

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

a. CERTIFICATE NUMBER 9228	b. REVISION NUMBER 28	c. DOCKET NUMBER 71-9228	d. PACKAGE IDENTIFICATION NUMBER USA/9228/B(U)F-96	PAGE 1	PAGES OF 4
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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)
GE-Hitachi Nuclear Energy Americas, LLC
3901 Castle Hayne Road
Wilmington, NC 28401
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
GE Hitachi Nuclear Energy consolidated application
dated April 28, 2016, 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 No.: 2000
- (2) Description

The cask body is constructed of two concentric 1-inch thick 304 stainless steel cylindrical shells (ASTM A240) joined at the bottom end to a 6-inch thick 304 stainless steel forging (ASTM A182). The overall packaging dimensions are approximately 131.5 inches in height and 72 inches in diameter, and its gross weight is approximately 33,550 lbs. The cavity of the packaging is approximately 26.5 inches in diameter and 54.0 inches deep.

The cask lid is fully recessed into the cask top flange and secured to the cask body by 15, 1.25-inch diameter socket head screws. The packaging is equipped with a seal test port on the side of the body, a vent port in the lid, and a drain port near the bottom of the packaging. The cask lid utilizes four O-rings in a metal retainer.

The overpack is constructed from two 0.5-inch thick concentric 304 stainless steel cylindrical shells (ASTM A240), separated radially by eight equally spaced tubes and horizontally by two tube sections. A 304 stainless steel toroidal shell impact limiter is attached to each end of the overpack. The overpack opens just above the lower impact limiter for access to the packaging. The top of the overpack is joined to the base by 15, 1-3/8-inch diameter shoulder screws. Gussets on the top and bottom impact limiters provide tie-down points for the package. The lifting devices are detached during transport.

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

A high performance insert (HPI) is fabricated from two concentric stainless steel cylindrical shells. The annulus between the cylindrical shells is filled with depleted uranium. The HPI is positioned within the cask cavity by support disks arranged axially to provide uniform support. Vertical lifting arms connect the support disks and also serve as the primary lifting fixtures. The HPI is shielded using encapsulated depleted uranium within both a top and a bottom plug. The top plug has a stepped design and an optional spacer may be added to provide additional shoring.

A material basket is also used for the shipment of contents described in 5(b)(1)(ii).

(3) Drawings

- (i) With the exception of packaging Serial No. 2001, the packaging is constructed and assembled in accordance with the following General Electric Company Drawings:

Drawing No.	Drawing Title	Revision
129D4946	Model 2000 Transport Container	12
105E9520	Model 2000 Shipping Cask all S/N's Except S/N 2001	9 (Sheet 1 of 2) 9 (Sheet 2 of 2)
105E9521	Model 2000 Cask Overpack All S/N's Except S/N 2001	7

- (ii) Packaging Serial No. 2001 is constructed and assembled in accordance with the following General Electric Company Drawings:

Drawing No.	Drawing Title	Revision
129D4946	Model 2000 Transport Container	12
101E8718	Model 2000 Shipping Cask S/N 2001	17 (Sheet 1 of 2) 17 (Sheet 2 of 2)
101E8719	Model 2000 Shipping Cask Overpack S/N 2001	14

- (ii) The HPI and HPI material basket are constructed and assembled in accordance with the following General Electric Company Drawings:

Drawing No.	Drawing Title	Revision
001N8422	GE 2000 HPI and Material Basket Licensing Drawing	3
001N8423	GE 2000 HPI Licensing Drawing	2
001N8424	GE 2000 HPI Material Basket Assembly Licensing Drawing	2
001N8425	GE 2000 HPI Body Licensing Drawing	2
001N8427	GE 2000 HPI Top Plug Assembly Licensing Drawing	2
001N8428	GE 2000 HPI Bottom Plug Assembly Licensing Drawing	2

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5.(b) (1) Contents

- (i) Irradiated hardware components composed of metallic alloys (e.g., stainless steels, carbon steels, FeCrAl, nickel alloys and zirconium alloys). Irradiated byproducts such as control rods and/or control blades containing either hafnium or boron carbide. The minimum cooling time for either irradiated hardware or irradiated byproducts shall be at least 30 days prior to shipment.
- (ii) ^{60}Co as either normal form rods, normal form encapsulated pellets or special form.
- (iii) GE BWR 10x10 irradiated fuel rods with the following characteristics:
 - 1. a minimum active fuel height of 5.3 inches,
 - 2. a minimum pellet diameter of 0.784 cm,
 - 3. a minimum cooling time of 120 days prior to shipment
 - 4. a maximum U-235 mass of 1750 grams,
 - 5. a maximum burnup of 72 GWd/MTU, and
 - 6. an initial U-235 enrichment between 1.5 wt% and 5 wt%.

5.(b) (2) Maximum quantity of material per package

- (i) For the contents described in 5(b)(1)(i), the maximum quantity of material shall not exceed the limits specified in Section 7.5.1 of the safety analysis report.
- (ii) For the contents described in 5(b)(1)(ii), the maximum quantity of material shall not exceed the limits specified in Section 7.5.2 of the safety analysis report, and the total activity in any axial 1-inch increment shall be less than or equal to 17,000 Curies.
- (iii) For the contents described in 5(b)(1)(iii), the maximum quantity of material shall not exceed the limits specified in Section 7.5.3 of the safety analysis report.
- (iv) For a combination of contents described in 5(b)(1)(i), 5(b)(1)(ii) and 5(b)(1)(iii), the maximum quantity of material shall not exceed the limits specified in Section 7.5.4 of the safety analysis report.
- (v) The contents described in 5(b)(1)(i) and 5(b)(ii) may contain fissile material provided the quantity of material does not exceed the exempt quantity under 10 CFR 71.15.
- (vi) The thermal heat load of the package shall not exceed 1500 W.
- (vii) The combined weight of the HPI, HPI basket, radioactive material, shoring, and secondary containers shall not exceed 5,450 lbs.

5.(c) Criticality Safety Index: 50.0

6. The HPI shall be used to transport contents 5(b)(1)(i), 5(b)(1)(ii) and 5(b)(1)(iii).
7. The HPI and the HPI material basket shall be used to transport content 5(b)(1)(ii) and 5(b)(1)(iii).

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8. Appropriate shoring must be provided as necessary to minimize content movement during accident conditions of transport.
9. The package shall be shipped in a vertical orientation.
10. Air transport is not authorized.
11. 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 7.0 of the application, as supplemented.
 - (b) The package must meet the Acceptance Tests and Maintenance Program in Section 8.0 of the application, as supplemented.
12. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
13. Revision No. 27 of this certificate may be used until April 30, 2021.
14. Expiration date: March 31, 2023.

REFERENCES

GE Hitachi Nuclear Energy Company application dated April 28, 2016.

Supplements dated: May 4, 2016; June 13, and September 29, 2017; January 9, and February 27, 2018; July 31, 2019; January 31, and April 2, 2020.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

John McKirgan, Chief
Transportation and Storage Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: April 23, 2020