

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

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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)
TN Americas LLC
7160 Riverwood Drive, Suite 200
Columbia, MD 21046 | b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
TN-32 Transportation Cask Safety Analysis Report,
dated June 2024. |
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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 No.: TN-32B

(2) Description:

The TN-32B packaging consists of a spent fuel basket assembly, a containment vessel, a forged steel shell body, a radial neutron shielding, and impact limiters.

Basket

The spent fuel basket consists of a honeycomb-like structure of stainless-steel cells, housing 32 fuel assemblies, separated by aluminum and poison plates that form a sandwich panel. The aluminum plates provide heat conduction paths from the spent fuel assemblies to the cask cavity wall. The poison material provides the necessary criticality control. The opening of the cells is 8.7 in. x 8.7 in., leaving a minimum of 1/8 in. clearance around the fuel assemblies. The overall basket length (160.0 in.) is less than the cask cavity length to allow for thermal expansion and fuel assembly handling.

Containment Vessel

The containment vessel consists of the inner shell and bottom inner plate, shell flange, closure lid outer plate, closure lid bolts, penetration cover plates and bolts, thermocouple lance assemblies and their seals, inner metallic seals of the lid, vent and drain seals. The containment vessel, which maintains an inert atmosphere (helium) in the cask cavity, is 171 inches long, with a wall thickness of 1.5 inch. The

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5. (a)(2) Description (Continued)

cylindrical cask cavity has an inner diameter of 68.8 inches and a length of 163.4 inches. The closure lid outer plate is 4.5 inches thick and is secured to the body by 48 high-strength closure lid bolts.

Body

The packaging body, i.e., a forged steel gamma shield shell, is around the inner shell and the bottom inner plate of the containment vessel. The 8.00 in. thick gamma shield shell and the 8.75 in. thick bottom plate completely surround the containment vessel shell and bottom plate, respectively. A 6.0 in. thick shield plate is also welded to the inside of the 4.5 in. thick lid outer plate, and 2.13 in. thick lance cover plates are placed over the thermocouple lances and welded to the closure lid outer plate.

The radial neutron shielding is enclosed within the welded steel outer shell. Radial neutron shielding is provided by a borated polyester resin compound surrounding the gamma shield shell. The total radial thickness of the resin and aluminum is 4.5 in.

Impact Limiters

The impact limiters, consisting of balsa wood and redwood blocks encased in stainless steel plates, have an outside diameter of 144 in. and an inside diameter of 89 in. The impact limiters, attached to each other using tie-rods, are also attached to the outer shell of the package with bolts. A puncture-resistant steel plate is placed on the cask lid and bolted to the package body prior to mounting the top impact limiter, to provide a smooth contact surface between the closure lid and the top impact limiter, and to protect the thermocouple lance assemblies from puncture.

A transport frame, which is not part of the packaging, is used for tie-down purposes.

The TN-32B package is 263.2 inches long and has a diameter of 144 in. with the impact limiters installed. The package body is 184.3 in. long (with the closure lid installed), and 87.75 in. in diameter. The closure lid is 79.50 in. in diameter. The cask outside diameter including the radial neutron shield is 98.14 in. The cask cavity is 163.38 in. long and 68.80 in in diameter. The total gross weight of the package is 269,000 lb.

5. (a)(3) Drawings

The packaging is fabricated and assembled in accordance with ORANO TN Drawing Nos.:

- | | |
|--------------------|-----------------------------------|
| 19885-71-1, Rev. 0 | General Arrangement Assembly |
| 19885-71-2, Rev. 0 | General Assembly |
| 19885-71-3, Rev. 0 | Lid Assembly and Parts List |
| 19885-71-4, Rev. 0 | Puncture resistant Plate Assembly |

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5. (a)(3) Drawings (continued)

19885-71-5, Rev. 0	Trunnion Details
19885-71-6, Rev. 0	Basket Assembly and Parts List
19885-71-7, Rev. 0	Thermocouple Lance Assembly, Lance Cover Plate
19885-71-8, Rev. 0	General Assembly Impact Limiters
19885-71-9, Rev. 0	Bottom Impact Limiter Assembly
19885-71-10, Rev. 0	Top Impact Limiter Assembly

5. (b) Contents

(1) Type and form of material

(a) Only intact fuel assemblies limited to the following fuel types, with specifications listed in Table 1-2 of the application:

- i. One (1) Westinghouse LOPAR 17×17 fuel assembly with Zirc-4 cladding
- ii. Twelve (12) Westinghouse NAIF 17×17 assemblies with ZIRLO™ cladding
- iii. One (1) Westinghouse NAIF 17×17 assembly with Low SN Zr-4 cladding
- iv. Eighteen (18) AREVA Advanced MK-BW 17×17 assembly with M5™ cladding

(b) Fuel assembly locations and poison rod assembly (PRA) locations shall be as provided in Figure 6-1 of the application.

(c) The maximum combined weight of a fuel assembly and a PRA shall not exceed 1,551 lb.

(d) The maximum initial enrichment of any fuel assembly is 4.55 wt.% ²³⁵U.

(e) The burnup for each assembly is greater than 50,000 MWd/MTU with the fuel burnup data for all 32 fuel assemblies being as provided in Table 1-3 of the application.

(f) The post-irradiation minimum cooling time is 11.6 years and the maximum total decay heat load shall be 25.84 kW, with a maximum of 0.878 kW for any fuel assembly.

(2) Maximum quantity of material per package

32 PWR assemblies as described in 5.b(1) with a combined weight (fuel assemblies and PRAs) not exceeding 50,000 lb.

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5.(c) Criticality Safety Index: 0.0

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

- (a) The package must be prepared for shipment and operated in accordance with the "Operating Procedures" in Chapter 7 of the application, as supplemented.
- (b) Each packaging must be acceptance tested and maintained in accordance with the "Acceptance Tests and Maintenance Program" in Chapter 8 of the application, as supplemented.

7. Transport by air is not authorized.

8. The personnel barrier shall be installed at all times during transport to meet package surface temperature and/or package dose rates requirements.

9. The package shall be transported under exclusive-use.

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: July 31, 2029.

REFERENCES

TN Americas LLC, application "TN-32 Transportation Cask Safety Analysis Report" dated June 2024.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Yaira Diaz-Sanabria, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety and Safeguards

Date: July 2, 2024