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
9367	1	71-9367	USA/9367/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)*

Holtec International
One Holtec Drive
Marlton, NJ 08053

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

Holtec International Report No. HI-2125175, *Safety Analysis Report on the HI-STAR 180D Package,* Revision No. 3, dated July 16, 2014.

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.: HI-STAR 180D

(2) Description

The HI-STAR 180D package is designed for transportation of undamaged irradiated Uranium Oxide (UO_2) fuel assemblies. The fuel basket provides criticality control and the packaging body provides the containment boundary, helium retention boundary, moderator exclusion barrier, gamma and neutron radiation shielding, and heat rejection capability. The outer diameter of the HI-STAR 180D packaging is approximately 2712-mm without impact limiters and approximately 3250-mm with impact limiters. The maximum gross weight of the loaded HI-STAR 180D package is 125 Metric Tons.

Fuel Basket

Metamic-HT, a metal matrix composite of aluminum and boron carbide, is the principal constituent material of the fuel basket, both as structural material and neutron absorber material. Two interchangeable fuel basket models, designated F-32 and F-37, contain either 32 or 37 Pressurized Water Reactor (PWR) fuel assemblies respectively, in regionalized and uniform loading patterns. The fuel basket features flux traps between some, but not all, cells.

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

Packaging Body

The cylindrical steel shell containment system is welded to a bottom steel baseplate and a top steel forging machined to receive two independent steel closure lids, with each lid being individually designated as a containment boundary component. The outer surface of the cask inner shell is buttressed with a monolithic shield cylinder for gamma and neutron shielding. Each closure lid features a dual metallic self-energizing seal system designed to ensure its containment and moderator exclusion functions. For this package, the inner closure lid inner seal and the inner closure lid vent/drain port cover inner seals are the containment boundary components on the inner lid; the outer closure lid inner seal and the outer closure lid access port plug seal are the containment boundary components on the outer lid.

Impact Limiters

The HI-STAR 180D package is fitted with two impact limiters fabricated of aluminum crush material completely enclosed by an all-welded austenitic stainless steel skin. Both impact limiters are attached to the body of the packaging with 16 bolts.

(3) Drawings

The packaging shall be constructed and assembled in accordance with the following Holtec International Drawing Numbers:

(a) HI-STAR 180D Cask — Drawing No. 8545, sheets 1-12, Rev. 4

(b) F-37 and F-32 Fuel Baskets — Drawing No. 8553, sheets 1-6, Rev. 4

(c) HI-STAR 180D Impact Limiter — Drawing No. 8552, sheets 1-5, Rev. 3

5.(b) Contents

(1) Type, Form, and Quantity of Material

(a) Only undamaged UO_2 fuel assemblies, with a Zr cladding type, meeting the specifications and requirements provided in Conditions 5.b(1)(b) through 5.b(1)(i), and with the characteristics listed in Table 7.D.1 of the application, are authorized for transportation.

5.(b)(1)(a) Continued

(b) Damaged fuel assemblies, i.e., assemblies with known or suspected cladding defects greater than pinhole leaks or hairline cracks and which cannot be handled by normal means, as well as fuel debris, non-fuel hardware and neutron sources are not authorized contents.

(c) The maximum initial enrichment of any UO_2 assembly is 4.55 wt.% ^{235}U.

(d) The post-irradiation minimum cooling time, maximum burnup, maximum decay heat load, and minimum initial enrichment per assembly are listed in Tables 7.D.2 and 7.D.3 of the application. The cell numbering for the F-32 and F-37 fuel baskets is depicted in Figures 7.D.1 and 7.D.2 of the application, respectively.

(e) Regions and cells for regionalized loading of the F-32 and F-37 baskets are identified in Table 7.D.5 of the application. Table 7.D.6 of the application provides the minimum burnup requirements for the F-37 basket, based on initial enrichment. Fuel assemblies with a maximum of 50 cm of control rod insertion during irradiation may be transported in the F-37 basket.

(f) In-core operating limits for those assemblies that need to meet the burnup requirements in Table 7.D.6 of the application are listed in Table 7.D.7 of the application. In addition, the maximum average fuel temperature during irradiation is 1251°K (977.9°C).

(g) For those spent fuel assemblies that need to meet the burnup requirements specified in Table 7.D.6 of the application, a burnup verification shall be performed in accordance with Appendix 7.E of the application.

(h) Allowable loading patterns and fuel specifications for each basket region are referenced in Tables 7.D.2 and 7.D.3 of the application. Alternative fuel specifications for each regional loading pattern are presented in Table 7.D.4 of the application.

(i) The maximum decay heat is 33.08 kW for the F-32 basket and 36.4 kW for the F-37 basket.

5.b.(2) Maximum Quantity of Material Per Package

32 or 37 PWR fuel assemblies, as described in 5(b)(1), in the F-32 or F-37 basket, respectively.

5.(c) Criticality Safety Index (CSI)= 0.0

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

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(a) The package shall be prepared for shipment and operated in accordance with Chapter 7 of the application.

(b) The package shall meet the acceptance tests and be maintained in accordance with Chapter 8 of the application. For the bend test qualification of a representative friction stir weld sample, the sample must meet the visual acceptance criteria of ASME Section III, Subsection NG 5362.

7. The personnel barrier shall be installed and remain installed while transporting the package if necessary to meet package surface temperature and/or package dose rates requirements.

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

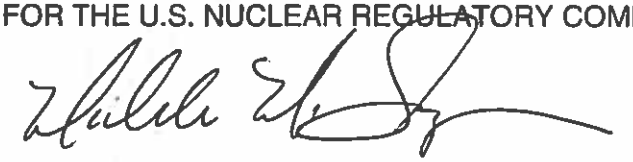
9. Transport by air of fissile material is not authorized.

10. Expiration Date: July 31, 2019

REFERENCES:

Holtec International application "Safety Analysis Report on the HI-STAR 180D Package," Revision No. 3, dated July 16, 2014.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Michele M. Sampson, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Date: September 10, 2014

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

SAFETY EVALUATION REPORT
Model No. HI-STAR 180D Package
Certificate of Compliance No. 9367
Revision No. 1

EVALUATION

On July 29, 2014, the staff issued Certificate of Compliance No. 9367, Revision No. 0, for the Model No. HI-STAR 180D package.

Subsequently, it was found that there was an inadvertent typographical error on one page of the Holtec International application "Safety Analysis Report on the HI-STAR 180D Package," Revision No. 3, dated July 16, 2014.

Page 8.1-7 of the application had misidentified a subsection of the ASME code: Subsection NG 5632 was incorrectly listed, while the correct reference is NG 5362.

Changes to Certificate of Compliance

The following change is included in Revision No. 1 to Certificate of Compliance No. 9367:

Condition No. 6(b) of the certificate was modified as follows: "The package shall meet the acceptance tests and be maintained in accordance with Chapter 8 of the application. For the bend test qualification of a representative friction stir weld sample, the sample must meet the visual acceptance criteria of ASME Section III, Subsection NG 5362."

The expiration date of the certificate was not modified.

CONCLUSION

Based on the statements and representations in the application, the staff has reviewed the proposed change for the Model No. HI-STAR 180D package. The staff concludes that the changes indicated do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9367, Revision No. 1,
on September 10, 2014.