Tank Farm Maintenance Procedure

**Electric Motor Inspection**

**MAINTENANCE**

**CHANGE HISTORY (≤ LAST 5 REV-MODS)**

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-2</td>
<td>12/03/2018</td>
<td>Comply with the new DOE-0359 updates</td>
<td>Steps 3.1.2, 5.1.2, 5.2.2 update Electrical Hazard Evaluation to Electrical Risk Assessment.</td>
</tr>
<tr>
<td>I-1</td>
<td>08/01/2016</td>
<td>Maintenance Request</td>
<td>Changed 4.1, 5.1.3, 5.1.5, 5.1.12, 5.1.14, 5.1.16, 5.1.17, 5.2.3, Added note above 5.1.5 and changed note above 5.2.4</td>
</tr>
<tr>
<td>I-0</td>
<td>03/15/2016</td>
<td>Periodic Review</td>
<td>Add DOE 0336 Lock &amp; Tag at Step 3.1.1. Changed Notes prior to Steps 5.1.1 and 5.1.8 to Special Inst. Reworded Steps 5.1.1, 5.1.14 – 5.1.16. Struck Warning at Step 3.1.1, Warning Boxes prior to Steps 5.1.2 and 5.2.2.</td>
</tr>
<tr>
<td>H-2</td>
<td>10/27/2014</td>
<td>CHAMPS no longer used</td>
<td>Deletes reference to CHAMPS.</td>
</tr>
<tr>
<td>H-1</td>
<td>08/19/2013</td>
<td>Inconsequential Change</td>
<td>Added GHS-SDS and/or to each instance of MSDS.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for performing electrical motor inspections.

1.2 Scope

This procedure involves all motors with the exception of those motors involved in active waste transfer.

2.0 INFORMATION

NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 During the performance of this procedure, compliance with the DOE-0336, Hanford Site Lockout/Tagout Procedure is required.

3.1.2 All work will be performed in accordance to the most current version of the Electrical Risk Assessment which was performed for the specific location where this procedure is being performed.

3.2 Radiation and Contamination Control

Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per the ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03.
Electric Motor Inspection

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Megohm meter (500V/1000V)
- Lubricant, as required (Premium grade lithium NLGI #2 EP grease, Shell Alvania EP 2 (GHS-SDS and/or MSDS # 25047), Stock No. 0012-4720-035, or equal), Aeroshell #7 or other as specified on data sheet
- Clamp-on Ammeter
- Volt/ohm meter
- Insulated tools.

4.2 Performance Documents

The following document may be needed to perform this procedure:

- Applicable equipment operating procedure as specified on Data Sheets.
- Lift/Landed Lead Record (Site Form Number A-6001-159)
5.0 PROEDURE

5.1 Non-Functional Inspection

**Special Instructions**

Sections 5.1 or 5.2 may be worked independently or not at all, depending on equipment configuration.

If performance of any steps in this procedure is not required for procedure completion, steps not performed are to be marked, "N/A" in appropriate Data Sheet signoff space, and explained in comments/remarks section of Data Sheet.

5.1.1 INSTALL Lock and Tag, or Authorized Worker Lockout/Tagout in accordance with the DOE-0336, Hanford Site Lockout/Tagout Procedure. *(Item 1)*

5.1.2 IF not currently donning prescribed PPE, DON proper PPE in accordance to the Electrical Risk Assessment (A-6007-595).

5.1.3 IF Control Voltages are present in the compartments being accessed and contact cannot be avoided, SHIELD components and/or terminals.

5.1.4 RECORD name plate data on Data Sheet. *(Item 2)*

NOTE - Megger readings may be taken at any accessible location that is locked-out.

5.1.5 IF motor being inspected operates at 480 volts, CHECK phase to ground Megger readings as follows using a 1000 volt Megger for one minute:

5.1.5.1 IF motor wires are fed directly from a VFD, VSD, AFD, etc., DISCONNECT motor wires from drive unit AND DOCUMENT on Lifted/Landed Lead Record

5.1.5.2 PERFORM megger check on each phase to ground AND RECORD readings on Data Sheet. *(Item 3)*

5.1.5.3 RECONNECT motor wires to drive unit AND DOCUMENT on Lifted/Landed Lead Record

5.1.6 IF motor being inspected is three phase and operates at less than 480 volts, CHECK phase to ground readings on the motor from motor controller using 500 volt Megger.
5.1 Non-Functional Inspection (Cont.)

5.1.6.1 IF motor wires are fed directly from a VFD, VSD, AFD, etc., 
**DISCONNECT** motor wires from drive unit **AND**
**DOCUMENT** on Lifted/Landed Lead Record

5.1.6.2 **PERFORM** Megger check on each phase to ground **AND**
**RECORD** readings on Data Sheet. *(Item 3)*

5.1.6.3 **RECONNECT** motor wires to drive unit **AND**
**DOCUMENT** on Lifted/Landed Lead Record

5.1.7 **OBTAIN** phase to phase ohm readings with ohm meter **AND**
**RECORD** on Data Sheet. *(Item 4)*

**Special Instructions**

Steps 5.1.8 through 5.1.14 may be worked in any order or simultaneously.

5.1.8 **CLEAN** motor, removing dirt and grease.

5.1.9 **ENSURE** motor is mounted securely and fasteners/fittings are tight.

5.1.10 IF motor mount and fasteners/fittings cannot be tightened, **CREATE** work package to correct discrepancy.

5.1.11 **CHECK** that all safety guards are in place and in good condition.

5.1.12 **LUBRICATE** motor bearings per data sheet. *(Item 5)*

5.1.13 **ROTATE** motor by hand to confirm no binding.

5.1.14 **INSPECT** motor terminal housing.

5.1.15 **REMOVE** lockout in accordance with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.16 Shift Manager/OE to **DOCUMENT** desired electrical component(s) position(s) on the Work Record.

5.1.17 **POSITION** electrical components as designated on the Work Record entry made by Shift Manager/OE.
5.2 Functional Inspection

5.2.1 IF motor is not operating, **REQUEST** Operations to start motor per applicable operating procedure.

5.2.2 IF not currently donning prescribed PPE, **DON** proper PPE in accordance to the Electrical Risk Assessment (A-6007-595).

5.2.3 IF Control Voltages are present in the compartments being accessed and contact cannot be avoided, **SHIELD** components and/or terminals,

**NOTE** - Readings may be taken at any accessible location.

5.2.4 **MEASURE** all phase currents and voltages **AND**

**RECORD** on the Data Sheet. *(Item 6)*

5.2.5 **RECORD** on the Data Sheet any discrepancies found and corrective actions taken during procedure performance. *(Item 7)*
5.3 Restoration

5.3.1 IF any problems were encountered while performing this procedure, INFORM FWS AND RECORD any issues on the Data Sheet.

5.3.2 ENSURE Test Equipment has been disconnected and removed.

5.3.3 RECORD Test Equipment information and motor status on Data Sheet.

5.3.4 ENSURE equipment is returned to operable condition.

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, as applicable.

5.6 Records

The performance of this procedure generates no records. However, PM 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.