Remove Organics from TK-C-100

Tank Farm Plant Operating Procedure

242-A Evaporator

USQ # EV-17-1865, Rev. 2

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>K-5</td>
<td>07/17/2018</td>
<td>Operations Request</td>
<td>Struck out Steps 5.3.2 &amp; 5.3.6, Changed process memo to per shift manager throughout procedure. Struck out Step 5.3.18 “CONTROL flow rate out of TK-C-100 to prevent overflow of the Condenser Room drain system” Changed from &quot;drain” to &quot;transfer” in steps and notes. Changes titles of attachments from “while” to &quot;after”. Changes to Attachment 1: Added new row &quot;Desired ending Tank level for TK-C-100”, Struck out rows “241-AW-02D Pit”, “Tank Farms monitoring (leak detectors, tank temperatures, and ventilation) is being conducted per applicable transfer procedure.” Updated Records section. Updated all signature lines for consistency</td>
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<tr>
<td>K-4</td>
<td>06/05/2018</td>
<td>Inconsequential change found in periodic review process</td>
<td>Update records section.</td>
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<td>K-3</td>
<td>12/20/2017</td>
<td>WRPS-PER-2017-1808</td>
<td>Updated authentication requirements and formatting</td>
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<td>K-2</td>
<td>11/21/2016</td>
<td>Operations Request</td>
<td>Clarification of ID tags in steps throughout procedure</td>
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<tr>
<td>K-1</td>
<td>07/14/2016</td>
<td>Inconsequential change</td>
<td>Updated records section.</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for the removal of organics from TK-C-100 by overflowing the tank.

1.2 Scope

This procedure applies to TK-C-100 and its associated instrumentation and controls.

2.0 INFORMATION

2.1 General Information

2.1.1 During normal process operations there is a possibility that feed solution pumped to the 242-A Evaporator could contain small amounts of organic material such as tributyl phosphate or normal paraffin hydrocarbons. Evaporator processing could cause organic liquid to collect in the condensate receiver tank TK-C-100 as an immiscible layer. The immiscible organics would cause operating difficulties at the Effluent Treatment Facility.

2.1.2 Removal of organics from tank TK-C-100 is done by overflowing the tank, which skims the organic layer from the surface. The organics-bearing overflow is drained back to tank 241-AW-102. The organics will eventually vaporize through passive evaporation.

2.1.3 This procedure can be performed while the evaporator is boiling off or while it is not boiling. Sections 5.1 and 5.2 apply while boiling; Section 5.3 applies when the Evaporator is not boiling.

2.1.4 When overflowing TK-C-100, flow meter FI-EC1-2 may provide erratic readings during the overflow process.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Radiation and Contamination Control

3.1.1 Work in radiological areas will be performed using a RWP following review by Radiological Control per ALARA work planning procedure TFC-ESHQ-RP_RWP-C-03 (ALARA Work Planning).

3.2 Environmental

3.2.1 Primary ventilation for 241-AW-102 and associated leak detector(s) in the AW-02D pit must be operational during overflow of TK-C-100.

NOTE Process condensate is considered a dangerous/mixed waste.

3.2.2 Immediately notify the appropriate Shift Office and Environmental for spills and/or releases per TFC-REC-001. This includes spills or releases to secondary containment.

4.0 PREREQUISITES

4.1 Performance Documents

The following documents may be needed to perform this procedure:

- TO-640-020, Operate 242-A Process Condensate System

4.2 Field Preparation

4.2.1 ENSURE at least one of the following conditions have been met before this procedure may commence:

- The specific gravity as read on INTERFACE UPPER (G18) and LI-C100-1 (F23) TK-C-100 UPPER INTERFACE has decreased below the nominal value of 0.99.

  OR

- The temperature in TK-C-100 as read on TI-C100-1 (G18, F23) TK-C-100 PROCESS CONDSATE TEMP is greater than or equal to 145 °F.

  OR

- Directed by Shift Manager/Process Memo.
5.0 PROCEDURE

5.1 Overflow TK-C-100 While Boil off is Occurring

NOTE - The organic layer in TK-C-100 will be removed by overflowing process condensate to 241-AW-102.

- When overflowing TK-C-100, flow meter FI-EC1-2 may provide erratic readings during the overflow process.

5.1.1 VERIFY the following:

• Tank 241-AW-102 level is to a level specified by the Shift Manager
• Primary tank ventilation for 241-AW-102 is operating.
• Tank Farms monitoring (leak detectors, tank temperatures, and ventilation) is being conducted per applicable transfer procedure.

5.1.2 REVIEW completion of the Step 5.1.1.

Signature / Print (First & Last) / Date / Time
Shift Manager

5.1.3 REQUEST Shift Manager sign the “Approval to Begin” section of Attachment 1 - Organic Removal Data Sheet.

NOTE - The amount of time necessary to overflow TK-C-100 will be specified by the Shift Manager.

5.1.4 RECORD the following data on Attachment 1 - Organic Removal Data Sheet:

• Tank 241-AW-102 liquid level
• LI-C100-1 TK-C-100 UPPER INTERFACE (F23)
• LI-C100-G TK-C-100 LEVEL (G18, F23)
• Required Overflow Time.
5.1 **Overflow TK-C-100 While Boil off is Occurring (Cont.)**

5.1.5 **ENSURE** that P-C100 CONDSATE TANK PUMP status is CF-OFF:

5.1.5.1 **SELECT** P-C100 (G18/7, F23).

5.1.5.2 **IF** P-C100 status is NOT CF-OFF, **STOP** the pump **AND**

**CHECK** that P-C100 status changes to CF-OFF.

**NOTE** - The overflow level for TK-C-100 occurs at approximately 15,800 gallons, or a Weight Factor of 95 as indicated on WFIC-C100.

5.1.6 **MONITOR** LI-C100-G (Current trend 24) TK-C-100 LEVEL until TK-C-100 reaches the overflow level:

5.1.6.1 **MONITOR** LI-C100-G (Current trend 24) until it reads greater than or equal to 15,800 gallons or stops increasing.

5.1.6.2 **RECORD** the time overflow starts on Attachment 1 - Organic Removal Data Sheet.

5.1.7 **AFTER** TK-C-100 has overflowed for the amount of time specified by the Shift Manager, **PERFORM** Section 5.2 to return TK-C-100 to its normal operating level.
5.2 Return TK-C-100 to Normal Operating Level

5.2.1 IF PC transfer to LERF is authorized by Shift Manager, RESTART PC to LERF per TO-640-020.

5.2.2 IF PC transfer to LERF is NOT approved, THEN return C-100 to operating level by slowly OPENING valve 1-3A.

5.2.2.1 MONITOR condenser room floor drains AND ADJUST valve 1-3A as needed to prevent drain line overflow.

5.2.2.2 IF liquid is seen rising from the condenser room floor drains, IMMEDIATELY close valve 1-3A.

5.2.2.3 CLOSE valve 1-3A when WFIC-C100 (G18, F23) stabilizes between 48 and 52%, or the level specified by the Shift Manager.

5.2.3 NOTIFY Shift Manager that the C-100 overflow is complete and that TK-C100 is at operating level as indicated on WFIC-C100 (G18, F23).

5.2.4 RECORD the following data on Attachment 1 - Organic Removal Data Sheet:

- 241-AW-102 liquid level
- LI-C100-1 TK-C-100 UPPER INTERFACE (F23)
- LI-C100-G TK-C-100 LEVEL (F23)
- Time TK-C-100 returns to normal level.
5.3 **Overflow TK-C-100 After Boil off is Secured**

5.3.1 **REQUEST** Shift Manager sign the “Approval to Begin” section of Attachment 1 - Organic Removal Data Sheet.

**NOTE** - The amount of time necessary to overflow TK-C-100 will be specified by the Shift Manager.

5.3.2 **RECORD** the following data on Attachment 1 - Organic Removal Data Sheet:
- Tank 241-AW-102 liquid level
- LI-C100-1 TK-C-100 UPPER INTERFACE (G18, F23)
- LI-C100-G TK-C-100 LEVEL (F23)
- Required Overflow Time.

5.3.3 **ENSURE** that P-C100 CONDSATE TANK PUMP status is CF-OFF:

5.3.3.1 **SELECT** P-C100 (G18/7, F23).

5.3.3.2 **IF** P-C100 status is NOT CF-OFF, **STOP** the pump **AND**

**CHECK** that P-C100 status changes to CF-OFF.
5.3 Overflow TK-C-100 After Boil off is Secured (Cont.)

5.3.4 PERFORM valve lineup as follows:

5.3.4.1 POSITION the valves as listed in Attachment 2 - Overflow TK-C-100 After Boil off is Secured in the order given.

5.3.4.2 IF using installed piping for Raw Water addition, POSITION the valves listed in Attachment 3 - Overflow TK-C-100 (Using Installed Piping) After Boil off is Secured in any order.

5.3.4.3 IF using Flex Hose for Raw Water addition, POSITION the valves listed in Attachment 4 - Overflow TK-C-100 (Using Flex Hose) After Boil off is Secured in any order.

5.3.5 OPEN valve 2-35, located on the second level of the Condenser Room, to start raw water flow to TK-C-100.

NOTE - The overflow level for TK-C-100 occurs at approximately 15,800 gallons, or a Weight Factor of 95 as indicated on WFIC-C100.

5.3.6 MONITOR LI-C100-G (Current Trend 24) TK-C-100 LEVEL until TK-C-100 reaches the overflow level:

5.3.6.1 MONITOR LI-C100-G (Current Trend 24) until it reads greater than or equal to 15,800 gallons OR stops increasing.

5.3.6.2 RECORD the time overflow starts on Attachment 1 - Organic Removal Data Sheet.

5.3.7 AFTER TK-C-100 has overflowed for the amount of time specified by the Shift Manager, CLOSE valve 2-35 to stop Raw Water flow to TK-C-100.

5.3.8 IF directed by Shift Manager, PERFORM Section 5.2 to pump TK-C-100 to LERF.

NOTE - Shift Manager will specify the amount of Process Condensate to transfer from TK-C-100.

5.3.9 RECORD the desired ending tank level for TK-C-100 on Attachment 1 - Organic Removal Data Sheet.
5.3 Overflow TK-C-100 After Boil off is Secured (Cont.)

5.3.10 IF directed by Shift Manager to drain Process Condensate from TK-C-100 to AW-102, PERFORM the following:

5.3.10.1 OPEN TK-C-100 drain valve 1-3A.

5.3.10.2 MONITOR condenser room floor drains and ADJUST valve 1-3A as needed to prevent drain line overflow.

5.3.10.3 IF liquid is seen rising from the condenser room floor drains, IMMEDIATELY close valve 1-3A.

5.3.10.4 MONITOR WFIC-C100 (G18/6, F23) TK-C-100 WT FACTOR as TK-C-100 drains.

5.3.10.5 AFTER the specified WF is reached in TK-C-100, CLOSE drain valve 1-3A.

5.3.11 ENSURE the valves are positioned as listed in Attachment 5 - Overflow TK-C-100 After Boil off is Secured.

5.3.12 RECORD the following on Attachment 1 - Organic Removal Data Sheet:

- 241-AW-102 liquid level
- LI-C100-1 TK-C-100 UPPER INTERFACE (F23)
- LI-C100-G TK-C-100 LEVEL (G18, F23)
- Time TK-C-100 returns to specified level.
5.4 Records

5.4.1 PERFORM the following for records identified within this procedure.

5.4.1.1 RECORD the number of times the record was generated in applicable column

OR

PLACE a check mark (✓) in the N/A column.

5.4.1.2 SUBMIT the package for verification of completed records.

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
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<tr>
<td><strong>5.1 Overflow TK-C-100 While Boil off is Occurring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 5.1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Attachments</strong></td>
<td></td>
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<tr>
<td>Attachment 1 - Organic Removal Data Sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment 2 - Overflow TK-C-100 After Boil off is Secured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment 3 - Overflow TK-C-100 (Using Installed Piping) After Boil off is Secured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment 4 - Overflow TK-C-100 (Using Flex Hose) After Boil off is Secured</td>
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</tr>
<tr>
<td>Attachment 5 - Overflow TK-C-100 After Boil off is Secured</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FWS/OE/Shift Manager SEND the completed records to the Central Shift Office for records retention.

Signature / Print (First & Last) / Date / Time

FWS/OE/Shift Manager

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.
## Remove Organics from TK-C-100

## Attachment 1 - Organic Removal Data Sheet

<table>
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<tr>
<th>APPROVAL TO BEGIN</th>
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<tr>
<td><strong>241-AW-102-- LIQUID LEVEL</strong></td>
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<tr>
<td>Tank 241-AW-102 level is to a level specified by the Shift Manager</td>
</tr>
<tr>
<td><strong>241-AW-102 Primary Tank Ventilation</strong></td>
</tr>
<tr>
<td>Primary Tank Ventilation is OPERATING to support TK-C-100 overflow</td>
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</table>

<table>
<thead>
<tr>
<th>Shift Manager’s Signature/Print (First &amp; Last)</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>

### OVERFLOW TK-C-100

- **241-AW-102 Liquid Level (per Shift Manager)**
- **LI-C100-1 (F23)**: SpG
- **LI-C100-G (G18, F23)**: gal
- **Required Overflow Time (per Shift Manager)**
- **Time Overflow begins**
- **Time Overflow end**

### RETURN TK-C-100 TO NORMAL OPERATING LEVEL

- **Desired ending Tank level for TK-C-100**
- **241-AW-102 Liquid Level**
- **LI-C100-1 (F23)**: SpG
- **LI-C100-G (G18, F23)**: gal
- **Time TK-C-100 at Normal Level**

<table>
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<tr>
<th>Operator's Signature/Print (First &amp; Last)</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
</table>
Remove Organics from TK-C-100

Attachment 2 - Overflow TK-C-100 After Boil off is Secured

<table>
<thead>
<tr>
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<th>VALVE</th>
<th>POSITION</th>
<th>FUNCTION</th>
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</thead>
<tbody>
<tr>
<td>1-3</td>
<td>CLOSE</td>
<td></td>
<td>Tank C-100 Drain</td>
</tr>
<tr>
<td>1-3A</td>
<td>CLOSE</td>
<td></td>
<td>Tank C-100 Drain</td>
</tr>
<tr>
<td>1-2</td>
<td>CLOSE</td>
<td></td>
<td>Seal Loop Drain</td>
</tr>
<tr>
<td>1-5</td>
<td>CLOSE</td>
<td></td>
<td>Tank C-100 Drain to Funnel</td>
</tr>
<tr>
<td>1-6</td>
<td>OPEN</td>
<td></td>
<td>Seal Loop Sight Glass Isolation</td>
</tr>
<tr>
<td>1-7</td>
<td>OPEN</td>
<td></td>
<td>Seal Loop Sight Glass Isolation</td>
</tr>
<tr>
<td>1-8</td>
<td>CLOSE</td>
<td></td>
<td>C-100 Inlet to Pump</td>
</tr>
<tr>
<td>1-9</td>
<td>CLOSE</td>
<td></td>
<td>C-100 Outlet from Pump</td>
</tr>
<tr>
<td>2-33</td>
<td>CLOSE</td>
<td></td>
<td>PC to LERF</td>
</tr>
<tr>
<td>2-35</td>
<td>CLOSE</td>
<td></td>
<td>RW to PC Line</td>
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Operator's Signature/Print (First & Last) ___________________________ Date ___________ Time ___________
## Remove Organics from TK-C-100

**Attachment 3 - Overflow TK-C-100 (Using Installed Piping) After Boil off is Secured**

<table>
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<th>CHECK</th>
<th>VALVE</th>
<th>POSITION</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>HV-RC3-3</td>
<td>DIVERT</td>
<td>PC to LERF Diversion Valve</td>
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<tr>
<td>1-16</td>
<td>OPEN</td>
<td>PC to C-100</td>
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<tr>
<td>1-17</td>
<td>CLOSE</td>
<td>PC to 241-AW-102</td>
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</tr>
<tr>
<td>1-18</td>
<td>OPEN</td>
<td>PCV-RC3-1 Isolation</td>
<td></td>
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<td>1-19</td>
<td>CLOSE</td>
<td>PCV-RC3-1 Bypass</td>
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<td>OPEN</td>
<td>PCV-RC3-1 Pressure Control</td>
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<td>1-21</td>
<td>OPEN</td>
<td>PCV-RC3-1 Isolation</td>
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<tr>
<td>1-27</td>
<td>CLOSE</td>
<td>AFPC Return from Sampler</td>
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</tr>
<tr>
<td>1-28</td>
<td>OPEN</td>
<td>PC Flow Path</td>
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</tr>
<tr>
<td>1-29</td>
<td>CLOSE</td>
<td>PC Line to RC3 Sampler</td>
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</tr>
<tr>
<td>2-32</td>
<td>CLOSE</td>
<td>Flex Hose Isolation</td>
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<td>2-36</td>
<td>CLOSE</td>
<td>TK-E-101 to PC Line</td>
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</tr>
<tr>
<td>1-26A</td>
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<td>Sample Isolation</td>
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</tr>
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Operator's Signature/Print (First & Last) _______________________________ Date ________ Time ________
## Remove Organics from TK-C-100

### Attachment 4 - Overflow TK-C-100 (Using Flex Hose) After Boil off is Secured

<table>
<thead>
<tr>
<th>CHECK</th>
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<tbody>
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<td>1-28</td>
<td>CLOSE</td>
<td>PC Flow Path</td>
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<tr>
<td>2-32</td>
<td>OPEN</td>
<td>Flex Hose Isolation</td>
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<td>2-38</td>
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<td>PC Line to RC3 Sampler</td>
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Operator's Signature/Print (First & Last) __________________________ Date ____________ Time ____________

## Attachment 5 - Overflow TK-C-100 After Boil off is Secured

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<thead>
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<th>VALVE</th>
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</thead>
<tbody>
<tr>
<td>2-33</td>
<td>OPEN</td>
<td>PC to LERF</td>
<td></td>
</tr>
<tr>
<td>1-29</td>
<td>OPEN</td>
<td>PC Line to RC3 Sampler</td>
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</tr>
<tr>
<td>1-28</td>
<td>CLOSE</td>
<td>PC Flow Path</td>
<td></td>
</tr>
<tr>
<td>1-27</td>
<td>OPEN</td>
<td>AFPC Return from Sampler</td>
<td></td>
</tr>
</tbody>
</table>

Operator's Signature/Print (First & Last) __________________________ Date ____________ Time ____________