Calibration of Great Lakes Instruments Model E63 Conductivity Analyzer

Tank Farm Maintenance Procedure
Effluent Treatment Facility

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

CHANGE HISTORY (≤ LAST 5 REV-MODS)

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<tr>
<th>Rev-Mod</th>
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<tr>
<td>A-2</td>
<td>04/19/2018</td>
<td>Periodic Review</td>
<td>Added Environmental steps and mitigated safety hazards with PPE.</td>
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<tr>
<td>A-1</td>
<td>07/20/2016</td>
<td>Correct Use Type</td>
<td>Change from continuous use to reference use per document owner’s direction.</td>
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<tr>
<td>A-0</td>
<td>11/04/2015</td>
<td>Converting to WRPS Format</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides a safe, uniform method to calibrate Great Lakes Model E63 Conductivity Analyzer with installed compatible conductivity sensor.

1.2 Scope

This procedure provides instructions for calibrating the Great Lakes Model E63 conductivity analyzer with installed compatible conductivity sensor.

2.0 INFORMATION

2.1 Terms and Definitions

- CO - Controlling Organization
- DI - Deionized.

2.2 General Information

2.2.1 Repair or replacement of the probe is allowed as needed during performance of this procedure (Section 5.2). The analyzer is calibrated using the conductivity calibration method regardless of the display format selected. (The three display formats are Conductivity, % Concentration, and total dissolved solids.)
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Some locations require lock and tag for protection against temperature, pressure or hazardous chemicals before breaching the system. Under these circumstances, lock and tag is required in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.

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-ESH-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 (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/S data sheet or is at least four times greater than specified device tolerance.

The following supplies may be needed to perform this procedure:

- GLI, International’s Conductivity Solution (SDS# 065467)
- DI water
- Sample containers
- Calibrated portable conductivity analyzer capable of referencing at 25 C
- Safety glasses with side shields
- nitrile gloves
- Container/bucket for rising conductivity element.

4.2 Performance Documents

- DOE-0336, Hanford Site Lockout/Tagout Procedure
- Vendor information, Great Lakes Instruments, Operating Instruction Manual, Model E63 Conductivity Analyzer.

4.3 Field Preparations

NOTE - Some locations require lock and tag for protection against temperature, pressure, or hazardous chemicals prior to breaching the system.

4.3.1 IF lock and tag is required, ENSURE it is installed by the controlling organization.
5.0 PROCEDURE

NOTE - Section 5.2 may be performed to repair or replace the probe when needed.

5.1 Initial Setup and Calibration

5.1.1 SELECT reference solution (standard) with a conductivity value near point of interest or as directed by PM/S data sheet AND

PERFORM acceptance criteria calculations on data sheet.

5.1.2 CONTACT Control Room AND

INFORM CRO of calibration to get approval to proceed.

5.1.3 ISOLATE conductivity element AND

CLOSE 60G-044 and 60G-045.

5.1.4 REMOVE from its installed location.

5.1.5 REMOVE drain cap AND

OPEN 60G-049 and 60G-046.

5.1.6 PRESS “CAL” key AND

SELECT “Conductivity Cal.”

5.1.7 USE arrow keys

5.1.8 IF sensor is being calibrated for the first time, SELECT “Yes” AND

FOLLOW onscreen Zero adjust instructions.

5.1.9 IF sensor has been previously calibrated, PRESS “ENTER” key while “No” is flashing.

5.1.10 PRESS “ENTER” key again to continue.

5.1.11 USE arrow keys to ENTER known “Cal Val,” “Cal Slope,” and “Ref Temp” of calibration solution.

5.1.12 SELECT “Save & Continue.”

5.1.13 PRESS “ENTER” key.

5.1.14 IF dirty, CLEAN element AND
RINSE conductivity element with DI water.
5.1 Initial Setup and Calibration (Cont.)

**Special Instructions**

Sensor must be fully immersed and must not touch container to prevent calibration errors.

NOTE - Temperature equalization may take 30 minutes or longer depending on temperature differences.

5.1.15 **PLACE** conductivity element into conductivity solution **AND**

**WAIT** for solution and sensor temperature to equalize and reading to stabilize.

5.1.16 **PRESS** “ENTER” key.

5.1.17 **RECORD** conductivity as-found indication on PM/S data sheet.

NOTE - A flashing unstable annunciator indicates the measurement signal is too unstable for accurate calibration.

5.1.18 **IF** unstable annunciator is flashing, **WAIT** until annunciator stops flashing before continuing.

5.1.19 **SELECT** “Calibrate” **AND**

**PRESS** “ENTER” key to complete calibration.

5.1.20 **RECORD** as-left field analyzer readings on PM/S data sheet.

5.1.21 **RINSE** conductivity element with DI water.

5.1.22 **PLACE** conductivity element into standard solution for single point check as directed per PM/S data sheet.

5.1.23 **RECORD** field analyzer reading on PM/S data sheet.

5.1.24 **RECORD** Control Room Reading on PM/S data sheet.

5.1.25 **RINSE** conductivity element with DI water.
5.2 Probe Replacement

NOTE – This section may be performed to repair or replace probes at any time during performance of this procedure.

5.2.1 CONTACT controlling organization for additional lock and tag documentation for probe replacement.

5.2.2 INSTALL lock and tag as identified by controlling organization.

5.2.3 REPLACE probe using like-for-like materials.

5.2.4 REMOVE additional lock and tag for probe replacement.

5.2.5 PERFORM Section 5.1.

5.3 Restoration

5.3.1 RESTORE to as-found condition.

5.3.2 CLOSE 60G-049 and 60G-0446.

5.3.3 OPEN 60-G-044 and 60G-045.

5.3.4 REMOVE Lock and Tag.

5.3.5 INFORM SOM and Control Room Operator test is complete and instrument/equipment/system may be returned to service.

5.3.6 DISPOSE of rinse water in Sump Tank 1 or Sample Prep Room Sink.

5.4 Review

5.4.1 INFORM FWS test is complete.

5.4.2 (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.
5.5 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.