Tank Farm Maintenance Procedure  Effluent Treatment Facility

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

Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>3</td>
</tr>
<tr>
<td>2.0</td>
<td>3</td>
</tr>
<tr>
<td>3.0</td>
<td>3</td>
</tr>
<tr>
<td>4.0</td>
<td>4</td>
</tr>
<tr>
<td>5.0</td>
<td>5</td>
</tr>
<tr>
<td>5.1</td>
<td>5</td>
</tr>
<tr>
<td>5.2</td>
<td>6</td>
</tr>
<tr>
<td>5.3</td>
<td>7</td>
</tr>
<tr>
<td>5.4</td>
<td>7</td>
</tr>
<tr>
<td>5.5</td>
<td>7</td>
</tr>
<tr>
<td>5.6</td>
<td>7</td>
</tr>
<tr>
<td>Attachment 1 - Water Trap/Pressure M&amp;TE</td>
<td>8</td>
</tr>
<tr>
<td>Attachment 2 – Calibration Instructions</td>
<td>10</td>
</tr>
</tbody>
</table>
Barton® Model 227A Differential Pressure Indicator

Figure 1 - Adjustment Locations ................................................................. 11
Figure 2 - “Slipping” Pointer ................................................................. 12
Figure 3 - Range/Linearity Adjustment (50% DP) ........................................ 13
Figure 4 - How the Trap Works ................................................................. 14
Figure 5 – Negative Pressure Connection ................................................. 15
Figure 6 – Positive Pressure ................................................................. 16
1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides a safe, uniform method for calibration of Barton® Model 227A differential pressure indicator.

1.2 Scope

This procedure provides instructions for calibrating the Barton Model 227A differential pressure indicator.

2.0 INFORMATION

None.

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 2)

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 - M&TE 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 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, adjustable for range of differential pressure indicator per data sheet
- Gauge to read pressure source
- Water trap device Figure 4

4.2 Performance Documents

The following documents may be required during the performance of this procedure.

- Radiological survey plan
- Waste planning checklist
- Pressure M&TE vendor manual.
5.0 PROCEDURE

5.1 Initial Set Up

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 4.

5.1.1.2 IF liquids or moisture gets into the Water Trap or Pressure M&TE REFER to Attachment 1.

5.1.1.3 IF performing this procedure on a system that is potentially contaminated, FOLLOW Calibration Instructions. (Attachment 2)

5.1.2 ISOLATE differential pressure indicator from process line.

5.1.3 DISCONNECT pressure source lines.

5.1.4 CONNECT pressure source to high pressure side of differential pressure indicator AND

VENT low side to atmosphere.

5.1.5 VARY input per data sheet AND

RECORD as-found values on data sheet.

5.1.6 IF as-found values are not within specified tolerance per data sheet, GO TO Section 5.2,

OR

IF as-found values are within specified tolerance, but deemed marginal, and optimization is desired, GO TO Section 5.2,

OR

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

GO TO Section 5.3.
5.2 Calibration

NOTE - Figure 1, Figure 2, and Figure 3 display adjustment locations.

5.2.1 APPLY Zero PSI pressure to input of differential pressure indicator.

5.2.2 SET pointer at Zero on scale by holding hexagon hub fixed with ¼ in. wrench and slipping (moving) the pointer tip to Zero with fingers (see Figure 2).

5.2.3 APPLY input pressure, which corresponds to “fullscale” per data sheet.

5.2.4 ADJUST range arm with range adjustment screw so pointer reads 100%.

5.2.5 REPEAT Steps 5.2.1 through 5.2.4 until output is within tolerance per data sheet.

5.2.6 APPLY 50% pressure.

5.2.7 IF linearity adjustment is required, LOOSEN drive arm to shift pointer in direction of error approximately 10:1 AND RETIGHTEN drive arm (see Figure 3).

5.2.8 IF gear in movement reaches limit of travel due to linearity adjustment, SLOPE gear approximately 5° from 37.5° to 43°:

5.2.8.1 RETEST at 50% and 100% differential pressures.

5.2.8.2 ADJUST linkage until pointer readings are acceptable.

5.2.9 RE-SET Zero AND CHECK Span.

5.2.10 TIGHTEN all screws AND

TEST pointer tightness by moving pointer (by finger) from 0% to 50% then releasing.

5.2.11 CONFIRM pointer returns to Zero.

5.2.12 IF pointer did not return to Zero, TIGHTEN hub AND REPEAT Steps 5.2.9 through 5.2.11.
5.2 Calibration (Cont.)

5.2.13 SET stops to prevent pointer from striking snubbers on scale.

5.2.14 VARY input per data sheet AND

RECORD as-left values on data sheet.

5.3 Restoration

5.3.1 RESTORE to as-found conditions.

5.3.2 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.
Attachment 1 - 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. Return to a RMA.
5. Disassemble the Water Trap.
6. Allow trap to dry overnight.
7. Survey disassembled trap components in accordance with Radcon survey plan.
8. If the Water Trap can be released return it to tool crib.
9. 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 1 - - 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 2 – 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 6
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 5
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.
Figure 1 - Adjustment Locations

RANGE ADJUST SCREW
SPAN ADJUSTMENT

STOP BRACKET

STARTING ARM ASSEMBLY

FULL SCALE

POINTER STOPS

POINTER

ZERO

TORQUE TUBE SHAFT

LINK ASSEMBLY

MOVEMENT ASSEMBLY
Figure 2 - “Slipping” Pointer
Figure 3 - Range/Linearity Adjustment (50% DP)
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 5 – Negative Pressure Connection
Figure 6 – Positive Pressure