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(g/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℃～38℃

(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

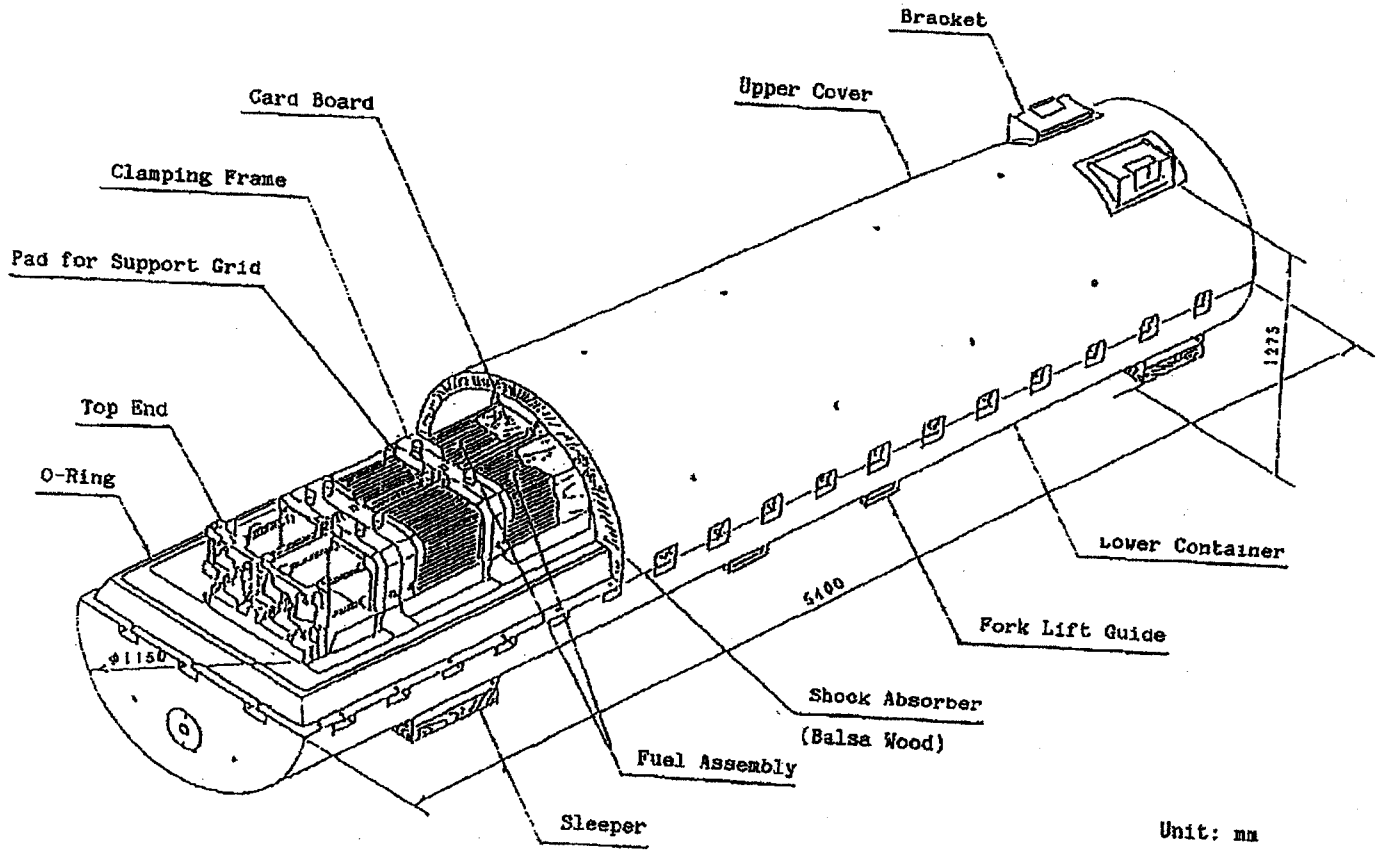

Figure-1 Illustration of Package (Bird's-eye view)

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

	Content I		Content II
a. Description	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 12ft 940kg-UO_2 or less Type 15×15 12ft 1,080kg-UO_2 or less Type 17×17 12ft 1,080kg-UO_2 or less		Type 14×14 10ft 778kg-UO_2 or less Type 14×14 12ft 937kg-UO_2 or less Type 15×15 12ft 1,077kg-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	$\leqq 2\times10^{-9}$ g/g ^{235}U	
	^{234}U	$\leqq 1\times10^{-2}$ g/g ^{235}U	
	^{236}U	$\leqq 5\times10^{-3}$ g/g ^{235}U	
	^{99}Tc	$\leqq 2\times10^{-7}$ g/g ^{235}U	