Perform Annual Inspection of Pro-Tec Emergency Shower

Tank Farm Maintenance Procedure

**MAINTENANCE**

USQ # GCX-2

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

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<th>Rev-Mod</th>
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<td>C-1</td>
<td>12/31/2018</td>
<td>Comply with the new DOE-0359 updates.</td>
<td>Steps 4.3.2 and 5.2.9.1 changing Electrical Hazard Evaluation to Electrical Risk Assessment to comply with the new DOE-0359 updates.</td>
</tr>
<tr>
<td>C-0</td>
<td>06/28/2016</td>
<td>Periodic Review</td>
<td>Removed Warnings, Removed Step 3.1.2, Removed Bullet #14 in Section 4.1, As Required from Step 5.2.9.1 and As Needed from Step 5.6.2.</td>
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<tr>
<td>B-3</td>
<td>05/12/2015</td>
<td>The water temperature controllers for the emergency showers are being upgraded from analog controllers to digital controllers, Company driven.</td>
<td>Steps 5.2.4 and 5.2.9.5 change 2 hours to 24 hours. Modified step 5.2.8 added steps 5.2.9, 5.2.10 through 5.2.10.9.</td>
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<tr>
<td>B-2</td>
<td>11/18/2014</td>
<td>CHAMPS Removal</td>
<td>Removed reference to CHAMPS, updated records statements and removed next periodic review date.</td>
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<tr>
<td>B-1</td>
<td>02/04/2014</td>
<td>Incorrect cross reference</td>
<td>At Step 5.2.6 changed cross reference from Section 5.5 to 5.3.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for the inspection and maintenance of emergency showers and eyewash units that are in service. Performance of this procedure ensures compliance with ANSI Z358.1, Section 4 (Emergency Shower) and Section 5 (Eyewash Unit) requirements.

1.2 Scope

This procedure applies to Pro-Tec portable emergency shower units. The emergency shower comprises the following:

- Grounding Lug
- 240VAC/120VAC 60 AMP external service panel
- 600-Gallon Water Supply Tank
- Electric Immersion Water Heater
- Water Recirculation Pump (3/4 hp)
- Water Supply Pump
- Emergency Shower
- Eyewash
- Drench Hose
- 400 Gallon sump
- Space Heater
- Miscellaneous support equipment.
Perform Annual Inspection of Pro-Tec Emergency Shower

2.0 INFORMATION

2.1 General Information

Due to this procedure being performed on several emergency showers, the equipment nomenclature referenced within the procedure steps can be interchanged with the following nomenclature which correlates to the individual number for each emergency shower Unit.

Table 1 - Emergency Shower Units

<table>
<thead>
<tr>
<th>Emergency Shower Unit</th>
<th>For the Emergency Shower Unit being worked on, interchange XXX with the applicable number below.</th>
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<td>Unit 8</td>
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</table>
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 If working around live circuits, extreme caution should be used. Failure to follow electrical safety practices as outlined in DOE–0359, Hanford Site Electrical Safety Program could result in serious injury.

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

3.1.3 Failure to use protective equipment when working on or near energized systems could result in serious injury. Job specific protective equipment requirements should be addressed during the pre-job brief and be in accordance with TFC-ESHQ-S_IS-C-02.

3.1.4 Removing tank heater PORXXX-EMER-HTR-101, WATER SUPPLY TANK HEATER front cover will expose energized terminals and could result in electrical shock if proper PPE is not worn.
3.2 Environmental Compliance

3.2.1 All non-emergency use, testing, and discharges of the emergency shower/eyewash assembly must be done in accordance with State Waste Water Discharge Permit ST 4511. Environmental approval for non-emergency discharge to the environment is required.

3.2.2 Immediately report all leaks or discharges to Environmental using the Environmental On-Call list in accordance with TFC-ESHQ-ENV_FS-C-01.

3.2.3 In accordance with TFC-ESHQ-ENV_RM-C-04, Water Discharge at Tank Farms, routine maintenance and operation activities may result in small incidental discharge of raw water as long as the limits and conditions listed below are met.

- Appropriate best management practices (BMPs) shall be implemented to prevent unnecessary discharge.
- No ponding of liquid.
- During pre-job planning, measures to limit soil erosion will be incorporated in the work plan.
- During performance of the work, all measures to limit ponding and/or erosion will be implemented.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following Measuring and Test Equipment (M&TE) may be needed to perform this procedure:

NOTE - M&TE 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
- Have an accuracy consistent with state-of-the-art limitations:
  
  Accuracy is equal to or greater than M&TE tolerance specified on PMID/Data Sheet

OR

  Accuracy is at least 4 times greater than specified device tolerance.

- Flowmeter (optional)
- Thermal heat gun

The following supplies may be needed to perform this procedure:

- Inspection Tags
- Potable water for cleaning
- Tape measure
- Tape
- Wrench(es)
- Stopwatch
- Bucket(s) with volumes marked at 1, 2, 3, and 5 gallons
- Sleevings
- Plexiglas gauge
- Clean cotton, latex, or plastic gloves
- Nitrile (or other chemical-compatible) gloves
4.1 Special Tools, Equipment, and Supplies (Cont.)
- 10% bleach solution
- GHS-SDS and/or MSDS for bleach
- Soft, lint-free, and chemical-free cloth
- Cotton swabs
- Temporary lighting
- Screwdriver of any kind
- Other tools, equipment, and supplies as identified by Shift Manager/OE/FWS/User.

4.2 Performance Documents
The following documents may be needed to perform this procedure:
- TO-020-031, Pro-Tec Emergency Shower Setup, Startup, Inspection and Shutdown
- TO-100-052, Perform Waste Generation, Segregation, Accumulation and Clean-up

4.3 Field Preparation
4.3.1 CONFIRM emergency shower unit is set up for operation per TO-020-031.
4.3.2 ENSURE Electrical Risk Assessment is completed.
5.0 PROCEDURE

NOTE - Section 5.6 may be performed independently.

5.1 Test Activation Button Automatic Actions

NOTE - Engaging the “PUSH TO ACTIVATE” button (by pushing in) will activate the visual alarm, interior light, and the shower water supply pump.

5.1.1 PUSH IN the “PUSH TO ACTIVATE” button.

5.1.2 CONFIRM Alarm Beacon activates AND RECORD on Data Sheet.

5.1.3 CONFIRM Interior Light illuminates AND RECORD on Data Sheet.
Perform Annual Inspection of Pro-Tec Emergency Shower

5.2 Check Initial System Conditions

5.2.1 ENSURE PORXXX-EMER-V-104, SUMP DRAIN VALVE (See Section 2.1 for XXX interchangeable number) is in the CLOSED position AND ENSURE LOCK/RESTRAIN devise is fully engaged.

Check Warning and Instructional Labels

5.2.2 CONFIRM placards/labels are clean, legible, and in good condition AND RECORD on Data Sheet.

Check Water Volume

5.2.3 CHECK PORXXX-EMER-TK-101, WATER SUPPLY TANK indicates water is between the high level indication mark and low level indication mark on the tank. (See Section 2.1 for XXX interchangeable number)

5.2.3.1 IF PORXXX-EMER-TK-101, WATER SUPPLY TANK level is not greater than the low level indication mark on the tank, NOTIFY FWS to contact the water purveyor to have the tank filled per TO-020-031. (See Section 2.1 for XXX interchangeable number)

Check Supply Tank Water Temperature

NOTE - Supply water in PORXXX-EMER-TK-101, WATER SUPPLY TANK requires a minimum of two (2) hours for the temperature to stabilize. (See Section 2.1 for XXX interchangeable number)

5.2.4 IF supply water has been recently added, WAIT a minimum of 24 hours for the water temperature to stabilize.

5.2.5 OBTAIN temperature of water in PORXXX-EMER-TK-101, WATER SUPPLY TANK. (See Section 2.1 for XXX interchangeable number)

5.2.6 IF temperature of the water is 70 to 95 °F, RECORD the temperature on Data Sheet AND GO TO Section 5.3.

5.2.7 IF temperature of the water is above 95 °F due to ambient temperature, RECORD temperature on Data Sheet AND INDICATE reason for discrepancy in COMMENTS section of Data Sheet.
5.2 Check Initial System Conditions (Cont.)

5.2.8 IF the temperature is above 95 °F and is not due to ambient temperature, OR

IF the temperature is below 70 °F, ADJUST PORXXX-EMER-HTR-101, WATER SUPPLY TANK HEATER (See Section 2.1 for XXX interchangeable number) per Step 5.2.9 for analog controllers or 5.2.10 for digital controllers:

5.2.9 IF using an analog water heater controller and water temperature setting needs adjusting, PERFORM the following:

5.2.9.1 DON PPE per Electrical Risk Assessment.

5.2.9.2 REMOVE tank heater PORXXX-EMER-HTR-101, WATER SUPPLY TANK HEATER (See Section 2.1 for XXX interchangeable number) front cover.

5.2.9.3 ADJUST temperature setting as appropriate.

5.2.9.4 REINSTALL PORXXX-EMER-HTR-101, WATER SUPPLY TANK HEATER (See Section 2.1 for XXX interchangeable number) front cover.

5.2.9.5 WAIT a minimum of 24 hours for the water temperature to stabilize.

5.2.9.6 GO TO Step 5.2.5.
5.2 Check Initial System Conditions (Cont.)

5.2.10 IF using a digital water heater controller, CHECK AND/OR ADJUST water temperature settings per the following:

NOTE - Per the vendor's manual, a delay of 30 seconds or more in between the performance of any of the following steps (5.2.10.1 through 5.2.10.4) will cause the controller to automatically reset itself. If this occurs, just restart the step sequence.

5.2.10.1 PRESS AND HOLD MENU until the display changes to flashing SP (this takes about 2 seconds).

a. WHILE flashing, PRESS the UP or DOWN arrows to display SP.

5.2.10.2 PRESS MENU AND CHECK the display, displays the current value of 85.

5.2.10.3 IF the displayed value is not set at 85 PRESS UP or DOWN arrow until the value is 85 THEN PRESS MENU to save the new value.

5.2.10.4 PRESS MENU.

NOTE - Per the vendor's manual, a delay of 30 seconds or more in between the performance of any of the following steps (5.2.10.5 through 5.2.10.8) will cause the controller to automatically reset itself. If this occurs, just restart the step sequence.

5.2.10.5 PRESS AND HOLD MENU until the display changes to flashing SP (this takes about 2 seconds).

a. WHILE flashing, PRESS the UP or DOWN arrows to display dIF.

5.2.10.6 PRESS MENU AND CHECK the display, displays the current value of 4.

5.2.10.7 IF the displayed value is not set at 4 PRESS UP or DOWN arrow until the value is 4 THEN PRESS MENU to save the new value.
5.2 Check Initial System Conditions (Cont.)

5.2.10.8 PRESS MENU.

5.2.10.9 IF settings were adjusted, PERFORM the following:

   a. WAIT a minimum of 24 hours for the water temperature to stabilize.

   b. AFTER a minimum of 24 hours, CHECK the display, displays a value between 85 to 89 °F.

   c. IF temperature reading is not within the desired value (85 to 89 °F) NOTIFY FWS.
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5.3 Inspect Drench Hose

5.3.1 IF bucket has not been staged, STAGE a bucket or capture container to capture as much water as possible to reduce or eliminate adding water to sump.

5.3.2 IF bucket has been staged AND
IF bucket is not empty, EMPTY the water collection container.

5.3.3 REMOVE drench hose from wall.

5.3.4 VISUALLY INSPECT hose and nozzle cover for damage or wear.

5.3.5 CONFIRM valve goes from OFF to ON in one second or less AND
CONFIRM flow out of drench hose is not hazardous to user.

5.3.6 SQUEEZE nozzle to start the water flow.

5.3.7 AT 1 minute, or when the bucket is filled to the 3-gallon graduated line, RELEASE nozzle to stop the water flow.

5.3.8 RELEASE valve to stop water flow.

5.3.9 CHECK hose and fittings for leaks AND
TIGHTEN loose fittings.

NOTE - Minimum acceptable water flow for Drench Hose is 3 GPM
- Steps 5.3.10 and 5.3.11 may be repeated.

5.3.10 RECORD damage, discrepancies, and results on Data Sheet.

5.3.11 REPLACE hose on the wall hanger.
5.4 Inspect Eyewash Station

5.4.1 CONFIRM valve actuator is easy to locate.

5.4.2 INSPECT eyewash covers for any deficiencies.

5.4.3 CHECK unit location provides enough room to allow eyelids to be held open with both hands while the eyes are in the water stream.

NOTE - Steps 5.4.4 through 5.4.7 may be worked concurrently.

____ 5.4.4 CONFIRM valve goes from OFF to ON in one second or less.

____ 5.4.5 CONFIRM valve remains ON without the use of the operator’s hands.

____ 5.4.6 CONFIRM flow of water is provided to both eyes simultaneously and water flow is not hazardous to end user.

____ 5.4.7 USE Plexiglas gauge, CONFIRM both eye wash streams cover the area between the scored lines when the gauge is lowered no more than 1.5 inches below the streams’ peaks.
Perform Annual Inspection of Pro-Tec Emergency Shower

5.4 Inspect Eyewash Station (Cont.)

NOTE - Steps 5.4.8 through 5.4.11 may be repeated as necessary.

5.4.8 IF bucket has not been staged, STAGE a bucket or capture container to capture as much water as possible to reduce or eliminate adding water to the sump.

5.4.9 IF bucket has been staged AND IF bucket is not empty, EMPTY the water collection container.

5.4.10 TAPE plastic sleeving around eyewash nozzles to funnel the flow into an empty bucket that has a 1-gallon graduated line.

NOTE - Minimum acceptable flow is 0.4 GPM.

5.4.11 CONFIRM it takes less than 2 minutes and 30 seconds to fill the bucket to the 1-gallon graduated line, OR CONFIRM that it takes less than 5 minutes to fill the bucket to the 2-gallon graduated line.

5.4.12 RECORD damage, discrepancies, and results on Data Sheet.

5.4.13 REMOVE the plastic and tape from eyewash nozzles.

5.4.14 REPLACE the covers on eyewash nozzles.

5.4.15 CHECK all parts of the eyewash station and plumbing for leaks AND TIGHTEN loose fittings.
5.5 **Inspect Emergency Shower**

**NOTE** - In this context, ANSI Z358.1 does not consider the Eyewash Station of a combination Emergency Shower/Eyewash Station an obstruction to allow for simultaneous use of the shower and eyewash equipment.

5.5.1 **ENSURE** shower enclosure provides a minimum unobstructed area of 34 inches in diameter.

5.5.2 **CHECK** all parts of the shower and plumbing for leaks **AND** **TIGHTEN** loose fittings.

**NOTE** - The use of sleeving is optional.

- Steps 5.5.3 through 5.5.9 may be repeated.

5.5.3 **IF** bucket has not been staged, **STAGE** a bucket or capture container to capture as much water as possible to reduce or eliminate adding water to the sump.

5.5.4 **IF** bucket has been staged **AND**

**IF** bucket is not empty, **EMPTY** the water collection container.

5.5.5 **CONNECT** a flowmeter to the shower head, **OR**

**IF** not using a flowmeter, **TAPE** plastic sleeving around the shower head to funnel the water into the measured bucket.

**NOTE** - Step 5.5.6, 5.5.7, and 5.5.8 may be worked concurrently.

5.5.6 **CONFIRM** time between initiation of flow and water coming out of the shower head is one second or less.

5.5.7 **CHECK** valve remains ON without the use of the operator’s hands.

5.5.8 **ACTIVATE** shower for 15 seconds.
5.5 Inspect Emergency Shower (Cont.)

5.5.9 IF using a flowmeter, CHECK the meter indicates the flow is a minimum of 20 gallons per minute.

OR

IF using a graduated container, CHECK the bucket is filled to the 5-gallon line at a minimum.

5.5.10 IF plastic sleeving was used, REMOVE plastic sleeving.

5.5.11 IF water has been collected, EMPTY water collection container.

NOTE - Steps 5.5.12, 5.5.13, and 5.5.14 may be worked in parallel.

5.5.12 CONFIRM spray pattern has a minimum diameter of 20 inches at 60 inches above the surface on which the user stands (see Figure 2).

5.5.13 CONFIRM water is dispersed throughout the spray pattern.

5.5.14 CONFIRM center of the spray pattern is at least 16 inches away from any obstruction (see Figure 2).

5.5.15 RECORD damage, discrepancies, and results on Data Sheet.

5.5.16 CHECK the unit for leaky fittings AND TIGHTEN loose fittings.

5.5.17 PULL OUT “PUSH TO ACTIVATE” button to disengage the system.

5.5.18 SIGN AND DATE on inspection tag.
5.6 Change Water Supply Filter

5.6.1 IF PORXXX-EMER-FLT-101, WATER SUPPLY FILTER housing has not already been removed previously, **PERFORM** Steps 5.6.1.1 through 5.6.1.7.

5.6.1.1 **TURN OFF** PORXXX-EMER-P-102, RECRIRC PUMP. (See Section 2.1 for XXX interchangeable number)

5.6.1.2 **POSITION** PORXXX-EMER-V-102, RECRIRC PUMP INLET VALVE to CLOSE/OFF. (See Section 2.1 for XXX interchangeable number)

5.6.1.3 **POSITION** PORXXX-EMER-V-103, RECRIRC PUMP DISCHARGE VALVE to CLOSE/OFF. (See Section 2.1 for XXX interchangeable number)

5.6.1.4 IF bucket has not been staged, **STAGE** a bucket under PORXXX-EMER-FLT-101, WATER SUPPLY FILTER to catch water. (See Section 2.1 for XXX interchangeable number)

5.6.1.5 IF bucket has been staged **AND**

IF bucket is not empty, **EMPTY** the water collection container.

5.6.1.6 **REMOVE** PORXXX-EMER-FLT-101, WATER SUPPLY FILTER housing by turning the housing counter-clockwise. (See Section 2.1 for XXX interchangeable number)

5.6.1.7 **REMOVE** the filter from the housing.

5.6.2 **REFER** to appropriate GHS-SDS and/or MSDS.
5.6 Change Water Supply Filter (Cont.)

5.6.3 DON nitrile (or other chemical-compatible) gloves.

5.6.4 CLEAN the interior of the housing unit using a clean rag moistened with 10% bleach solution.

5.6.5 RINSE the interior of the housing unit using a clean rag moistened with potable water.

5.6.6 INSERT a new filter into the housing.

5.6.7 ATTACH the housing to unit.

5.6.8 POSITION PORXXX-EMER-V-102, RECIRC PUMP INLET VALVE to OPEN/ON. (See Section 2.1 for XXX interchangeable number)

5.6.9 POSITION PORXXX-EMER-V-103, RECIRC PUMP DISCHARGE VALVE to OPEN/ON. (See Section 2.1 for XXX interchangeable number)

5.6.10 TURN ON PORXXX-EMER-P-102, RECIRC PUMP. (See Section 2.1 for XXX interchangeable number)

5.6.11 RECORD filter replacement on Data Sheet.
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5.7 Restoration

5.7.1 IF PORXXX-EMER-TK-101, WATER SUPPLY TANK water level is below lower level mark (380 gallons), NOTIFY FWS to contact the water purveyor to refill the water storage tank per TO-020-031. (See Section 2.1 for XXX interchangeable number)

5.7.2 DRAIN the residual fluid from the emergency shower plumbing lines per TO-020-031.

5.7.3 DISCONNECT AND REMOVE test equipment as necessary.

5.7.4 IF fluid has collected in the sump, EMPTY the sump per TO-020-031.

5.7.5 REPORT any deficiencies and/or probable cause of early failure to the FWS for corrective action.

5.7.6 CHECK equipment restoration by observing indications are consistent with expected conditions.

5.7.7 NOTIFY Operations the test is complete and the system may be returned to the desired configuration.

5.7.8 DISPOSE of waste per TO-100-052.
5.8 Acceptance Criteria

Verification of data in applicable steps of the procedure satisfies the Acceptance Criteria for this procedure.

5.9 Review

5.9.1 INFORM the Field Work Supervisor the test is complete.

5.9.2 FWS REVIEW AND ENSURE the following:
- 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.

5.10 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.
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Figure 1 - Emergency Shower/Eyewash Layout

Top View

1. PORXXX-EMER-V-101 Tank Drain Valve
2. PORXXX-EMER-V-102 Recirc Pump Inlet Valve
3. PORXXX-EMER-V-103 Recirc Pump Discharge Valve
4. PORXXX-EMER-V-104 Sump Drain Valve
5. PORXXX-EMER-HTR-101 Water Supply Tank Heater
6. PORXXX-EMER-HTR-102 Room Heater
7. PORXXX-EMER-FLT-101 Water Supply Filter
8. PORXXX-EMER-P-101 Main Supply Pump
9. PORXXX-EMER-P-102 Recirc Pump
10. PORXXX-EMER-UVSS-101 Ultra Violet Sanitizer System
11. PORXXX-EMER-DP-101 Distribution Panel

S1 – Main Pump Disconnect
S2 – UV Pump Disconnect
S3 – Tank Heater Disconnect
S4 – Room Heater Disconnect
Figure 2 - Emergency Shower and Eyewash Unit

**NOTE:** Eyewash is not considered an obstruction.