Polyethylene High Integrity Container Overpack Handling Procedure

Revision 14

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1. SCOPE

1.1 Purpose

This procedure provides guidelines for the utilization of Polyethylene High Integrity Container Overpacks for shipping and burial of 55-gallon drums, 24" diameter steel pressure vessels, and loose material. Adherence to these guidelines serve to protect the integrity of the polyethylene container and ensure the container meets the requirements of EnergySolutions, LLC's Quality Assurance Program denoted in South Carolina's Department of Health And Environmental Control's Certificate Of Compliance.

1.2 Applicability

This procedure applies to all EnergySolutions, LLC personnel and EnergySolutions, LLC customers handling, using, or shipping Polyethylene High Integrity Container Overpacks for radioactive waste disposal.

1.3 Prerequisites

Each user will have on file within the Chem-Nuclear's Licensing Department a "Certification Statement for Polyethylene High Integrity Container Overpacks" (Attachment 5.1).

Note: Should the original purchaser of the high integrity container overpack transfer ownership to a third party, contact EnergySolutions, LLC Liner Operations for instruction prior to transfer.

2. REFERENCES

2.1 S20-AD-010, Barnwell Waste Management Facility Site Disposal Criteria Chem-Nuclear Systems, L.L.C. Barnwell Office

2.2 ES-QA-PR-005, Records

2.3 EnergySolutions, LLC Operating Procedures for Solidification Processes, Demineralization Processes, and Dewatering Processes as specified by the appropriate Project Manager.

2.4 Applicable Utility Handling and Storage Procedures.

3. DETAILED GUIDELINES

Note: Loading of any materials into the overpack should follow the guidelines detailed below.

The EnergySolutions, LLC Technical Service Representative (TSR) or user representative shall complete the attached user's checklist (Attachment 5.3) to ascertain compliance with Sections 3.1 through 3.4. The user's representative shall ensure the containers are stored properly and the waste is compatible with applicable sections of this procedure. It is the TSR's/representative's responsibility to sign, date, and return the completed checklist with the shipment.

3.1 General Storage and Handling

3.1.1 Polyethylene High Integrity Containers (HICs) shall not be stored on or near sharp objects or protrusions that could scrape, cut, or puncture the container.

3.1.2 Each Polyethylene HIC shall be stored on a flat, smooth, supportive surface.

3.1.3 As much as practical, the HICs should be kept out of direct sunlight to prevent ultraviolet light degradation.

3.1.3.1 No Polyethylene HIC shall be stored in direct sunlight for a period greater than one year.

3.1.3.2 When the HIC is ready for disposal shipment, the utility must enter on the User's Checklist the number of days the HIC was stored in direct sunlight. This number must not exceed the maximum time span allotted for the container.

3.1.3.3 At the utility's request, EnergySolutions, LLC shall supply a statement indicating the maximum length of time the HIC may be exposed to direct sunlight. This will be calculated by subtracting the number of days the Polyethylene HIC is exposed to sunlight between the date of manufacture and the date it is shipped, from 365 days.

3.1.4 Exposure of the HICs to chemicals listed in Attachment 5.4, Table I must comply with the following:

3.1.4.1 Only 3M Hot Jet Melt #3779, PVC / CPVC / PVC ABS Glue, Polyurethane Foam, PVC / CPVC Primer, Gasket Contact Cement, RTV Silicone, Pipe Joint Compound, or approved equivalent per shall be used for the adhesive bonding process.

Note: Any and all spills of these materials must be cleaned up immediately from the HIC Overpack using the methods described in 3.1.4.3.

3.1.4.2 Only Enamel spray paint may be used for stenciling and labeling the HIC Overpack.

3.1.4.3 PVC Primer may be used for the removal of old glue, gasket cement, paint and other water insoluble materials. A soap and water solution will be used for the removal of ordinary dirt.

Note: Trace amounts of chemicals, such as acetone, ethyl acetate, methyl ethyl ketone, tetrahydrofuron and toluene, known to cause degradation of polyethylene may be present in the glue used for hic overpack internals assembly, gasket cement, and stenciling paint. These chemicals are not present in sufficient quantities nor do they remain in contact with the polyethylene sufficiently long to initiate degradation.

3.1.5 Care shall be taken when loading and transporting the containers with a forklift to prevent scuffing or puncturing the Polyethylene HIC.

3.1.6 Only nylon, hemp, or other soft pliable materials shall be used for lifting, moving, or tying down the Polyethylene HICs. The manufactured metal lifting slings are acceptable, but other metal cables, chains, or wire ropes shall not be used.

3.1.7 Two empty Polyethylene HICs may be stacked for storage provided the bottom HIC is at least the same diameter of the top HIC.

3.1.8 No objects or materials shall be placed into Polyethylene HICs for ultimate disposal that may cause chemical (See Attachment 5.4, Table 1) or physical damage to the container.

3.1.9 All due care and caution shall be taken upon physical entry or in handling of these HICs to ensure that the HIC is not damaged.

3.1.10 When shipped by means other than a cask or van, all Polyethylene HIC Overpacks shall have the lids installed and tightened.

3.1.11 The maximum gross weight shall be 2500 pounds.

3.2 **Preliminary Inspection**

Prior to using the Polyethylene HIC, the TSR or the utility's representative shall:

3.2.1 Perform a visual inspection of the HIC for obvious flaws or defects.

Note: Contact EnergySolutions, LLC Liner Operations for guidance if flaws or defects discovered.

3.2.2 Record the HIC and lid serial numbers on the user's checklist (Attachment 5.3).

3.2.3 Ascertain the HIC lid is equipped with a vent and vent holes are present in the lid.

3.2.4 Check the vent orifice and lid vent holes to be sure they are clean and free of debris.

3.2.5 Assure the HIC lid closure tool, applicable shoring and cable assemblies are available.

3.2.6 Loosen the 3/8" nut on the rolled angle ring located at the top of the HIC.

3.3 **Loading Procedure for 55-Gallon Drums**

3.3.1 Drum Sling Assembly Method

3.3.1.1 Remove the overpack lid.

3.3.1.2 Remove drum pallet and styro-foam spacers from overpack.

3.3.1.3 Visually inspect sling assembly to ensure that no damage was sustained during shipping.

3.3.1.4 Lay drum pallet flat onto ground. Orient cables to one side, being sure not to cross or overlap cables.

3.3.1.5 Spray the HIC threads with silicone lubricant or apply a thin coating of petroleum jelly to the threads.

3.3.1.6 Insert loading funnel into HIC mouth, if needed.

3.3.1.7 Spread drum sling assembly and attach crane hook to pear ring of sling.

3.3.1.8 Place drums onto drum pallet assembly base per selected method.

Note: Drum lid retaining ring bolts should be positioned away from cables.

3.3.1.9 Lift drum slings into place, and visually check to ensure cables are equally positioned around drums.

3.3.1.10 Load drum pallet into overpack.

3.3.1.11 Remove the loading funnel (if installed).

3.3.1.12 Spray the lid threads with silicone lubricant or apply a thin coating of petroleum jelly to the threads.

3.3.1.13 Install top shoring, as required, to within one (1) inch from the gasket sealing groove of the overpack mouth.

3.3.1.14 Attach lid tool to overpack lid.

3.3.1.15 Install the overpack lid with lid match mark and HIC "start" match mark aligned.

3.3.1.16 Ensure lid is seated into HIC and rotate lid clockwise, using lid tool, until the lid match mark and HIC "seal" match marks are aligned.

3.3.1.17 Tighten snugly the 3/8" nut on the rolled angle ring.

3.3.2 Loading Without Drum Pallet

3.3.2.1 Remove the overpack lid.

3.3.2.2 Ensure bottom shoring is placed in the bottom of the HIC.

3.3.2.3 Spray the HIC threads with silicone lubricant or apply a thin coating of petroleum jelly to the threads.

3.3.2.4 Insert loading funnel into HIC mouth, if needed.

3.3.2.5 Load drums into overpack.

3.3.2.6 Remove loading funnel (if installed).

3.3.2.7 Spray the lid threads with silicone lubricant or apply a thin coating of petroleum jelly to the threads.

3.3.2.8 Install top shoring, as required, to within one (1) inch from the gasket sealing groove of the overpack mouth.

3.3.2.9 Attach lid tool to overpack lid.

3.3.2.10 Install the overpack lid with lid match mark and HIC "start" match mark aligned.

3.3.2.11 Ensure lid is seated into HIC and rotate lid clockwise, using lid tool, until the lid and HIC "seal" match marks are aligned.

3.3.2.12 Tighten snugly the 3/8" nut on the rolled angle ring.

3.4 Loading of 24" Diameter Pressure Vessels

3.4.1 Remove the overpack lid.

3.4.2 Ensure bottom shoring is placed in the bottom of the HIC.

3.4.3 Spray the HIC threads with silicone lubricant or apply a thin coating of petroleum jelly to the threads.

3.4.4 Insert loading funnel into HIC, if needed.

3.4.5 Load pressure vessel into the overpack.

3.4.6 Remove loading funnel (if installed).

3.4.7 Spray the lid threads with silicone lubricant or apply a thin coating of petroleum jelly to the threads.

3.4.8 Install top shoring, as required, to within one (1) inch from the gasket sealing groove of the overpack mouth.

3.4.9 Attach lid tool to overpack lid.

3.4.10 Install the overpack lid. Ensure the lid match mark and HIC "start" match marks are aligned.

3.4.11 Rotate lid clockwise, using lid tool, until the lid match mark and HIC "seal" match mark are aligned.

3.4.12 Tighten snugly the 3/8" nut on the rolled angle ring.

3.5 Loading Procedure For Loose Material

Call EnergySolutions, LLC Project Manager for instructions.

3.6 **Post-Operational Guidelines**

3.6.1 The TSR or utility representative shall ensure that a loaded Polyethylene HIC shall not be lifted or moved until:

3.6.1.1 The external surface temperature is less than 140 degrees F.

3.6.1.2 The internal temperature of the contents is less than 140 degrees F.

3.6.2 Attach overpack lifting assembly or other EnergySolutions, LLC approved assemblies to overpack lifting cables and load into cask per applicable cask procedures.

3.6.3 Ensure the "Certification Statement for Disposal of Polyethylene High Integrity Container Overpacks" (Attachment 5.2) is correct, complete, and forwarded with the shipment.

3.6.4 Ensure the "User's Checklist" (Attachment 5.3) is correct, complete, and forwarded with the shipment.

4. RECORDS AND REPORTS

4.1 Liner Operations shall ensure that each customer of an EnergySolutions, LLC High Integrity Container has the effective revision of the C of C and this procedure.

4.2 The user has on file with the CNS Licensing Department a "Certification Statement for Polyethylene High Integrity Container Overpacks" (Attachment 5.1).

4.3 The user has completed and submitted with the shipment documents a "Certification Statement for Disposal of polyethylene High Integrity Container Overpacks (Attachment 5.2).

4.4 The user has correctly completed the "User's Checklist" (Attachment 5.3), which may be used as an inspection form and submitted with the shipment.

4.5 All records generated by this procedure shall be stored and maintained in accordance with Reference 2.2.

5. ATTACHMENTS

5.1 Polyethylene High Integrity Container Overpack Certification Statement

5.2 Certification Statement for Disposal of Polyethylene High Integrity Container Overpacks

5.3 Users Checklist

5.4 Table I – Materials Not Compatible with Polyethylene High Integrity Containers

Attachment 5.1

POLYETHYLENE HIGH INTEGRITY CONTAINER
OVERPACK CERTIFICATION STATEMENT

_____ ("Company") hereby certifies that for each Polyethylene High Integrity Container purchased directly or indirectly from EnergySolutions, and for which disposal is proposed, attempted, or completed at the Barnwell, South Carolina, Low-Level Radioactive Waste Burial Facility, or for which any use in connection with the collection, storage, processing or transportation of low-level radioactive waste is proposed, attempted or completed, it has read and will comply with: (1) the effective Certificate of Compliance issued by the South Carolina Department of Health and Environmental Control, Bureau of Radiological Health, No. DHEC-HIC-PO-006 (The "C of C"), (2) the effective revision of EnergySolutions Procedure FO-OP-019, "Polyethylene High Integrity Container Overpack Handling Procedure", and, (3) the effective South Carolina Radioactive Materials License No. 097 (For current revision levels contact CNS Barnwell Licensing). Company further certifies that it will not make any modification or change in the Polyethylene High Integrity Container design, materials, or usage from the design, materials and usage described in the C of C without prior approval of EnergySolutions and the South Carolina Department of Health and Environmental Control. Company understands that the Polyethylene High Integrity Containers purchased either directly or indirectly from EnergySolutions will be maintained, stored, transported, and used in accordance with the above requirements. When the High Integrity Container is disposed at the Barnwell, South Carolina, Low-Level Radioactive Waste Burial Facility, Company will complete the Certification Statement for Disposal of Polyethylene High Integrity Container Overpacks (Attachment 5.2) prior to such disposal.

Date: _____

Company: _____

By: _____

Its: _____

Attachment 5.2

CERTIFICATION STATEMENT FOR DISPOSAL OF POLYETHYLENE HIGH INTEGRITY CONTAINER OVERPACKS

For the Polyethylene High Integrity Container Overpacks to be disposed of at Chem-Nuclear's Barnwell, South Carolina, Low-Level Radioactive Waste Burial Facility and identified by Serial Numbers_____, (Company) _____ hereby certifies that its use of such containers is in compliance with (1) the effective Certificate of Compliance issued by the South Carolina Department of Health and Environmental Control, Bureau of Radiological Health, No. DHEC-HIC-PO-006, (2) the effective revision of EnergySolutions Procedure FO-OP-019, "Polyethylene High Integrity Container Overpack Handling Procedure", and (3) the effective South Carolina Radioactive Material license No. 097. The effective revisions of these documents can be verified by contacting CNS Barnwell Licensing.

Date: _____

Company: _____

By: _____

Its: _____

NOTE: COMPLETE AND RETURN WITH SHIPMENT.

Attachment 5.3
USER'S CHECKLIST

ITEM	INITIALS		DATE
1.	High Integrity Containers Stored Properly (User's Rep)		
2.	Total Cumulative Days of Sunlight (UV) Exposure _____		
3.	Proper Lifting Devices Used		
4.	Externals Inspected		
5.	Container Serial Number _____		
6.	Lid Serial Number _____		
7.	Lid Vent in Place. Reference Section 3.2.3		
8.	Lid Vent Orifice and Lid Vent Holes Free of Debris. Reference Section 3.2.4		
9.	Lid Tool And Equipment Available		
10.	Certification Statement for Polyethylene High Integrity Container Overpacks on file with CNS (Appendix A)		
11.	Completed Certification Statement for Disposal of Polyethylene High Integrity Container Overpacks (Appendix B) forwarded with shipment		
12.	Internal Media Properly Loaded		
13.	Lubricant Applied to Container & Lid		
14.	Lid Tightened		
15.	HIC Surface Temperature Less Than 140Degrees F		
16.	Contents Less Than 140 degrees F		
17.	Maximum Gross Weight Not To Exceed 2500 Pounds		
18.	High Integrity Container Loaded in Cask		
19.	Proper Shoring and Bracing		

NOTE: WHEN THE HICS ARE USED UNDER A BROKER'S QUALITY ASSURANCE PROGRAM IDENTITY THE BROKER IN THE COMMENT SECTION.

OPERATION COMPLETED

_____ _____
Signature Date

COMMENTS:_____

_____

_____

_____

Complete Form and Forward With Shipment

Attachment 5.4

TABLE I

Materials Not Compatible With Polyethylene High Integrity Containers

Acetone
Amyl Acetate
Amyl Chloride
Aqua Regia
Benzene
Bromine Liquid
Camphor Oil
Carbon Disulfide
Carbon Tetrachloride
Chlorine Liquid
Moist Chlorine Gas
Chlorobenzene
Chloroform
Chlorosulfonic Acid
Cyclohexanone
Dimethylamine
Ethyl Acetate
Ethyl Butyrate
Ethyl Chloride
Ethyl Ether
Ethylene Chloride
Ethylene Chlorohydrin
Ethylene Dichloride
Flourine
Furfural
Furfuryl Alcohol
Fuel Oil
Gasoline
Hydrofluoric Acid (Concentrated)
Iodine
Methyl Bromide
Methyl Chloride
Methyl Ethyl Ketone (MEK)
Methylene Chloride
Nitric Acid (Concentrated)
Nitrobenzene
Octyl Cresol
Oleic Acid
Oleum
Petroleum Ether
Phenol
Propylene Dichloride
Sulfuric Acid (60%)
Tetrahydrofurane
Titanium Tetrachloride
Toluene
Trichloroethylene
Xylene
Turpentine
Tetralin

NOTE: PETRO CHEMICAL (OIL, GASOLINE, ETC.) ARE ACCEPTABLE IN TRACE QUANTITIES NOT TO EXCEED 1.0%