# Routine 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>
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<tbody>
<tr>
<td>D-2</td>
<td>08/03/2017</td>
<td>Periodic Review</td>
<td>Re-worded 5.1.2, 5.1.4, 5.1.6, 5.1.12, 5.2.1, 5.2.2, 5.5.2, 5.5.3 and 5.5.4 for clarification.</td>
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<tr>
<td>D-0</td>
<td>06/11/2014</td>
<td>Periodic Review</td>
<td>Added WARNING pg. 3. Reworded 10th bullet at 4.1, Steps 4.3.2, 4.3.3, 5.1.6, Note prior to 5.1.9, 5.1.12, 5.3.2, Sections 5.4 &amp; 5.6. Added WARNING box and Steps 5.1.1 – 5.1.3.2 c, 5.1.11, 5.1.12.</td>
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<tr>
<td>C-3</td>
<td>01/15/2013</td>
<td>DOE Standard</td>
<td>Replaced references to document TFC-ESHQ-S-STD-03, Electrical Safety with DOE–0359, Hanford Site Electrical Safety Program.</td>
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</table>
1.0 PURPOSE AND SCOPE

1.1 Purpose
This procedure provides a method for performing maintenance on exit lights.

1.2 Scope
This procedure applies to “annual and monthly inspections,” cleaning and maintenance of exit lights.

2.0 INFORMATION
NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

WARNING - Batteries contain sulfuric acid. Failure to don the proper PPE while working on batteries that show evidence of leaking or rupture can cause burns, eye injury and other serious injuries.

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

3.1.2 If working around live circuits, comply with Electrical Safety practices as outlined in DOE–0359, Hanford Site Electrical Safety Program.

3.1.3 Compliance with TFC-ESHQ-S-STD-19 “Emergency Shower, Eyewash, and Decontamination Facility Operation Standard”.

3.1.4 Compliance with TFC-ESHQ-FP-STD-04 “Fire Protection System Testing, Inspection and Maintenance”.

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.
4.0 PREREQUISITES

4.1 Special Tools, Equipment and Supplies

The following supplies may be needed to perform this procedure:

- Digital Multi-meter
- ¼-inch hex head wrench
- Small straight and Phillips screwdriver
- Terminal coating
- Neutralizing solution, mixed, one pound of bicarbonate-of-soda to one gallon of water
- Battery cleaner, KRYLON, or equivalent
- Wiping cloths
- MSDS #051434
- Safety glasses, goggles, face shield
- Rubber or Neoprene gloves
- Protective aprons
- Portable or stationary water facilities for rinsing eyes and skin in case of acid spills
- Distilled water and jug
- Replacement bulbs
- Voltage rated hand tools
- Ladder
- Portable or stationary eyewash station
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.

NOTE - Equipment used to collect qualitative 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.
4.2 Performance Documents
- DOE-0336, Hanford Site Lockout/Tagout Procedure
- TO-100-052, Perform Waste Generation, Segregation and Accumulation.

4.3 Field Preparation

4.3.1 **OBTAIN** release from Operations Management prior to beginning performance of this procedure.

4.3.2 **ONLY** personnel trained in battery installation, charging, and maintenance are permitted to work on batteries.

4.3.3 Personnel working on batteries shall have current hazardous waste generator training.
5.0 PROCEDURE

5.1 Monthly Inspection of Powered Exit Light(s)

WARNING

Batteries contain sulfuric acid. Failure to don the proper PPE while working on batteries that show evidence of leaking or rupture can cause burns, eye injury and other serious injuries.

5.1.1 DON appropriate PPE (e.g. safety glasses, goggles).

5.1.2 PRIOR to working on a battery, DISCHARGE any acquired static electricity with bare hand by OBTAINING a good grounding point.

5.1.3 VISUALLY INSPECT battery case and terminals for signs of breakage or corrosion per Data Sheet.

5.1.3.1 IF battery shows evidence of leaking or rupture DON rubber or neoprene gloves, and safety glasses with goggles and/or full face shield.

5.1.3.2 IF battery case is cracked or leakage is present, PERFORM the following:

a. NEUTRALIZE with bicarbonate solution (see Section 4.1 for solution mixture) UNTIL fizzing stops.

b. COLLECT residue in a suitable non-metallic (plastic bag(s)) AND DISPOSE of per TO-100 052.

c. INSTALL new, fully charged battery.

5.1.4 VISUALLY INSPECT AND CLEAN exit light(s) listed on Data Sheet.

5.1.5 ENSURE unit is securely mounted.
5.1 Monthly Inspection of Powered Exit Light(s) (Cont.)

NOTE - The test button only simulates the interrupted power condition, but can be used if the exit light is connected to the normal lighting source.

5.1.6 ENSURE test button/switch or circuit breaker controlling normal lighting where the exit light is located, is in the OPEN (OFF) position.

5.1.7 MEASURE output voltage of exit light AND

RECORD As-Found voltage on Data Sheet.

5.1.8 TEST operation of units for 90 minutes.

NOTE - Light must be lit and a minimum remaining voltage required is 87.5% of nominal or 5.25 Vdc for 6 Volt systems (10.5 Vdc for 12 volt system).

5.1.9 MEASURE exit light output voltage AND

RECORD voltage on Data Sheet.

5.1.10 USE the following equation to determine if exit light meet the minimum requirements as specified on Data Sheet AND

CHECK [✓] satisfactory or unsatisfactory on Data Sheet.

Output voltage \( \times \) 0.875 (87.5%) = voltage

Example equation: 6 Vdc \( \times \) 0.875 = 5.25 Vdc.

5.1.11 IF the battery voltage is below 5.25 Vdc for 6 volt battery (10.5 Vdc for 12 volt battery) or less than 87.5% of nominal battery voltage, REPLACE the battery.

5.1.12 IF dirty, CLEAN battery(s) with a dry cloth.

5.1.13 REPLACE any lamps that are burnt out or dim.
5.2 Annual Inspection of Tritium or Self Illuminating Exit Light(s)

5.2.1 VISUALLY INSPECT for damage AND CHECK expiration date.

5.2.2 REPLACE damaged exit lights AND REPLACE exit lights with expiration dates that will terminate BEFORE the next inspection cycle.

5.3 Restoration

5.3.1 ENSURE system is returned to normal operation.

5.3.2 IF circuit breaker was opened, ENSURE it is in the CLOSED (ON) position.

5.4 Acceptance Criteria

The battery voltage is above 5.25 Vdc for 6 volt battery (10.5 Vdc for 12 volt battery) or \( \geq 87.5\% \) of nominal battery voltage and the battery expiration date is greater than one (1) year from date of inspection.

5.5 Review

5.5.1 REPORT deficiencies, or cause of early failure to Maintenance Manager for corrective action.

5.5.2 INFORM Operations management and Maintenance management procedure is complete.

5.5.3 FWS REVIEW AND ENSURE completed Data Sheets meet acceptance criteria, and comments sections are filled out appropriately.

5.5.4 FWS IDENTIFY any work requests needed as a result of this procedure AND ENSURE they are generated.

5.5.5 RECORD in Comments/Remarks section of Data Sheet work request number(s) of any work documents generated as a result of this procedure, as applicable.
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.