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1.0 INTRODUCTION

1.1 Purpose

This procedure provides a safe, uniform method of calibrating Rosemount® Model 1056 contacting conductivity analyzer.

1.2 Scope

This procedure applies to Model 1056 contacting conductivity analyzers used at ETF. Probe cleaning or replacement is allowed as part of this procedure.

2.0 INFORMATION

2.1 Terms and Definitions

- DI water - De-ionized Water.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Hach buffer solution has been analyzed by industrial hygiene and the PPE controls needed are covered by the General Hazard Analysis (GHA), safety glasses with side shields and nitrile gloves.

3.2 Radiation and Contamination Control

3.2.1 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.

3.3 Environmental Compliance

3.3.1 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:

- Thermometer (any calibrated temperature measuring device, i.e., thermometer, thermocouple) capable of reading in 0.1°C increments (per PM/S data sheet)
- CMD 0 to 20 mADC range
- Portable or bench-type conductivity analyzer capable of referencing at 25°C
- Conductivity reference solution, if required
  - Hach pH 4 (MSDS/SDS #060545)
  - Hach pH 10 (MSDS/SDS #060544(A))
  - Salt (MSDS/SDS #059083).
- DI water, near process temperature, if possible
- Sampling containers
- Conductivity M&TE

4.2 Field Preparation

4.2.1 NOTIFY Operations before starting procedure.
5.0 PROCEDURE

Special Instructions

Sections 5.2, 5.3, and 5.4 are performed only with probe replacement.

Probe replacement may be performed when needed during performance of this procedure.

5.1 Conductivity Calibration

NOTE - Reference solution may be a pre-mixed product or it may be mixed by combining DI water and buffer solution and then checked with M&TE to determine solution conductivity.

5.1.1 SELECT reference solution with a value near point of interest AND RECORD reference solution conductivity on PM/S data sheet.

5.1.2 PERFORM acceptance calculations on data sheet.

5.1.3 REMOVE electrode from process.

5.1.4 IF probe is defective, PERFORM the following:

5.1.4.1 REPLACE probe.

5.1.4.2 RECORD replacement on PM/S data sheet.

5.1.4.3 GO TO Section 5.2.

5.1.5 RINSE electrode in DI water.

5.1.6 IMMERSE electrode in container of reference solution.
5.1 Conductivity Calibration (Cont.)

5.1.7 WAIT for reading to stabilize.

5.1.8 RECORD analyzer reading in reference solution in as-found reading on PM/S data sheet.

5.1.9 IF reading is within tolerance per data sheet, and no further adjustments are desired, PERFORM the following:

5.1.9.1 RECORD as-found reading in the as-left reading on PM/S data sheet.

5.1.9.2 RECORD MCS reading on data sheet.

5.1.9.3 PRESS Menu.

5.1.9.4 GO TO Section 5.6.

5.1.10 SELECT Calibrate AND

PRESS Enter.

5.1.11 SELECT Sensor 1 AND

PRESS Enter.

5.1.12 SELECT Conductivity AND

PRESS Enter.

5.1.13 SELECT In Process Cal AND

PRESS Enter.

5.1.14 WHEN analyzer reads “Take Sample,” PRESS Enter.

5.1.15 WHEN stable, PERFORM the following:

5.1.15.1 PRESS Enter.

5.1.15.2 EDIT the solution value.

5.1.15.3 PRESS Enter.
5.1 Conductivity Calibration (Cont.)

5.1.16 WAIT for calibration to complete.

5.1.17 PRESS Exit until main screen is displayed.

5.1.18 RECORD solution conductivity on as-left portion of PM/S data sheet.

5.1.19 RECORD Control Room reading on PM/S data sheet.

5.1.20 RE-INSERT probe in probe housing AND

GO TO Section 5.6.
5.2 Entering the Conductivity Cell Constant (for Probe Replacement)

5.2.1 PRESS Menu.

5.2.2 SELECT Calibrate AND
PRESS Enter.

5.2.3 SELECT Sensor 1 AND
PRESS Enter.

5.2.4 SELECT Conductivity AND
PRESS Enter.

5.2.5 SELECT Cell K AND
PRESS Enter.

5.2.6 EDIT the cell constant value AND
PRESS Enter.

5.2.7 PRESS Exit until main screen is displayed.
5.3 Conductivity Cell Temperature Calibration (for Probe Replacement)

5.3.1 REMOVE electrode from process.
5.3.2 RINSE electrode in DI water.
5.3.3 PRESS Menu.
5.3.4 SELECT Calibrate AND

PRESS Enter.
5.3.5 SELECT Sensor 1 AND

PRESS Enter.
5.3.6 SELECT Temperature AND

PRESS Enter.
5.3.7 RECORD as-found temperature reading.
5.3.8 IF display and thermometer reading do not match, SET display to match thermometer reading.
5.3.9 PRESS Enter.
5.3.10 RECORD as-left temperature reading.
5.3.11 PRESS Exit until main screen is displayed.
5.4  Zeroing the Instrument (for Probe Replacement)

5.4.1  ENSURE probe is isolated per PM/S data sheet.

5.4.2  REMOVE electrode from process.

5.4.3  IF probe is defective, PERFORM the following:
   5.4.3.1  REPLACE probe.
   5.4.3.2  RECORD replacement on PM/S data sheet.
   5.4.3.3  GO TO Section 5.2.

5.4.4  RINSE electrode in DI water.

5.4.5  THOROUGHLY DRY the probe.

5.4.6  PRESS Menu.

5.4.7  SELECT Calibrate AND
       PRESS Enter.

5.4.8  SELECT Sensor 1 AND
       PRESS Enter.

5.4.9  SELECT Conductivity AND
       PRESS Enter.

5.4.10  SELECT Zero Cal AND
        PRESS Enter.

5.4.11  IF “SENSOR ZERO DONE” is displayed, PRESS Exit until main screen is displayed AND
        GO TO Section 5.1.

5.4.12  IF “SENSOR ZERO FAIL” is displayed, PERFORM the following:
   5.4.12.1  RECORD on data sheet.
   5.4.12.2  PRESS Exit until main screen is displayed.
   5.4.12.3  GO TO Section 5.1.
5.5 4 to 20 mA Output Trim

NOTE - Output trim is only to be performed on transmitters with remote readouts, and only when remote readouts are suspect or out of tolerance.

5.5.1 PLACE CMD in series with output.

5.5.2 PRESS Menu.

5.5.3 SELECT Calibrate AND

PRESS Enter.

5.5.4 SELECT Output 1 (or Output 2) AND

PRESS Enter.

5.5.5 RECORD as-found low CMD reading on PM/S data sheet.

5.5.6 ENTER value of CMD reading AND

PRESS Enter.

5.5.7 RECORD as-found high CMD reading on PM/S data sheet.

5.5.8 ENTER value of CMD reading AND

PRESS Enter.

5.5.9 WAIT for display to return to Calibrate menu indicating calibration is complete.

5.5.10 PRESS Enter.

5.5.11 RECORD as-left low measurement on PM/S data sheet.

5.5.12 PRESS Enter.

5.5.13 RECORD as-left high measurement on PM/S data sheet.

5.5.14 PRESS Enter.

5.5.15 WAIT for display to return to Calibrate menu indicating calibration is complete.

5.5.16 PRESS Exit to return to Main Menu.
5.6 Restoration

5.6.1 **RESTORE** to as-found conditions.

5.6.2 **ENSURE** any liquid that has contacted process waste is emptied into Sump Tank 2/laboratory sink, or Sump Tank 1.

5.6.3 **ENSURE** alarms are reset or cleared.

5.6.4 **INFORM** SOM test is complete and instrument/equipment/system may be returned to service.

5.7 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).

5.8 Review

5.8.1 **INFORM** FWS test is complete.

5.8.2 (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.

5.9 Records

The performance of this procedure generates no records. However PM/S 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.