Microtuf Model LS3100 Point Level Switch

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 a safe, uniform method for functional checking of Microtuf Model LS3100 Point Level Switch.

1.2 Scope

The Microtuf Model LS3100 Point Level Switch is currently authorized for use at the Load-In Station at ETF.

2.0 INFORMATION

2.1 General Information

2.1.1 Level switch sensor consists of a pair of matched RTDs encased in twin 316 series stainless steel tubes. One RTD is self-heated using a constant DC current. The other is unheated and provides an accurate ambient process temperature reference. The thermal differential created between the heated and reference RTDs is a function of the process media. The differential is greatest when no liquid is present (dry) and decreases as liquid quenches the switch sensor (wet). Solid state electronics transform the temperature differential into a voltage that is compared to a control voltage to actuate a relay and indicate a change in state (wet versus dry).

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Truck load-in-station level switch sensors are located in the sump pit, which is a non-permit-required confined space.

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

The following supplies may be needed to perform this procedure:
- Bucket of water.

4.2 Performance Documents

The following documents may be needed to perform this procedure:
- DOE-0360, Hanford Site Confined Space Procedure (HSCSP)

4.3 Field Preparations

4.3.1 PRIOR to making entry into the sump pit, COMPLETE the Hanford Confined Space Hazard Identification Form (A-6005-724) per DOE-0360.
5.0 PROCEDURE

5.1 Initial Setup and Functional Check

5.1.1 IF instrument head cover requires removal, REMOVE instrument head cover to view LEDs (see Figure 1 - LS3100 Point Level Switch).

5.1.2 PRIOR to making entry into the sump pit, CONFIRM Hanford Confined Space Hazard Identification Form (A-6005-724) has been completed.

NOTE - Level switch transmitters are located in a shack ten yards from the sump pit, at the bottom of the equipment cabinet with a large window.

5.1.3 RAISE liquid level until level switch sensor is submerged,

OR

REMOVE level switch from mounting bracket AND

SUBMERGE sensor into bucket of water.

5.1.4 CONFIRM the following:
- Switch activates (red LED OFF, green LED ON)
- Control room or alarm indications are correct.

5.1.5 DECREASE liquid level,

OR

REMOVE sensor from bucket of water.

5.1.6 CONFIRM the following:
- Switch activates (red LED OFF, green LED ON)
- Control room or alarm indications are correct.

5.1.7 IF switch functions properly and no adjustments are required, GO TO Section 5.3.
5.2 Adjustment

NOTE - With TRIP ADJUST pot at 50%, there will be a delay of approximately 5 seconds from contact to trip for dry-to-wet operation, and a delay of 30 seconds for wet-to-dry operation. The trip time in one direction can be decreased at the expense of the other. Turning the TRIP ADJUST pot from 50 towards 0 will decrease the dry-to-wet trip time, but increase the wet-to-dry trip time. Turning the TRIP ADJUST pot from 50 towards 100 will have the opposite effect.

5.2.1 POWER UP LS3100 in its dry position AND
BEFORE adjusting, ALLOW fifteen-minute warm-up.

5.2.2 SET TRIP ADJUST pot to 0.

5.2.3 SET WET pot to full counter clockwise (25 turns).

5.2.4 ADJUST DRY pot until red LED illuminates.

5.2.5 TOGGLE DRY pot back and forth until switch point is well-defined.

5.2.6 RAISE liquid level until level switch sensor is submerged, OR
SUBMERGE sensor into liquid.

5.2.7 ADJUST TRIP ADJUST pot to 100.

5.2.8 ADJUST WET pot until green LED just illuminates.

5.2.9 TOGGLE WET pot back and forth until switch point is well-defined.

5.2.10 ADJUST TRIP ADJUST pot to 50 (mid-range).

5.2.11 RETURN TO Section 5.1.
5.3 Restoration

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

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

5.4 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).

5.5 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

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.
Figure 1 - LS3100 Point Level Switch

Figure showing the components of the LS3100 Point Level Switch:
- RED LED
- GREEN LED
- Fuse
- Wet Pot
- Trip Adjust Pot
- Dry Pot