
Removing Free Standing Water from EnergySolutions FEXM HICs

Revision 0

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- New
- Title Change
- Revision
- Rewrite
- Cancellation

Effective
Date 6/2/09

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1.0 SCOPE

1.1 Purpose

This document contains the instructions for the verification of no freestanding water in a PL-series FEXM High Integrity Container (HIC) after the HIC has been loaded with filters, including polypropylene cartridge filters, TnNuclear filters and other types.

1.2 Applicability

This procedure is applicable for the verification of no freestanding water in a EnergySolutions FEXM HIC equipped with a water removal leg.

2.0 REFERENCES

2.1 FO-AD-002, Operating Guidelines for Use of Polyethylene High Integrity Containers

2.2 FO-AD-003, Field Operations Quality Assurance Records

2.3 ETI-01-009, Engineering Test Instruction for Determination of Filter Moisture Content

3.0 REQUIREMENTS

3.1 Prerequisites

3.1.1 An approved Radiation Work Permit (RWP) shall be issued before the start of any work.

3.1.2 The High Integrity Container shall be stored and inspected prior to use in accordance with Reference 2.1.

3.1.3 The High Integrity Container has been set up in the process shield and the HIC is ready to accept filters.

3.1.4 A filter dose rate cut off is established for each type of filter to assure that the liner will not exceed Class limits for intended disposal and dose rates do not exceed limits for the designated shipping cask(s).

3.2 Tools, Materials and Equipment

3.2.1 HIC closure tool

- 3.2.2 HIC dewatering equipment including an AOD dewatering pump with vacuum gauge on inlet.
- 3.3 Plant Interface Requirements
 - 3.3.1 Service air – 50 scfm @ 80 psig (approximately) or as required by dewatering pump and/or other air operated equipment
 - 3.3.2 Demineralized or Condensate Water
- 3.4 Precautions
 - 3.4.1 All personnel shall follow all limitations and precautions as directed by the RWP.
 - 3.4.2 All personnel shall observe applicable safety procedures.
 - 3.4.3 All personnel shall adhere to good housekeeping practices.
 - 3.4.4 The HIC shall be handled in accordance with the requirements of Reference 2.1.
 - 3.4.5 Only filters may be loaded into the High Integrity Container. All filters shall be of such size and shape that they can be inserted through the container opening with ease and without squeezing, bending or otherwise disturbing the filter.
 - 3.4.6 DAW may not be loaded into a HIC containing filters. Other forms of waste may only be included with the expressed consent of the EnergySolutions Project Manager or his designee.
 - 3.4.7 A shipping cask schedule should be coordinated through EnergySolutions to support prompt removal (120 hours) of the filter HIC following the final verification cycle (See Step 4.3.6).

4.0 DETAILED PROCEDURE

4.1 Filter Loading

Caution: HP Operations should take periodic dose rates on the outside of the liner or shield to ensure that the dose limits established in the radiological safety review are not exceeded. These actions are necessary to prevent exceeding the dose limitations of the shipping cask and waste classification per 3.1.4.

- 4.1.1 Allow filters sufficient time to drain prior to loading into container. When drained, there should be minimal water falling from the filters. Transfer filters to HIC staging area.
- 4.1.3 Position the filters over the HIC opening and allow them to drop into the container through the liner funnel (if used).
- 4.1.4 Process is repeated until HIC is loaded based on dose rate or waste classification or until liner volume is filled.
- 4.1.5 Record date and time of last filter loading in the Completion Record. Wait a minimum of (24) hours before proceeding to step 4.2, Verification of No Freestanding Water.

4.2 Verification of No Freestanding Water

Note: The water removal methodology in this procedure has been used extensively throughout the industry, and has been demonstrated to adequately remove freestanding water accumulated in the HIC. However, due to the wide array of filter types used by the industry, EnergySolutions cannot assure that the filters will drain. However, water draining from the filters will be removed by this methodology. This procedure is intended only for verification of no freestanding water in a HIC loaded with filters detailed in Step 1.1 Waste forms other than filters must be pre-approved by the EnergySolutions Project Manager or designee.

Caution: Removal of freestanding water requires a minimum of 24 hours from the time the last load of filters went into the HIC until the start of the initial pumping cycle.

- 4.2.1 Connect the suction hose to the outlet connection on the HIC water removal leg and to the suction side of the diaphragm pump.
- 4.2.2 Connect one end of a hose to the discharge side of the diaphragm pump and direct the other to a Plant designated location.
- 4.2.3 Connect the service air to the diaphragm pump.
- 4.2.4 Adjust the air supply valve to the diaphragm pump and establish the desired pumping rate. A rate of approximately 1-2 strokes per second is typical. Record the date/time the pump was started on the Completion Record (Attachment 6.1). Vacuum gauge should read > 20" Hg while water is being removed. Record vacuum gauge reading in Completion Record.

4.2.5 Secure the dewatering pump when the pump loses suction as indicated by a significant increase in pump stroke rate and/or vacuum falling below 4" Hg on the inlet gauge. Record the date/time the pump was secured on the Completion Record.

Note: Not all filters loaded into the container will be loaded with significant freestanding liquid and thus vacuum/suction will not be achieved. In this event, the operator shall run the pump for a minimum of one hour to ensure no freestanding liquid and document in the completion record (Attachment 6.1). Go to Step 4.2.8.

4.2.6 Let the HIC stand for a minimum of eight (8) hours.

4.2.7 Repeat step 4.2.4 and 4.2.5.

4.2.8 Let the HIC stand for a minimum of eight (8) hours

4.2.9 Direct the discharge hose to a suitable container and repeat steps 4.2.4 and 4.2.5.

4.2.10 Measure the volume of water collected in step 4.2.9 and record the volume on the Completion Record.

4.2.11 IF < 500 ml of water was measured in step 4.2.10 proceed to step 4.2.12. IF ≥ 500 ml was collected in 4.2.10, repeat steps 4.2.8 through 4.2.10 for one additional cycle (FOURTH CYCLE).

Note: If after four cycles > 500 mls is collected, secure dewatering and notify EnergySolutions Project Manager. Document notification and response in the Daily Operations Log and Attachment 6.2 Liner Acceptance Sheet.

4.2.12 Disconnect the suction hose from the outlet connection of the HIC water removal leg.

4.3 HIC Closure

4.3.1 Perform a radiation survey at the top of the HIC.

4.3.2 If waste characterization has been performed, ensure the correct waste class is marked on the top surface of the HIC lid.

4.3.3 Apply a thin coat of petroleum jelly or similar approved thread lubricant to the threads of the HIC lid.

Caution: The HIC lid thread is a double lead. The lid can inadvertently be started at 180° Out if the lid match mark and liner “start” marks are not properly aligned.

Note: The lid may be rotated beyond the seal mark.

4.3.4 Align the HIC lid match mark with the “START” match mark on the HIC body and use the HIC closure tool to rotate the lid clockwise until the lid match mark aligns with the “SEAL” match mark on the HIC body (a minimum rotation of 180° is required).

4.3.5 Complete the HIC User’s Checklist from Reference 2.1.

4.3.6 Liner must be shipped within 120 hours of final verification cycle except as noted in this step. Coordinate with the EnergySolutions Project Manager or Designee to ensure cask availability. If greater than 120 hours, another verification cycle should be performed either onsite or at an offsite processor prior to disposal.

5.0 RECORDS

- 5.1 Operation, repair and maintenance activities shall be recorded in the daily project log that will be maintained as part of the project file.
- 5.2 If dewatering is performed by an ES Technical Service Representative, the original Verification of No Free Standing Water Completion Record shall be forwarded to the EnergySolutions Project Manager and a copy of the Completion Record shall be retained in the project file.
- 5.3 If dewatering is performed by an ES Technical Service Representative, the project file is a Quality Assurance record and shall be maintained in accordance with Reference 2.2.

6.0 ATTACHMENTS AND FORMS

- 6.1 Completion Record – Verification of No Freestanding Water
- 6.2 Liner Acceptance Sheet

6.1 COMPLETION RECORD - VERIFICATION OF NO FREESTANDING WATER

IF LINER IS TO BE SHIPPED FOR DIRECT DISPOSAL, SHIPMENT MUST OCCUR WITHIN 120 HOURS OF FINAL VERIFICATION CYCLE (SEE STEP 4.3.6).

Utility: _____

Shipment Number: _____

HIC Serial Number: _____

Project Number: _____

NOTE: A WAITING PERIOD OF 24 HOURS IS REQUIRED BETWEEN THE TIME OF THE LAST LOADING OF FILTERS AND THE START OF THE INITIAL PUMPING CYCLE.

	<i>Last Filter Load</i>	<i>Time/date</i>	<i>Initial</i>	(Date/Time, Volume)	Initials
	_____	_____	_____		
	Record the date/time pump started				
	Vacuum gauge reading			inHg	
	Record the date/ time pump secured				
8 HOUR MINIMUM WAITING TIME					
	Record the date/time pump started				
	Record the date/ time pump secured				
8 HOUR MINIMUM WAITING TIME					
	Record the date/time pump started				
	Record the date/ time pump secured				
	Measure volume of water collected			_____ ml	
* IF REQUIRED - 8 HOUR MINIMUM WAITING TIME					
	Record the date/time pump started				
	Record the date/ time pump secured				
	Measure volume of water collected			_____ ml	

*NOTE: IF MORE THAN FOUR CYCLES ARE REQUIRED, SECURE DEWATERING AND NOTIFY ENERGYSOLUTIONS PROJECT MANAGER. RECORD NOTIFICATION AND RESPONSE IN ATTACHMENT 6.2.

6.2 LINER ACCEPTANCE SHEET

A review of the Completion Record has been conducted. The stand times and the volume of liquid collected were in accordance with FO-OP-073.

Operator(s):

Signature Date

ES Project Manager/Designee:

Signature Date

Comments (sign/date): _____

