Calibrate Consilium Pump Controller

Tank Farm Maintenance Procedure

USQ # Routine Maintenance

<table>
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<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
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<tr>
<td>E-1</td>
<td>10/11/2018</td>
<td>Maintenance Request</td>
<td>Added Steps 5.1.1, 5.1.7, 5.1.8, 5.1.9, 5.1.10. Modified Steps 5.1.2, 5.1.4, 5.1.5, 5.4.2, 5.4.3, 5.4.4, 5.4.5, and 5.4.6.</td>
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<tr>
<td>E-0</td>
<td>03/16/2016</td>
<td>Periodic Review</td>
<td>Add Special Instructions prior to Section 5.1. Struck Step 5.1.1, Reword Steps 5.1.5, 5.4.3, 4th bullet under 5.6.2.</td>
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<tr>
<td>D-2</td>
<td>03/06/2013</td>
<td>Maintenance request due to incorrect nomenclature for AZ301.</td>
<td>Updated drawing number and step to reflect the correct area location (AC301) and updated a note to a step.</td>
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<td>D-1</td>
<td>01/22/2013</td>
<td>DOE Standard</td>
<td>Replaced references to document TFC-ESHQ-S-STD-03, Electrical Safety with DOE–0359, Hanford Site Electrical Safety Program.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions to calibrate Consilium pump controller.

1.2 Scope

This procedure involves calibration of Consilium pump controller.

2.0 INFORMATION

NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Job specific protective equipment requirements should be addressed during the Pre-job brief and be in accordance with TFC-ESHQ-S_IS-C-02.

3.1.2 If working around live circuits, extreme caution should be used. Failure to follow electrical safety practices as outlined in DOE-0359, Hanford Site Electrical Safety Program could result in serious injury or death.

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

3.2 Radiation and Contamination Control

Work in radiological areas will be performed using a Radiological Work Permit following review by Radiological Control per the ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03.
4.0 PREREQUISITES

4.1 Special Tools, Equipment and Supplies

The following supplies may be needed to perform this procedure:

- Calibrated current source
- Calibrated current measurement instrument.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- CVI 50289, sh. 13, Instruction Manual and Detailed Product Specification Duplex Pump Control System Model Numbers CPC-2 and CPC-2A
- H-14-105764, sh. 2, P&ID AZ-PC-SP-1 Condensate Distribution System
- H-14-105770, sh. 9, Electrical AZ301-COND-ENCL-101 Layout
- H-14-105772, sh. 1, Electrical Pump Control Elementary Diagram
- H-14-105772, sh. 4, Electrical Termination Diagram Secondary Containment.

4.3 Field Preparation

4.3.1 NOTIFY operations to remove equipment from service prior to testing.
5.0 PROCEDURE

Special Instructions

If any step is not required for procedure completion, record “N/A” in the applicable space(s) on the Data Sheet and document the justification in the Data Sheet’s Comments/Remarks section.

5.1 Obtain As-Found Data

5.1.1 RECORD position of AZ301-COND-HS-106 (located at AZ301-COND-ENCL-101)

5.1.2 IF not already off, TURN AZ301-COND-HS-106 to the OFF position.

5.1.3 RECORD mA source MTE number and calibration due on Data Sheet.

5.1.4 DISCONNECT analog output leads Enraf field terminal TB1: (see Figure 4)
- TB1-1 (Red)
- TB1-2 (Black).

5.1.5 CONNECT mA source to disconnected wires.

5.1.6 APPLY input values per Data Sheet AND RECORD the following screen display As-Found values on Data Sheet:
- LIC-101
- 241-AZ-271.

5.1.7 SLOWLY VARY input signal through the P1 channel interlock LO Set-points until P1 channel “LO” LED transitions from off to on AND

5.1.8 RECORD mA value in As-Found LIC-101 P1 interlock “LO pump ON” data sheet. See Figure 3 for location of LEDs.

5.1.9 SLOWLY VARY input signal through the P1 channel interlock HI Set-points until P1 channel “HI” LED transition from off to on AND

RECORD mA value in As-Found LIC-101 P1 interlock “LO pump ON” data sheet.

5.1.10 IF 241-AZ-271 is out of tolerance, CONTACT FWS AND

PROCEED to Section 5.4

5.1.11 IF LIC-101 Display and Pump Interlock are within tolerance, PROCEED to Section 5.3.

5.1.12 IF LIC-101 Display and Pump Interlock are NOT within tolerance, PROCEED to Section 5.2
5.2 Input Span Adjust

5.2.1 REMOVE 7 Amp fuse (F2) to Power Unit Off.

5.2.2 PRESS AND HOLD “Reset”/”Mute” buttons AND SIMULTANEOUSLY REINSTALL 7 Amp fuse (F2) to power up unit.

5.2.3 HOLD Reset/Mute buttons at least 2 seconds THEN RELEASE Reset/Mute buttons.

5.2.4 PRESS AND HOLD “Test” button approximately 2 seconds, OR UNTIL display LEDs turn on (Unit is now in external gain cal mode).

5.2.5 APPLY input signal per the Data Sheet.

5.2.6 ADJUST HI Setpoint knob to desired level.

5.2.7 PRESS “Alarm Sel” button until the “Alarm Sel” lamp comes on (approx. 8 sec) THEN RELEASE “Alarm Sel” button.

5.2.8 APPLY input values per Data Sheet AND RECORD the following screen display As-Left values on Data Sheet:
- LIC-101
- 241-AZ-271.
5.3 P1 Channel Interlock Setpoints Calibration

5.3.1 APPLY input signal corresponding to HI P1 channel interlock setpoint per the Data Sheet.

5.3.2 PRESS AND HOLD “SEL” button.

5.3.3 WHEN “SEL” LED lights (approximately 15 seconds), ADJUST HI setpoint potentiometer on front panel of pump controller until LED is ON.

5.3.3.1 RECORD in As-Left Section of the Data Sheet.

5.3.4 RELEASE “SEL” button.

5.3.5 APPLY input signal corresponding to LO P1 channel interlock setpoint per the Data Sheet.

5.3.6 PRESS AND HOLD “SEL” button.

5.3.7 WHEN “SEL” LED lights (approximately 15 seconds), ADJUST LO setpoint potentiometer on front panel of pump controller until LED is ON

5.3.7.1 RECORD in As-Left Section of the Data Sheet.

5.3.8 RELEASE “SEL” button.

5.4 Restoration

5.4.1 NOTIFY FWS testing is complete.

5.4.2 DISCONNECT test equipment.

5.4.3 RE-TERMINATE Enraf field terminal TB1.

5.4.4 CHECK equipment system restoration by observing indications are consistent with expected conditions.

5.4.5 TURN AZ301-COND-HS-106 to the “As Found” position in Step 5.1.1.

5.4.6 IF all as-left values are in tolerance, NOTIFY Operations that testing is complete and system may be returned to desired configuration.
5.5 Acceptance Criteria

Acceptance Criteria has been met when Steps in this procedure have been satisfactorily performed and As-Left values meet the specifications and tolerance(s) per the Data Sheet.

5.6 Review

5.6.1 NOTIFY FWS testing 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

The performance of this procedure generates no records. However, PM Data Sheets associated with the procedure, are records and are maintained in the work package as record material.

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 – Connector J1

**CONNECTOR J1**

<table>
<thead>
<tr>
<th>PIN NO.</th>
<th>FUNCTION</th>
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<tbody>
<tr>
<td>1</td>
<td>GROUND (level sensor - input)</td>
</tr>
<tr>
<td>2</td>
<td>LEVEL SENSOR INPUT +</td>
</tr>
<tr>
<td>3</td>
<td>DISABLE FLOATS ground this pin if no floats are used</td>
</tr>
<tr>
<td>4</td>
<td>DISABLE PUMP 1 disable pump 1 if shorted to ground</td>
</tr>
<tr>
<td>5</td>
<td>DISABLE PUMP 2 disable pump 2 if shorted to ground</td>
</tr>
<tr>
<td>6</td>
<td>PUMPS OFF FLOAT SWITCH</td>
</tr>
<tr>
<td>7</td>
<td>LEAD PUMP FLOAT SWITCH</td>
</tr>
<tr>
<td>8</td>
<td>LAG PUMP FLOAT SWITCH</td>
</tr>
<tr>
<td>9</td>
<td>LOW ALARM FLOAT SWITCH (if not used then short to ground.)</td>
</tr>
<tr>
<td>10</td>
<td>LEVEL OUTPUT + (4-20 mA current loop out +)</td>
</tr>
<tr>
<td>11</td>
<td>GROUND (4-20 mA current loop out -)</td>
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<td>12</td>
<td>HIGH ALARM FLOAT SWITCH</td>
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<td>13</td>
<td>GROUND</td>
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<tr>
<td>14</td>
<td>not used</td>
</tr>
<tr>
<td>15</td>
<td>not used</td>
</tr>
<tr>
<td>16</td>
<td>GROUND</td>
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Figure 2 – CPC-2 Wiring Diagram
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Figure 3 – Duplex Pump Controller Faceplate
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Figure 4 – Enraf Field Terminal TB1