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Inspection and Use Guidelines for High Integrity Containers (HIC) and Steel Liners

Revision 41

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1. SCOPE

1.1 Purpose

This procedure provides guidelines for the utilization of polyethylene High Integrity Containers (HICs) and Steel Liners for EnergySolutions resin transfers, demineralization processes, interim storage, and other identified uses by EnergySolutions and/or Utility. Adherence to these guidelines serves to protect the integrity of the polyethylene HIC and Steel Liner and ensure both meet the requirements of EnergySolutions' Quality Assurance Program denoted in South Carolina's Department of Health and Environmental Control's Certificate of Compliance and the requirements of EnergySolutions' Bulk Waste Disposal and Treatment Facilities Waste Acceptance Criteria (WAC) and Containerized Waste Facility.

1.2 Applicability

- 1.2.1 This procedure applies to all EnergySolutions personnel and EnergySolutions customers handling, using, storing, or shipping of HICs or Steel Liners for radioactive waste disposal or off-site processing.
- 1.2.2 The term Liner within this procedure applies generically to both a polyethylene High Integrity Container (HIC) and a Steel Liner unless referenced specifically.
- 1.2.3 This procedure is to be considered as an addendum to specific Utility interim storage procedures.

2.0 REFERENCES

- 2.1 EnergySolutions Procedure, ES-SH-PG-100, Safety and Health Program.
- 2.2 EnergySolutions procedure, S20-AD-010, Barnwell Waste Management Facility Site Disposal Criteria Chem-Nuclear Systems Barnwell Office.
- 2.3 EnergySolutions procedure, ES-QA-PR-028, Certificates of Conformance.
- 2.4 EnergySolutions procedure, ES-QA-PR-005, Records.
- 2.5 EnergySolutions procedure, TR-OP-023, Polyethylene High Integrity Container Storage and Shipping Procedure.
- 2.6 EnergySolutions Drawing C-038-166003-001, Stackable HIC Liner Shell (Proprietary).
- 2.7 EnergySolutions Drawing C-121-D-0059, Stackable Lifting Arrangement for CNSI Polyethylene HICs (Proprietary).

- 2.8 *EnergySolutions* Drawing C-001-166035-001, Pneumatic HIC Lid Closure Device (Proprietary).
- 2.9 *EnergySolutions* Drawing C-122-D-0031, Compact “T” Handle Lid Closure Tool for High Integrity Containers.
- 2.10 *EnergySolutions* Drawing CHNC-000885, MagneSeal ALARA Lid Lifting Device.
- 2.11 *EnergySolutions* Drawing CHNC-000884, MagneSeal ALARA Lid.
- 2.12 *EnergySolutions* procedure, SD-OP-091 Operating Procedure for Multi-size Battery-Operated Remote-Controlled Liner Grapple or Site-specific grapple procedure.
- 2.13 *EnergySolutions* procedure, CS-OP-PR-115, HIC Stacking Procedure.
- 2.14 *EnergySolutions* Liner Operations Order Form (Current).
- 2.15 *EnergySolutions* Site specific Job Hazard Analysis.

3.0 REQUIREMENTS

3.1 Prerequisites

- 3.1.1 The *EnergySolutions* Liner Operations Order Form shall be completed and sent to the *EnergySolutions* Services Manager, or designee. The *EnergySolutions* Services Manager, or designee, can supply the Liner Operations Order Form upon request.
- 3.1.2 Liner ordered is accompanied with the current Certificate of Conformance.
- 3.1.3 User should ensure that each Liner and its waste contents meet the applicable acceptance requirements for the specific facility at the time of shipment.
- 3.1.4 Media Liners are designed to be single use only. The utility assumes full responsibility of reuse.
- 3.1.5 The use of Not Applicable (N/A) may be used within sections of this procedure. Any use of N/A on Attachment 7.1, Liner Checklist, must be documented in the Comments section.
- 3.1.6 A pre-job brief shall be conducted in accordance with Site procedures.
- 3.1.7 An approved Radiation Work Permit (RWP) shall be in effect when performing work in the RCA.

3.2 Equipment

NOTE: Equipment listed is not all inclusive nor is used at all Sites.

3.2.1 Liner Grapple.

3.2.2 Pneumatic HIC Closure Tool.

3.2.3 Compact “T” Handle HIC Lid Closure Tool.

3.2.4 MagneSeal ALARA Lid Lifting Device.

3.3 Industrial Safety

3.3.1 Perform 2-minute drill before performing job activities. This must be done at the job site.

3.3.2 The *EnergySolutions* Operator(s) shall conduct activities in accordance with Utility safety procedures and Reference 2.3, ES-SH-PG-100, Health and Safety Program.

3.4 Radiological Safety

3.4.1 The *EnergySolutions* Operator(s) shall always follow all radiological precautions to minimize the spread of contamination and to limit personal exposure to ionizing radiation.

3.4.2 The *EnergySolutions* Operator(s) shall wear protective clothing as specified by the Radiation Work Permit during all operations of the process equipment.

4.0 DETAILED GUIDELINES

The *EnergySolutions* Technical Service Representative (TSR) and/or Utility Representative shall complete Attachment 7.1, Liner Checklist to ensure compliance with this procedure. It is the TSR and/or Utility Representative(s) responsibility to sign, date and include the checklist with the shipment. The Utility Representative(s) shall ensure the waste stream is compatible with applicable sections of this procedure.

4.1 General Storage and Handling

The storage and handling detailed within this section apply to all phases of Liner use including filling, storage and shipping to ensure Liner remains free of damage.

Note: The term Liner within this procedure applies generically to both a polyethylene High Integrity Container (HIC) and a Steel Liner unless referenced specifically.

- 4.1.1 Liners should be stored in a building, or some other protective structure, to prevent extreme weather conditions from damaging the Liner and its internals.
- 4.1.2 Liners shall be stored in temperatures greater than -40°F to prevent internal damage.
- 4.1.3 When loading or transporting a Liner with a forklift, a flat, smooth, supportive surface must be placed under the Liner, or the supplied shipping pallet must be utilized. Pallet inspection is required prior to use to ensure it is in serviceable condition.
- 4.1.4 Liners shall be stored on a flat, smooth, supportive surface.
- 4.1.5 Liners shall not be stored on or near sharp objects or protrusions that could scrape, cut, or puncture the Liner.

Note: Care should be taken when transporting Liners as internal parts and connections are fragile.

- 4.1.6 Approved manufactured metal lifting slings supplied by *EnergySolutions* or an *EnergySolutions* remote grapple is acceptable for lifting Liners. Other metal cables, chains, or wire ropes SHALL NOT be used unless approved by *EnergySolutions* Engineering.
- 4.1.7 The *EnergySolutions* fillhead or grapple are the only approved item(s) to be placed or stored on a Liner without authorization from *EnergySolutions*.

Note: When fillheads are utilized, hoses and other related attachments should be supported, whenever possible, to ensure undue stress is not placed on the HIC fill plate.

- 4.1.8 Do not stack empty Liners at any time unless Liner is specifically designed for stacking. Reference 2.13, *EnergySolutions* procedure, CS-OP-PR-115, HIC Stacking Procedure.

Note: No HIC shall be stored in direct sunlight for a period greater than one (1) year – 365 cumulative days.

- 4.1.9 *EnergySolutions* shall supply a statement indicating the number of days the HIC has been exposed to direct sunlight between the date of manufacture and the date the HIC is shipped.

- 4.1.10 All HICs not stored indoors shall be covered with a UV-restrictive cover. These covers should be inspected weekly to ensure the cover does not deteriorate from the weather or become inadvertently removed.
- 4.1.11 Liner(s) shall not be exposed to any chemicals listed on Attachment 7.4, Non-Compatible Materials for Liners.
- 4.1.12 If listed chemicals contact Liner(s) rinse off immediately and notify EnergySolutions Services Manager.
- 4.1.13 Liner(s) shall not be exposed to noxious vapors or organic solvents, such as those detectable by human senses.
- 4.1.14 If required to store Liners near organic solvents, a physical separation shall be maintained (i.e., environmental barrier/containment for the organic solvents and/or the Liner).
- 4.1.15 VERIFY that the Liner has been stored properly

4.2 Receipt Inspection.

Liner(s) are required to be inspected within ten (10) days of receipt to verify that the Liner(s) were received with no condition issues. Without proper receipt inspection, the utility will assume the Liner(s) was received safely and is in satisfactory condition.

Note: The term Liner within this procedure applies generically to both a polyethylene High Integrity Container (HIC) and a Steel Liner unless referenced specifically.

- 4.2.1 REMOVE the Liner UV-restrictive cover, if installed. RETAIN for reinstallation, if required.
- 4.2.2 PERFORM a visual inspection of Liner external surface for the following:
 - 4.2.2.1 Evidence of exposure to high temperature (i.e., warping, melting, rusting).
 - 4.2.2.2 Evidence of excessive exposure to weather (i.e., weather-beaten, rust, or stained).
 - 4.2.2.3 Evidence of rough handling (i.e., dents, cuts, punctures).
 - 4.2.2.4 Any other visual flaws or defects.

Note: If a Liner is received in a cask, Liner should be removed from cask to verify Liner information and perform external inspection.

4.2.3 VERIFY information on Liner is the correct size and type as ordered.

4.2.4 VERIFY Liner Serial Number matches Serial Number on HIC lid.

Note: Steel Liner lids may not have Serial Numbers indicated on them.

4.2.5 VERIFY the information on the Liner matches the information on the Certificate of Conformance.

4.2.6 RECORD Liner Serial Number on Attachment 7.1, Liner Checklist.

4.2.7 RECORD Liner Manufactured Date on Attachment 7.1, Liner Checklist.

4.2.8 VERIFY the HIC Sunlight Exposure is < 365 cumulative days as indicated on the “Sunlight Letter”.

Note: PL 14-215 and L 14-195 Liner Size / Type, and Dimensions may be found on the C of C's. REQUEST information from EnergySolutions if these items are not found. These items may be recorded at any time prior to requesting cask for shipment.

4.2.9 VERIFY the Liner height and diameter, and document on Attachment 7.1, if utilizing a PL 14-215 or L 14-195 size liner.

Note: Liner lifting arrangement Serial Numbers are different and will not match liner Serial Numbers.

Note: Some liners may be ordered without cables. If cables are not included, the bail itself should still be fitted properly.

4.2.10 VERIFY lifting bail with cables attached are fitted into the bail grooves of the HIC with all components intact.

Note: Bail orientation on HICs without lifting bail grooves is not critical.

4.2.11 VERIFY lifting arrangement(s) acceptance tag is in place.

4.2.12 VERIFY Liner lifting arrangement(s) is attached and secured correctly and no visible flaws or defects at attachment points.

4.2.13 VERIFY Liner lifting arrangement(s) is undamaged, no visible flaws or defects.

Note: HIC's with grapple rings should be lift tested with lid in place to verify grapple clearance prior to use.

4.2.14 Perform HIC Lid Inspection

4.2.14.1 ENSURE there is a “Start” (green) mark and “Seal” (red) mark on top of the HIC, and “Alignment” mark on the lid.

4.2.14.2 REMOVE the lid from HIC.

4.2.14.3 INSPECT lid threads for obvious flaws or defects.

4.2.14.4 VERIFY the HIC lid vent is installed, and vent orifice and vent holes are clear of any obstructions or debris.

4.2.14.5 PLACE HIC lid safely aside. ENSURE the lid does not fall or get damaged.

4.2.15 Perform Steel Liner Lid Inspection (Bolted)

Note: A crane may be required to remove lid for inspection.

4.2.15.1 VERIFY all bolts are in place.

4.2.15.2 LOOSEN bolts to enable lid removal.

4.2.15.3 REMOVE liner lid.

4.2.15.4 VERIFY lid gasket is free of defects.

4.2.15.5 VERIFY lid is free of defects.

4.2.15.6 VERIFY the lid vent is installed.

4.2.15.7 PLACE Liner lid safely aside. ENSURE the lid does not fall or get damaged.

4.2.16 Perform Steel Liner Barrel Lid Inspection (Lever Lock)

4.2.16.1 OPEN lever lock and remove ring.

4.2.16.2 REMOVE Liner lid.

4.2.16.3 VERIFY lid gasket is free of defects.

4.2.16.4 VERIFY the lid vent is installed.

4.2.16.5 VERIFY lid is free of defects.

4.2.16.6 PLACE lid safely aside. ENSURE the lid does not fall or get damaged.

4.2.17 Perform MagneSeal Liner Lid Inspection

4.2.17.1 REMOVE lid by grasping lid and lifting.

4.2.17.2 VERIFY lid gasket is free of defects.

4.2.17.3 VERIFY the lid vent is installed.

4.2.17.4 VERIFY lid is free of defects.

4.2.17.5 PLACE lid safely aside. ENSURE the lid does not fall or get damaged.

4.2.18 PERFORM a visual inspection of the Liner internals and connections, if applicable, to verify components are in place and intact and verify no cracks, breaks, broken connections, or any other abnormalities and RECORD deficiencies in Comments section on Attachment 7.1, Liner Checklist, as necessary.

4.2.19 PERFORM a visual inspection of the Liner dewatering filters, if applicable, to ensure no rips, collapsed filters, broken connections, or any other abnormalities and RECORD deficiencies in Comments section Attachment 7.1, Liner Checklist, as necessary.

Note: The visual inspection does not verify the integrity of the filter elements or Liner internals.

4.2.20 ENSURE no foreign or loose material is observed in the Liner that would cause damage to internals or equipment, prevent filters from dewatering, or possibly cause any other undesirable result.

4.2.21 PERFORM the following visual inspection of SEDS/SERDS fill plate:

4.2.21.1 ENSURE all screws are installed and tight.

4.2.21.2 VERIFY the fill plate is not bent or warped.

4.2.21.3 VERIFY the internal level gauge is installed.

Note: An EnergySolutions approved hand tool consisting of a threaded rod with T-handle can be utilized to verify the condition of the threads in the latching port.

4.2.21.4 VERIFY the latching port for the fillhead Acme Thread is free of debris and in good condition with no visible defects.

4.2.21.5 VERIFY latching port is lubricated (i.e., anti-seize lubricant). Apply additional lubricant material if necessary.

Note: The SEDS/SERDS fill plate serial numbers are different and will not match Liner serial numbers.

Note: The SEDS/SERDS fill plate may have a label identifying DW-5 and/or colored orange to identify its location.

4.2.21.6 VERIFY fill plate match mark extends outside the fill plate onto the Liner top surface. This mark may be extended in the field if necessary.

Note: Some SEDS/SERDS fillheads have gaskets installed which may make Steps 4.2.20.7 through 4.2.20.9 unnecessary.

4.2.21.7 PERFORM a visual inspection of the SEDS/SERDS fill plate gasket(s) to ensure it has no rips, tears, or other visible defects, if installed and RECORD deficiencies in Comments section on Attachment 7.1, Liner Checklist, as necessary.

4.2.21.8 INSTALL the fill plate gasket on the SEDS/SERDS fill plate, if required, and ensure all holes are aligned.

4.2.21.9 IF Liner is provided with a gasket, use a straight edge tool, ROTATE the straight edge tool 360 degrees (one complete turn) to ensure the gasket height is above the SEDS/SERDS fill plate screws. If the fill plate screws contact the straight edge an additional gasket may be required.

4.2.22 PERFORM a visual inspection of the Liner lid gasket, to ensure it has no rips or tears and RECORD deficiencies in Comments section on Attachment 7.1, Liner Checklist, as necessary.

4.2.23 IF inspecting a Non-SEDS/SERDS Liner PERFORM the following:

4.2.23.1 PERFORM a visual inspection of the Liner internal hose(s), hose connections and/or piping, if applicable, to ensure no cuts, collapsed hose, broken connections, or any other abnormalities. ENSURE any camlok connections are secured with a tie wrap, or similar material and RECORD deficiencies in Comments section on Attachment 7.1, Liner Checklist, as necessary.

4.2.23.2 PERFORM a visual inspection of the FAVA plug, cable, and metal level sensing rods of a non-SEDS/SERDS Liner. Ensure no crimped wires, cut wires, bent electrical leads, bent rods, or any other abnormalities and RECORD deficiencies in Comments section on Attachment 7.1, Liner Checklist, as necessary.

4.2.23.3 ENSURE fill plate of non-SEDS/SERDS Liner is secure.

4.2.24 REINSTALL the Liner lid, and secure, if required.

Note: The following steps should be performed when temperature is above freezing.

4.2.25 IF inspecting a HIC in a stackable shell PERFORM the following:

4.2.25.1 REMOVE the drain plug from the steel shell.

4.2.25.2 DRAIN/VERIFY DRAINED all water found between the Liner and the steel shell.

4.2.25.3 REINSTALL the drain plug and tighten until snug.

4.2.26 RECORD the completion and date of the Receipt Inspection on Attachment 7.1, Liner Checklist.

4.2.27 DOCUMENT any identified defects and NOTIFY EnergySolutions Services Manager.

4.2.28 INSPECT HIC UV-restrictive cover for rips, holes, or other defects. Repair or replace as necessary.

4.2.29 REINSTALL HIC UV-restrictive cover, if required.

4.3 Process Controls

Note: The term Liner within this procedure applies generically to both a polyethylene High Integrity Container (HIC) and a Steel Liner unless referenced specifically.

Note: PL 14-170 and PL 14-215 HICs equipped with the modified baskets for compatibility with a Radlok 179/195 grapple are limited to maximum gross weights of 10,800 lbs and 13,000 lbs respectively.

4.3.1 VERIFY waste streams do not contain materials listed on Non-Compatible Materials for Liners, Attachment 7.4, Non-Compatible Materials for Liners. If such materials are noted, contact the EnergySolutions Services Manager prior to proceeding.

Caution: Waste stream temperatures may be required to be lower than stated in Step 4.3.3, if the temperature rating of the equipment used (i.e., hoses) have a lower maximum temperature capacity.

4.3.2 VERIFY the waste stream sample is acceptable and <140°F.

4.3.3 VERIFY no objects or materials are placed in a Liner for disposal that may cause chemical or physical damage to the Liner as referenced in Attachment 7.4, Non-Compatible Materials for Liners.

4.3.4 CONTACT *EnergySolutions* Services Manager if lifting a bead resin or precoat media Liner prior to being filled to 85% or greater.

Caution: Improper handling may result in the Liner lid seal to be broken.

Note: If a dewatered Liner is stored for greater than six months, *EnergySolutions* recommends, but does not require, dewatering verification to ensure the Liner is dewatered and has reached the 1% or 0.5% free standing water acceptance criteria.

4.4 HIC Lid Installation

4.4.1 VERIFY the threads of both lid and container are clean and free of debris/damage and SPRAY HIC lid threads with silicone lubricant or APPLY a coating of petroleum jelly to the threads of the HIC lid.

4.4.2 NOTIFY Shipping Department of opportunity to affix liner label to lid prior to installation for ALARA purposes. However, label may be applied at any time including after lid installation.

4.4.3 Manual HIC Lid Installation

4.4.3.1 INSPECT lid closure tool for sharp edges/loose fittings prior to use.

4.4.3.2 ASSEMBLE lid closure tool.

4.4.3.3 PLACE HIC lid on HIC, centered over opening.

Caution: HIC lid engagement must start when the “Alignment” mark on lid is at the “Start” (green) mark on liner. If engagement starts at a different location the lid shall be removed and restarted at the “Start” (green) mark.

4.4.3.4 ROTATE lid counterclockwise until the “Alignment” mark on lid is immediately before the “Start” (green) mark. Lid should drop down into the groove and become level.

4.4.3.5 ROTATE lid clockwise to start engagement of lid.

4.4.3.6 LIFT lid closure tool onto HIC, and center over the HIC lid.

4.4.3.7 ENGAGE the drive spuds of the lid closure tool into the cavities of the HIC lid.

Note: Lid may become harder to rotate clockwise when it approaches the “Seal” (red) mark on liner. Short bumps may be used to apply the appropriate force needed to seal the HIC lid.

4.4.3.8 APPLY a slight force downward on the tool to ensure the drive spuds remain in the cavities of the HIC lid.

4.4.3.9 ROTATE tool and lid clockwise until lid “Alignment” mark and HIC “Seal” (red) mark align OR a minimum rotation of 270° past the “Start” (green) mark.

Note: Lid may rotate beyond “Seal” (red) mark. The HIC lid will not overtighten using the Manual HIC lid closure tool.

4.4.3.10 NOTIFY the EnergySolutions Services Manager if “Seal” (red) mark is not met.

4.4.3.11 LIFT closure tool via crane hook or by hand to disengage it from the HIC lid and store in designated area.

4.4.4 Remote Pneumatic HIC Lid Installation

The Pneumatic HIC Lid Closure Tool can be used with either a ratchet strap or stabilizing poles. This section details both methods.

Caution: Do not exceed the maximum air pressure rating of 95 PSIG for forward, and 85 psig for reverse. Minimum air flow of 40 CFM is required. High torque is generated by the closure tool motor, and failure to adequately restrain the lid closure tool handles with a fixed support, or by manual resistance, may result in personal injury.

4.4.4.1 BLOWDOWN plant air source to ensure clean, dry air.

4.4.4.2 INSPECT the lid closure tool for sharp edges/loose fittings prior to use.

4.4.4.3 INSPECT the lid closure tool drive spud locking clips to ensure they are in working order.

4.4.4.4 INSPECT the lid closure tool rigging for frayed, broken wires, crimped cable, etc.

4.4.4.5 ATTACH the lid closure tool lifting cables to the crane hook.

4.4.4.6 LIFT the four drive spud lock levers to the vertical position.

Note: HIC lid must be on a flat surface while performing the following step.

4.4.4.7 RAISE the lid closure tool and PLACE the drive spuds in the HIC lid cavities. ENSURE the drive spud clips are within the HIC lid drive cavities.

4.4.4.8 ENGAGE the four drive spud lock levers to the horizontal locked position. It may be necessary to loosen the four drive spud adjustment bolts to set the locks.

Caution: Over-tightening the drive spud adjustment bolts may cause the drive spud locking clips to bend or break.

4.4.4.9 TIGHTEN the drive spud adjustment bolts to ensure the HIC lid is secured to the Pneumatic HIC Lid Closure Tool.

4.4.4.10 APPLY a small amount of light weight oil in the air hose and CONNECT lid closure tool to clean and dry air source.

4.4.4.11 ATTACH the lid closure tool lifting cables to the crane hook, if not previously done.

4.4.4.12 RAISE crane hook until the HIC lid is slightly off the ground.

4.4.4.13 PLACE the Drive Selection Collar into the forward position.

4.4.4.14 SLOWLY ENGAGE air valve and verify the forward rotation.

4.4.4.15 RELEASE the air valve to stop rotation.

4.4.4.16 PLACE the Drive Selection Collar into the reverse position.

4.4.4.17 SLOWLY ENGAGE air valve and verify the reverse rotation.

4.4.4.18 RELEASE the air valve to stop rotation.

4.4.4.19 IF using a ratchet strap to stabilize lid closure tool, INSTALL a ratchet strap on top of the lid closure tool.

4.4.4.20 IF using stabilization poles, ATTACH poles to lid closure tool.

Caution: Hoses, cables, and straps hang off the lid closure tool when being lifted and moved via the crane hook.

4.4.4.21 RAISE the lid closure tool with lid attached and center over the HIC opening.

Caution: Lifting cables should be as slack as possible, to prevent lid closure tool from accidentally disengaging itself when operated.

4.4.4.22 SLOWLY LOWER the lid closure tool onto the HIC opening and allow lifting cable to become slack.

4.4.4.23 USING remote handling tool, hold the motor in place, and partially ENGAGE the air valve to rotate the lid counterclockwise.

Caution: HIC lid engagement must start when the “Alignment” mark on lid is at the “START” (green) mark on liner. If engagement starts at a different location the lid shall be removed and restarted at the “Start” (green) mark.

4.4.4.24 WHEN the “Start” (green) mark is reached and the lid falls into place, RELEASE the air valve to stop the rotation.

4.4.4.25 PLACE the drive selection collar into the forward position.

4.4.4.26 USING remote handling tool, hold the motor in place, and partially ENGAGE the air valve to rotate the lid clockwise.

4.4.4.27 RELEASE the air valve to stop the rotation.

4.4.4.28 REMOVE remote handling tool from lid closure tool.

4.4.4.29 IF using a ratchet strap, ATTACH ratchet strap(s) and hook to the process shield turn buckles, or suitable anchor points.

Caution: Overtightening the ratchet straps may cause the lid closure tool to tilt and release the lid.

4.4.4.30 TIGHTEN the ratchet straps until snug.

Caution: Stabilizing pole shall be positioned firmly against unyielding support to prevent damage or injury.

4.4.4.31 IF using stabilizing poles, brace poles against unyielding support.

4.4.4.32 ENGAGE air valve to rotate HIC lid clockwise.

4.4.4.33 ROTATE the lid closure tool clockwise until lid “Alignment” mark on lid and HIC “Seal” (red) marks align OR a minimum rotation of 270° past the “Start” (green) mark, OR until rotation stops.

Note: Lid may rotate beyond “Seal” (red) mark. The HIC lid will not overtighten using the pneumatic HIC lid closure tool.

4.4.4.34 RELEASE the air valve.

4.4.4.35 REPEAT Steps 4.4.4.32 through 4.4.4.34, as necessary.

4.4.4.36 NOTIFY *EnergySolutions* Services Manager if “Seal” (red) mark is not reached.

4.4.4.37 CLOSE plant air supply valve.

4.4.4.38 ENGAGE lid closure tool air valve to depressurize air hose.

4.4.4.39 IF using a ratchet strap, RELEASE ratchet straps and disconnect from process shield turnbuckles.

4.4.4.40 USING a remote handling tool release the four lock levers to the unlocked vertical position.

4.4.4.41 RAISE crane hook to remove lid closure tool from HIC lid.

4.4.4.42 REMOVE stabilization poles for storage, if necessary.

4.4.4.43 STORE Pneumatic HIC lid closure tool in designated area.

4.4.4.44 DISCONNECT plant air supply, if required.

4.4.5 VERIFY the HIC lid was installed correctly.

4.5 Steel Liner Lid Installation

4.5.1 Square Lid Installation

Note: Impact wrenches shall not be used to tighten lid bolts unless approved by *EnergySolutions* Services Manager.

4.5.1.1 VERIFY lid seating surface clean and free of debris.

4.5.1.2 INSPECT lid gasket for damage and deformation.

4.5.1.3 ATTACH lid lifting arrangement to crane.

4.5.1.4 RAISE lid and center over Liner opening.

4.5.1.5 SLOWLY LOWER lid onto Liner.

4.5.1.6 ALIGN lid with match marks and/or bolt holes.

4.5.1.7 TIGHTEN bolts in a star pattern to snug tight.

**Note: If Utility requires a specific torque value contact
EnergySolutions Service Manager.**

4.5.1.8 VERIFY the Liner lid was installed correctly.

4.5.2 Round Lid Installation

**Note: Impact wrenches shall not be used to tighten lid bolts unless approved
by EnergySolutions Services Manager.**

4.5.2.1 VERIFY lid seating surface clean and free of debris.

4.5.2.2 INSPECT lid gasket for damage and deformation.

4.5.2.3 ATTACH lid lifting arrangement to crane.

4.5.2.4 RAISE lid and center over Liner opening.

4.5.2.5 SLOWLY LOWER lid onto Liner.

4.5.2.6 ALIGN lid with match marks and/or bolt holes.

4.5.2.7 TIGHTEN lid bolts in a star pattern to snug tight.

**Note: If Utility requires a specific torque value contact
EnergySolutions Service Manager.**

4.5.2.8 VERIFY the Liner lid was installed correctly.

4.5.3 Barrel Lid Installation

4.5.3.1 VERIFY lid seating surface clean and free of debris.

4.5.3.2 INSPECT lid gasket for damage and deformation.

4.5.3.3 PLACE lid on Liner.

4.5.3.4 INSTALL lid ring.

4.5.3.5 CLOSE lever lock to secure lid to Liner.

4.5.3.6 VERIFY RECORD on Attachment 7.1, Liner Checklist the Liner lid was installed correctly.

4.5.4 MagneSeal Lid Installation

4.5.4.1 INSPECT the MagneSeal Lifting Device including slings for damage or deformation.

4.5.4.2 VERIFY MagneSeal Lid seating surface clean and free of debris.

4.5.4.3 INSPECT MagneSeal Lid gasket for damage and deformation.

4.5.4.4 VERIFY a vent is installed in the MagneSeal Lid, if required.

4.5.4.5 ATTACH MagneSeal Lifting Device to crane with lid Installation side down.

4.5.4.6 RAISE MagneSeal Lifting Device with lid attached and CENTER over the Liner opening.

4.5.4.7 SLOWLY LOWER MagneSeal Lifting Device and lid onto the Liner opening and allow lifting cable to become slack.

4.5.4.8 RAISE MagneSeal Lifting Device. The Lifting Device will release as the MagneSeal Lid magnetically attaches to Liner.

4.5.4.9 VERIFY MagneSeal Lid is seated on Liner properly.

4.5.4.10 STORE MagneSeal Lifting Device in designated area.

4.5.4.11 VERIFY RECORD on Attachment 7.1, Liner Checklist the MagneSeal Lid was installed correctly.

4.5.5 MagneSeal Lid Removal

4.5.5.1 INSPECT the MagneSeal Lifting Device including slings for damage or deformation.

- 4.5.5.2 ATTACH MagneSeal Lifting Device to crane with lid Removal side down.
- 4.5.5.3 RAISE MagneSeal Lifting Device and CENTER over the MagneSeal Lid.
- 4.5.5.4 SLOWLY LOWER MagneSeal Lifting Device onto the MagneSeal Lid and allow lifting cable to become slack to engage magnets.
- 4.5.5.5 RAISE MagneSeal Lifting Device. MagneSeal Lid will be released from the Liner.
- 4.5.5.6 STORE MagneSeal Lid per RP direction, if required.
- 4.5.5.7 STORE MagneSeal Lifting Device in designated area.

4.6 Post-Operational Guidelines

Note: The term Liner within this procedure applies generically to both a polyethylene High Integrity Container (HIC) and a Steel Liner unless referenced specifically.

Note: Loaded Liners shall not be lifted or moved until the temperature is less than 140°F.

- 4.6.1 ENSURE proper contamination control during fillhead removal.

Note: Step 4.6.2 should be performed for all Liners prior to shipment, except as ALARA dictates. The Utility will assume the responsibility of the Liner being free of external debris, media, and/or foreign material prior to shipment if this step is N/A.

- 4.6.2 INSPECT the Liner using a high intensity light to ensure the Liner is free of external debris, media, and/or foreign material prior to shipping Liner.
- 4.6.3 IF using a HIC, CALCULATE total number of sunlight exposure (number of sunlight days exposure prior to receipt + number of sunlight days exposure prior to shipment = total sunlight days exposure). RECORD Total Cumulative Days of Sunlight (UV) Exposure on Attachment 7.1, Liner Checklist. This number must not exceed one (1) year – 365 cumulative days for any HIC.
- 4.6.4 VERIFY complete Attachment 7.1, Liner Checklist and forward with shipment.

5.0 Mechanical Filter Loading

Note: The term Liner within this procedure applies generically to both a polyethylene High Integrity Container (HIC) and a Steel Liner unless referenced specifically.

- 5.1 NOTIFY EnergySolutions Engineering of the proposed use of a Liner for filter loading.
- 5.2 PROVIDE EnergySolutions Engineering with pertinent details of the filter assemblies as requested. These details will include the dimensions, and any details of sharp edges or protrusions should also be supplied. A sketch may be required.
- 5.3 The shipper is responsible for ensuring that mechanical filters or other hardware is adequately secured to prevent damage to the Liner during shipping and disposal.

6.0 RECORDS AND REPORTS

- 6.1 Complete Attachment 7.1, Liner Checklist and submit with shipment.
- 6.2 Liner Operations shall ensure that each customer of an EnergySolutions Liner has the effective revision of the C of C and this procedure.
- 6.3 The User has on file with EnergySolutions Liner Operations Department Attachment 7.2, Polyethylene High Integrity Container Certification Statement.
- 6.4 Complete and submit with the shipment Attachment 7.3, Certification Statement for Disposal of Polyethylene High Integrity Container.
- 6.5 All records generated by this procedure shall be STORED and MAINTAINED in accordance with Reference 2.4, ES-QA-PR-005, Records.

7.0 ATTACHMENTS

- 7.1 Liner Checklist.
- 7.2 Polyethylene High Integrity Container Certification Statement.
- 7.3 Certification Statement for Disposal of Polyethylene High Integrity Containers.
- 7.4 Non-Compatible Materials for Liners.
- 7.5 Pneumatic HIC Lid Closure Tool Sketch.

ATTACHMENT 7.1, Liner Checklist

<u>Item</u>	<u>Initials</u>	<u>Date</u>
Liner stored properly.		
Liner Serial Number _____.		
Lid Serial Number and Serial Number on HIC match. Does not apply to Steel Liners.		
Manufactured Date of Liner _____.		
Lid Vent installed.		
Lid Vent Orifice and Lid Vent Holes free of debris.		
Fill plate gasket properly installed and free of defects, if required.		
Liner lid gasket properly installed and free of defects.		
Liner internal components (e.g., hoses, filters) visually inspected, if applicable.		
FAVA Level System installed, if applicable. Non-SEDS/SERDS Liners.		
Liner externals visually inspected, where feasible.		
Lifting sling(s) properly installed.		
Correct lifting device(s) used.		
Receipt Inspection complete. Date: _____.		
Waste Stream sample acceptable for transfer.		
Waste Stream Temperature _____°F (<140°F).		
Mechanical Filters or other hardware stabilized. Non-SEDS/SERDS Liners.		
Tighten Steel Liner lid bolts to snug tight, if applicable. *		
Liner lid installation is complete and verified sealed.		
Affix liner label per RP, if applicable.		
Liner Temperature is less than 140°F.		
Liner is free of external debris and contamination prior to storing in On-Site Storage Facility ("N/A" if not performed).		
Liner is free of external debris and contamination prior to shipment.		
HIC Total Cumulative Days of Sunlight (UV) Exposure _____.		
Liner Information: Size/ Type _____ Height _____ Diameter _____ (PL 14-215 or L 14-195 liners only)		

*If Utility requires specific torque value contact EnergySolutions Services Manager.

*The use of N/A may be used when completing this attachment.

OPERATION COMPLETED: _____
Signature Date

Comments : _____

Complete form and forward with shipment.

Attachment 7.2

**POLYETHYLENE HIGH INTEGRITY CONTAINER
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, 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, No. DHEC-HIC-PL-001 (the "C of C"), (2) the effective revision of EnergySolutions Procedure FO-AD-002, "Operating Guidelines for Use of Polyethylene High Integrity Containers," and (3) the effective Radioactive Materials License for the facility to which the HIC is to be shipped. 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. 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 polyethylene High Integrity Container is disposed, Company will complete the Certification Statement for Disposal of polyethylene High Integrity Container (Attachment 7.3) prior to such disposal.

Date: _____

Company: _____

By: _____

Its: _____

Attachment 7.3

**CERTIFICATION STATEMENT FOR DISPOSAL
OF
POLYETHYLENE
HIGH INTEGRITY CONTAINERS**

For the Polyethylene High Integrity Container identified by serial numbers _____,
(Company) _____
hereby certifies that its use of such HICs is in compliance with (1) the effective Certificate of
Compliance issued by the South Carolina Department of Health and Environmental Control, No.
DHEC-HIC-PL-001; (2) the effective revision of *EnergySolutions* Procedure FO-AD-002,
"Operating Guidelines for Use of Polyethylene High Integrity Containers," and (3) the effective
Radioactive Materials License for the facility to which the HIC is being shipped.

Date: _____

Company: _____

By: _____

Its: _____

Note: Complete and return with shipment.

ATTACHMENT 7.4, Non-Compatible Materials for Liners

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

Note: Liners shall not be subjected to concentrated free-standing oil. However, this does not prohibit the materials in the Liner from containing incidental or trace amounts of oil or petroleum-based materials which have been absorbed in the waste materials, provided that the amount of absorbed oil and petroleum-based materials does not exceed one percent (1%) by waste volume in the Liner.

ATTACHMENT 7.5, Pneumatic HIC Lid Closure Tool Sketch

