USQ Not Required – ETF is a <Hazard Category 3 Radiological Facility

**CHANGE HISTORY (≤ LAST 5 REV-MODS)**

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<td>A-6</td>
<td>09/27/2018</td>
<td>Periodic Review</td>
<td>Added New Step 5.3.1</td>
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<td>03/06/2018</td>
<td>Maintenance Request</td>
<td>Remove 60I-202 and 60I-317 in Step 5.1.8</td>
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<td>A-4</td>
<td>03/05/2018</td>
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<td>Added , 60I-202 and 60I-317 to Step 5.1.8</td>
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<td>A-3</td>
<td>04/19/2017</td>
<td>Maintenance Request</td>
<td>Changed Label References, Title, Added Special Instruction Added Section 3.1 Personnel Safety, Modified Section 5.2 and Updated Record Section</td>
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<td>A-2</td>
<td>08/24/2016</td>
<td>Process Improvement</td>
<td>Update process for cleaning level switches. Clarify the new gasket specs by adding Section 4.1. Include referenced documents by adding Section 4.2.</td>
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<td>A-1</td>
<td>07/20/2016</td>
<td>Correct Use Type</td>
<td>Change from continuous use to reference use per document owner’s direction.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides a safe, uniform method to perform a functional test of level switches and or cleaning of level elements located in the vapor compressor inlet and outlet silencers.

1.2 Scope

Procedure instructions include steps for the initial setup and functional check of level switches LS60I146 and LS60I136.

2.0 INFORMATION

2.1 General Information

The Dynatrol paddle is driven into vibration by the driver coil. A second coil located in the pick-up end produces a voltage proportional to the paddle vibrational amplitude. When the paddle becomes covered by the process media, its amplitude of vibration decreases and the output voltage drops from 800 mVAC to 100 mVAC. This change in output signal operates the single-pole, double-throw (SPDT) contacts of the EC 102B relay switch receiver. A contact closure occurs between terminals 2 and 3 at low process levels, and between terminals 2 and 1 at high process level.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 IF lock and tag is required, during the performance of this procedure, comply with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

3.2 Radiation and Contamination Control

3.2.1 Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per ALARA Work Planning procedure, TFC-ESHQ-RP_RWP-C-03.

3.3 Environmental Protection

3.3.1 In the event of a spill/leak/release, notify the SOM/FWS and respond per ETF-ERP-85B-003, Emergency Spill or Release at ETF.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies will be needed to perform Section 5.2 of this procedure:
- Gasket (one for each LE): 1-inch Flexitallic LS Spiral wound, Class 150, 316L/Flexicarb, 304 SS Outer.

4.2 Performance Documents

The following documents may be needed to perform this procedure:
- DOE 0336, Hanford Site Lockout/Tagout Procedure.
5.0 PROCEDURE

Special Instructions

Individual sections of this procedure may be performed in any order or not at all as field conditions dictate. Steps and actions within the applicable sections being worked must be done sequentially, unless otherwise directed by a flexibility or conditional statement.

5.1 Functional Check

5.1.1 ENSURE lockout/tagout and overlocking requirements have been satisfied per DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.2 REQUEST Operations ensure drain bucket is in place under valve 60I-300.

5.1.3 ENSURE the following drain valves are open:

- 60I-300
- 60I-202
- 60I-317.

5.1.4 REQUEST Operations open outlet silencer manual drain valve, 60I-200.

5.1.5 REQUEST Operations raise water level in vapor compressor inlet silencer by opening valve 95D-043 until water comes out drain valve 60I-300.

NOTE – LS136 and LS146 tags are located on evaporator graphic. Tag is green when switches are immersed.

5.1.6 IF tags LS146 or LS136 are clear, PROCEED to Step 5.1.8. IF not clear CONTINUE.

5.1.7 IF tag LS146 or LS136 indicate high water levels in either vapor compressor inlet silencer or outlet silencer, PERFORM the following:

5.1.7.1 CLOSE valve 95D-043.

5.1.7.2 CLOSE valve 60I-300.

5.1.7.3 NOTIFY FWS and Operations of switch and relay failure.

5.1.7.4 IF LE60I146 or LE60I136 are inoperable, CLEAN in accordance with Section 5.2.

5.1.8 REQUEST Operations close drain valve 60I-300 to allow water to rise above switches.
5.1 Functional Test (Cont.)

5.1.9 CONFIRM proper functioning of the level switch and relay by observing the following tags change state in the MCS:
   - LS146
   - LS136.

5.1.10 IF tag has not changed states by the time water is above the switch (approximately 2 gallons for LS60I146 and 45 gallons for LS60I136), PERFORM the following:

5.1.10.1 REQUEST Operations shut off water by closing valve 95D-043.

5.1.10.2 NOTIFY FWS and Operations of possible switch and relay failure.

5.1.11 REQUEST Operations close valve 95D-043.

5.1.12 REQUEST Operations connect a hose to 60I-300 and direct hose to sump.

5.1.13 REQUEST Operations open drain valve 60I-300 and drain water into sump (should be approximately 3 to 5 gallons for LS60I146 and 40 to 45 gallons for LS60I136. This will raise the sump level by about 5%).

5.1.14 CONFIRM the following tags in the MCS changes state as water drains:
   - LS146
   - LS136.

5.1.15 REQUEST Operations ensure the following valves are closed:
   - 60I-300
   - 60I-200.

5.1.16 NOTIFY FWS and Operations of any failure of the level switch and relay.

5.1.17 NOTIFY Operations the vapor compressor may have to be drained.

5.1.18 PROCEED to Section 5.3.
5.2 Cleaning LE60I146 or LE60I136

5.2.1 **ENSURE** lockout/tagout and overlocking requirements have been satisfied per DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.2.2 **REQUEST** Operations ensure drain bucket is in place under valve 60I-300.

5.2.3 **ENSURE** the following drain valves are open:
- 60I-300
- 60I-202
- 60I-317.

5.2.4 **REQUEST** Operations open outlet silencer manual drain valve, 60I-200.

5.2.5 **REMOVE** LE60I146 or LE60I136.

5.2.6 **CLEAN** instrument paddle and well.

5.2.7 **REINSTALL** LE60I146 or LE60I136 with new gasket (see Section 4.1).

5.2.8 **TORQUE** flange bolt to 25 to 35 ft-lb.

5.2.9 **IF** Functional Check is required, **GOTO** Section 5.1 **IF** not **GOTO** Section 5.3.
5.3 Restoration

5.3.1 DISPOSE of drained liquid in Sump 1 or Sample Prep Room sink.

5.3.2 RESTORE to as-found conditions.

5.3.3 REMOVE lock and tag if installed.

5.3.4 INFORM SOM test is complete and instrument/equipment/system may be returned to service.

5.4 Acceptance Criteria

Acceptance criteria has been met when steps in this procedure have been satisfactorily performed and results are recorded on the data sheet(s).

5.5 Review

5.5.1 INFORM FWS test is complete.

5.5.2 (FWS) REVIEW AND ENSURE the following:

- Completed data sheets meet the acceptance criteria
- Comments sections are filled out appropriately
- Work requests needed as a result of this procedure are identified and generated
- Work request number(s) of any work documents generated as a result of this procedure, are recorded in the Comments/Remarks section of the data sheet.

5.6 Records

This procedure is performed within a work package, as such, the procedure in its entirety will be maintained as a record per the Work Control process.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.