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 B(U)F FISSILE RADIOACTIVE MATERIALS PACKAGE DESIGN CERTIFICATE USA/0208/B(U)F-96, REVISION 12

REVALIDATION OF JAPANESE COMPETENT AUTHORITY CERTIFICATE J/61/B(U)F-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 Agency[1] and the United States of America[2].

1. Package Identification - JRC-80Y-20T.

2. Package Description and Authorized Radioactive Contents - as described in Japan Certificate of Competent Authority J/61/B(U)F-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.

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[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.

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 regulations[1] 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.

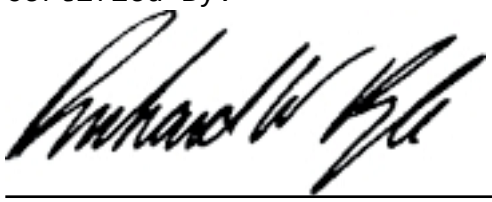
5. Special Condition - Package is not authorized for transport by air.

6. Marking and Labeling - The package shall bear the marking USA/0208/B(U)F-96 in addition to other required markings and labeling.

7. Expiration Date - This certificate expires on July 12, 2016. On October 09, 2012, this certificate supersedes all previous revisions of USA/0208/B(U)F-96.

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 November 23, 2011 petition by Transport Logistics International, Fulton, MD, and in consideration of other information on file in this Office.

Certified By:



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

Dec 15 2011
(DATE)

Revision 12 - issued to revalidate Japanese Certificate of Approval No. J/61/B(U)F-96, Revision 2, dated September 28, 2011.

IDENTIFICATION MARK
J/61/B(U)F-96(Rev.2)

COMPETENT AUTHORITY
OF
JAPAN

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

ISSUED BY MINISTRY OF EDUCATION, CULTURE,
SPORTS, SCIENCE AND TECHNOLOGY
3-2-2 KASUMIGASEKI, CHIYODA-KU, TOKYO, JAPAN

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

This is to certify, in response to the application (including Safety Analysis Report for J/61/B(U)F-96(Rev.2)) by Japan Atomic Energy Agency on June 29 , 2011, that the package design described herein satisfies the design requirements of type B(U) fissile package, 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 law on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors.

COMPETENT AUTHORITY
IDENTIFICATION MARK: J/61/B(U)F-96(Rev.2)

September 28, 2011
Date

for Kunimi Toshida
Takafumi GODA

Director General,
Science and Technology Policy Bureau,
Ministry of Education, Culture,
Sport, Science and Technology
Competent Authority of Japan for
Package Designs of Radioactive Materials

1. The Competent Authority Identification Mark : J/61/B(U)F-96(Rev.2)

2. Name of Package : JRC-80Y-20T

3. Type of Package : Type B(U) package for fissile material

4. Specification of Package
   (1) Materials of Packaging : See the attached Table-1
   (2) Total Weight of Packaging : 22.8×10^3 kg or less
   (3) Outside Dimensions of Packaging
      (i) Outer Diameter : Approximately 1.9 m
      (ii) Height : Approximately 2.1 m
   (4) Total Weight of Package : 23.2×10^3 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

   Containment system consists of body, lid, vent valve, and drain valve made of stainless steel. Silicone rubber is used for contact surface of the lid, the valves, and valve seat.

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

      Confinement system consists of the basket which maintains the fuel elements contained in the package.
   (3) Assumptions of Leakage of Water into Package

      No water will leak into any void spaces of package not only during routine transport but also under both normal and accident conditions.
   (4) Special Features in Criticality Assessment

      Any special features are not considered in the criticality assessment, because the subcriticality calculation is evaluated upon the assumption that internal void spaces of the package are filled with water.

8. For Type B(M) Packages, a statement regarding prescriptions of Type B(U) Package that do not apply to this Package

No application. (This package is Type B(U))

9. Assumed Ambient Condition

(i) Ambient Temperature Range	: -40℃～38℃
(ii) Insolation Data	: Table 13. of IAEA Regulation

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 and the crane.

(iii) When packaging is stored outdoors, it should be covered with an appropriate waterproof sheet, avoiding the situation where it is placed directly on the ground.

(2) Inspection 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.

a) Visual Inspection	b) Leakage Rate Measurement Inspection
c) Lifting Inspection	d) Subcriticality Inspection
e) Heat Transfer Inspection	f) Shielding Inspection

(3) Action prior to Shipment

The following inspections should be performed prior to shipment.

(i) Visual Inspection	(ii) Lifting Inspection
(iii) Weight Inspection	(iv) Surface Contamination Inspection
(v) Dose Rate Inspection	(vi) Subcriticality Inspection
(vii) Contents Inspection	(viii) Surface Temperature Inspection
(ix) Leakage Rate Inspection	(x) Pressure 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

(i) Issue Date	: July 13, 2011
(ii) Expiry Date	: July 12, 2016

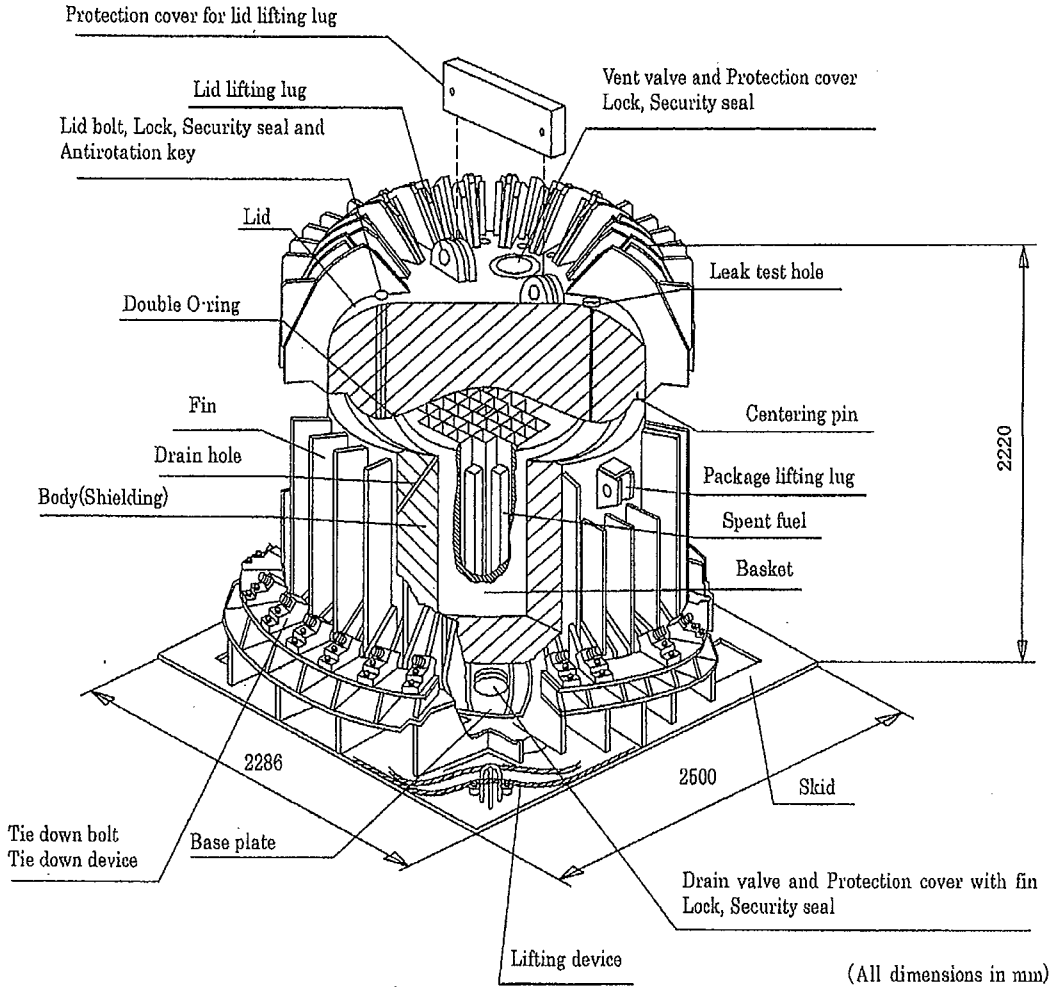


Figure-1 Illustration of JRC-80Y-20T Package

Table-1 Materials of Packaging

Part		Material
Body	Shell	Stainless steel
	Body bottom plate	Stainless steel
	Heat dissipation and shock absorbing fin	Stainless steel
	Body lifting lug	Stainless steel
Lid	Lid plate	Stainless steel
	Lid bolt	Stainless steel
	O-ring	Silicon rubber
	Lid lifting lug	Stainless steel
Vent and drain valves.	Body	Stainless steel
	Valve seat	Stainless steel, Silicon rubber
	Bellows	Stainless steel
	O-ring	Silicon rubber
	Gasket	Silicon rubber
	Plug	Stainless steel
	Bolt	Stainless steel
	Protection cover	Stainless steel
Basket	Neutron poison	Boron carbide
	Frame	Stainless steel
	Bottom plate	Stainless steel
	Compartment plate	Stainless steel, Boral plate
	Partition plate	Stainless steel
	Adapter (for follower type fuel element)	Aluminum alloy
Tie down device	Tie down device	High-tensile steel, Stainless steel

Table-2 Specification of contents

Classification / Item		Box type				Box type(with Adapters)			MNU type
Basket		Box type				Box type(with Adapters)			MNU type
Reactor		JRR-3	JRR-3	JRR-4	JMTR	JRR-3	JRR-3	JMTR	JRR-3
Fuel element		Standard aluminide type	Standard silicide type	Low enrichment silicide type	Standard type (LEU)	Follower aluminide type	Follower silicide type	Fuel follower (LEU)	MNU type
Fuel type		Plate fuel	Plate fuel	Plate fuel	Plate fuel	Plate fuel	Plate fuel	Plate fuel	Rod fuel
Number of fuel elements (piece)		40 or less	40 or less	40 or less	40 or less	40 or less	40 or less	40 or less	160 or less
Initial enrichment (%) 1)		20 or less	20 or less	20 or less	20 or less	20 or less	20 or less	20 or less	0.72
Total mass of ^{235}U (g/piece) 1)		306 or less	485 or less	210 or less	450 or less	194 or less	310 or less	302 or less	61.2 or less
Total mass of U (g/piece) 1)		1,530 or less	2,481 or less	1,075 or less	2,338 or less	970 or less	1,586 or less	1,569 or less	8,500 or less
Burnup (%) 2)		50 or less	60 or less	50 or less	60 or less	50 or less	60 or less	60 or less	23 or less
Cooling time (day)		300 or more 3)	600 or more	110 or more	800 or more	300 or more 3)	600 or more	800 or more	2,190 or more
Total activity (Bq/package)		2.04×10^{16} or less 4)	2.09×10^{16} or less	2.02×10^{15} or less	1.64×10^{16} or less	9.53×10^{15} or less 4)	1.33×10^{16} or less	1.10×10^{16} or less	9.33×10^{14} or less
Decay heat (W/package)		2.25×10^{3} or less 4)	2.24×10^{3} or less	2.15×10^{3} or less	1.77×10^{3} or less	1.03×10^{3} or less 4)	1.43×10^{3} or less	1.19×10^{3} or less	7.24×10 or less
Fuel material	Fuel meat	Uranium aluminum dispersion type alloy	Uranium silicon aluminum dispersion type alloy	Uranium silicon aluminum dispersion type alloy	Uranium silicon aluminum dispersion type alloy	Uranium aluminum dispersion type alloy	Uranium silicon aluminum dispersion type alloy	Uranium silicon aluminum dispersion type alloy	Metallic natural uranium
	Clad	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy
	Side plate, etc.	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	Aluminum alloy	——
Dimension at stored width×height×length (mm)		77.04×77.04×800	77.04×77.04×800	80×80×660	77.04×77.04×800	63.6×63.6×880	63.6×63.6×880	63.64×63.64×890	φ37×933 and φ37×944
Weight at stored (kg/piece)		8.0 or less	8.0 or less	5.6 or less	8.0 or less	5.2 or less	5.2 or less	5.2 or less	10 or less

1) The value in the nuclear specification shows an upper value which contains fabrication tolerance.
2) Burn up (%) = ((All depletion weight of ^{235}U)+Initial weight of ^{235}U))×100
3) One operation cycle of JRR-3 with JRR-3 aluminide fuels (standard type and follower type) is 35 days (27 days for reactor operation and 8 days for shutdown). Refueling work is carried out once in an operation cycle, and 4 standard type fuels and 2 follower type fuels are refueled. Therefore, cooling days of fuels contained in the package are at a minimum of 300 days, and added 35 days in turn for every 4 standard type fuels and 2 follower type fuels. (Standard type fuel: 300 days or more (4 fuels), 335 days or more (4 fuels), ..., 615 days or more (4 fuels). Follower type fuel: 300 days or more (2 fuels), 335 days or more (2 fuels), ..., 965 days or more (2 fuels).)
4) Activity and heat generation rate are based on the cooling days in 3).

Note: The fuel elements of JRR-3 (except MNU type) and JRR-4 are able to be consolidated in one basket. The JMTR fuel elements are able to be consolidated in one basket.

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CERTIFICATE NUMBER: USA/0208/B(U)F-96, Revision 12

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