NRC FORM 618
(8-2000)
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

# CERTIFICATE OF COMPLIANCE
## FOR RADIOACTIVE MATERIAL PACKAGES

| 1. a. CERTIFICATE NUMBER | b. REVISION NUMBER | c. DOCKET NUMBER | d. PACKAGE IDENTIFICATION NUMBER | PAGE | | PAGES |
|---|---|---|---|---|---|---|
| 9319 | 0 | 71-9319 | USA/9319/B(U)F-96 | 1 | OF | 5 |

2. PREAMBLE

a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*

AREVA NP, Inc.
1724 Mt. Athos Rd.
Lynchburg, VA 24504

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

AREVA NP, Inc., application dated March 13, 2007, as supplemented.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model Nos.: MAP-12 and MAP-13

(2) Description

The MAP package is designed to transport unirradiated uranium fuel assemblies with enrichment up to 5.0 wt%. The package is designed to carry two fuel assemblies with core components. The package consists of two components: a base and lid. The containment system of the MAP package is the fuel rod cladding.

The base consists of a fixed stainless steel strong-back which supports the fuel assemblies. A series of inner stiffeners are secured to the underside of the strong-back. A neutron moderator and absorber are positioned directly beneath the strong-back between each inner stiffener. The base inner stiffeners are retained by a stainless steel cover. Exterior to the cover is a layer of rigid polyurethane foam and an outer shell of 11-gauge stainless steel. A 12-gauge stainless steel sheet is provided between the two middle stiffeners. Four stainless steel outer stiffeners support the package base. The payload rests on the "W" shaped strong-back (referred to as a W-plate) and is held in place with hinged and latched aluminum doors. The lid is similar to the base – a "W" shaped stainless steel inner shell is fitted with a series of inner stiffeners, neutron moderator and absorbers, and a stainless steel cover is fitted over the stiffeners. The package is equipped with a trapezoidal impact limiter at each end. The impact limiters are constructed from rigid polyurethane foam encased by the package outer stainless shell skin.

5.(a) (2) Description (continued)

There are two models of the MAP package, the MAP-12 and MAP-13. The approximate weights and dimensions of the package are as follows:

MAP-12 (for 144-in Nominal Active Fuel Length):

| | |
|---|---|
| Maximum Gross Weight | 8,630 lbs |
| Maximum Payload Weight | 3,400 lbs |
| Outer Dimensions | |
| Length | 208 in |
| Width | 45 in |
| Height | 31 in |

MAP-13 (for 150-in Nominal Active Fuel Length):

| | |
|---|---|
| Maximum Gross Weight | 8,630 lbs |
| Maximum Payload Weight | 3,400 lbs |
| Outer Dimensions | |
| Length | 221 in |
| Width | 45 in |
| Height | 31 in |

(3) Drawings

The MAP-12 and MAP-13 packages are fabricated and assembled in accordance with the following AREVA NP, Inc., Drawing Nos.: 9045393, Rev. 1; 9045397, Rev. 0; 9045399, Rev. 0; 9045401, Rev. 0; 9045402, Rev. 0; 9045403, Rev. 0; 9045404, Rev. 0; 9045405, Rev. 0.

(b) Contents

(1) Type and Form of Material

Unirradiated fuel assemblies, with parameters listed in Table 1 below. The fuel is composed of enriched commercial grade uranium or enriched reprocessed uranium, (as defined in ASTM C996-04), oxide fuel rods enriched to no more than 5.0 wt% in the U-235 isotope, with limits specified in Table 2 below. The fuel rods are loaded with sintered pellets of uranium oxides and/or with sintered pellets of uranium oxides mixed with various additives (e.g., Chromium, Boron, Gadolinium, and Europium). Non-fissile, base-plate mounted and spider body core components are permitted. Loose fuel rods or partial fuel assemblies are not permitted.

Table 1: Parameters for Fuel Assemblies

| Fuel Rod Array | 14x14 | | 15x15 | | | | 16x16 | 17x17 | |
|---|---|---|---|---|---|---|---|---|---|
| Assembly Type | 1 | 2 | 1 | | | 2 | 3 | 1 | 1 | 2 |
| No. of Fuel Rods | 176 | 179 | 208 | | | 216 | 204 | 236 | 264 | 264 |
| No. of Non-Fuel Cells | 20 | 17 | 17 | | | 9 | 21 | 20 | 25 | 25 |
| Nominal Fuel Rod Pitch (in) | 0.580 | 0.556 | 0.568 | | | 0.550 | 0.563 | 0.506 | 0.502 | 0.496 |
| Maximum Pellet Outer Diameter (in) | 0.3812 | 0.3682 | 0.3622 | 0.3707 | 0.3742 | 0.3617 | 0.3682 | 0.3282 | 0.3252 | 0.3232 |
| Minimum Fuel Rod Outer Diameter (in) | 0.438 | 0.422 | 0.414 | 0.428 | 0.428 | 0.414 | 0.422 | 0.380 | 0.377 | 0.372 |
| Minimum Clad Wall Thickness (in) | 0.0245 | 0.0230 | 0.0220 | 0.0245 | 0.0230 | 0.0220 | 0.0230 | 0.0220 | 0.0220 | 0.0205 |
| Maximum Guide Tube Inner Diameter (in) | N/A | N/A | 0.500 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Minimum Guide Tube Outer Diameter (in) | N/A | N/A | 0.528 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Number of Guide Tubes | N/A | N/A | 16 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Maximum Instrument Tube Inner Diameter (in) | N/A | N/A | 0.443 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Minimum Instrument Tube Outer Diameter (in) | N/A | N/A | 0.491 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Number of Instrument Tubes | N/A | N/A | 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Clad/Tube Material Type | Zr Alloy | Zr Alloy | Zr Alloy | | | Zr Alloy | Zr Alloy | Zr Alloy | Zr Alloy | Zr Alloy |
| Maximum Active Fuel Length (in) | 160 | 160 | 160 | | | 160 | 160 | 160 | 160 | 160 |

(b) Contents

(1) Type and Form of Material (continued)

Table 2: Maximum Authorized Concentrations

| Isotope | Maximum Content |
|---|---|
| U-232 | $2.00 \times 10^{-9}$ g/g U |
| U-234 | $2.00 \times 10^{-3}$ g/g U |
| U-235 | $5.00 \times 10^{-2}$ g/g U |
| U-236 | $2.50 \times 10^{-2}$ g/g U |
| U-238 | Balance of Uranium |
| Np-237 | $1.66 \times 10^{-6}$ g/g U |
| Pu-238 | $6.20 \times 10^{-11}$ g/g U |
| Pu-239 | $3.04 \times 10^{-9}$ g/g U |
| Pu-240 | $3.04 \times 10^{-9}$ g/g U |
| Gamma Emitters | $6.38 \times 10^{5}$ MeV – Bq/kg U |

(2) Maximum Quantity of Material per Package

Two fuel assemblies per package. The total payload weight should not exceed 3,400 lbs.

(c) Criticality Safety Index: 2.8

6. In addition to the requirements of Subpart G of 10 CFR Part 71:

(a) The package shall be prepared for shipment and operated in accordance with the Package Operations in Section 7 of the application, as supplemented.

(b) Each package must meet the Acceptance Tests and Maintenance Program of Section 8 of the application, as supplemented.

7. Each fuel assembly must be unsheathed or must be enclosed in an unsealed, polyethylene or polypropylene 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.

8. The fuel rods must be leak tested after fabrication to ensure that each fuel rod has a leakage rate less than 1E-07 ref cc/sec.

9. Transport by air of fissile material is not authorized.

10. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

11. Expiration date: January 31, 2013.

REFERENCES

AREVA NP, Inc., application dated March 13, 2007.

Supplements dated: October 24, December 6 and 14, 2007.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Robert A. Nelson, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Date: January 30, 2008