Low Voltage Electrical Distribution System Inspection and Testing

Tank Farm Maintenance Procedure

USQ # N/A-4

CHANGE HISTORY (≤ LAST 5 REV-MODS)

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
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<tr>
<td>F-5</td>
<td>05/03/2018</td>
<td>Engineering Request</td>
<td>Added Section 5.8 for testing UPS Systems.</td>
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<tr>
<td>F-4</td>
<td>07/05/2017</td>
<td>Periodic Review</td>
<td>Upgraded Records statement and re-worded vague phrases.</td>
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<td>F-3</td>
<td>12/07/2016</td>
<td>Maintenance Request</td>
<td>Many changes made throughout for clarification</td>
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<td>F-2</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for inspecting and testing of Low Voltage Electrical Distribution Components and electrical enclosures for Tank Farms.

1.2 Scope

This procedure involves inspecting and testing switchgear, motor control centers, load centers, distribution panels, disconnect switches, transformers, control and other electrical enclosures as shown on applicable Data Sheet(s) for Tank Farms.

2.0 INFORMATION

NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Some Motor Control Centers/Load Centers, Switchgear cubicles have more than one source of power. De-energized cubicles must be safe to work checked prior to work being performed in them to prevent personnel injuries.

**WARNING** - UPS units are installed in some cabinets/enclosures and have a battery life of approximately 20 minutes. Voltage may be present in the associated cabinet/enclosure after the main power supply has been removed. De-energized cabinets/enclosure must be safe to work checked prior to work being performed to prevent personnel injuries.

**WARNING** - Failure to confirm no work activities downstream of megger testing may result in work being performed on energized systems and possible personnel injury.

**WARNING** - Following each insulation test, the tested component shall be thoroughly grounded to dissipate any accumulated charge to prevent personnel injury.

3.1.1 Comply with DOE–0359, Hanford Site Electrical Safety Program.
3.1 Personnel Safety (Cont.)

3.1.2 If a lock and tag is required during the performance of this procedure, comply with DOE-0336, Hanford Site Lockout/Tagout Procedure.

3.1.3 Remove personal protective grounds to obtain proper readings. Replace the grounds when testing is complete for any phase.

3.1.4 If animal droppings or nests are found, stop work in affected area, and notify Operations.

3.1.5 In order to prevent unknown beryllium particles from becoming airborne, pressurized air (canned air) will not be used to clean electrical distribution equipment in which favorable beryllium testing results have not been obtained. Pressurized air (canned air) shall not be utilized in a radiological area. Review SDS for InTech 200 or InTech QD cleaner, or equivalent.

3.2 Radiation and Contamination Control

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

3.2.2 Opening of any system or component within a Radiological Area requires the presence of a Health Physics Technician to verify contamination control.

3.3 Environmental Compliance

3.3.1 If HEPA vacuums are used in a radiological area during the performance of this procedure, a work package must be used and they will be operated in accordance with the requirements ofRPP-ENV-32854 “Filtered Vacuum Cleaner Checklist”.

3.3.2 IF working in Radiological or potentially Radiologically contaminated equipment, ensure a Pre-Job Rad survey is performed. IF working on contaminated equipment, a Post-Job survey is required.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

NOTE - The amount of material taken into contaminated areas is to be minimized to reduce radioactive waste creation and future decontamination needs.

The following supplies may be needed to perform this procedure:

- Voltage Rated Gloves, within test certification period, and leather protectors for safe to work checks.
- Digital Volt-Ohm Meter, accuracy ± 5%
- Calibrated Digital Low Resistance Ohmmeter capable of reading in Micro-Ohms, accuracy ± 5%
- Calibrated Torque wrench, accuracy ± 5%
- Calibrated 1000 Volt Megger
- Vacuum cleaner, HEPA filter equipped, with insulated attachments. Notify Operations or Insulator group (see section 3.3)
- Repair materials for unused openings
- Personal Protective ground cables, as deemed necessary by the craftsmen. Ground cables will be rated for specific fault duty of the electrical system it is applied to
- Portable generator
- Light Plant(s)
- Lint-free cleaning rags
- InTech 200 or InTech QD cleaner, or equivalent
- Soft bristle brush
- Material to place a barricade
- Warning signs to prevent injury to unauthorized personnel
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.
4.2 **Performance Documents**

The following document may be needed in performance of this procedure.

- Lifted/Landed Lead Record A-6003-876.
- RPP-ENV-32854, Filtered Vacuum Cleaner Checklist
- TO-100-052, Perform Waste Generation, Segregation, Accumulation and Clean-up

4.3 **Field Preparation**

4.3.1 **IF** any step is not required for procedure completion, **RECORD** “N/A” in the applicable space(s) on the Data Sheet **AND**

**DOCUMENT** the justification in Data Sheet’s Comments/Remarks section.

4.3.2 **IF** equipment is not listed on the Data Sheet, **CONTACT** responsible engineer/FWS prior to cleaning the additional equipment.

4.3.3 **IF** additional equipment requires cleaning, with OE/SOM approval **DOCUMENT** it on work record **AND**

**PERFORM** appropriate section of procedure for identified equipment.

4.3.4 **CONTACT** engineering to update Data Sheets upon close-out.

4.3.5 **INSTALL** barricades and warning signs.
4.3 Field Preparation (Cont.)

4.3.6 IF this procedure is performed in ancillary facilities outside tank farms OR when in a tank farm where an outage procedure is not applicable, COMPLETE the following:

4.3.6.1 COORDINATE with Electric Utilities when interrupting power to the affected Switchgear identified for maintenance.

4.3.6.2 SHED loads (i.e. breakers/fuses, disconnect switches) fed by the Switchgear/MCC/Load Center AND DOCUMENT As-Found conditions on work record of work document.

4.3.6.3 COORDINATE with Operations to provide backup power for equipment required to remain in service.

4.3.6.4 PERFORM Lock and Tag or Authorized Worker Lockout/Tagout as specified by the Shift Manager, to the power supply(s) feeding any of the following:

- Switchgear
- Motor Control Centers/Load Centers
- Distribution Panels
- Disconnect Switches.
- Electrical Enclosures

4.3.6.5 REQUEST Operations to remove Lock and Tags/Administrative Lock, for equipment to be cleaned and inspected during the outage.

4.3.6.6 ENSURE Tag outs are installed to prevent back feed to the switchgear being serviced through the load side breaker.
5.0 PROCEDURE

NOTE - Individual sections in this procedure may be performed in any order or in parallel as field activities and conditions dictate.

- Because Data Sheets are tailored to individual components, Data Sheets will determine steps to be utilized during inspection and testing sections of this procedure.

- After proper equipment isolation, applicable sections for switchgear, MCC's, distribution panels, disconnect switches and/or transformers and/or other electrical enclosure may be worked concurrently, independently, or not at all depending on equipment to be maintained.

- Documentation of As-Found component positions on Data Sheets may be performed at any time during this work evolution as determined by the FWS/OE.

- Any deficiencies found before or during maintenance shall be documented in the Comments Section of the applicable Data Sheet.

5.1 Prepare Switchgear/MCC/Load Center

5.1.1 IF equipment is in Project Status or otherwise inaccessible, and if directed by FWS or Engineering, ENTER N/A in all affected Data Sheet locations.

NOTE - Step 5.1.2 will be performed as necessary. Step may have been addressed during performance of an outage procedure.

5.1.2 DOCUMENT Switchgear/MCC/Load Center configuration in the Work Package for proper configuration during restoration.
5.2 Switchgear/MCC Bus Compartment

5.2.1 ENSURE Switchgear/MCC is isolated for maintenance AND
INITIAL Step 1 of the Data Sheet.

**WARNING**

Some Motor Control Centers/Switchgear Bus Compartments have more than one source of power. De-energized compartments must be safe to work checked prior to work being performed in them to prevent personnel injuries.

**WARNING**

UPS units are installed in some cabinets/enclosures and have a battery life of approximately 20 minutes. Voltage may be present in the associated cabinet/enclosure after the main power supply has been removed. De-energized cabinets/enclosure must be safe to work checked prior to work being performed to prevent personnel injuries.

5.2.2 PERFORM a safe to work check in each compartment opened for maintenance AND
INITIAL on Data Sheet.

5.2.3 INSPECT bus compartment AND RECORD inspection results in Step 4 of the Data Sheet for the following:
- Signs of moisture
- Signs of overheating
- Condition of insulators
- Condition of grounding conductors/straps (conductors, lugs, terminals, etc.)
- Wiring for damage or Deterioration

5.2.4 IF interior of enclosure needs to be cleaned, CLEAN AND RECORD findings on Step 4 of the Data Sheet after completion.
5.2 Switchgear/MCC Bus Compartment (Cont.)

5.2.5 **TIGHTEN** loose connections/terminations.

5.2.5.1 **IF** terminal lugs need to be replaced, **REPLACE** terminal lugs.

5.2.5.2 **RECORD** findings on Step 4 of the Data Sheet after completion.

5.2.6 **IF** bus connections are NOT readily accessible, **CONTACT** FWS or Engineering for direction.

5.2.7 **IF** bus connections are readily accessible, **PERFORM** a Ductor/Digital Low Resistance Ohmmeter test across connections of the bus **AND**

**RECORD** value(s) in Step 2 of the Data Sheet (Ductor/DLRO results section) for locations above 20 micro-ohms.

**OR**

**RECORD** in Step 2 of the Data Sheet that no connections were above 20 micro-ohms.

5.2.8 **IF** any Resistance value(s) is above 20 micro-ohms or are unacceptable to FWS or Engineering, **PERFORM** the following:

5.2.8.1 **DISASSEMBLE AND CLEAN** connections.

5.2.8.2 **REPLACE** hardware with new Bellville washers.

5.2.8.3 **TORQUE** connection per Table 1.

5.2.8.4 **PERFORM** a Ductor/Digital Low Resistance Ohmmeter test across connections of the bus.

a. **CROSS-OUT** old results.

b. **RECORD** new value(s) in Step 2 of the Data Sheet.

5.2.8.5 **IF** resistance readings continue to be unacceptable, **INFORM** either FWS or Engineering of value(s).
5.2 Switchgear/MCC Bus Compartment (Cont.)

5.2.9 IF present, REMOVE the following:

- Power Transformer fuses from instrument compartment
- Personal protective grounds to obtain proper megger readings for equipment to be megger tested.

**WARNING**

Failure to confirm no work activities downstream of megger testing may result in work being performed on energized systems and possible personnel injury.

5.2.10 ENSURE downstream disconnecting means is OPENED, to obtain acceptable readings.

5.2.10.1 DOCUMENT disconnecting means opened on work document work record.

**WARNING**

Following each insulation test, the tested component shall be thoroughly grounded to dissipate any accumulated charge to prevent personnel injury.

5.2.11 PERFORM a 1000 VDC megger insulation test if applicable, phase-to-ground/phase-to-phase for 15 ± 10 seconds on the load side of each compartment AND RECORD results in Step 3 of the Data Sheet.

5.2.11.1 IF readings are less than 5 meg ohms, NOTIFY FWS or Engineering AND DOCUMENT the findings in Step 3 (Comment Section) of the Data Sheet.

5.2.11.2 DISCHARGE to ground, any capacitive charge accumulated while applying test voltage for a time limit NO shorter than the time the test voltage was applied.
5.2 Switchgear/MCC Bus Compartment (Cont.)

5.2.12 IF further testing is necessary due to unfavorable readings, PERFORM the following:

5.2.12.1 REPEAT Step 5.2.10.
5.2.12.2 CROSSOUT old results in Step 3 of Data Sheet.
5.2.12.3 RECORD new results in Step 3 of Data Sheet.
5.2.12.4 DISCHARGE to ground, any capacitive charge accumulated while applying test voltage for a time limit NO shorter than the time the test voltage was applied.
5.2.12.5 AFTER testing is complete, REPLACE personal protective grounds for any phase, if removed.

5.2.13 ENSURE test equipment has been disconnected and removed.
5.2.14 RESTORE Power Transformer fuses to instrument cubicle if removed.
5.2.15 RECORD discrepancies in Comment Section.
5.2.16 ENSURE downstream disconnecting means is returned to as-found status.
5.2.17 DOCUMENT disconnecting means returned to as-found status on work document work record.
5.3 Switchgear/MCC/Load Center Cubicle

5.3.1 IF present, ENSURE disconnect/breaker As-Found position(s) are RECORDED on the Data Sheet.

**WARNING**

Some Motor Control Centers/Load Centers, Switchgear cubicles have more than one source of power. De-energized cubicles must be safe to work checked prior to work being performed in them to prevent personnel injuries.

**WARNING**

UPS units are installed in some cabinets/enclosures and have a battery life of approximately 20 minutes. Voltage may be present in the associated cabinet/enclosure after the main power supply has been removed. De-energized cabinets/enclosure must be safe to work checked prior to work being performed to prevent personnel injuries.

5.3.2 PERFORM safe to work check in each cubicle opened for maintenance AND

INITIAL on Data Sheet.

NOTE - Steps 5.3.3 through 5.3.14 may be worked in any logical order.

5.3.3 INSPECT all cubicle wiring AND

CHECK Step 5 of the Data Sheet (after completion) for the following:

- Damage
- Deterioration
- Signs of overheating.
- Cubicle for deterioration, including door seals.
- Condition of grounding components (conductors, lugs, terminals, etc.)
5.3 **Switchgear/MCC/Load Center Cubicle (Cont.)**

NOTE - Cleaning may be performed with a vacuum cleaner and/or soft bristle brushes. For areas with possible contamination a HEPA vacuum and approved work package is required.

5.3.4 IF interior of enclosure needs to be cleaned, CLEAN AND CHECK Step 6 of the Data Sheet after completion.

5.3.5 TIGHTEN loose connections/terminations.

5.3.5.1 IF terminal lugs need to be replaced, REPLACE terminal lugs.

5.3.5.2 CHECK Step 7 of the Data Sheet after completion.

5.3.6 IF present, INSPECT Line Starter contacts for excessive wear, pitting AND PERFORM the following as applicable:

5.3.6.1 BURNISH contacts.

5.3.6.2 REPLACE contacts.

5.3.6.3 CHECK Step 8 of the Data Sheet after completion.

5.3.7 OPERATE cubicles with breakers manually to ensure smooth operation.

5.3.7.1 LEAVE the breakers in the OPEN position.

5.3.7.2 CHECK Step 9 of the Data Sheet after completion.

5.3.8 IF not already provided, RECORD the following As-Found current settings in Step 10 of Data Sheet.

- Adjustable trip setting for molded case circuit breakers
- Magnetic trip setting of motor circuit protectors
- Motor overload relay heaters/SETTINGS
- Ground Fault relay (satisfactory/unsatisfactory).

5.3.8.1 IF the current settings are recorded on Data Sheet and do not match the field conditions, NOTIFY FWS or Engineering.
5.3 Switchgear/MCC/Load Center Cubicle (Cont.)

5.3.9 **RECORD** in Step 11 of Data Sheet the following As-Found breaker settings.
- Long Time Setting
- Instantaneous Pickup
- Long Time Delay
- Ground Fault Pickup
- Short Time Setting
- Ground Fault Delay
- Short Time Delay.

5.3.10 **WITH** cubicle doors open, **ENSURE** door interlock prevents disconnects from operating to CLOSED (ON) position, if so designed.

5.3.10.1 **IF** interlocks need to be adjusted, **ADJUST** interlocks.

5.3.10.2 **CLOSE** cubicle doors.

5.3.11 **WITH** disconnects in the CLOSED (ON) position, **ENSURE** cubicle door interlocks prevents door from opening, if so designed.

5.3.11.1 **IF** interlocks need to be adjusted, **ADJUST** interlocks.

5.3.11.2 **CHECK** Step 12 of the Data Sheet if SAT OR UNSAT.

5.3.12 **ENSURE** cubicle disconnect is in OPEN (OFF) position.

5.3.13 **INSPECT** all hardware. (i.e. lamps, and miscellaneous items associated with this equipment).

5.3.13.1 **IF** hardware needs to be adjusted or repaired, **ADJUST, OR REPAIR**, hardware. (i.e. lamps, and miscellaneous items associated with this equipment).

5.3.14 **PLUG** all unused openings in the cubicle or door.
5.3 Switchgear/MCC/Load Center Cubicle (Cont.)

**WARNING**

Failure to confirm no work activities downstream of Megger testing may result in work being performed on energized systems and possible personnel injury.

5.3.15 **CONFIRM** that no work is being performed downstream of Megger testing.

**WARNING**

Following each insulation test, the tested component shall be thoroughly grounded to dissipate any accumulated charge to prevent personnel injury.

5.3.16 **ENSURE** downstream disconnecting means is **OPENED**, to obtain acceptable readings.

5.3.16.1 **DOCUMENT** disconnecting means opened on work document work record.

5.3.17 **PERFORM** a 1000 VDC Megger insulation test if applicable, phase-to-ground/phase-to-phase for 15 ± 10 seconds on the load side of each compartment **AND**

**RECORD** results in Step 3 of the Data Sheet.

5.3.17.1 **DISCHARGE** to ground, any capacitive charge accumulated while applying test voltage for a time limit NO shorter than the time the test voltage was applied.

5.3.18 **RETURN** disconnect/breaker to As-Found position(s) **OR** as directed by FWS/OE.

5.3.19 **RECORD** any discrepancies in the Comment Section.

5.3.20 **ENSURE** downstream disconnecting means is returned to as-found status.

5.3.20.1 **DOCUMENT** disconnecting means returned to as-found status on work document work record.
5.4 Distribution Panels

5.4.1 **PERFORM** safe to work check in each distribution panel opened for maintenance **AND**

**INITIAL** Step 13 of the Data Sheet.

5.4.2 **RECORD** breaker(s) As-Found position on the Data Sheet.

**NOTE** - Steps 5.4.3 through 5.4.6 may be worked in any order.

5.4.3 **INSPECT** enclosure wiring **AND**

**CHECK** Step 14 of the Data Sheet (after completion) for the following:
- Damage
- Deterioration
- Signs of overheating
- Enclosure for deterioration, including door seals.
- Condition of grounding components (conductors, lugs, terminals, etc.)

**NOTE** - Cleaning may be performed with a vacuum cleaner and/or soft bristle brushes. For areas with possible contamination HEPA vacuum and approved work package is required.

5.4.4 **IF** interior of enclosure needs to be cleaned, **CLEAN AND**

**CHECK** Step 15 of the Data Sheet after completion.

5.4.5 **TIGHTEN** loose connections/terminations.

5.4.5.1 **IF** terminal lugs need to be replaced, **REPLACE** terminal lugs.

5.4.5.2 **CHECK** Step 16 of the Data Sheet after completion.

5.4.6 **OPERATE** all enclosure breakers manually to confirm smooth operation.

5.4.6.1 **LEAVE** breakers in the As-Found position.

5.4.6.2 **CHECK** Step 17 of the Data Sheet after completion.

5.4.7 **RECORD** discrepancies in enclosure Comments Section of Data Sheet.
5.5 Disconnect Switches

5.5.1 **PERFORM** safe to work check in each disconnect switch opened for maintenance **AND**

**INITIAL** Step 18 on Data Sheet after completion.

5.5.2 **RECORD** disconnect As-Found position on the Data Sheet.

**NOTE** - Steps 5.5.3 through 5.5.6 may be worked in any logical order.

5.5.3 **INSPECT** enclosure wiring **AND**

**CHECK** Step 19 of the Data Sheet (after completion) for the following:
- Damage
- Deterioration
- Signs of overheating
- Enclosure for deterioration, including door seals.
- Condition of grounding components (conductors, lugs, terminals, etc.)

**NOTE** - Cleaning may be performed with a vacuum cleaner and/or soft bristle brushes. For areas with possible contamination HEPA vacuum and approved work package is required.

5.5.4 **IF** interior of enclosure needs to be cleaned, **CLEAN AND**

**CHECK** Step 20 of the Data Sheet after completion.

5.5.5 **TIGHTEN** loose connections/terminations.

5.5.5.1 **IF** terminal lugs need to be replaced, **REPLACE** terminal lugs.

5.5.5.2 **CHECK** Step 21 of the Data Sheet after completion.

5.5.6 **OPERATE** all disconnect handles manually to confirm smooth operation.

5.5.6.1 **LEAVE** disconnect in the As-Found position, OR as directed by FWS/OE.

5.5.6.2 **CHECK** Step 22 of the Data Sheet after completion.

5.5.7 **RECORD** discrepancies in Comments Section of Data Sheet.
5.5 Disconnect Switches (Cont.)

NOTE - The following steps are for disconnect enclosures with interlock mechanism's.
- Steps 5.5.8 and 5.5.9 may be worked in any logical order.

5.5.8 WITH enclosure doors open, ENSURE door interlock prevents disconnects from operating to CLOSED (ON) position.

  5.5.8.1 IF interlocks need to be adjusted, ADJUST interlocks.
  5.5.8.2 CLOSE enclosure doors.

5.5.9 WITH disconnects in the CLOSED (ON) position, ENSURE enclosure door interlocks prevent door from opening.

  5.5.9.1 IF interlocks need to be adjusted, ADJUST interlocks.

5.5.10 LEAVE disconnect in the As-Found position, OR as directed by FWS/OE.

5.5.11 RECORD discrepancies in enclosure Comments Section of Data Sheet.
5.6 Transformers

5.6.1 Perform safe to work check in each compartment opened for maintenance AND

Initial Step 23 of the Data Sheet after completion.

NOTE - Cleaning may be performed with a vacuum cleaner and/or soft bristle brushes. For areas with possible contamination HEPA vacuum and approved work package is required.

5.6.2 Clean transformer and compartment AND

Check Step 24 of the Data Sheet after completion.

5.6.3 Inspect transformer AND

Check Step 25 of the Data Sheet (after completion) for the following:
- Corrosion
- Signs of overheating
- Condition of insulators
- Wiring for damage or Deterioration
- Signs of moisture
- Loose Connectors.
- Condition of grounding components (conductors, lugs, terminals, etc.)

5.6.4 Tighten loose connections/terminations AND

If terminal lugs need to be replaced, replace terminal lugs.

5.6.4.1 Check Step 26 of the Data Sheet after completion.

5.6.5 Record any discrepancies in Comments Section of the Data Sheet.
5.7 Other Electrical Enclosures

5.7.1 **PERFORM** safe to work check in each enclosure opened for maintenance AND

**INITIAL** Step 27 of the Data Sheet after completion.

5.7.2 **IF** present, **ENSURE** disconnect/breaker As-Found position(s) are **RECORDED** on the Data Sheet

**NOTE** - Cleaning may be performed with a vacuum cleaner and/or soft bristle brushes. For areas with possible contamination HEPA vacuum and approved work package is required.

5.7.3 **CLEAN** electrical enclosure AND

**CHECK** Step 28 of the Data Sheet after completion.

5.7.4 **INSPECT** electrical enclosure AND

**CHECK** Step 29 of the Data Sheet (after completion) for the following:
- Corrosion
- Signs of overheating
- Condition of insulating material
- Wiring for damage or Deterioration
- Signs of moisture
- Loose Connectors.
- Condition of grounding components (conductors, lugs, terminals, etc.)

5.7.5 **TIGHTEN** loose connections/terminations AND

**IF** terminals need to be replaced, **REPLACE** terminals.

5.7.5.1 **CHECK** Step 30 of the Data Sheet after completion.

5.7.6 **OPERATE** all enclosure breakers/switches manually to confirm smooth operation.

5.7.6.1 **LEAVE** breakers/switches in the As-Found position, OR as directed by FWS/OE.

5.7.6.2 **CHECK** Step 31 of the Data Sheet after completion.

5.7.7 **RECORD** any discrepancies in Comments Section of the Data Sheet.
5.8 UPS Uninterruptible Power Supply

5.8.1 **INSPECT** Uninterruptible Power Supply (UPS) for any current alarms or warnings.

5.8.2 **CHECK** Step 32 of Data Sheet after completion.

5.8.3 **CHECK** UPS log for any previous events or fault that have occurred.

5.8.4 **CHECK** Step 33 of Data Sheet after completion.

5.8.5 **DOCUMENT** any findings on Data Sheet **AND**

**NOTIFY** FWS of any abnormalities.
5.9 Restoration

5.9.1 REMOVE personal protective grounds, if installed.

5.9.2 ENSURE all test equipment has been disconnected and removed.

5.9.3 RESTORE maintained equipment to original configuration as documented in Outage Procedure, Work Package, or Data Sheet OR as directed by FWS/OE.

5.9.4 NOTIFY Shift Manager all lock and tag devices may be restored to original configuration.

5.9.5 ENSURE all Lifted Leads are Re-Landed.

5.9.6 ENSURE HEPA vacuum is properly stored.

5.9.7 ENSURE work area is clean AND

DISPOSE of waste per TO-100-052.

5.9.8 ENSURE all maintained equipment is energized as requested by Operations.

5.10 Review

5.10.1 INFORM Operations Management that maintenance is completed.

5.10.2 PLACE any filled out Lifted/Landed Lead Record(s) in the Work Package.

5.10.3 IF HEPA vacuums were used in a radiological area, the FWS or Engineering will FORWARD a copy of completed logs and Data Sheets to Environmental Representative.

5.10.4 PROVIDE completed data sheets (originals or a copy) to Electrical Engineer for review upon completion of the task.

5.10.5 RECORD in the Comment/Remarks Section of Data Sheet, work request number(s) of work documents generated as a result of these instructions, if applicable.

5.10.6 IF additional equipment was cleaned, ENSURE engineering has updated the Data Sheets upon close-out.
5.11 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.
## Table 1 U.S. Standard Bolt Torques for Bus Connections

<table>
<thead>
<tr>
<th>BOLT DIAM.</th>
<th>HEAT TREATED STEEL-CADMIUM OR ZINC PLATED</th>
<th>SILICON LUBRICATED</th>
<th>BRONZE NON-LUBRICATED</th>
<th>ALUMINUM ALLOY LUBRICATED</th>
<th>STAINLESS STEEL UNCOATED</th>
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