Tank Farm Maintenance Procedure

MAINTENANCE

Glycol System Maintenance on POR126 and POR127 Exhauster Heat Exchanger

USQ # GCX-2

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CHANGE HISTORY (≤ LAST 5 REV-MODS)

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<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
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<tr>
<td>A-4</td>
<td>09/06/2018</td>
<td>Maintenance Request</td>
<td>Removal of references to TO-060-108 and POR107.</td>
</tr>
<tr>
<td>A-3</td>
<td>06/21/2018</td>
<td>Periodic Review</td>
<td>Deleted the word &quot;AND&quot; from 5.1.77.</td>
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<tr>
<td>A-2</td>
<td>06/15/2017</td>
<td>Maintenance Request</td>
<td>Add POR126 and POR127 to Procedure Title.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Add TO-060-126 and TO-060-127 to multiple locations in procedure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Add &quot;Typical of H-14-108926 Sheet 1 (POR126)&quot;) and &quot;Typical of H-14-108927 Sheet 1 (POR127)&quot; to Figure 1.</td>
</tr>
<tr>
<td>A-1</td>
<td>04/24/2017</td>
<td>Maintenance Request</td>
<td>Add to Step 5.1.78, (POR-107), or TO-060-126 (POR-126), or TO-060-127 (POR-127)</td>
</tr>
<tr>
<td>A-0</td>
<td>04/20/2016</td>
<td>Engineering request.</td>
<td>Various changes made for clarification and farm specification.</td>
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New Procedure
Glycol System Maintenance on POR126 and POR127 Exhauster Heat Exchanger

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Glycol System Maintenance on POR126 and POR127 Exhauster Heat Exchanger

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for maintenance of the glycol system on the heat exchanger for Exhauster POR126 and POR127.

1.2 Scope

This procedure involves inspecting POR126 or POR127 Exhauster heater system, cleaning the reservoir sight glass, cycling the glycol system valves and sampling, flushing, and filling the propylene glycol/water mixture in the Exhauster heat exchanger.

2.0 INFORMATION

2.1 General Information

2.1.1 Unless otherwise specified, component identification numbers are preceded by “POR126-VTP” or “POR127-VTP”.

2.1.2 Glycol can be drained from system by using one of the following methods:
  • Peristaltic pump using tubing connected to hose barb at Glycol drain valve.
  
  OR

  • Gravity drain with tubing connected to hose barb at Glycol drain valve.

2.1.3 The Glycol system will hold approximately eight to ten (8-10) gallons.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Glycol tank, exposed piping and valves may be hot (120°F to 190°F). Temperature will be verified and allowed to cool below 120°F prior to working glycol system.

3.1.2 During the performance of the low temperature system maintenance, compliance with the DOE-0336, Hanford Site Lockout/Tagout Procedure is required.

3.1.3 The Work package will perform a location-specific hazards analysis in accordance with TFC-ESHQ-SAF_S-C-02.

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-ESHQ-RP_RWP-C-03

3.2.2 When disconnecting, breaching or opening systems or system components that are currently or previously connected to waste tanks or waste transfer systems:
   - Continuous HPT coverage is required
   - Pre-job and post-job surveys are required
   - A job specific RWP may be required.
3.3 Environmental Compliance

3.3.1 The Central Shift Office must be notified in the event of a leak or a spill in accordance with TFC-ESHQ-ENV_FS-C-01, Environmental Notifications. This includes Prestone Radiator Flush, Propylene Glycol, de-mineralized water, and/or raw water.

3.3.2 The glycol heater is required abatement equipment as listed in permit AIR 15-809 and must be operable during exhauster operation. Any shutdown, bypass or new issues identified with heater systems must be reported to the appropriate Operations shift manager per TFC-ESHQ-ENV_FS-C-01.
4.0 PREREQUISITES

4.1 Special Tools, Equipment and Supplies

The following supplies may be needed to perform this procedure:

- Leather gloves
- Waste container(s) capable of containing approximately 10 - 30 gallons
- Two (2) five gallon buckets for glycol transfer due to drain valve height restrictions (optional)
- Clear one (1) quart waste container
- Ground cover with absorbent pads
- One, 1” (inch) 90° Swagelok elbow, with female NPT threads, both ends or equivalent
- 1” (inch) hose barb, MNPT threads (for drain valve connection) or equivalent
- 1” Tygon tubing; length as determined by FWS
  
  OR

- 1” Tygon tubing, Peristaltic Grade; (length as determined by FWS)
- One, (1), 1” hose clamp or equivalent for Tygon tubing
- Peristaltic pump (Optional)
- GFCI (with extension cord)
- Funnel
- Prestone radiator flush (GHS-SDS and/or MSDS #018682A)
- 50/50 mix of propylene glycol with corrosion inhibitors and de-mineralized water for glycol system (GHS-SDS and/or MSDS #038772, GHS-SDS and/or MSDS #041791 or equivalent)
- Bag with absorbents
- Pipe cleaners and rags
- Portable Eyewash Station
- 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-100-052, Perform Waste Generation, Segregation, Accumulation and Clean-up
- TFC-ESHQ-ENV_FS-C-01, Environmental Notifications
- DOE-0336, Hanford Site Lockout/Tagout Procedure
- TO-060-126, Operate POR126 Portable Exhaust Ventilation System
- TO-060-127 Operate POR127 Portable Exhaust Ventilation System.

4.3 Field Preparation

4.3.1 NOTIFY HPT coverage is required during system breach.

4.3.2 REQUEST Operations to configure the identified system to allow performance of this procedure.

4.3.3 ENSURE lockout/tagout and overlocking requirements have been satisfied per DOE-0336, Hanford Site Lockout/Tagout Procedure.
5.0 PROCEDURE

Special Instructions

Refer to Figure 1 for Glycol System layout and valve locations.

As field conditions dictate, Steps and Activities may be performed in any logical order, in parallel, independently or N/A’ed to complete individual task(s) when directed by FWS with directions recorded on work record or Comments Section of Data Sheet.

5.1 POR126 or POR127 Glycol System Maintenance

Inspect Heater System and Cycle Valves

5.1.1 CONFIRM with operations that low temperature system is lock and tagged per DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.2 VISUALLY INSPECT the following Glycol system exterior components for damage, corrosion, etc.
   - Recirculation Pump
   - Piping
   - Instrumentation and Controls.

5.1.3 RECORD inspection results on Data Sheet.

5.1.4 CHECK drain valve V-370 on Glycol system is capped/plugged.

5.1.4.1 IF NOT, OBTAIN cap/plug for installation during Restoration Section 5.2

5.1.5 RECORD the Glycol System As-Found valve(s) positions on Data Sheet.

5.1.6 CYCLE drain valve V-370 manually two (2) to three (3) times:

5.1.7 RETURN valve to As Found position AND

RECORD those positions in As Left column on Data Sheet.

5.1.8 RECORD any discrepancies and/or comments on Data Sheet.
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

Drain Glycol Tank

5.1.9 CONFIRM at HMI that glycol heater and pump is OFF.

NOTE - Depending on temperature, it could take up to 24 hours for glycol to cool below 120°F.

5.1.10 CHECK glycol temperature using HMI.

5.1.10.1 IF glycol temperature is above 120°F, ALLOW cooling until the temperature is below 120°F.

5.1.11 INSTALL ground cover with absorbent pads under glycol waste container(s), glycol reservoir tank and glycol tank drain valve.

5.1.12 PERFORM pre-job radiological survey.

5.1.13 OPEN glycol vent valve V-375 (Figure 1).

5.1.14 IF using Peristaltic Pump to drain glycol from tank, GO TO Step 5.1.22.

5.1.15 IF installed, REMOVE plug from glycol “Drain” valve V-370.

5.1.16 ATTACH hose barb to fitting

OR

IF space is insufficient to connect fitting and hose barb as a unit, ATTACH fitting to glycol drain valve V-370, THEN

CONNECT/TIGHTEN the hose barb to fitting.
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

Drain Glycol Tank (Cont.)

NOTE - Five gallon bucket(s) may be required for glycol transfer due to drain valve height restrictions.

5.1.17 CONNECT Tygon drain hose to V-370, glycol drain valve hose barb AND ROUTE drain hose into an appropriate waste container(s).

5.1.18 OPEN glycol drain valve V-370.

5.1.19 AFTER system is fully drained (observed by no more fluid draining from tank), PERFORM the following:

5.1.19.1 CLOSE glycol vent valve V-375.

5.1.19.2 CLOSE glycol tank drain valve V-370.

5.1.20 INSPECT drained glycol AND RECORD any discoloration, sediment, etc. on Data Sheet.

5.1.21 GO TO Step 5.1.23

Drain Glycol using Peristaltic Pump

5.1.22 DRAIN Glycol tank using Peristaltic Pump as follows:

5.1.22.1 IF installed, REMOVE plug from glycol “Drain” valve V-370.

5.1.22.2 ATTACH hose barb to fitting

OR

IF space is insufficient to connect fitting and hose barb as a unit, ATTACH fitting to glycol drain valve V-370, THEN

CONNECT/TIGHTEN the hose barb to fitting.
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

Drain Glycol using Peristaltic Pump (Cont.)

5.1.22.3 CONNECT Tygon drain hose to V-370, glycol drain valve hose barb and to inlet of peristaltic pump.

5.1.22.4 INSTALL end of drain hose, to outlet of peristaltic pump AND ROUTE into an appropriate waste container(s).

5.1.22.5 OPEN glycol drain valve V-370.

5.1.22.6 PLUG GFCI to peristaltic pump and 120 volt receptacle (using extension cord if needed) AND TURN peristaltic pump switch on to drain glycol tank.

5.1.22.7 AFTER system is fully drained (observed by no more fluid draining from tank), PERFORM the following:

a. CLOSE glycol vent valve V-375.

b. CLOSE glycol tank drain valve V-370.

Flush the Glycol Tank

5.1.23 IF not already open, OPEN Fill Port (for glycol reservoir tank).

NOTE - Glycol system holds approximately eight to ten (8 - 10) gallons.

5.1.24 ADD required quantity per manufacturer’s instructions of flush solution (Prestone Radiator Flush/De-ionized water) into glycol tank Fill Port until level indicator reads approximately 55-75%.

5.1.25 CLOSE Fill Port located on top of glycol tank.

5.1.26 REMOVE lockout/tagout and overlocking in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.27 REQUEST operations to start the glycol pump per system operating procedure TO-060-126 for POR126

OR

TO-060-127 for POR127 (to cycle the flush solution throughout system).
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

Flush the Glycol Tank (Cont.)

5.1.28 RUN glycol pump for 2 hours (minimum) to achieve proper flush.

5.1.29 WHEN flush is complete, REQUEST operations to stop glycol pump per system operating procedure TO-060-126 for POR126

OR

TO-060-127 for POR127.

5.1.30 PERFORM lockout/tagout and overlocking in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.31 IF using Peristaltic Pump to drain flush solution, GO TO Step 5.1.38

5.1.32 OPEN glycol vent valve V-375.

5.1.33 ENSURE drain hose is still connected to glycol drain valve V-370.

5.1.34 ENSURE other end of drain hose is still placed into an appropriate waste container.

5.1.35 OPEN glycol system drain valve V-370.

5.1.36 AFTER system is fully drained (observed by no more fluid draining from valve), CLOSE the following valves:

- Glycol system vent valve, V-375.
- Glycol tank drain valve, V-370.

5.1.37 GO TO Step 5.1.44
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

Drain Flush Solution using Peristaltic Pump

5.1.38 IF REMOVED, ATTACH hose barb to fitting

OR

IF space is insufficient to connect fitting and hose barb as a unit, ATTACH fitting to glycol drain valve V-370, THEN

CONNECT/TIGHTEN the hose barb to fitting.

5.1.39 CONNECT Tygon drain hose to V-370, glycol drain valve hose barb and to inlet of peristaltic pump.

5.1.40 INSTALL end of drain hose, to outlet of peristaltic pump AND

ROUTE into an appropriate waste container(s).

5.1.41 OPEN glycol drain valve V-370.

5.1.42 PLUG GFCI to peristaltic pump and 120 volt receptacle (using extension cord if needed) AND

TURN peristaltic pump switch on to drain glycol tank.

5.1.43 AFTER system is fully drained (observed by no more fluid draining from tank), PERFORM the following:

5.1.43.1 CLOSE glycol vent valve V-375.

5.1.43.2 CLOSE glycol tank drain valve V-370.
### 5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

#### Rinse the Glycol Tank

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.44</td>
<td><strong>IF</strong> not already open, <strong>OPEN</strong> Fill Port located on top of glycol reservoir tank.</td>
</tr>
<tr>
<td>5.1.45</td>
<td><strong>ADD</strong> the required quantity of De-ionized water into glycol tank Fill Port until level indicator reads approximately 55-75%.</td>
</tr>
<tr>
<td>5.1.46</td>
<td><strong>CLOSE</strong> Fill Port located on top of glycol reservoir tank.</td>
</tr>
<tr>
<td>5.1.47</td>
<td><strong>REMOVE</strong> lockout/tagout and overlocking in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.</td>
</tr>
<tr>
<td>5.1.48</td>
<td><strong>REQUEST</strong> operations to <strong>START</strong> the glycol pump per system operating procedure TO-060-126 <strong>OR</strong> TO-060-127 to cycle the rinse solution throughout system.</td>
</tr>
<tr>
<td>5.1.49</td>
<td><strong>RUN</strong> glycol pump for 2 hours (minimum) to achieve proper rinse.</td>
</tr>
<tr>
<td>5.1.50</td>
<td><strong>WHEN</strong> the rinse is complete, <strong>REQUEST</strong> operations to <strong>STOP</strong> glycol pump per operating procedure TO-060-126 (POR126) <strong>OR</strong> TO-060-127 (POR127).</td>
</tr>
<tr>
<td>5.1.51</td>
<td><strong>PERFORM</strong> lockout/tagout and overlocking in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.</td>
</tr>
<tr>
<td>5.1.52</td>
<td><strong>IF</strong> using Peristaltic Pump to drain rinse from tank, <strong>GO TO</strong> Step 5.1.59</td>
</tr>
<tr>
<td>5.1.53</td>
<td><strong>ENSURE</strong> the drain hose is installed into an appropriate waste container(s).</td>
</tr>
</tbody>
</table>
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

5.1.54 OPEN glycol vent valve V-375.

5.1.55 ENSURE other end of drain hose is still placed into waste container.

5.1.56 OPEN glycol tank drain valve V-370.

5.1.57 AFTER system is fully drained (observed by no more fluid draining from tank), CLOSE the following valves:
   • Glycol system vent valve, V-375.
   • Glycol tank drain valve, V-370.

5.1.58 GO TO Step 5.1.69

**Drain Rinse Solution using Peristaltic Pump**

5.1.59 IF REMOVED, ATTACH hose barb to fitting

   OR

   IF space is insufficient to connect fitting and hose barb as a unit, ATTACH fitting to glycol drain valve V-370, THEN

   CONNECT/TIGHTEN the hose barb to fitting.

5.1.60 CONNECT Tygon drain hose to V-370, glycol drain valve hose barb and to inlet of peristaltic pump.

5.1.61 INSTALL end of drain hose, to outlet of peristaltic pump AND

   ROUTE into an appropriate waste container(s).

5.1.62 OPEN glycol drain valve V-370.

5.1.63 PLUG GFCI to peristaltic pump and 120 volt receptacle (using extension cord if needed) AND

   TURN peristaltic pump switch on to drain glycol tank.

5.1.64 AFTER system is fully drained (observed by no more fluid draining from tank), PERFORM the following:

   5.1.64.1 CLOSE glycol vent valve V-375.

   5.1.64.2 CLOSE glycol tank drain valve V-370.
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

5.1.65 IF rinse results for Glycol Tank are not satisfactory, REPEAT Steps 5.1.44 through 5.1.57 AND

IF unable to obtain satisfactory rinse results, NOTIFY FWS for resolution.

5.1.66 DISCONNECT AND REMOVE hose from drain valve, V-370.

5.1.67 IF installed per this procedure, DISCONNECT fittings from drain valve.

5.1.68 IF removed, RE-INSTALL plug into glycol drain valve outlet.

Clean Glycol Reservoir Tank Sight Glass

5.1.69 INSPECT Glycol Reservoir Site Glass for cleanliness.

5.1.70 IF clean, RECORD sight glass cleaned on Data Sheet.

5.1.71 IF not clean, PERFORM the following steps below:

5.1.71.1 PLACE a bag with absorbents under glycol tank sight glass LG-370.

5.1.71.2 CLOSE the following sight glass isolation valves.

- V-373 Upper sight glass valve
- V-374 Lower sight glass valve.

5.1.71.3 DISASSEMBLE sight glass assembly.

5.1.71.4 CLEAN sight glass with pipe cleaners, rags, etc.

5.1.71.5 IF parts are worn, REPLACE with new parts AND

RE-ASSEMBLE sight glass assembly.

5.1.71.6 OPEN the following sight glass isolation valves.

- V-373 Upper sight glass valve
- V-374 Lower sight glass valve

5.1.71.7 RECORD sight glass cleaned on Data Sheet.
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

**Fill Glycol Reservoir Tank**

NOTE - The glycol system holds approximately eight to ten (8 to 10) gallons.

5.1.72 IF Fill Port on glycol reservoir tank is closed, **OPEN** Fill Port.

5.1.73 **ADD** a mixture of 50% de-ionized water and 50% propylene glycol with corrosion inhibitors to glycol reservoir tank until glycol level indicator reads approximately 55-75%.

5.1.74 **CLOSE** Fill Port.

5.1.75 **RECORD** volume of glycol mixture added on Date Sheet.

**Fill Glycol Reservoir Tank** (Cont.)

5.1.76 **ENSURE** lockout/tagout and overlocking has been removed in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.+

5.1.77 **REQUEST** operations to **START** the glycol pump per system operating procedure TO-060-126 (POR126)

OR

TO-060-127 (POR127) (to cycle the glycol solution throughout system).

5.1.78 **RUN** glycol pump for ≥ ten (10) minutes to disperse glycol through system.

5.1.78.1 **WHILE** pump is running, **CHECK** for leaks, **AND** **TIGHTEN/REPAIR** any leaks found.
5.1 POR126 or POR127 Glycol System Maintenance (Cont.)

5.1.79 WHEN the run time is complete, REQUEST operations to stop glycol pump per system operating procedure per TO-060-126 (POR-126), or TO-060-127 (POR-127).

5.1.80 ALLOW approximately 10 minutes for glycol drain-back to Tank.

5.1.81 IF glycol level indication is > 55% GO TO Step 5.1.83

5.1.82 IF glycol level indication is < 55%, PERFORM lockout/tagout and overlocking in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.82.1 ADD glycol mixture per Step 5.1.73 to bring level up to 55% - 75%.

5.1.82.2 REMOVE lockout/tagout and overlocking in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.83 ENSURE glycol Fill Port is closed.

5.1.84 RECORD glycol reservoir tank fluid level As-Left reading (approximate) on the Data Sheet.
5.2 Restoration

5.2.1 **PERFORM** post job radiological survey.

5.2.2 **IF** any de-ionized water or propylene glycol is spilled, **NOTIFY** Shift Manager to contact Environmental per on-call list to inform them of event and amount.

5.2.3 **IF** not already installed, **INSTALL** cap/plug on drain valve V-370.

5.2.4 **IF** any problems were encountered, **INFORM** FWS.

5.2.5 **DISPOSE** of fluids in waste container per TO-100-052 and waste planning checklist.

5.2.6 **REMOVE** ground cover.

5.2.7 **DISPOSE** of bag with absorbents per TO-100-052 and waste planning checklist.

5.2.8 **ENSURE** lockout/tagout and overlocking has been removed in accordance with DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.2.9 **NOTIFY** Operations that testing is complete and system may be returned to desired configuration.
5.3 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.

5.4 Review

5.4.1 INFORM FWS test is complete.

5.4.2 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.

5.5 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.
Figure 1 – Glycol System for Heat Exchanger at POR126, POR127

Excerpt from H-14-108928 Sheet 1 (POR-107)
Typical of H-14-108926 Sheet 1 (POR126)
Typical of H-14-108927 Sheet 1 (POR127)