VOG Blower Discharge Flow Loop

Tank Farm Maintenance Procedure

Effluent Treatment Facility

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

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<td>Updated procedure to respond to WRPS-PER-2016-2301.1 regarding druck pressure calibrator and indicator equipment usage, and providing guidance to take when liquid enters a druck.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides a safe, uniform method for testing and calibrating equipment associated with the Vessel Offgas (VOG) filter unit 2025E-45D-FL-1 exhaust flow loop (see Figure 1). The loop will be performed by input of signals at the transmitter and readings taken in the Control Room.

The instruments in Loop LC-45D-005 perform the following:

- FE-45D-005 Flow element is installed downstream of the VOG blower discharge and generates a differential pressure of 0 to 11.24 in. WC which is equivalent to 0 to 1200 SCFM flow.
- FT-45D-005 Flow transmitter senses differential pressure from the flow element, locally indicates flow rate on an integral 0 to 100% display and generates a 4 to 20 mA DC signal equivalent to 0 to 11.24 in. WC. This signal is sent to the control room for square root extraction and flow indication at the MCS.

NOTE - The following flow indication is designated as “FT-45D-005” on MCS graphics and group display “VOG.”

- FI-45D-005 Square root extraction and flow indication takes place within the MCS.

1.2 Scope

1.2.1 Instruments are located as follows:

- FE-45D-005: Located in room 129, ten feet above the floor. Access to this device in not required to perform this procedure.
- FT-45D-005: Located in room 129, four feet above the floor and is accessible.

NOTE - The following flow indication is designated as “FT-45D-005” on MCS graphics and group display “VOG.”

- FI-45D-005: Displayed at the Control Room and is located within the group “VOG.”

1.2.2 Performance of this procedure requires stationing a person in the Control Room to read data.
2.0 INFORMATION

2.1 General Information

2.2.1 Attachment 1 – Loop Accuracy Calculation Sheet provides an example of the Square root extraction method used in this procedure.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Radiation and Contamination Control

3.1.1 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.

3.1.2 When disconnecting, breaching, or opening systems or system components that are currently or previously connected to waste tanks or waste transfer systems:
  • Follow Calibration Instructions. (Attachment 3)

3.2 Environmental Compliance

3.2.1 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

NOTE - Measuring and Test Equipment used to collect acceptance criteria data during performance of this procedure shall meet the following requirements:

- Be within its current calibration cycle as evidenced by an affixed calibration label
- Be capable of desired range
- Accuracy is equal to or greater than M&TE tolerance specified on PM/S data sheet or is at least four times greater than specified device tolerance.

The following supplies may be needed to perform this procedure:

- Pressure source capable of generating 0 to 15 in. WC, or equivalent
- Pressure gauge capable of measuring 0 to 15 in. WC in 0.01 inch increments, or equivalent
- Container to catch fluid which may exist in transmitter process piping
- Two-way radios to communicate between transmitter and Control Room
- Water trap device Figure 2.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- ETF-EL18036, Rosemount Model 1151DR/DP Electronic Differential Pressure Transmitter
- CVI V-1373-015-B-901, Rosemount Model 1151DP Differential Pressure Transmitter
- Drawing H-2-88993, P&ID, Vessel Offgas System
- Radiological survey plan
- Waste planning checklist
- Pressure M&TE vendor manual.
5.0 PROCEDURE

5.1 Preparation

5.1.1 IF performing this procedure on a system that has the potential for free liquids or moisture to enter the Pressure M&TE, USE a water trap device.

5.1.1.1 ENSURE the Water Trap is installed in a vertical position to operate correctly Figure 2.

5.1.1.2 IF liquids or moisture gets into the Water Trap or Pressure M&TE REFER to Attachment 2.

5.1.1.3 IF performing this procedure on a system that is potentially contaminated, FOLLOW Calibration Instructions. (Attachment 3)

5.1.2 CLOSE isolation valves V-FT45D005-F and V-FT45D005-G.

5.1.3 SLOWLY OPEN valves V-FT45D005-H and V-FT45D005-I.

5.1.4 CONNECT pressure source and gauge.
5.2 As-Found Loop Data

**Special Instructions**

Readings will be taken in the Control Room. Two-way communication is required. Radio transmission may affect transmitter output.

5.2.1 **APPLY** test input values specified by PM/S data sheet.

**NOTE** – Attachment 1 depicts the calculation loop the MCS makes.

5.2.2 **RECORD** output value from MCS display in the Control Room in as-found section of PM/S data sheet.

**IF** as-found values are not within specified tolerance per data sheet, **GO TO** Section 5.3,

**OR**

**IF** as-found values are within specified tolerance, but deemed marginal, and optimization is desired, **GO TO** Section 5.3,

**OR**

**IF** as-found values are within specified tolerance, **RECORD** as-found values in as-left column of data sheet **AND**

**GO TO** Section 5.4.
5.3 **FT-45D-005 Calibration**

5.3.1 **PERFORM** calibration instruction ETF-EL18036.

5.3.2 **IF** device calibration was successful, **GO TO** Step 5.3.4.

5.3.3 **IF** device calibration was not successful, **PERFORM** the following:

5.3.3.1 **RE-APPLY** inputs per PM/S data sheet.

5.3.3.2 **RECORD** as-left values in as-left columns on PM/S data sheet.

5.3.3.3 **RECORD** comments on PM/S data sheet.

5.3.3.4 **NOTIFY** FWS that loop check has failed.

5.3.3.5 **GO TO** Section 5.4.

5.3.4 **RE-APPLY** test input values per PM/S data sheet.

5.3.5 **IF** loop output values are within tolerance per PM/S data sheet, **RECORD** as-left values on data sheet AND **GO TO** Section 5.4.

5.3.6 **IF** loop check still fails, **PERFORM** the following:

5.3.6.1 **RECORD** as-left values on PM/S data sheet.

5.3.6.2 **RECORD** comments on PM/S data sheet.

5.3.6.3 **NOTIFY** FWS that loop check has failed.

5.3.6.4 **GO TO** Section 5.4.
5.4 Restoration

5.4.1 **REMOVE** pressure source and pressure gauge.
5.4.2 **DUMP** any waste water in Sump 1 or sample prep room sink.
5.4.3 **CLOSE** the following drain valves:
   - V-FT45D005-H
   - V-FT45D005-I.
5.4.4 **OPEN** the following isolation valves
   - V-FT45D005-F
   - V-FT45D005-G.
5.4.5 **RESTORE** to as-found conditions.
5.4.6 **INFORM** SOM test is complete and instrument/equipment/system may be returned to service.

5.5 Acceptance Criteria

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

5.6 Review

5.6.1 **INFORM** FWS test is complete.
5.6.2 (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.
5.7 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.
Figure 1 - Loop LC-45D-005

NOTE - This flow indication is designated as “FT-45D-005” on MCS graphics and group display “VOG.”
Figure 2 - How the Trap Works

1. Gas/Air enters through the top slot which goes into the chamber.
2. Dirt and Moisture particles are collected in the chamber, which is visible through the clear transparent glass window.
3. Then Gas/Dry Air goes into the centre slot where it enters the instrument.
Figure 3 – Negative Pressure Connection
Figure 4 – Positive Pressure
Attachment 1 – Loop Accuracy Calculation Sheet

FT-45D-005 accuracy = 0.25%

FI-45D-005 accuracy = 0.75% with √.

Calculation method used is square root of the sum of the squares.

FI-45D-005 LOOP = √((0.25%²) + (0.75%²)) = 0.791%

Tolerance = 1200 X 0.00791 = ± 9.49 scfm
Attachment 2 - Water Trap/Pressure M&TE

**Water Trap with Potentially Contaminated Liquid**

1. If potentially contaminated liquid gets into Water Trap, Suspend the work.
2. Notify the FWS.
3. When provided approval from the FWS proceed as follows.
4. Remove Pressure M&TE from field.
5. Return to a RMA.
6. Disassemble the Water Trap.
7. Allow trap to dry overnight.
8. Survey disassembled trap components in accordance with Radcon survey plan.
9. If the Water Trap can be released return it to tool crib.
10. If the Water Trap cannot be released, dispose of it per waste planning checklist.

**Water Trap with Clean Liquid (NOT Contaminated)**

1. If clean liquid gets into Water Trap, disassemble the Water Trap.
2. Allow Water Trap to dry overnight.
3. Re-assemble the Water Trap.
4. Return the Water Trap to the tool crib.
Attachment 2 - Water Trap/Pressure M&TE (Cont.)

M&TE with Potentially Contaminated Liquid

1. If potentially contaminated liquid gets past water trap and inside Pressure M&TE, Suspend the work.
2. Notify FWS.
3. Wait for further directions.

M&TE with Clean Liquid (NOT Contaminated)

1. If clean liquid gets past the water trap disassemble and dry out Pressure M&TE per manufactures direction.
2. Return the M&TE to the tool crib.
3. Request the M&TE to be returned to NIST calibration lab for recalibration.
Attachment 3 – Calibration Instructions

**Positive pressure calibrations:**

Note: Vent Valve assembly is required on all positive pressure calibrations to ensure M&TE is not contaminated by venting potential process air back through M&TE.

Install vent valve assembly Per Figure 4

Ensure IV is open and VV is closed

Proceed with calibration per work package

- Whenever venting is required during calibration steps, vent stored pressure as follows.

**NOTE** - Valve IV can remain open when reading is required via M&TE.

Ensure IV valve is closed

Ensure VV valve is opened

Repeat sequence as necessary to complete the calibration.

After all steps are completed for the calibration, perform RCT survey release plan XXX

**Negative pressure calibrations:**

Note: use of surrogate filter is required for negative pressure calibrations to ensure M&TE is not contaminated by pulling process air into M&TE while drawing Vacuum.

Negative calibrations should be performed as follows.

Ensure surrogate filter holder has media installed.

Connect filter in-line per Figure 3

Ensure IV is Open

Pull a representative vacuum into M&TE through filter

Ensure IV is closed

Vent through VV

RCT to perform survey of the media.

IF no contamination found remove surrogate filter holder/manifold and proceed with calibration.