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
9228	29	71-9228	USA/9228/B(U)F-96	1	OF 4

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 June 10, 2022, 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.

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

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)(1)(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).

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. 28 of this certificate may be used until November 30, 2023.

14. Expiration date: March 31, 2028.

REFERENCES

GE Hitachi Nuclear Energy Company application dated June 10, 2022.

Supplements dated: November 17, 2022.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Yoira K. Diaz-Sanabria Signed by Diaz-Sanabria, Yoira
on 12/01/22

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

Date: December 1, 2022

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT

Docket No. 71-9228
Model No. 2000
Certificate of Compliance No. 9228
Revision No. 29

SUMMARY

By application dated June 10, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22161A957), as supplemented on November 17, 2022 (ADAMS Accession No. ML22321A112), GE-Hitachi Nuclear Energy Americas, LLC (GEH) requested renewal of Certificate of Compliance No. 9228 for the Model No. 2000 shipping package. GEH made only editorial and administrative changes to the safety analysis report. GEH did not request any changes to the package design or authorized contents. The certificate has been renewed for a five year term.

1.0 GENERAL INFORMATION

GEH updated Quality Assurance Program references in safety analysis report sections 1.1 and 1.4 to identify the most recent version approved by the NRC. In addition, GEH added text to the section 1.2.2.1 description of metallic alloys. Staff reviewed these changes and determined that they are administrative and editorial in nature. GEH did not request any changes to the package design or authorized contents. Based on a review of the statements and representations in the application, the staff concludes that the package has been adequately described to meet the requirements of 10 CFR Part 71.

2.0 STRUCTURAL

The staff reviewed the proposed changes and determined that they did not impact previous SER findings regarding the package structural design. Therefore, the staff finds that a new evaluation is not needed.

3.0 THERMAL EVALUATION

The staff reviewed the proposed changes and determined that they did not impact previous SER findings regarding the package thermal design. Therefore, the staff finds that a new evaluation is not needed.

4.0 CONTAINMENT EVALUATION

The staff reviewed the proposed changes and determined that they did not impact previous SER findings regarding the package containment design. Therefore, the staff finds that a new evaluation is not needed.

5.0 SHIELDING EVALUATION

GEH added text to the safety analysis report section 5.2 description of metallic alloys. Staff reviewed these changes and determined that they are editorial in nature. Therefore, the staff finds that a new evaluation is not needed.

6.0 CRITICALITY EVALUATION

The staff reviewed the proposed changes and determined that they did not impact previous SER findings regarding the package criticality design. Therefore, the staff finds that a new evaluation is not needed.

7.0 MATERIALS EVALUATION

The staff reviewed the proposed changes and determined that they did not impact previous SER findings regarding the package material design. Therefore, the staff finds that a new evaluation is not needed.

8.0 PACKAGE OPERATIONS

While reviewing the safety analysis report operating procedures, staff noted that operational information was missing and discussed this with GEH on October 26, 2022 (ADAMS Accession No. ML22335A433). GEH supplemented their application on November 17, 2022 (ADAMS Accession No. ML22321A112). Staff confirmed that the missing operational information had been adequately incorporated. Based on a review of the statements and representations in the application, the staff concludes that the package operations have been adequately described to meet the requirements of 10 CFR Part 71.

9.0 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM REVIEW

GEH updated Quality Assurance Program references in safety analysis report sections 8.1, 8.1.1 and 8.4 to identify the most recent version approved by the NRC. Staff reviewed these changes and determined that they are administrative in nature. Therefore, the staff finds that a new evaluation is not needed.

CONCLUSION

GEH made administrative and editorial changes to the safety analysis report but did not request any changes to the package design or authorized contents. The staff reviewed the documents referenced in the certificate and determined that the documentation was available and complete. In addition, the certificate of compliance is revised to update the revision number, remove unnecessary change bars, and make editorial changes.

The certificate has been renewed for a five year term that expires on March 31, 2028. This change does not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9228, Revision No. 29, on December 1, 2022