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Endress-Hauser FMI51 Level Transmitter Calibration

1.0 PURPOSE

1.1 Purpose

This procedure provides a method of calibrating Endress-Hauser FMI51 Level Transmitter.

1.2 Scope

This procedure applies to Endress-Hauser FMI51 Glycol level monitors installed in AP241-VTP A-Train and B-Train.

2.0 INFORMATION

2.1 General Information

2.1.1 For a 15 % level, this is 15 % x 0.16 mA which equals 0.024 mA. This must be added to the 4 mA to obtain the current value to be set: 0.024 mA + 4 mA = 4.024 mA.

2.1.2 Before carrying out empty and full calibration, the medium properties must be configured. If the medium is conductive and tends to form buildup, the "Buildup" operating mode must be selected.

2.1.3 Before and after the automatic proof test, it is essential to check whether the level value displayed corresponds to the actual level value. When the self-test is activated, the current output is set to 4 mA and follows a ramp function up to 22 mA. This test is completed after approx. 40 s.

2.1.4 After the self-test, the device automatically returns to the operating mode.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Level transmitter probe may be hot (120°F to 190°F). Leather gloves should be worn while removing level transmitter probe.

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

3.1.3 As per TVIS AP-001 Industrial Hygiene sampling and monitoring requirements for General Farm Entry are specified in Industrial Hygiene Sample Plan IHSP-EABO-11047. Industrial Hygiene sampling and monitoring requirements for Vapor Control Zone (VCZ) entry are specified in Industrial Hygiene Sample Plan IHSP-EABO-11048.

3.2 Equipment Safety

CAUTION - Failure to check all available Inhibit checkboxes for each transmitter selected can result in shutdown of a running exhauster.

3.3 Radiation and Contamination Control

3.3.1 Work in radiological areas will be performed using a Radiological Work Permit following screening and review by Radiological Control per the ALARA work planning procedure TFC-ESHQ-RP_RWP-C-03.

3.3.2 Radiological areas may be downposted based on survey results. Areas postings will be adjusted as changing conditions and work activities require.

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

3.4.1 Work conducted on potentially contaminated systems shall be accomplished in accordance with the following:

3.4.1.1 Radiological controls and monitoring shall be in accordance with the latest revision of HNF-5183.

3.4.1.2 Equipment with removable contamination and/or work with removable contamination will be contained per the latest revision of the Containment Selection guide, Attachment A, in TFC-ESHQ-RP_RWP-C-02.

3.4.1.3 Pre- and post-job surveys (smears) shall be taken.

4.0 PREREQUISITES

4.1 Performance Documents

- Endress Hauser Liquicap M FMI51 Operations Manual
- H-14-020103 Sheet 11 Ventilation Tank Primary System (VTP) A-Train O&M SYS P&ID
- H-14-020103 Sheet 12 Ventilation Tank Primary System (VTP) B-Train O&M SYS P&ID
5.0 PROCEDURE

NOTE - In normal operation, the function switch on the level transmitter must be set to position 1.

- The subsections within 5.0 can be worked independently, concurrently, or in parallel with other sections as directed by the FWS with those directions recorded on work record or Comments Section of Data Sheet.

- Interlocks not required on a non-running exhauster train.

5.1 Inhibit Alarms

5.1.1 NAVIGATE to Exhauster Process Details HMI display.

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

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

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

NOTE - The “PCmd/Ilock” faceplate tab Inhibit checkboxes vary from none to several depending on which transmitter is selected.

CAUTION

Failure to check all available Inhibit checkboxes for each transmitter selected can result in shutdown of a running exhauster.

5.1.5 CHECK all available “Inhibit” checkboxes on the “PCmd/Ilock” faceplate tab.

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

5.1.7 UNCHECK the “Enable Object Error Alarm/Event” checkbox on the “A/E Obj” faceplate tab.
5.2 Immersion Calibration Bench Test

5.2.1 OPEN fuse at location designated on Instrument Loop Drawing.

5.2.2 DON leather gloves, level detector probe may be hot.

5.2.3 REMOVE level detector and probe

5.2.4 Using a damp rag, WIPEOFF excess coolant from probe.

5.2.5 ASSEMBLE level detector AND probe on empty Simulator Tank.

5.2.6 CALIBRATE level detector utilizing the HART protocol.

5.2.7 FILL Simulator Tank with water to the designated Minimum level.

5.2.8 ENSURE the level in the Simulator Tank matches the output value of 4 mA at 0% full.

5.2.9 IF output value does not match the Simulator tank level.

5.2.10 ADJUST values using the HART until output for 0% full is within the range shown in step 5.2.11.

5.2.11 RECORD output for 0% full on datasheet.
5.2 Immersion Calibration Bench Test (Cont.)

5.2.12 **FILL** Simulator Tank with water to the designated Maximum liquid level.

5.2.13 **ENSURE** the level in the Simulator Tank matches the output value of 20 mA at 100% full, which is 1 inch down from the bottom of threads on probe.

5.2.14 **IF** output value does not match the Simulator tank level **THEN**

**ADJUST** values using the HART until output for 100% full is within the range shown in step 5.2.15.

5.2.15 **RECORD** output for 100% full on datasheet.

5.2.16 **REMOVE** level detector and probe from simulation tank.

5.2.17 **INSTALL** level detector and probe on Glycol tank.
5.3 Restoration

5.3.1 IF any problems were encountered with calibration, INFORM FWS.

5.3.2 IF not already removed; DISCONNECT AND REMOVE Test Equipment.

5.3.3 RE-CONNECT probe wires to transmitter.

5.3.4 RECORD the Test Equipment information and calibration status on Data Sheet.

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

**Enable Flow interlock**

5.3.6 If not already logged in, LOGIN TFMCS ABB 800xA HMI.

5.3.7 NAVIGATE to exhauster process details HMI display.

5.3.8 SELECT the transmitter tag to open the transmitter’s reduced face plate.

5.3.9 CLICK middle button (..) to expand face plate.

NOTE - The “PCmd/ILock” face plate tab inhibits checkboxes vary from non to several depending on which transmitter is selected.

5.3.10 SELECT “PCmd/ILock” tab on the transmitter face plate.

5.3.11 UNCHECK all available “Inhibit” checkboxes on the “PCmd/ILock” face plate tab.

5.3.12 SELECT the “A/E obj” tab on transmitter face plate.

5.3.13 CHECK the “Enable Object Error Alarm/Event” checkbox on the “A/E obj” face plate tab.

5.3.14 VERIFY the inhibit indication is not present on transmitter display Elements Status Indicator.

5.3.15 NOTIFY Operations that testing is complete and system may be returned to desired configuration.
5.4 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.

5.5 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 (if applicable).

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.