



Holtec Center, 555 Lincoln Drive West, Marlton, NJ 08053

Telephone (856) 797-0900

Fax (856) 797-0909

November 21, 2008

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Reference: Docket No. 71-9336, TAC No. L24121  
Holtec Project 1630  
[1] Holtec Letter 1630042-NRC, dated November 21, 2008

Subject: Electronic Files Supporting Response to RAI on Certificate of Compliance (CoC)  
License Application for HI-STAR 60 Package

Dear Mr. Saverot:

The enclosures to this letter are electronic input and output files supporting the structural review of the HI-STAR 60 Transport Package Response to RAI submitted in Holtec Letter 1630042-NRC [1].

An affidavit pursuant to 10CFR2.390 (Attachment 1) is included to request withholding of this information due to its proprietary nature.

Sincerely,

Tammy Morin  
Acting Licensing Manager  
Holtec International

Attachments:

[1] Non-Proprietary Affidavit Pursuant to 10CFR2.390

cc: Mr. Pierre Saverot, Project Manager, SFST, NMSS, USNRC  
Mr. Eric Benner, Branch Chief, SFST, NMSS, USNRC (Cover Letter Only)  
Mr. Nader Mamish, Deputy Director, SFST, NMSS, USNRC (Cover Letter Only)  
1630int (Cover Letter Only-via email)

**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

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I, Tammy S. Morin, being duly sworn, depose and state as follows:

- (1) I have reviewed the information described in paragraph (2) which is sought to be withheld, and am authorized to apply for its withholding.
- (2) The information sought to be withheld are the enclosures to Holtec Letter, Document ID 1630043-NRC, which contain Holtec Proprietary information.
- (3) In making this application for withholding of proprietary information of which it is the owner, Holtec International relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4) and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).
- (4) Some examples of categories of information which fit into the definition of proprietary information are:
  - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by Holtec's competitors without license from Holtec International constitutes a competitive economic advantage over other companies;
  - b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a

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similar product.

- c. Information which reveals cost or price information, production, capacities, budget levels, or commercial strategies of Holtec International, its customers, or its suppliers;
- d. Information which reveals aspects of past, present, or future Holtec International customer-funded development plans and programs of potential commercial value to Holtec International;
- e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs 4.a, 4.b, and/or 4.e above.

- (5) The information sought to be withheld is being submitted to the NRC in confidence. The information (including that compiled from many sources) is of a sort customarily held in confidence by Holtec International, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by Holtec International. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within Holtec International is limited on a "need to

**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

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know" basis.

- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his designee), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside Holtec International are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- (8) The information classified as proprietary was developed and compiled by Holtec International at a significant cost to Holtec International. This information is classified as proprietary because it contains detailed descriptions of analytical approaches and methodologies not available elsewhere. This information would provide other parties, including competitors, with information from Holtec International's technical database and the results of evaluations performed by Holtec International. A substantial effort has been expended by Holtec International to develop this information. Release of this information would improve a competitor's position because it would enable Holtec's competitor to copy our technology and offer it for sale in competition with our company, causing us financial injury.
- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to Holtec International's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of Holtec International's comprehensive spent fuel storage technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology, and includes development of the expertise to determine and apply the appropriate evaluation process.

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The research, development, engineering, and analytical costs comprise a substantial investment of time and money by Holtec International.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

Holtec International's competitive advantage will be lost if its competitors are able to use the results of the Holtec International experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to Holtec International would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive Holtec International of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Document ID 1630043-NRC  
Non-Proprietary Attachment 1

**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

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STATE OF NEW JERSEY     )  
  )  
  )     ss:  
COUNTY OF BURLINGTON )

Ms. Tammy S. Morin, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at Marlton, New Jersey, this 21<sup>st</sup> day of November, 2008.



Tammy S. Morin  
Holtec International

Subscribed and sworn before me this 21<sup>st</sup> day of November, 2008.



MARIA C. MASSI  
NOTARY PUBLIC OF NEW JERSEY  
My Commission Expires April 25, 2010

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
	9336	0-Draft	71-9336	USA/9336/B(U)F-96	1	OF	4

2. PREAMBLE

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."

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  
555 Lincoln Drive West  
Marlton, NJ 08053

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION  
Holtec International Report No. HI-2073710, Safety Analysis Report on HI-STAR 60 Transport Package, Revision 1, dated November 21, 2008.

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 60

(2) Description

The HI-STAR 60 Packaging consists of a cask with a fuel basket, a pair of impact limiters, and if necessary a personnel barrier. The HI-STAR 60 Packaging is designed for transportation of used nuclear fuel with a fuel basket that provides criticality control and a cask that provides the containment boundary, helium retention boundary, gamma and neutron radiation shielding, and heat rejection. The outer diameter of the HI-STAR 60 Packaging is approximately 1924 mm (75.8 in) without impact limiters and approximately 2864 mm (112.8 inches) with impact limiters. Maximum gross weight of the loaded HI-STAR 60 Packaging as presented for transport is 74.4 Metric Tons (164,000 lbs). Specific tolerances germane to the safety analyses are called out in the drawings listed below.

Fuel Basket

There is one fuel basket model designated as the F-12. The double digits in the model number designate the fuel assembly capacity. The F-12 fuel basket is designed to contain Pressurized Water Reactor (PWR) fuel assemblies.

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The HI-STAR 60 basket is a fully welded, stainless steel, honeycomb structure and features flux traps between some but not all cells.

#### Cask

The HI-STAR 60 cask is a multi-layer steel cylinder with a welded baseplate and bolted lid (closure plate). The inner shell of the cask forms an internal cylindrical cavity for housing the basket. The outer surface of the cask inner shell is buttressed with intermediate steel shells for radiation shielding. The cask closure plate incorporates a dual O-ring design to ensure its containment function. The containment system consists of the cask inner shell, bottom plate, top flange, top closure plate, top closure inner O-ring seal, vent port plug and seal, and drain port plug and seal.

#### Impact Limiters

The HI-STAR 60 Cask is fitted with two impact limiters. Impact limiter aluminum honeycomb crush material and neutron shield are completely enclosed by an all-welded stainless steel skin. One impact limiter is attached to the top of the cask with 8 studs and nuts and one impact limiter is attached to the bottom of the cask with 8 studs and nuts.

### (3) Drawings

The package shall be constructed and assembled in accordance with the following drawings or figures in Holtec International Report No. HI-2073710, Safety Analysis Report on HI-STAR 60 Transport Package, Revision 1, Section 1.3:

- (a) HI-STAR 60 Cask                      Drawing 5238, Sheets 1-7, Rev. 3
- (b) HI-STAR 60 Fuel Basket          Drawing 5217, Sheets 1-3, Rev. 4
- (c) HI-STAR 60 Impact Limiter      Drawing 5237, Sheets 1-3, Rev. 3

### (b) Contents

#### (1) Type, Form, and Quantity of Material

- (a) Fuel assemblies meeting the specifications and quantities provided in Appendix A to this Certificate of Compliance and meeting the requirements provided in Conditions 5.(b) are authorized for transportation.

- (b) The following definitions apply:

NRC FORM 618 (8-2000) 10 CFR 71		U.S. NUCLEAR REGULATORY COMMISSION					
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1.	a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE		PAGES
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**Undamaged Fuel Assemblies** are fuel assemblies without known or suspected cladding defects, as determined by a review of records, greater than pinhole leaks or hairline cracks, whose structural integrity has not been impaired such that geometric rearrangement of fuel or gross failure of the cladding is not expected based on engineering evaluations, and which can be handled by normal means. Fuel assemblies without fuel rods in fuel rod locations shall not be classified as undamaged fuel assemblies unless dummy fuel rods are used to displace an amount of water greater than or equal to that displaced by the original fuel rod(s).

**Minimum Enrichment** is the minimum assembly average enrichment. Natural uranium blankets are not considered in determining minimum enrichment.

**Non-Fuel Hardware** are removable fuel assembly hardware not used to produce thermal energy in the reactor but considered high-level waste.

**ZR** means any zirconium-based fuel cladding materials authorized for use in a commercial nuclear power plant reactor.

(c) Criticality Safety Index (CSI)=0.0

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

(a) Each package shall be both prepared for shipment and operated in accordance with detailed written operating procedures. Procedures for both preparation and operation shall be developed. At a minimum, those procedures shall include the provisions provided in Chapter 7 of the HI-STAR SAR.

(b) All acceptance tests and maintenance shall be performed in accordance with detailed written procedures. Procedures for acceptance testing and maintenance shall be developed and shall include the provisions provided in Chapter 8 of the HI-STAR SAR.

(c) The HI-STAR 60 containment boundary shall be designed, manufactured, and tested according to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NB – Class 1 Components, 2004, with the Code alternatives listed in SAR Table 2.1.17

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

<b>NRC</b>		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>					
<b>FORM 618</b> (8-2000) 10 CFR 71		<b>CERTIFICATE OF COMPLIANCE</b>					
		<b>FOR RADIOACTIVE MATERIAL PACKAGES</b>					
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	9336	0-Draft	71-9336	USA/9336/B(U)F-96	4	OF	4

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

9. Expiration Date: TBD

**REFERENCES:**

Holtec International Report No. HI-2073710, Safety Analysis Report on HI-STAR 60 Transport Package, Revision 1, dated November 21, 2008.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

TBD, Chief  
Licensing Section  
Division of Spent Fuel Storage and Transportation  
Office of Nuclear Material Safety and Safeguards

Date: TBD

Attachment: Appendix A

**APPENDIX A**

**CERTIFICATE OF COMPLIANCE NO. 9336, REVISION 0**

**MODEL NO. HI-STAR 60 SYSTEM**

APPENDIX A - CERTIFICATE OF COMPLIANCE NO. 9336, REVISION 0

INDEX TO APPENDIX A

<b>Page</b>	<b>Table</b>	<b>Description</b>
A-1	Table A.1	Fuel Assembly Limits
A-2	Table A.2	PWR Fuel Assembly Characteristics
A-3	Table A.3	PWR Fuel Assembly Cooling, Average Burnup, and Initial Enrichment
A-4	Table A.4	Required Critical Characteristics of the Commercial Spent Fuel and Host Reactor

Table A.1 (Page 1 of 1)  
Fuel Assembly Limits

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I. BASKET MODEL: F-12

A. Allowable Contents

1. Uranium Oxide, PWR undamaged fuel assemblies meeting requirements in Table A.2, A.4, and the following specifications:

- a. Cladding Type: Zr-4 per ASTM B 811-1997 or equivalent
- b. Maximum Initial Enrichment: 4.1 wt% <sup>235</sup>U
- c. Post-irradiation cooling time, average burnup, and minimum initial enrichment per assembly: As specified in Table A.3
- d. Decay heat per assembly: ≤ 0.875 kW
- e. Fuel assembly length: ≤ 3530 mm (nominal design)
- f. Fuel assembly width: ≤ 199.3 mm (nominal design)
- g. Fuel assembly weight: ≤ 471 kg

B. Quantity per F-12: Up to 12 PWR fuel assemblies

C. Fuel assemblies shall not contain non-fuel hardware.

APPENDIX A - CERTIFICATE OF COMPLIANCE NO. 9336, REVISION 0

Table A.2 (Page 1 of 1)  
PWR FUEL ASSEMBLY CHARACTERISTICS

<b>Fuel Assembly Type</b>	<b>15x15</b>
Design Initial U (kg/assy.)	≤ 300
No. of Fuel Rod Locations	204
Fuel Rod Clad O.D. (mm)	≥10.0
Fuel Rod Clad thickness (mm)	≥ 0.7
Fuel Pellet Dia. (mm)	≤8.43
Fuel Rod Pitch (mm)	≤13.3
Active Fuel Length (mm)	≤2900
No. of Guide and/or Instrument Tubes	21
Guide/Instrument Tube Thickness (mm)	≥0.5

Notes:

1. All dimensions are nominal values

APPENDIX A - CERTIFICATE OF COMPLIANCE NO. 9336, REVISION 0

Table A.3 (Page 1 of 1)  
PWR FUEL ASSEMBLY COOLING, AVERAGE BURNUP, AND INITIAL ENRICHMENT

<b>Post-Irradiation Cooling Time (years)</b>	<b>Assembly Burnup (MWD/MTU)</b>	<b>Assembly Initial Enrichment (wt% <sup>235</sup>U)</b>
≥ 5	≤ 45,000	≥ 3.6
≥ 5	≤ 40,000	≥ 3.4
≥ 5	≤ 37,000	≥ 3.0
≥ 5	≤ 30,000	≥ 2.67
≥ 5	≤ 27,000	≥ 2.4

APPENDIX A - CERTIFICATE OF COMPLIANCE NO. 9336, REVISION 0

TABLE A.4  
 REQUIRED CRITICAL CHARACTERISTICS OF THE COMMERCIAL SPENT FUEL AND  
 HOST REACTOR

<b>Host Reactor Operating Parameters</b>	
<b>Item</b>	<b>Requirement</b>
Reactor Type	Base Load Light Water Pressurized Reactor
Average rod power in the reactor during normal reactor operations	< 20 kW/m
Maximum rod power in the reactor during normal reactor operations	< 60 kW/m
Minimum Reactor coolant inlet temperature	> 523 °F (273 °C)
Maximum Reactor coolant outlet temperature	< 624 °F (329 °C)
Maximum Soluble Boron Content in Core	< 1500 ppm
Typical Cycle Length	12 to 24 month
pH value of primary coolant	Between 4.2 (high boric acid concentration) and 10.5 (low boric acid concentration) at 25 Deg C
Hydrogen control of primary coolant system	25 to 50 cm <sup>3</sup> (STP)/kg-H <sub>2</sub> O
<b>Fuel Parameters</b>	
<b>Item</b>	<b>Requirement</b>
Initial fill pressure	< 3.44 MPa
Maximum end-of-life hoop stress in the cladding @ 400 °C peak cladding temperature	90 MPa
Co-59 content of fuel assembly hardware (end fittings, spacer grids, etc.)	< 1200 ppm
Maximum cladding oxide thickness at EOL	0.05 mm

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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Non-Proprietary Attachment 5

**AFFIDAVIT PURSUANT TO 10 CFR 2.390**

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I, Tammy S. Morin, being duly sworn, depose and state as follows:

(1) I have reviewed the information described in paragraph (2) which is sought to be withheld, and am authorized to apply for its withholding.

(2) The information sought to be withheld is the following Attachments submitted with Holtec Letter, Document ID 1630042-NRC, which contain Holtec Proprietary information:

- Attachment 2 - Responses to Proprietary RAI dated September 3, 2008
- Attachment 4 - HI-2073710, Rev. 1, HI-STAR 60 SAR, Proprietary Version
- Attachment 6 - HI-2073722, Rev. 2, "HI-STAR 60 Shielding Evaluation"
- Attachment 7 - HI-2073728, Rev. 2, "HI-STAR 60 Containment Analysis"
- Attachment 8 - HI-2073727, Rev. 2, "Criticality Evaluation for the HI-STAR 60"
- Attachment 9 - HI-2073740, Rev. 2, "Thermal Analyses of the HI-STAR 60"
- Attachment 9a - Thermal Analysis Input and Output Files
- Attachment 10- HI-2073716, Rev. 3, "Structural Calculation Package for HI-STAR 60"
- Attachment 11- HI-2084166, Rev. 0, "Calculation Package For HI-STAR 60 Drop Simulations Using Differential Equation Method"
- Attachment 12- HI-2073725, Rev. 2, "Finite Element Impact Analyses Supporting HI-STAR 60 SAR"
- Attachment 13- HI-2073743, Rev 1, "Benchmarking of LS-DYNA Impact Response Prediction Model for the HI-STAR Transport Package using the AL-STAR Impact Limiter Test Data" – Except Appendix D
- Attachment 14- Licensing Drawings - 5217 Revisions 2 and 3; 5237 Revision 2; and 5238 Revision 2
- Attachment 15- HI-992252, Rev. 1, "Topical Report on the HI-STAR/HI-STORM Thermal Model and its Benchmarking with Full-Size Cask Test Data"
- Attachment 16- HI-992278, Rev. 1, "TN-24P Benchmarking and HI-STAR/HI-STORM Thermal Modeling Calculation Package"

(3) In making this application for withholding of proprietary information of which it is the owner, Holtec International relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4) and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10CFR Part

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- (8) The information classified as proprietary was developed and compiled by Holtec International at a significant cost to Holtec International. This information is classified as proprietary because it contains detailed descriptions of analytical approaches and methodologies not available elsewhere. This information would provide other parties, including competitors, with information from Holtec International's technical database and the results of evaluations performed by Holtec International. A substantial effort has been expended by Holtec International to develop this information. Release of this information would improve a competitor's position because it would enable Holtec's competitor to copy our technology and offer it for sale in competition with our company, causing us financial injury.
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