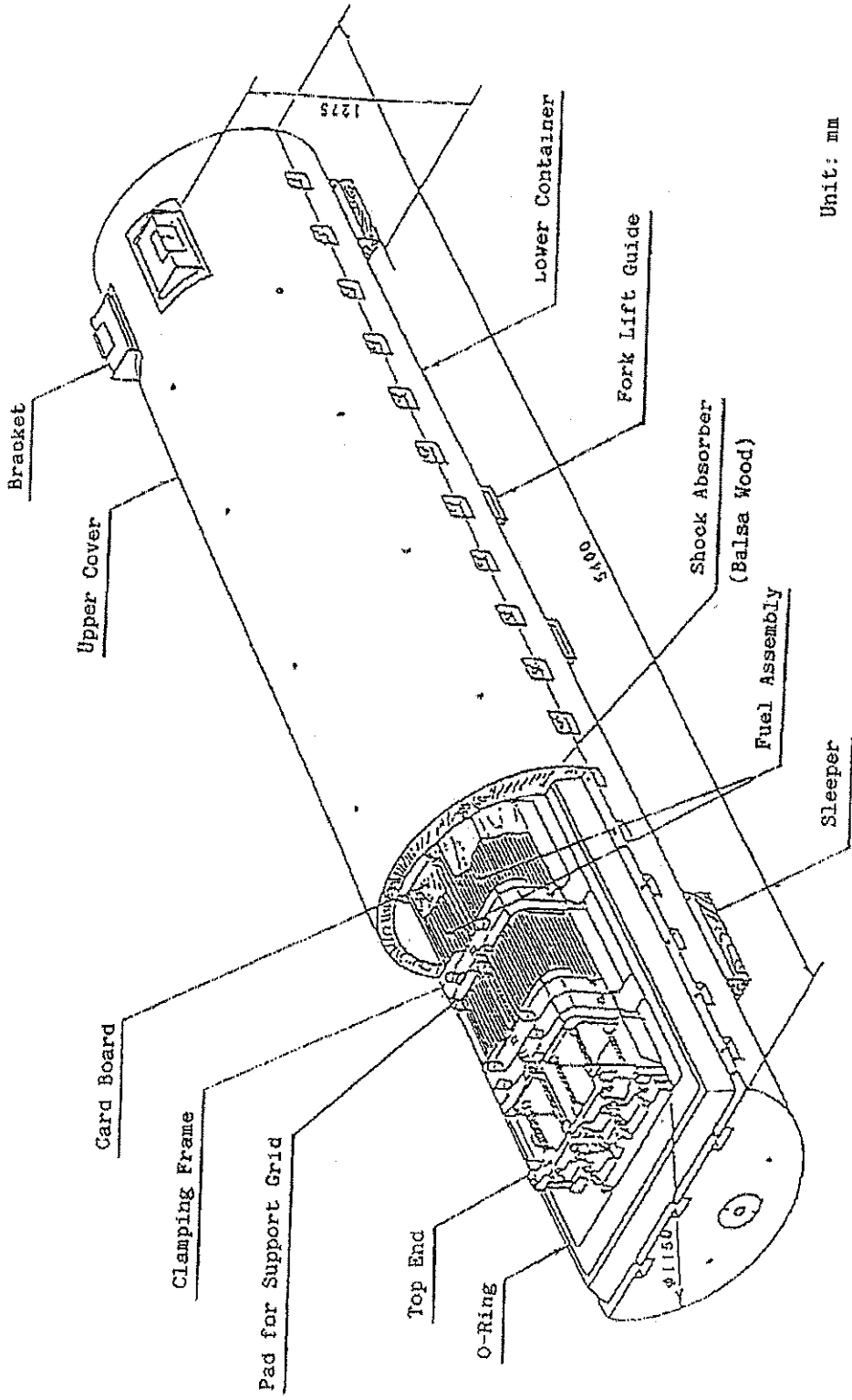


Figure-1 Illustration of Package (Bird's-eye view)

Table-1 Material of Packaging

Construction	Material
a. External Shell	Carbon Steel (SPCC, SS400)
b. Shock Absorber	Wood (Balsa Wood)
c. Cradle Assembly	Carbon Steel (SPCC, SS400), and Boronated Stainless Steel
d. O-Ring	Synthetic Rubber (Neoprene)
e. Shock Mount	Synthetic Rubber (Polybutadiene)

Table-2 Specification of Radioactive Content

a. Description	Content I	Content II
	Fuel Assembly for PWR (UO ₂ Pellet)	Fuel Assembly for PWR (UO ₂ Pellet and Gadolinia-UO ₂ Pellet)
b. Weight of Fuel	Type 14×14 10ft 780kg-UO ₂ or less	Type 14×14 10ft 778kg-UO ₂ or less
	Type 14×14 12ft 940kg-UO ₂ or less	Type 14×14 12ft 937kg-UO ₂ or less
	Type 15×15 12ft 1,080kg-UO ₂ or less	Type 15×15 12ft 1,077kg-UO ₂ or less
	Type 17×17 12ft 1,080kg-UO ₂ or less	Type 17×17 12ft 1,077kg-UO ₂ or less
c. Total Activity	154 GBq or less	154 GBq or less
d. Physical State	Solid (Pellet)	Solid (Pellet)
e. Initial Enrichment	5.0 wt% or less	5.0 wt% or less
f. Total Heat Generation Rate	Not Applicable	Not Applicable
g. Burn Up Rate	Not Applicable	Not Applicable
h. Cooling Time	Not Applicable	Not Applicable
i. Radio-nuclides	²³² U	$\leq 2 \times 10^{-9}$ g/g ²³⁵ U
	²³⁴ U	$\leq 1 \times 10^{-2}$ g/g ²³⁵ U
	²³⁶ U	$\leq 5 \times 10^{-3}$ g/g ²³⁵ U
	⁹⁹ Tc	$\leq 2 \times 10^{-7}$ g/g ²³⁵ U



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CERTIFICATE NUMBER: USA/0535/AF-96, Revision 3

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