Precision Electric Boiler, 2025 E Thin Film Dryer Boiler, System 65A, Inspection and Cleaning

Tank Farm Maintenance Procedure  Effluent Treatment Facility

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

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for safe, uniform methods to perform annual test and inspection of Precision Electric boiler, 2025 E 216 KW, 630 lb/hr, 150 psig/360°F.

1.2 Scope

This procedure applies to performing annual testing and inspection of the Precision Electric boiler, 2025 E 216 KW.

2.0 INFORMATION

None.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Boiler and systems using steam will be hot, which could cause burns if contact is made before the unit is drained and cooled.

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 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:
- CMD
- Vacuum cleaner (portable), with non-conductive hose attachments
- Meg-ohm meter
- Torque wrench (0 to 200 ft/lbs; see Step 5.1.13)
- Video boroscope camera.
- 10-inch Ring Gasket, 150# flexitallic CG or LS spiral-wound, 304 SS flexicarb qty 1.

4.2 Performance Documents

The following documents may be needed to perform this procedure:
- DOE-0336, Hanford Site Lockout/Tagout Procedure
- ETF-60J-001, Thin Film Dryer Operation

4.3 Field Preparations

4.3.1 CONTACT Third Party Inspector coordinator to ensure third party inspector is available to perform required inspections.

4.3.2 ENSURE boiler is drained.
5.0 PROCEDURE

5.1 Mechanical System Maintenance

5.1.1 ENSURE valves 65A-058, 65A-101, and 65A-201 are in the open position.

5.1.2 ENSURE lock and tag applied per DOE-0336.

5.1.3 REMOVE access covers AND INSPECT internal threaded and gasketed plumbing connection for leaks.

5.1.4 DISCONNECT heater bundle electrical connections.

5.1.5 INSPECT threaded and gasketed heater element connections for leaks.

5.1.6 REMOVE heater bundle.

5.1.7 INSPECT boiler interior.

5.1.8 IF requested by Third Party Inspector, PERFORM video boroscope inspection of LSL-65A-013.

Special Instructions

Scale deposits will require water treatment changes.

5.1.9 IF scale deposits are present, NOTIFY FWS.

5.1.10 IF requested by third party inspector, PERFORM the following:

5.1.10.1 REMOVE pipe plug from tee below LSL-65A-013.

5.1.10.2 INSPECT interior of tee.

5.1.10.3 ROD OUT pipes supplying water level indicator and transmitter.

5.1.10.4 REPLACE plug in tee.

5.1.11 REPLACE gaskets.

5.1.12 REINSTALL heater bundle.
5.1 Mechanical System Maintenance (Cont.)

5.1.13 TIGHTEN heater bundle bolts to 133 ft/lbs.

5.2 Electrical System Maintenance

5.2.1 RECONNECT heater bundle electrical connections.

5.2.2 CLEAN interior of control and power panels AND VACUUM interior with non-conducting hose attachments.

5.2.3 INSPECT enclosure for signs of moisture AND RECORD findings on work package.

5.2.4 INSPECT AND REPAIR the following:

- Power lugs
- Wiring connections.
5.2 Electrical System Maintenance (Cont.)

NOTE - Steps 5.2.5 and 5.2.7 will aid in troubleshooting.

- Minimum resistance between all test points is two meg-ohms (heater stage to ground, any phase).

5.2.5 MEGGER heater stages in accordance with PM/S data sheet.

5.2.6 IF any readings are less than two meg-ohms, NOTIFY DA.

5.2.7 MEASURE AND RECORD load resistance of each stage per PM/S data sheet as follows:

- (A to B)
- (A to C)
- (B to C).

5.2.8 INSPECT each component per data sheet.

5.2.9 TIGHTEN/REPAIR loose or broken terminals.

5.2.10 INSPECT control wiring for tightness.
5.3 Restoration

5.3.1 RESTORE to as-found condition.

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

5.3.3 IF lock and tag was installed, REQUEST its removal.

5.4 Acceptance Testing

5.4.1 With all loads off, CLOSE MSWGR #1 breaker feeding this boiler.

**Special Instructions**

The tags to be created in the real time trend will represent the following values:

- LAL65A013 shows the contact state of LSL-65A-013. When LAL 65A013 is 0, the contact is closed (i.e., alarm is OFF); when LAL65A013 is 1, the contact is open (i.e., the alarm is ON).
- LT65A010 shows the level in the Thin Film Dryer boiler in percent level.
- VD61566 is the alarm tag. When VD61566 is 1, the alarm is ON; when VD61566 is 0, the alarm is OFF.

The computer system requires Step 5.4.2 to be performed for each of the following tags:

- LAL65A013 (LCU06)
- LT65A010 (LCU06)
- VD61566 (LCU06).

5.4.2 CREATE real-time trend on the MCS for the first tag as follows:

5.4.2.1 SELECT Trends.

5.4.2.2 SELECT Real Time.

5.4.2.3 SELECT INSTR. TECH TRENDS.

5.4.2.4 OPEN desired side.

5.4.2.5 RIGHT-CLICK on graph.

5.4.2.6 SELECT Chart Properties.
5.4 Acceptance Testing (Cont.)

5.4.2.7 SELECT Pens tab.

5.4.2.8 SELECT “Tag (live data)” from Pen Source drop down menu.

5.4.2.9 SELECT Add Pens.

5.4.2.10 SELECT Tags.

5.4.2.11 CLICK on (-) next to folder 2025e_hmi to collapse that folder.

5.4.2.12 CLICK on (+) to expand 2025_data_clx.

5.4.2.13 CLICK on (+) to expand the LCU.

5.4.2.14 CLICK (folder) offline.

5.4.2.15 SELECT tag on right side pane.

5.4.2.16 SELECT OK.

5.4.2.17 SELECT OK.

5.4.2.18 SELECT APPLY.

5.4.2.19 SELECT OK.

5.4.2.20 CLOSE Instrument Tech trend screen.

5.4.3 REPEAT Step 5.4.2 for the remaining tags (second, third, etc.).

5.4.4 DOCUMENT on LSL-65A-013 PM/S data sheet that:

- LSL-65A-013 contacts are OPEN (LAL65A013 = 1)
- Thin Film Dryer boiler is empty (LT65A010 is less than 5%)
- MCS alarm STEAM BOILER LEVEL LO LALX-65A011 is ON (VD61566 = 1).

5.4.5 FILL boiler AND

WATCH level indicator to track water level, in accordance with ETF-60J-001.
5.4 Acceptance Testing (Cont.)

5.4.6 DOCUMENT on LSL-65A-013 PM/S data sheet that:
- LSL-65A-013 contacts CLOSED (LAL65A013 = 0)
- Approximate water level when the contacts closed as indicated by LT65A010
- MCS alarm STEAM BOILER LEVEL LO LALX-65A011 is OFF (VD61566 = 0).

5.4.7 DRAIN boiler AND

WATCH level indicator to track water level, in accordance with ETF-60J-001.

5.4.8 DOCUMENT on LSL-65A-013 PM/S data sheet that:
- LSL-65A-013 contacts are OPEN (LAL65A013 = 1)
- Approximate water level when the contacts closed as indicated by LT65A010
- MCS alarm STEAM BOILER LEVEL LO LALX-65A011 is ON (VD61566 = 1).

5.4.9 FILL boiler AND

WATCH level indicator to track water level, in accordance with ETF-60J-001.

5.4.10 DOCUMENT on LSL-65A-013 PM/S data sheet that:
- LSL-65A-013 contacts CLOSED (LAL65A013 = 0)
- Approximate water level when the contacts closed as indicated by LT65A010
- MCS alarm STEAM BOILER LEVEL LO LALX-65A011 is OFF (VD61566 = 0).

5.4.11 BRING UP to operating pressure AND

CHECK for leaks.

5.4.12 IF leaks are discovered,

OR

IF LSL-65A-013 failed to actuate properly, NOTIFY FWS.
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.

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.

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.