 <p>PROMOTE PROTECT PROSPER South Carolina Department of Health and Environmental Control</p>	<p>South Carolina Department of Health and Environmental Control Bureau of Land & Waste Management Division of Waste Management</p> <hr/> <p>CERTIFICATE OF COMPLIANCE</p> <hr/> <p>High Integrity Container</p>
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AMENDMENT AH TO: **DHEC-HIC-PL-001 in its entirety**

ISSUED TO: **EnergySolutions, LLC**
Suite 100, 100 Center Point II
100 Center Point Circle
Columbia, South Carolina 29210

1. Application:

This certificate is applicable to containers specified below for use at Chem-Nuclear Systems, LLC, burial facility at Barnwell, South Carolina for containment and disposal of low-level radioactive waste as specified in South Carolina Radioactive Material License No. 097.

2. General Design:

The design, materials, manufacture and use of the containers shall conform to the specifications and analysis which has received approval of the Department including:

- A. Polyethylene High Integrity Container Specification: ES-C-007, Rev. 3
- B. CNSI Polyethylene HIC Passive Vent Design, RA-0461-5, September 30, 1985.
- C. Corrugated Top HIC Test Report, RA-0304-7, May 14, 1987

- D. EnergySolutions/Duratek/CNS Drawings
- 1) C-003-001456-001, Rev. 1, HIC Vent
 - 2) C-003-001456-002, Rev.2, Poly HIC CRM Closure System
 - 3) C-003-001456-003, Rev.1, Poly HIC Vent Installation
 - 4) C-003-001456-004, Rev.4, Corrugated Top HIC
 - 5) C-003-001456-007, Rev. 3, Poly HIC CRM Flat Bottom Liner
 - 6) C-003-001456-011, Rev. 0, HIC PL8-120 FEXM w/ Steel Liner Option
 - 7) C-038-044114-001, Rev. 2, PL-14-170 Stackable Liner Shell with Forklift Risers
 - 8) C-038-166003-001, Rev. 2, Stackable HIC Liner Shell
 - 9) C-038-166003-002, Rev.1, CF Stackable Liner Shell with Forklift Risers
 - 10) C-038-166003-004, Rev. 1 “WSRC PL 14-170 Stackable Liner Shell with Forklift risers”
 - 11) B-900-E-0007, Rev. 5, Poly HIC Foam Filled
 - 12) C-120-D-0124, Rev. 3, PL14-215 Stackable HIC Liner Shell
 - 13) C-121-D-0044, Rev. 12, Poly HIC Arrangement for Liner Without Foam
 - 14) C-121-D-0050, Rev. 19, HIC Lifting Arrangement
 - 15) C-121-D-0051, Rev. 18, PL 14-215 HIC Lifting Arrangement
 - 16) C-121-D-0054, Rev. 7, Grapple Compatible Lifting Arrangement 21-300 HIC
 - 17) C-121-D-0059, Rev. 12, Stackable Lifting Arrangement for CNSI Poly HICS
 - 18) C-313-D-1002, Rev. 5, HIC Mixer Blade and Extension Shaft
 - 19) C-313-D-1003, Rev. 2, HIC Mixer Blade Installation
 - 20) C-313-D-1004, Rev. 6, Mixer Blade Support
 - 21) C-313-D-1005, Rev. 5, Lifting Arrangement for Solidified HIC
 - 22) C-313-D-1006, Rev. 1 Cement HIC Dewatering Filter Installation
 - 23) C-313-D-1009, Rev. 1, Solidified HIC Grapple Lifting Arrangement
 - 24) C-340-D-6325, Rev.7, Low Pressure Resin Catch Tank Assembly and Closure Pan Details, Norfolk Naval Shipyard
 - 25) C-340-D-6327, Rev. 9, 14-170 and Smaller Navy Steel Shell Details
 - 26) C-340-D-6377, Rev. 1, West Coast Carrier Low Pressure Resin Catch Tank-WCLRPT Liner
 - 27) C-042-046941-001, Rev. 2, CLPRCT Navy Cask Liner
 - 28) C-340-D-6349, Rev. 6, 14-195 Navy Steel Shell Details
 - 29) C-042-044158-006, Rev. 3, New Generation Remote Fillhead HIC Pan
 - 30) C-054-161041-001, Rev.0, Oyster Creek PL-14-170, Grapple ring
 - 31) C-054-161041-002, Rev.0, Oyster Creek PL-14-195, Grapple ring
 - 32) C-054-161041-003, Rev.1, Oyster Creek PL-14-215, Grapple ring
 - 33) DWG-LIN-166177-ST-001, Rev. 0, Puget CLPRCT Lifting Arrangement for 21-300 HIC

- E. Correspondence from CNS dated June 29, 2000, regarding the weight increase for the PL 6-80 container.
- F. Correspondence from CNS dated July 21, 2000, regarding the PL 10-160C container.

3. Applicable Approved Containers:

This certificate shall apply to the following identified containers:

A. Smooth Top Solidification Liners:

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| 1) PL 1-50 | 6) PL 14-150 |
| 2) PL 6-80 | 7) PL 14-170 |
| 3) PL 7-100 | 8) PL 14-195 |
| 4) PL 8-120 | 9) PL 21-300 |
| 5) PL 10-160 | |

B. Dewatered Resin Process Liners:

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|--------------|----------------|
| 1) PL 1-50R | 6) PL 10-160R |
| 2) PL 4-85R | 7) PL 14-150R |
| 3) PL 6-80R | 8) PL 14-170R |
| 4) PL 7-100R | 9) PL 14-195R |
| 5) PL 8-120R | 10) PL 21-300R |

C. Corrugated Top Liners:

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|--------------|---------------|
| 1) PL 14-215 | 2) PL 14-215S |
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4. Quality Assurance:

The containers shall be manufactured, stored, and used in accordance with the quality assurance documents and procedures which have received approval of the Department including:

- A. QP-002, Rev. 4, Quality Assurance Plan for Crosslinked Polyethylene High Integrity Containers.

5. User Requirements:

Use of this container shall be in accordance with the latest approved revision of Chem-

Nuclear Operating Procedure FO-AD-002, Rev.36, Operating Guidelines for Use of Polyethylene High Integrity Containers.

6. Specific Limitations:

The following specific limitations for the containers described and identified in this certificate shall apply and be strictly adhered to:

- A. Free Standing Liquid: Any free standing liquid must be non-corrosive and less than one percent (1%) by waste volume.
- B. Radiation: All waste forms shall not exceed 1.0×10^8 rads (β, γ) maximum integrated dose to the container. If the specific activity of dewatered resins exceeds 350 $\mu\text{Ci/cc}$ of isotopes greater than five year half lives, documentation must be provided which shows that the maximum integrated dose to the container will not exceed 1.0×10^8 rads (β, γ).
- C. Chemicals: Organic solvents, petrochemicals, concentrated acid and other chemicals specified in CNS procedure FO-AD-002, Rev. 36, are not allowed to be introduced into the container nor the container subjected to these materials.
- D. Thermal: The container and contents must be kept below 170°F for handling, lifting, and disposal. At no time can the container be subjected to temperature in excess of 200°F due to a process or its contents.
- E. Ultraviolet: The containers shall not be stored in such a way as to cause exposure to sunlight or other ultraviolet radiation to exceed one (1) year.
- F. Weight: The maximum payload weight for the containers may not exceed:

Liner Model	Dewatered Liner Weight (lbs.)	Solidification Liner Weight (lbs.)
PL 1-50	3,200	6,100
PL 6-80	7,500	10,000
PL 7-100	6,250	-----
PL 8-120	10,000	14,000
PL 10-160C	9,500	16,000
PL 10-160N	9,500	16,000

Liner Model	Dewatered Liner Weight (lbs.)	Solidification Liner Weight (lbs.)
PL 14-150	9,500	16,000
PL 14-170	10,800	18,000
PL 14-195	12,200	19,000
PL 14-215	13,000	-----
PL 14-215S	13,000	-----
PL 21-300	18,750	-----

- G. Vent: A passive vent as per applicable drawings and reports of Section 2, General Design, is mandatory.
- H. Volumes: The disposal volume for each container shall be as follows for the purpose of burial records. The internal volume shall be for Chem-Nuclear License criteria.

Container Model	Internal Volume Cubic Feet	Disposal Volume Cubic Feet
PL 1-50	47.0	52.8
PL 1-50R	47.0	52.8
PL 4-85R	74.3	83.6
PL 6-80	73.3	83.4
PL 6-80R	73.3	83.4
PL 7-100	78.0	94.4
PL 7-100R	68.9	94.4
PL 8-120	107.6	120.3
PL 8-120R	107.6	120.3
PL 10-160N	125.4	141.0
PL 10-160C	129.8	145.8
PL 10-160NR	125.4	141.0

Container Model	Internal Volume Cubic Feet	Disposal Volume Cubic Feet
PL 10-160CR	129.8	145.8
PL 14-150	134.0	154.1
PL 14-170	150.3	170.8
PL 14-170R	150.3	170.8
PL 14-195	171.4	194.1
PL 14-195R	171.4	194.1
PL 14-215	189.2	205.8
PL 14-215S	179.7	195.9
PL 21-300	285.1	314.2
PL21-300R	285.1	314.2

- I. The High Integrity Container is limited to the following waste forms (Classes A, B, and C):
- (1) Dewatered bead resins, powdered resins, and diatomaceous earth
 - (2) Compressible and noncompressible solid waste
 - (3) Filter elements and cartridges
 - (4) Solidified resins, sludges, and liquid waste
 - (5) Incinerator ash, residuals, or equivalent waste which has been rendered non-dispersable in a binding matrix
- J. Waste such as mechanical or cartridge filters, scrap, or other sharp objects placed in the container shall not cause internal damage to the container nor shift about during transportation and handling.
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Any modifications or changes of the container design, materials or usage are subject to prior approval of the Department.

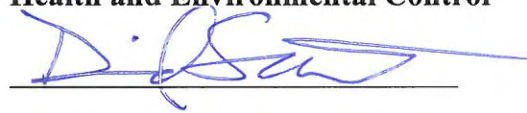
This approval is contingent and does not constitute a final determination by the Department. These containers will be subjected to further evaluations and assessed for their integrity and ability to meet all specified conditions and criteria.

Should such an evaluation determine that additional requirements are necessary, appropriate modifications shall be made before their continued use. This Certificate is subject to revocation if warranted.

**For the South Carolina Department of
Health and Environmental Control**

Issue Date: June 6, 2014

By:



David Scaturo, PE, PG, Director
Division of Waste Management
Bureau of Land & Waste Management