Table of Contents

1.0 PURPOSE .......................................................................................................................... 3
  1.1 Purpose.................................................................................................................................. 3
  1.2 Scope..................................................................................................................................... 3

2.0 INFORMATION.................................................................................................................... 3
  2.1 Terms and Definitions........................................................................................................ 3

3.0 PRECAUTIONS AND LIMITATIONS.............................................................................. 3
  3.1 Radiation and Contamination Control ....................................................................... 3
  3.2 Environmental Compliance ......................................................................................... 4
  3.3 Limits.................................................................................................................................. 4

4.0 PREREQUISITES ................................................................................................................. 5
  4.1 Special Tools, Equipment, and Supplies.................................................................. 5
  4.2 Performance Documents ............................................................................................. 5
  4.3 Field Preparation............................................................................................................ 5

5.0 PROCEDURE....................................................................................................................... 6
  5.1 Disable Transmitter Software Interlocks ..................................................................... 6
  5.2 Disable De-Entrainer Transmitters Object Errors....................................................... 8

Type CONTINUOUS  Document No. 6-PCD-613  Rev/Mod F-4  Release Date 10/12/2017  Page 1 of 30
AW HVAC Foundation Fieldbus Pressure Transmitters

5.3 Transmitter Test ........................................................................................................ 9
5.4 Calibrate Transmitter .................................................................................................. 10

Table 1 - FF Network to EIN Tag Name Correlation ......................................................... 12
5.5 Transmitter Replacement ............................................................................................ 16

Table 2 - FF Network to EIN Tag Name Correlation ......................................................... 18
5.6 Fault Resolution .......................................................................................................... 21
5.7 Re-Enable Transmitters Identified for Field Service .................................................... 22
5.8 Restore Transmitter Software Interlocks .................................................................. 23
5.9 Restoration ................................................................................................................ 25
5.10 Records .................................................................................................................. 25

Data Sheet 1 - Information Record Sheet .......................................................................... 26

Figure 1 - Transmitter Connection ................................................................................ 27

Table 3 - AW HVAC FF Transmitter Interlock/Alarm Management ................................. 28
1.0 PURPOSE

1.1 Purpose

To provide instructions for calibrating Yokogawa Instruments Pressure Transmitters with Foundation Fieldbus (FF) communication protocol, minor troubleshooting and component replacement.

1.2 Scope

This procedure applies to Yokogawa Instruments Pressure Transmitters with Foundation Fieldbus communication protocol, in AW Farm Primary Ventilation Systems. This includes tank pressure transmitters and De-Entrainer differential pressure transmitters which communicate to Tank Farm MCS and AW Primary Ventilation PLCs via Fieldbus communication protocol.

The procedure covers calibration of transmitters, minor troubleshooting, and component replacement.

2.0 INFORMATION

2.1 Terms and Definitions

- DCS  Distributed Control System
- EIN  Equipment Identification Number
- FF  Foundation Fieldbus
- FFB  Foundation Fieldbus Builder
- HSE  High Speed Ethernet

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 TFC-ESHQ-RP_RWP-C-03, ALARA Work Planning.

3.1.2 The opening of any system or component within a Radiological Area requires presence of a Health Physics Technician to verify contamination control.
3.2 Environmental Compliance

3.2.1 Report all planned and unplanned exhauster shutdowns, problems with abatement control equipment and required stack monitoring to the Central Shift Office to be evaluated for reporting purposes per procedure TF-REC-001, "Response to Environmental Condition".

3.2.2 When disconnecting, breaching or opening systems or system components that are currently or previously connected to waste tanks or waste transfer systems:

- Pre- and Post-Job radiological surveys are required
- Follow the RWP for additional radiological control requirements.

3.2.3 Waste generated during the performance of this procedure should be managed per TO-100-052 or approved Waste Planning Checklist.

3.3 Limits

HNF-SD-WM-TSR-006, Tank Farms Technical Safety Requirements

- LCO 3.1, DST Primary Tank Ventilation Systems
- LCO 3.4, DST Induced Gas Release Event Flammable Gas Control
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:
- Variable pressure source (as required per Data Sheet)
- Calibrated digital manometer capable of Data Sheet range.

4.2 Performance Documents

The following document may be needed to perform this procedure:
- Yokogawa Model EJA Fieldbus Communication Type Instruction Manual
- TO-100-052 Perform Waste Generation Segregation Accumulation and Clean-up.

4.3 Field Preparation

4.3.1 Shift Manager/OE VERIFY that there are no ongoing transfers and no waste disturbing activities that requires this system to be OPERABLE. (LCO 3.4)

_________________________ / ______________________ / ______________________
Signature Print (First and Last) Date

Shift Manager /OE

4.3.2 NOTIFY Shift Manager to initiate time monitoring per LCO 3.1.A. (LCO 3.1)

4.3.3 REPORT all discrepancies to FWS immediately upon completion of this procedure AND RECORD in comment section of Work Record.

4.3.4 IF equipment is found out of service, IMMEDIATELY NOTIFY Shift Manager and OE.

4.3.5 IF system will be shut down or modified, CONFIRM Shift Manager has been notified of possible expected alarms which may be caused by performance of this procedure.

NOTE - Engineering level access to Tank Farm MCS is required to either calibrate or replace a transmitter.

4.3.6 IF a transmitter is to be either calibrated or replaced, CONTACT Production Operations Process and Control System (P&CS) engineering AND REQUEST assistance.
5.0 PROCEDURE

NOTE - Sections may be performed as required, or at discretion of FLM/FWS.

- There are multiple ways to navigate through the HMI screens to get to the same desired screens.

- Disabling one group of transmitters at a time, completing required tests, and re-enabling the group transmitters is preferable to disabling the entire farm at once.
  (i.e. each DST tank as a group, each train’s De-Entrainers, etc.)

- The faceplate “APPLY” button will need to be pressed for each command entered.

5.1 Disable Transmitter Software Interlocks

NOTE - Any Tank Farm MCS (TFMCS) ABB 800xA HMI with FF Builder installed will work for performing this procedure.

5.1.1 USING Cal technician password, LOGIN TFMCS ABB 800xA HMI.

NOTE - If field service activities involve triggering a DST Narrow Range Transmitter Low – Low Pressure (Interlock 19), exhauster will shut down if associated ABB 800xA interlocks are not inhibited.

5.1.2 USE Table 3 as a tool to help track/manage each AW HVAC FF transmitter’s interlocks when working to this procedure.

5.1.2.1 WHEN inhibiting interlocks and disabling alarms, PLACE an “X” or “✓” in the “Maintenance” column cell of Table 3 that is associated with each action performed.

5.1.3 PERFORM Steps 5.1.3.1 through 5.1.3.8 for each DST transmitter identified for field service for the running exhauster train.

5.1.3.1 NAVIGATE to graphic display EV-02-03 “AW Farm – Tank Pressure Transmitters”.

5.1.3.2 For “Data Source” SELECT running train.

5.1.3.3 SELECT transmitter tag to open the transmitter’s reduced faceplate.

5.1.3.4 CLICK middle button (..) to expand faceplate.
5.1 Disable Transmitter Software Interlocks (Cont.)

5.1.3.5 SELECT “PCmd/Ilock” tab on transmitter faceplate.

5.1.3.6 CHECK “Inhibit LL” checkbox on “PCmd/Ilock” faceplate tab.

5.1.3.7 SELECT “A/E Obj” tab on the transmitter faceplate.

5.1.3.8 UNCHECK “Enable Object Error Alarm/Event” checkbox on “A/E Obj” faceplate tab.

5.1.4 IF a transmitter does not require repair or replacement, GO TO Section 5.3.

5.1.5 IF replacing a transmitter, GO TO Section 5.5.

5.1.6 IF replacing components or minor troubleshooting, GO TO Section 5.6.
5.2 Disable De-Entrainer Transmitters Object Errors

5.2.1 **PERFORM** Steps 5.2.1.1 through 5.2.1.6 for each DST De-Entrainer transmitter identified for field service for both A and B trains.

5.2.1.1 **NAVIGATE** to graphic display EV-02-02 “AW De-Entrainer Process Details”.

5.2.1.2 For “Data Source” **SELECT** running train.

5.2.1.3 **SELECT** transmitter tag to open the transmitter’s reduced faceplate.

5.2.1.4 **CLICK** middle button (..) to expand faceplate.

5.2.1.5 **SELECT** “A/E Obj” tab on transmitter faceplate.

5.2.1.6 **UNCHECK** “Enable Object Error Alarm/Event” checkbox on “A/E Obj” faceplate tab.

5.2.2 **IF** a transmitter does not require repair or replacement, **GO TO** Section 5.3.

5.2.3 **IF** replacing a transmitter, **GO TO** Section 5.5.

5.2.4 **IF** replacing components or minor troubleshooting, **GO TO** Section 5.6.
5.3 Transmitter Test

5.3.1 PERFORM Steps 5.3.1.1 through 5.3.1.6 for each HVAC FF transmitter identified for field service.

5.3.1.1 VALVE-OUT transmitter to be calibrated.

5.3.1.2 CONNECT test equipment per Figure 1.

NOTE - When applying Data Sheet input values it should be done slowly to allow sufficient response time.

- Readings are taken from both the transmitter’s local display and from the HMI’s EV-02-03 “AW Farm – Tank Pressure Transmitters” and EV-02-02 “AW De-Entrainer Process Details” graphic displays.

5.3.1.3 APPLY input per Data Sheet AND

RECORD As-Found HMI graphic display and local readout indications on the Data Sheet.

5.3.1.4 IF As-Found readings are out of tolerance, GO TO Step 5.4.1.

5.3.1.5 RE-PERFORM Steps 5.3.1.1 through 5.3.1.4 for the next HVAC FF transmitter identified for field service, until all transmitter(s) are complete.

5.3.1.6 IF As-Found readings are within tolerance, RECORD As-Found indication in As-Left column of Data Sheet.

5.3.1.7 GO TO Section 5.7 to re-enable a transmitter.
5.4 Calibrate Transmitter

NOTE - Engineering level access to Tank Farm MCS is required to calibrate a transmitter.

5.4.1 IF a transmitter is to be calibrated, CONTACT Production Operations P&CS engineering AND REQUEST assistance. (This Step may be skipped if already performed in Section 4.3.)

5.4.2 LOGIN the Tank Farm MCS ABB 800xA HMI using Engineer credentials.

5.4.3 OPEN Engineering Workplace.

NOTE - Steps 5.4.4 through 5.4.19 provide recommended path for completion of this action.

5.4.4 NAVIGATE to "Control Structure".

5.4.5 SELECT AND EXPAND "Root, Domain" object.

5.4.6 SELECT "Tank_Farm_HSE" object.

5.4.7 SELECT “FF Management” aspect from the "Aspects of Tank_Farm_HSE" list.

5.4.8 RIGHT CLICK AND SELECT "Main View" from popup menu.

5.4.9 SELECT "Open Project" button to start Foundation Fieldbus Builder (FFB) this opens up FF project associated with "Tank_Farm_HSE" subnet.

5.4.10 USING "FF Network" navigation pane on left side of FFB, SELECT AND EXPAND "FF_Net".
5.4 Calibrate Transmitter (Cont.)

5.4.11 SELECT AND EXPAND "Tank_Farm_HSE" High Speed Ethernet (HSE) Subnet.

5.4.12 SELECT "AW241-YYC-LD800" ABB LD800HSE device.

5.4.13 RIGHT CLICK AND SELECT "Reserve nodes recursively" from popup menu.

5.4.14 SELECT "AW241-YYC-360-CI" HSE Host CI860 device.

5.4.15 RIGHT CLICK AND SELECT "Reserve nodes" from popup menu.

5.4.16 SELECT "AW241-YYC-460-CI" HSE Host CI860 device.

5.4.17 RIGHT CLICK AND SELECT "Reserve nodes" from popup menu.

5.4.18 SELECT "FF Object editor" from FFB's menu buttons AND SELECT "Commissioning" from drop down menu.

5.4.19 USING "FF Network" navigation pane on the left side of FFB, SELECT AND EXPAND the following:

- "AW-HH-11" H1 Link device
- "AW-HH-13" H1 Link device
- "AW-HH-16" H1 Link device
- "AW-ENCL-114" H1 Link device.
5.4 Calibrate Transmitter (Cont.)

NOTE - When identifying the transmitter scheduled for calibration within the “FF Network” navigation pane, the transmitter tag name will not match the full EIN name.

5.4.20 USING tag naming convention shown in Table 1, IDENTIFY correlation between FFB tag name and full EIN tag name.

Table 1 - FF Network to EIN Tag Name Correlation

<table>
<thead>
<tr>
<th>Full EIN Tag Name (FFSSS-SYS-III-xxx)</th>
<th>FF</th>
<th>SSS</th>
<th>SYS</th>
<th>III</th>
<th>xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Name</td>
<td>Closest physical structure number</td>
<td>System</td>
<td>Instrument Type</td>
<td>Sequential random numbers</td>
<td></td>
</tr>
<tr>
<td>e.g. AW</td>
<td>e.g. 271, 281, 296, 101, etc.</td>
<td>e.g. VTP, WT, IA, etc.</td>
<td>e.g. PI, PIT, TI, LDE, etc.</td>
<td>e.g. 101, 102, 145, 356, etc.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FFB Tag Name (FFTTT-III-xxx)</th>
<th>FF</th>
<th>TTT</th>
<th>III</th>
<th>xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Name</td>
<td>Tank Number</td>
<td>Instrument Type</td>
<td>Loop Number</td>
<td></td>
</tr>
<tr>
<td>e.g. AW</td>
<td>e.g. 101, 102, 105, etc.</td>
<td>(e.g. PDI, LI, TI, etc. Notice there is no “T” designation “PDIT or LIT, etc.”)</td>
<td>e.g. 221, 242, 260, etc.</td>
<td></td>
</tr>
</tbody>
</table>

5.4.21 SELECT FF transmitter identified for calibration.

5.4.22 SELECT AND RIGHT CLICK Block ID “Transducer Block 1” from right hand pane of FFB.

5.4.23 SELECT “Set Block Mode…” from popup menu.
5.4 Calibrate Transmitter (Cont.)

NOTE - A known bug exists with FFB that reverts the mode selection back to its original mode if “Enter” key is not pressed in very close succession to mode selected.

5.4.24 CHECK box “Out of Service (O/S)” from “Set Block Target Mode” window AND IMMEDIATELY PRESS “ENTER” key.

5.4.25 CONFIRM “Automatic (Auto)” checkbox is cleared and “Out of Service (O/S)” box is checked.

5.4.25.1 IF unable to achieve intended results (i.e. “Out of Service (O/S)” checkbox is not cleared and “Automatic (Auto)” box is not checked.), REPEAT Steps 5.4.24 and 5.4.25 up to three times. OR

5.4.25.2 IF Steps 5.4.24 and 5.4.25 have been repeated and intended results have still not been achieved, NOTIFY FWS for resolution.

   a. RECORD directions on Data Sheet 1.
   b. PROCEED as directed.

5.4.26 SELECT AND RIGHT CLICK Block ID “Transducer Block 1” from right hand pane of FFB.

5.4.27 SELECT “Properties…” from popup menu.

5.4.28 SELECT AND EXPAND “Advanced” from left hand pane of new properties window.

5.4.29 SELECT “Properties”.
5.4 Calibrate Transmitter (Cont.)

5.4.30 USING vertical and horizontal scroll bars, NAVIGATE to parameters “TRIM_MODE” from the right pane.

5.4.31 SET “TRIM_MODE” parameter to “Trim Enable” AND SELECT the “apply” button for the parameter change.

5.4.32 ISOLATE transmitter for calibration.

5.4.33 CONFIRM “CAL_UNIT” parameter value is set to In. H₂O.

5.4.33.1 IF “CAL_UNIT” parameter value differs, NOTIFY Production Operations P&CS group.

5.4.34 APPLY pressure per Data Sheet (Input Range Low).

5.4.35 USING right pane and vertical and horizontal scroll bars, NAVIGATE to parameter “CAL_POINT_LO”.

5.4.36 APPLY pressure per Data Sheet (Input Range Low).

5.4.37 ENTER (Input Range Low) per Data Sheet as “CAL_POINT_LO”, AND SELECT the “apply” button for the parameter change.

5.4.38 USING right pane and vertical and horizontal scroll bars, NAVIGATE to parameter “CAL_POINT_HI”.

5.4.39 APPLY pressure per Data Sheet (Input Range High).

5.4.40 ENTER (Input Range High) per Data Sheet as “CAL_POINT_HI” AND SELECT the “apply” button for the parameter change.

5.4.40.1 REMOVE pressure from transmitter.

5.4.41 USING the vertical and horizontal scroll bars, NAVIGATE to parameter “TRIM_MODE” from the right pane.

5.4.42 SET “TRIM_MODE” parameter to “Trim Disable” AND SELECT the “apply” button for the parameter change.
**5.4 Calibrate Transmitter (Cont.)**

5.4.43 SELECT “OK” button on the “Save To Configuration?” dialog window.

5.4.44 SELECT FF transmitter identified for calibration.

5.4.45 SELECT AND RIGHT CLICK Block ID “Transducer Block 1” from right had pane of FFB.

5.4.46 SELECT “Set Block Mode…” from popup menu.

NOTE - A known bug exists with FFB that reverts the mode selection back to its original mode if “Enter” key is not pressed in very close succession to the mode selected.

5.4.47 CHECK box “Automatic (Auto)” from “Set Block Target Mode” window AND IMMEDIATELY PRESS “ENTER” key.

5.4.48 CONFIRM “Out of Service (O/S)” checkbox is cleared and “Automatic (Auto)” box is checked.

5.4.48.1 IF unable to achieve intended results (i.e. “Out of Service (O/S)” checkbox is not cleared and “Automatic (Auto)” box is not checked.), REPEAT Steps 5.4.47 and 5.4.48 up to three times. OR

5.4.48.2 IF Steps 5.4.47 and 5.4.48 have been repeated and intended results have still not been achieved, NOTIFY FWS for resolution.

a. RECORD directions on Data Sheet 1.

b. PROCEED as directed.

5.4.49 SELECT “FF Object editor” from FFB’s menu buttons.

5.4.50 SELECT “Save” from drop down menu.

5.4.51 SELECT “FF Object editor” from Foundation Fieldbus Builder menu.

5.4.52 SELECT “Exit” from drop down menu to exit application.

5.4.53 GO TO Section 5.3 Transmitter Test.
5.5 Transmitter Replacement

NOTE - Engineering level access to Tank Farm MCS is required to replace a transmitter.

5.5.1 IF a transmitter is to be replaced, CONTACT Production Operations P&CS engineering AND REQUEST assistance. (This Step may be skipped if already performed in Section 4.3.)

5.5.2 DISCONNECT AND REMOVE old transmitter.

5.5.3 ENSURE waste generated is managed per TO-100-052 or approved Waste Planning Checklist.

5.5.4 INSTALL AND CONNECT new transmitter.

5.5.5 ENERGIZE new transmitter.

5.5.6 USING Engineer credentials, LOGIN Tank Farm MCS ABB 800xA HMI.

5.5.7 OPEN Engineering Workplace.

NOTE - Steps 5.5.8 through 5.5.24 provide the recommended path for completion of this action.

5.5.8 IF directed by engineering to use shortcuts or alternative navigation, DOCUMENT shortcuts and/or alternative navigation used on Data Sheet 1.

5.5.9 NAVIGATE to “Control Structure”.

5.5.10 SELECT AND EXPAND “Root, Domain” object.

5.5.11 SELECT “Tank_Farm_HSE” object.

5.5.12 SELECT “FF Management” aspect from “Aspects of Tank_Farm_HSE” list.

5.5.13 RIGHT CLICK AND SELECT “Main View” from popup menu.

5.5.14 SELECT “Open Project” button to start FFB this opens up FF project associated with “Tank_Farm_HSE” subnet.
5.5 Transmitter Replacement (Cont.)

5.5.15 USING “FF Network” navigation pane on left side of FFB, SELECT AND EXPAND “FF_Net”.

5.5.16 SELECT AND EXPAND “Tank_Farm_HSE” High Speed Ethernet (HSE) Subnet.

5.5.17 SELECT “AW241-YYC-LD800” ABB LD800HSE device.

5.5.18 RIGHT CLICK AND SELECT “Reserve nodes recursively” from popup menu.

5.5.19 SELECT “AW241-YYC-360-CI” HSE Host CI860 device.

5.5.20 RIGHT CLICK AND SELECT “Reserve nodes” from popup menu.

5.5.21 SELECT “AW241-YYC-460-CI” HSE Host CI860 device.

5.5.22 RIGHT CLICK AND SELECT “Reserve nodes” from popup menu.

5.5.23 SELECT “FF Object editor” from FFB’s menu buttons AND SELECT “Commissioning” from drop down menu.

5.5.24 USING "FF Network" navigation pane on left side of FFB, SELECT AND EXPAND the following:

- “AW-HH-11” H1 Link device
- “AW-HH-13” H1 Link device
- “AW-HH-16” H1 Link device
- “AW-ENCL-114” H1 Link device.
5.5 Transmitter Replacement (Cont.)

NOTE - When identifying the transmitter scheduled for calibration within the “FF Network” navigation pane, the transmitter tag name will not match the full EIN name.

5.5.25 USING the tag naming convention shown in Table 2, IDENTIFY the correlation between the FFB tag name and the full EIN tag name.

**Table 2 - FF Network to EIN Tag Name Correlation**

<table>
<thead>
<tr>
<th>Full EIN Tag Name (FFSSS-SYS-III-xxx)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FF</td>
<td>SSS</td>
</tr>
<tr>
<td>Farm Name</td>
<td>Closest physical structure number</td>
</tr>
<tr>
<td>e.g. AW</td>
<td>e.g. 271, 281, 296, 101, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FFB Tag Name (FFTTT-III-xxx)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FF</td>
<td>TTT</td>
</tr>
<tr>
<td>Farm Name</td>
<td>Tank Number</td>
</tr>
<tr>
<td>e.g. AW</td>
<td>e.g. 101, 102, 105, etc.</td>
</tr>
</tbody>
</table>

5.5.26 SELECT AND RIGHT CLICK H1 Link that contains device scheduled for replaced.

5.5.27 SELECT “object” AND

SELECT “Live List” from slide out menu from drop down list.
5.5 Transmitter Replacement (Cont.)

NOTE - The new window is composed of two panes. The pane on the left contains the devices coded in FFB. The pane on the right contains the physical devices recognized as being connected in the field.

- It may be necessary to disconnect and reconnect the newly installed field device while the Production Operations P&CS engineer monitors the “Live List” to identify the actual device that was scheduled for replacement.

- This action assigns new field device name and address defined by software.

5.5.28 SELECT AND DRAG device who’s “PD Tag” matches vendor paperwork for newly installed transmitter or device identified by Production Operations P&CS engineer over to left hand pane device which was scheduled for replacement from right hand pane.

5.5.29 SELECT the “OK” button on the dialog window which opens when performing the action in Step 5.5.30.

5.5.30 CONFIRM address and name assignment action completes successfully with no errors. “Address”, “PD Tag”, “Device Type”, and “Device ID”, of device scheduled for replacement on left hand pane should now match device on right hand pane.

5.5.30.1 IF errors occur, CONSULT with Production Operations P&CS engineer to identify and resolve problem.

5.5.31 RECORD “Device ID” from the vendor in the work record.

5.5.32 SELECT “Close” button.

5.5.33 SELECT AND RIGHT CLICK device scheduled for replacement from “FF Network” navigation pane on the left side of FFB.

5.5.34 SELECT “Object” AND

SELECT “Online Dialog…” from slide out menu from pull down menu.

5.5.35 SELECT “Download to device” tab from new window.

5.5.36 ENSURE “Incremental download” is selected from “Device Configuration Download” group.
5.5 Transmitter Replacement (Cont.)

5.5.37 ENSURE “Changed parameters” is selected from the “Block Parameters Download” group.

5.5.38 ENSURE Stop cyclic communication during download is unchecked.

5.5.39 SELECT “Start” button.

5.5.40 SELECT “Continue” from new dialog window,

5.5.41 CONFIRM download completes with no errors from new window. This is indicated by “Total error count:” field containing a value of zero (0).

5.5.41.1 IF errors occur, CONSULT with Production Operations P&CS engineer to identify and resolve the problem.

5.5.42 SELECT “Close” when download has completed.

5.5.43 SELECT “Close” on Online Dialog window.

5.5.44 CONFIRM device scheduled for replacement now has a green “✔” from the “FF Network” navigation pane on left side of FFB.

5.5.45 OPEN Operator Workplace to transmitter that was scheduled for replacement.

5.5.46 CONFIRM transmitter is not indicating Bad Quality and is displaying an analog value.

5.5.47 RETURN to Engineering FFB screen.

5.5.48 SELECT “FF Object editor” from FFB’s menu buttons AND

SELECT “Save” from drop down menu.

5.5.49 SELECT “FF Object editor” from FFB’s menu buttons AND

SELECT “Exit” from drop down menu.

5.5.50 VERIFY current project is saved on Work Record.

5.5.51 GO TO Section 5.4, Calibrate Transmitter.
5.6 Fault Resolution

5.6.1 IF Transmitter Display module requires replacement, PERFORM the following:

5.6.1.1 OBTAIN Bill of Material (BOM) and replacement module.

5.6.1.2 REPLACE defective display module with new unit.

5.6.2 IF HMI display reads Bad data Quality (i.e. “Communication Failure”), PERFORM the following:

5.6.2.1 LIFT 24 VDC lead at Transmitter for several seconds AND RE-LAND lead.

5.6.2.2 OBSERVE HMI display to check if “Fail” clears (this may take several minutes).

5.6.2.3 IF “Fail” does not clear, NOTIFY FWS for resolution.

5.6.3 IF loss of power is apparent, CHECK the fuse as follows:

5.6.3.1 PLACE DMM across fuse and look for voltage reading due to open circuit

OR

REMOVE fuse and check fuse for continuity.

5.6.3.2 IF fuse is open, REPLACE with like-for-like fuse.

5.6.3.3 IF fuse is good, CHECK power side of fuse holder terminal for 24 VDC AND NOTIFY FWS for resolution.
5.7 Re-Enable Transmitters Identified for Field Service

5.7.1 ENSURE all test equipment is disconnected and removed.

5.7.2 VALVE-IN transmitter AND RETURN to service per Section 5.8.
5.8 Restore Transmitter Software Interlocks

5.8.1 WHEN working to this procedure, USE Table 3 as a tool to help enable each AW HVAC FF transmitter’s interlocks.

5.8.2 IF Re-Enabled transmitter is an AW DST transmitter, GO TO Step 5.8.4 to restore interlocks.

5.8.3 IF Re-Enabled transmitter is an AW De-Entrainer transmitter, GO TO Step 5.8.14 to restore Object Error alarm.

DST Transmitters

NOTE - The following Steps 5.8.4 through 5.8.13 enable the associated interlocks and alarms for each AW DST transmitter identified for field service for the running Trains.

5.8.4 NAVIGATE to graphic display EV-02-03 “AW Farm – Tank Pressure Transmitters”.

5.8.5 ACKNOWLEDGE all AW A/B alarms generated by the procedure.

5.8.6 For “Data Source” SELECT the running train.

5.8.7 SELECT transmitter tag to open the transmitter’s reduced faceplate.

5.8.8 CLICK middle button (..) to expand faceplate.

5.8.9 SELECT the “PCmd/Ilock” tab on the transmitter faceplate.

5.8.10 UNCHECK the “Inhibit LL” checkbox on the “PCmd/Ilock” faceplate tab.

5.8.11 SELECT the “A/E Obj” tab on the transmitter faceplate.

5.8.12 CHECK the “Enable Object Error Alarm/Event” checkbox on the “A/E Obj” faceplate tab.

5.8.13 RE-PERFORM Steps 5.8.4 through 5.8.12 for each AW DST transmitter identified as field work complete.
5.8 Restore Transmitter Software Interlocks (Cont.)

De-Entrainer Transmitters

NOTE - The following Steps 5.8.14 through 5.8.21 enable associated Object Error alarms for each AW De-Entrainer transmitters identified for field service for the running trains.

5.8.14 NAVIGATE to graphic display EV-02-02 “AW De-Entrainer Process Details”.

5.8.15 ACKNOWLEDGE all AW A/B alarms generated by the procedure.

5.8.16 For “Data Source” SELECT the running train.

5.8.17 SELECT transmitter tag to open the transmitter’s reduced faceplate.

5.8.18 CLICK middle button (..) to expand faceplate.

5.8.19 SELECT the “A/E Obj” tab on the transmitter faceplate.

5.8.20 CHECK the “Enable Object Error Alarm/Event” checkbox on the “A/E Obj” faceplate tab.

5.8.21 RE-PERFORM Steps 5.8.14 through 5.8.20 for each AW De-Entrainer transmitter identified for field service.
## 5.9 Restoration

5.9.1 **WHEN** all transmitters scheduled for service have been restored to service, **RECORD** results on Work Record.

5.9.2 **LOGOUT** at HMI.

5.9.3 **IF** transmitter is replaced, **CHECK** pressure readings from transmitter match readings from same tank.

5.9.4 **FORWARD** copy of Device ID to Engineering to update Component Index Form.

5.9.5 FWS **INFORM** responsible Shift Manager status of test.

5.9.6 **IF** testing passed, **NOTIFY** Shift Manager to stop time monitoring per LCO 3.1.A. (LCO 3.1)

5.9.7 **INFORM** Shift Manager and FWS test is complete and exhauster may be returned to operation.

5.9.8 **RECORD** in COMMENTS/REMARKS section of Data Sheet, work request number(s) of any work documents generated as a result of this procedure.

## 5.10 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.
<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Information</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FWS
Figure 1 - Transmitter Connection

If a pressure generator is used:

Low pressure side is open to atmosphere

If a pressure source and a manometer are combined:

High Pressure Side

Reference Pressure

Pressure Source

Connect to high pressure side for high pressure input and vent low pressure side to atmosphere.

Connect to low pressure side for low pressure and vent high pressure side to atmosphere.

Low pressure side

High Pressure Side

Reference Pressure

Digital Manometer
### Table 3 - AW HVAC FF Transmitter Interlock/Alarm Management

<table>
<thead>
<tr>
<th>Location</th>
<th>HMI Tag Name</th>
<th>Maintenance</th>
<th></th>
<th>Nominal Operation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Interlock Inhibit</td>
<td>OE Alarm Disabled</td>
<td>Interlock Active</td>
<td>OE Alarm Enable</td>
</tr>
<tr>
<td>AW-101</td>
<td>PDI-210</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-101</td>
<td>PDI-211</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-101</td>
<td>PDI-212</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-102</td>
<td>PDI-220</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-102</td>
<td>PDI-221</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-102</td>
<td>PDI-222</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-103</td>
<td>PDI-230</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-103</td>
<td>PDI-231</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-103</td>
<td>PDI-232</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Table 3 - AW HVAC FF Transmitter Interlock/Alarm Management (Cont.)

<table>
<thead>
<tr>
<th>Location</th>
<th>HMI Tag Name</th>
<th>Train</th>
<th>Maintenance</th>
<th>Nominal Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interlock Inhibit</td>
<td>OE Alarm Disabled</td>
</tr>
<tr>
<td>AW-104</td>
<td>PDI-240</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDI-241</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDI-242</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-105</td>
<td>PDI-250</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDI-251</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDI-252</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AW-106</td>
<td>PDI-260</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDI-261</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDI-262</td>
<td>A, B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 3 - AW HVAC FF Transmitter Interlock/Alarm Management (Cont.)

<table>
<thead>
<tr>
<th>Location</th>
<th>HMI Tag Name</th>
<th>Train</th>
<th>Maintenance</th>
<th>Nominal Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interlock Inhibit</td>
<td>OE Alarm Disabled</td>
</tr>
<tr>
<td>DE-005</td>
<td>PDI-152</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DE-006</td>
<td>PDI-162</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>