

**CERTIFICATE OF COMPLIANCE  
FOR RADIOACTIVE MATERIAL PACKAGES**

| 1. | a. CERTIFICATE NUMBER | b. REVISION NUMBER | c. DOCKET NUMBER | d. PACKAGE IDENTIFICATION NUMBER | PAGE | PAGES |
|----|-----------------------|--------------------|------------------|----------------------------------|------|-------|
|    | 9374                  | 0                  | 71-9374          | USA/9374/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*)  
Holtec International  
Holtec Center  
One Holtec Drive  
Marlton, NJ 08053

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION  
Holtec International Report No. HI-2146261, *Safety Analysis Report on the HI-STAR 80 Package*,  
Revision TBD, dated TBD.

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 80

(2) Description

**HI-STAR 80 Package**

The HI-STAR 80 package is designed for transportation of undamaged irradiated Uranium Oxide (UO<sub>2</sub>) and Mixed Oxide (MOX) fuel assemblies as well as radioactive non-fuel waste and hardware. The fuel package consists of a fuel basket and fuel assemblies. The non-fuel waste package consists of a waste basket, optional secondary packaging and non-fuel waste. The HI-STAR 80 Cask provides containment boundary, heat rejection and shielding functions. The fuel basket provides criticality control. Non-fuel waste basket provides a location for the waste and shielding function. The optional secondary packaging provides no safety function. The outer diameter of the HI-STAR 80 packaging is approximately 2285 mm without impact limiters. Impact limiters have a diameter of approximately 2713 mm. The maximum gross weight of the loaded HI-STAR 80 package is provided in Table 7.A.1 of the application.

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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 combination of lead, steel, aluminum and a neutron absorber for gamma and neutron shielding. Each closure lid and each cask port features a dual elastomeric seal system designed to ensure containment and moderator exclusion functions of the package. The moderator exclusion function is required for packages containing high burnup fuel (HBF). Containment boundary seals are identified in the drawing package listed in 5.(a)(3) and also listed in Table 8.1.2

### **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 fuel basket models, designated F-12P and F-32B, contain either up to 12 Pressurized Water Reactor (PWR) or up to 32 Boiling Water Reactor (BWR) fuel assemblies respectively. The fuel baskets feature honeycomb structure, with flux traps between the cells in the F-12P.

### **Non-Fuel Waste Basket**

One non-fuel waste basket, designated NFWB-1, is made from stainless steel and is designed to hold non-fuel waste with or without secondary packaging.

### **Non-Fuel Waste Secondary Containers**

Optional non-fuel waste secondary containers are made from stainless steel and designed to hold non-fuel waste. Secondary containers are loaded into non-fuel waste baskets, are not sealed shut, and provide no safety function.

### **Impact Limiters**

The HI-STAR 80 package is fitted with two impact limiters fabricated of aluminum based crush material completely enclosed by an all-welded austenitic stainless steel skin. Both impact limiters are attached to the cask with 16 bolts.

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(3) Drawings

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

- (i) HI-STAR 80 Cask Drawing No. 9800, Sheets 1-11, Rev. 5
- (ii) F-12P Fuel Basket Drawing No. 9796, Sheets 1-4, Rev. 3
- (iii) F-32B Fuel Basket Drawing No. 9797, Sheets 1-4, Rev. 3
- (iv) NFWB-1 Non-Fuel Waste Basket Drawing No. 9798, Sheets 1-2, Rev. 4
- (v) HI-STAR 80 Impact Limiter Drawing No. 9801, Sheets 1-7, Rev. 3
- (vi) HI-STAR 80 Transport Package Drawing No. 9795, Sheets 1-7, Rev. 3

5.(b) Contents

(1) Type, Form, and Quantity of Material

- (i) Spent Nuclear Fuel
  - (a) Only undamaged  $UO_2$  and MOX BWR and  $UO_2$  PWR fuel assemblies, with a Zr cladding type, meeting the specifications and requirements provided in Conditions 5.b(1) and 5.b(2), and meeting the characteristics listed in Appendix 7.D of the application, are authorized contents. Zircaloy 2, Zircaloy 4, ZIRLO and M5 fuel cladding material are permitted.
  - (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 are not authorized contents.
  - (c) The maximum initial  $UO_2$  enrichment of any assembly is listed in Table 7.D.1 of the application.
  - (d) The post-irradiation minimum cooling time, maximum burnup, and minimum initial enrichment per assembly are listed in Tables 7.D.4 and 7.D.5 of the application. Maximum per assembly heat load and total cask maximum decay heat load are listed in Table 7.D.1. The F-12P and F-32B fuel basket cell numbering is depicted in Figures 7.D.1 and 7.D.2 of the application, respectively.

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5.(b)(1)(i) Contents (continued)

(e) Fuel specifications are referenced in Tables 7.D.2 and 7.D.3 of the application.

(ii) Non-Fuel Waste

(a) Only non-fuel waste meeting the specifications and requirements provided in Table 7.D.6 of the application are authorized contents.

(2) Maximum Quantity of Material Per Package

(i) 12 or 32 PWR or BWR fuel assemblies, as described in 5(b)(1), in the F-12P or F-32B basket respectively.

(ii) The contents described in item 5(b)(1)(ii), in the NFWB-1 basket.

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

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 Chapter 7 of the application.

(b) The package shall meet the acceptance tests and be maintained in accordance with Chapter 8 of the application.

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. The package may be used in the U.S. for shipment of UO<sub>2</sub> fuel or Non-Fuel Waste meeting the above specifications.

11. If a system of tie-down devices that is a structural part of the package is employed then the system must be designed to the static force values specified under 10 CFR 71.45(b)(1) for package shipment in the U.S.

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12. Expiration Date: TBD

REFERENCES:

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Revision TBD.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

TBD

Date: TBD



