Evaluate and Change 242-A Process Condensate Filter F-C-1

Tank Farm Plant Operating Procedure 242-A Evaporator

USQ # EV-18-1877-S, Rev. 0

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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<tr>
<td>N-4</td>
<td>01/14/2019</td>
<td>DOE-0359 Change Implementation</td>
<td>Updated Safety section regarding preventative maintenance and applicable ERA to use.</td>
</tr>
<tr>
<td>N-3</td>
<td>11/15/2018</td>
<td>Periodic Review</td>
<td>Updated Records Section, Added Signature Sheet. Updated/Modified Figure 1</td>
</tr>
<tr>
<td>N-2</td>
<td>12/19/2017</td>
<td>WRPS-PER-2017-1808</td>
<td>updated authentication requirements and formatting</td>
</tr>
<tr>
<td>N-1</td>
<td>03/02/2017</td>
<td>Operation request to provide more flexibility</td>
<td>Added steps and wording to allow inspecting and evaluating to see if filter requires changing. Changed title.</td>
</tr>
<tr>
<td>N-0</td>
<td>11/08/2016</td>
<td>Periodic Review</td>
<td>No Changes</td>
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Evaluate and Change 242-A Process Condensate Filter F-C-1

1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for inspecting, evaluating and changing out the filters in the Process Condensate F-C-1 Filter assembly.

1.2 Scope

This procedure applies to the 242-A Evaporator Facility Process Condensate F-C-1 Filter Assembly.

2.0 INFORMATION

2.1 General Information

2.1.1 The process condensate, after being collected in the C-100 Tank, is pumped through filter assembly F-C-1. The unit consists of three layers of nineteen cartridge-type (57 total), disposable filters of a 5-micron rating. Piping consists of a \( \frac{1}{2} \) -inch vent line, and a \( \frac{1}{2} \) -inch sludge drain line.

2.1.2 MCS alarms HI at a dP of 20 psid and HI-HI at 40 psid; the setpoint for the interlock that shuts down the Process Condensate Pump is set at 40 psid.

2.1.3 The filters will be changed when the differential pressure across the unit increases so that the production rate can no longer be maintained, or when the filter radiation readings exceed 5 mR/hr.

2.1.4 F-C-1 filter is required to be in service when process condensate is being transferred to LERF. If the F-C-1 filter is not in service or removed from service when transferring to LERF, weekly suspend solids sampling of the process condensate will be required.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Housing flush water must be considered contaminated. Contact with water splashing or spraying out of the housing may result in personnel injury.

3.1.1 Nitrile gloves are required to change out filters in the process condensate filter assembly F-C-1.

3.1.2 Hearing protection is required when entering the condenser room with condensers operating.

3.1.3 A safety shower must be readily available prior to changing filters in the process condensate filter assembly F-C-1.

3.1.4 Operation of electrical equipment and overcurrent protective devices shall be performed by a qualified person.

3.1.5 Component operation requires an Electrical Risk Assessment (ERA).

3.1.6 When the clean and inspects are current on the electrical equipment (breaker, switchgear, disconnects, motor starters, etc.), the ERA for normal operating condition is applicable, for those workers interacting with electrical equipment.

3.1.6.1 Use safety glasses and leather gloves when manipulating electrical components per the normal ERA.

3.1.7 When the clean and inspects are delinquent, the ERA for non-normal operating condition is applicable, for those workers interacting with electrical equipment.
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 the ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03, (ALARA Work Planning).

3.2.2 When work is performed in or when work will result in a high contamination, high radiation or an airborne radioactivity area, then an approved work package must be developed which is reviewed by Radiological Control per the ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03, (ALARA Work Planning). Any changes in the work package that affects radiological aspects of the work must be approved by the appropriate project Radiological Control management.

3.3 Environmental Protection

Process condensate is to be considered a mixed waste; any item that has come into contact with the process condensate should also be considered a mixed waste upon discard and managed accordingly per TO-100-052. (Examples of these items include but are not limited to spent filters, collected process condensate liquid, process condensate contacted PPE, etc.).

4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Plastic bags
- Paper (for protecting and covering floor and surrounding equipment from contamination)
- 57 count 5-micron filters
- Filter cover O-ring gasket
- Waste container
- Nitrile gloves
- Absorbent material as specified in TO-100-052
- 50' hose.

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.
5.0  PROCEDURE

NOTE - If Evaporator is in Operation, Sections 5.1 and 5.2 may be performed in any logical order.

5.1  Prepare Work Site

5.1.1  DIRECT HPT to take a pre-job dose rate reading of work site.

5.1.2  OBTAIN plastic bags with absorbent for disposal of waste and the removed filters.

5.1.3  IF condenser is in operation, ENSURE hearing protection is donned prior to entering condenser room.

5.1.4  LAY paper and plastic to protect floor, wall, and equipment from possible contamination.

5.1.5  IF Evaporator is in operation, GO TO Section 5.2.

5.1.6  IF Evaporator is shutdown, COMPLETE Checklist 1 AND GO TO Section 5.3.
5.2 Remove F-C-1 Filter from Service during Operations

NOTE - With evaporator operating at maximum boil off, assume 3,250 gallons per hour flow into tank TK-C-100 while pump P-C100 is shut down.

5.2.1 CALCULATE volume available to receive process condensate in TK-C-100 while filters are changed by performing the following:

5.2.1.1 DETERMINE TK-C-100 volume from WFIC-C100 (G18/6, F23) TK-C-100 WT FACTOR.

5.2.1.2 CALCULATE TK-C-100 available volume to ensure there is sufficient volume available to receive process condensate:

Estimated Time required to change filter:

___ (hrs pump P-C100 is down) x 3,250 gal = (A) = ______ gal

Volume as read on MCS (B) = ______ gal

15,800 gal - (B) gal = (C) gal.

NOTE - At Shift Manager's direction, TK-C-100 may be allowed to temporarily overflow to Tank 241-AW-102 until filter change is complete.

5.2.2 IF tank TK-C-100 has a sufficient volume [(C) is greater than (A)] available to receive process condensate AND

IF directed by Shift Manager, CONTINUE with filter change activities.

5.2.3 SET P-C100 (G18/7, F23) CONDNSATE TANK PUMP to CF-OFF.

5.2.4 SET FIC-C1005 (G18/9, F23) PC FLOW TO F-C-1 to MANUAL and 35% Output.

5.2.5 ENSURE hearing protection is donned.

5.2.6 ENSURE valve A2-4 (located on AMU mezzanine), RW to 1st Floor Hose Connection is OPEN.

5.2.7 CLOSE Filter Inlet Valve 1-12 (see Figure 1).

5.2.8 CLOSE Filter Outlet Valve 1-15 (see Figure 1).

5.2.9 MONITOR WFIC-C100 (G18/6, F23) TK-C-100 WT FACTOR, for overflow while changing filters.
5.3 Inspect, Evaluate and Change F-C-1 Filter

5.3.1 ENSURE Valve A2-4, RW to 1st Floor Hose Connection is OPEN.

5.3.2 OPEN Filter Drain Valve 1-13.

5.3.3 OPEN Filter Vent Line Valve 1-13A.

5.3.4 ALLOW F-C-1 Filter unit to drain completely.

5.3.5 AFTER F-C-1 filter unit has drained completely, DIRECT craft personnel to remove filter(s) as follows:

5.3.5.1 DON nitrile gloves.

5.3.5.2 REMOVE filter assembly cover.

NOTE - The following steps 5.3.5.3 through 5.3.5.5 may be performed simultaneously or in any logical order, as required.

5.3.5.3 REMOVE filter(s).

5.3.5.4 DIRECT HPT to survey filters as they are removed.

5.3.5.5 INSPECT and EVALUATE F-C-1 Filter.

WARNING
Housing flush water must be considered contaminated. Contact with water splashing or spraying out of the housing may result in personnel injury.

5.3.6 IF visual observation of filter housing indicates flushing is necessary, PERFORM the following:

5.3.6.1 CONNECT water hose to Valve 1-40 located in basement of condenser room (see Figure 2).

5.3.6.2 OPEN Valve 1-40.

5.3.6.3 WASH filter housing using water hose.

5.3.6.4 WHEN washing is completed, CLOSE Valve 1-40.

5.3.7 IF inspection and evaluation of the F-C-1 Filter determines the filters must be changed, DIRECT craft personnel to install new filters.
5.3 Inspect, Evaluate and Change F-C-1 Filter (Cont.)

5.3.8 **DISPOSE** of waste/filters per TO-100-052.

5.3.9 **INSPECT** Filter Cover O-ring gasket **AND**
**REPLACE**, as necessary.

5.3.10 **REASSEMBLE** unit.
5.4 Check F-C-1 Filter Unit for Leaks

5.4.1 AFTER reassembly of filter unit is complete, CLOSE Filter Drain Valve 1-13.

5.4.2 ENSURE filter vent Valve 1-13A is OPEN.

5.4.3 OPEN filter inlet Valve 1-12 (See Figure 1).

5.4.4 IF Evaporator is in Operation Mode, GO TO Step 5.4.15.

Evaporator is in Shutdown Mode

5.4.5 ENSURE MCC-1 Cubicle D1 (Condensate Pump P-C-100) is ON.

5.4.6 IF Evaporator is in Shutdown Mode, ENSURE HV-RC3-3 (G18/12, G44/6, F25) is in CF-DVRT AND START pump as follows:

5.4.6.1 SET HV-RC3-3 (G18/12, G44/6, F25) PROCESS CONDENSATE DIVERT VALVE to MANUAL and CF-DVRT.

5.4.6.2 SELECT P-C100 (G18/7, F23) CONDNSATE TANK PUMP.

5.4.6.3 PRESS CMD# 3 and ENTER to start Pump P-C100.

5.4.6.4 CHECK that P-C100 status is CF-ONDIV.

NOTE - When in Shut Down Mode, F-C-1 fills slowly.

5.4.7 WHEN condensate overflows through vent line, OPEN outlet Valve 1-15.

5.4.8 CLOSE filter vent Valve 1-13A.

5.4.9 CHECK filter unit for leaks.

5.4.10 IF no leaks are present, PROCEED to Step 5.4.13.

5.4.11 IF leaks are present, PERFORM the following:

5.4.11.1 SET P-C100 (G18/7, F23) CONDNSATE TANK PUMP to CF-OFF.

5.4.11.2 IF filter housing has not been previously tightened, TIGHTEN filter housing.
5.4 Check F-C-1 Filter Unit for Leaks (Cont.)

5.4.11.3 IF leak cannot be repaired immediately, PERFORM the following:

a. NOTIFY Shift Manager.

**Bypass F-C-1**

b. POSITION the following valves as indicated and order provided to bypass F-C-1.

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
<th>Position</th>
<th>Check Complete (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-11</td>
<td>F-C-1 Bypass</td>
<td>OPEN</td>
<td></td>
</tr>
<tr>
<td>1-12</td>
<td>F-C-1 Isolation</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>1-15</td>
<td>F-C-1 Isolation</td>
<td>CLOSED</td>
<td></td>
</tr>
</tbody>
</table>

5.4.12 ENSURE HV-RC3-3 (G18/12, G44/6, F25) is in CF-DVRT AND RE-START pump as follows:

5.4.12.1 ENSURE HV-RC3-3 (G18/12, G44/6, F25) PROCESS CONDENSATE DIVERT VALVE is set to MANUAL and CF-DVRT.

5.4.12.2 SELECT P-C100 (G18/7, F23) CONDNSATE TANK PUMP.

5.4.12.3 PRESS CMD# 3 and ENTER to start Pump P-C100.

5.4.12.4 CHECK that P-C100 status is CF-ONDIV.

5.4.13 GRADUALLY INCREASE FIC-C1005 (G18/9, F23) PC FLOW TO F-C-1, output in 3% to 5% increments to 60% to 85% AND CHECK for leaks.

5.4.13.1 IF leaks are observed, GO TO Step 5.4.11.

5.4.14 IF no leaks are present, GO TO Section 5.5.
Evaluate and Change 242-A Process Condensate Filter F-C-1

5.4 Check F-C-1 Filter Unit for Leaks (Cont.)

Evaporator is in Operational Mode

5.4.15 IF Evaporator is in Operation Mode, ENSURE HV-RC3-3 (G18/12, F25) PROCESS CONDENSATE DIVERT VALVE is in CF-NORM AND START P-C100, CONDENSATE TANK PUMP, as follows:

5.4.15.1 SET P-C100 (G18/7, F23) CONDENSATE TANK PUMP to CF-ONLRF.

5.4.16 WHEN condensate overflows through vent line, OPEN outlet Valve 1-15.

5.4.17 CLOSE filter vent Valve 1-13A.

5.4.18 CHECK filter unit for leaks.

5.4.19 IF no leaks are present, PROCEED to Step 5.4.22.

5.4.20 IF leaks are present, PERFORM the following:

5.4.20.1 SET P-C100 (G18/7, F23) CONDENSATE TANK PUMP to CF-OFF.

5.4.20.2 IF filter housing has not been previously tightened, TIGHTEN filter housing.

5.4.20.3 IF leak cannot be repaired immediately, PERFORM the following:

a. NOTIFY Shift Manager.

Bypass F-C-1

b. POSITION the following valves as indicated and order provided to bypass F-C-1.

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
<th>Position</th>
<th>Check Complete (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-11</td>
<td>F-C-1 Bypass</td>
<td>OPEN</td>
<td></td>
</tr>
<tr>
<td>1-12</td>
<td>F-C-1 Isolation</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>1-15</td>
<td>F-C-1 Isolation</td>
<td>CLOSED</td>
<td></td>
</tr>
</tbody>
</table>

5.4.20.4 PERFORM Suspended Solids Sampling weekly.
5.4 Check F-C-1 Filter Unit for Leaks (Cont.)

NOTE - The following step re-starts P-C100, CONDENSATE TANK PUMP.

5.4.21 IF P-C100 CONDENSATE TANK PUMP was shut down due to leakage, ENSURE P-C100 is re-started as follows:

5.4.21.1 ENSURE HV-RC3-3 (G18/12, F25) PROCESS CONDENSATE DIVERT VALVE is in CF-NORM.

5.4.21.2 SET P-C100 (G18/7, F23) CONDENSATE TANK PUMP to CF-ONLRF.

5.4.22 GRADUALLY INCREASE FIC-C1005 (G18/9, F23) PC FLOW TO F-C-1, output in 3% to 5% increments to 60% to 85% AND CHECK for leaks.

5.4.22.1 IF leaks are observed, GO TO Step 5.4.20.

5.4.23 IF no leaks are present, GO TO Section 5.6.

5.5 Reconfigure PC Valving During Shutdown

5.5.1 SET P-C100 (G18/7, F23) CONDENSATE TANK PUMP to CF-OFF.

5.5.2 SET FIC-C1005 (G18/9, F23) PC FLOW TO F-C-1 to MANUAL and OUTPUT 35%.

5.5.3 ENSURE HV-RC3-3 (G18/12, G44/6, F25) PROCESS CONDENSATE DIVERT VALVE is set to CF-NORM.

5.5.4 POSITION the following Valves as indicated:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
<th>Position</th>
<th>Check Complete (✓)</th>
</tr>
</thead>
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<tr>
<td>1-9</td>
<td>P-C-100 Outlet</td>
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</tr>
<tr>
<td>1-8</td>
<td>TK-C-100 Outlet</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>1-21</td>
<td>PCV-RC3-1 Isolation</td>
<td>CLOSED</td>
<td></td>
</tr>
</tbody>
</table>
5.6 **Return F-C-1 Filter Assembly to Service during Operations**

NOTE - Trending of WFIC-C100, TK-C-100 WT FACTOR is most easily accomplished by monitoring current trend #24.

5.6.1 **IF** Process Condensate pumping is to continue, **ADJUST** FIC-C1005 (G18/9, F23) output flow rate to a value that will trend the level in TK-C-100 back to a level of 50%.

5.6.2 **WHEN** WFIC-C100 (G18/6, F23) TK-C-100 WT FACTOR is approximately 50% (49% - 51%), **SET** controller to AUTO and Setpoint 50.

5.6.3 **SET** FIC-C1005 (G18/9, F23) PC FLOW TO F-C-1 to AUTO.

5.6.4 **IF** FIC-C1005 (G18/9, F23) Cascade is OPEN, **SET** CASC Key to CLOSE.

5.7 **Clean Up Work Site**

5.7.1 **IF** Evaporator is SHUTDOWN, turn MCC-1 Cubicle D1 (Condensate Pump P-C-100) OFF.

5.7.2 **ENSURE** all removed filters are plastic wrapped.

5.7.3 **ENSURE** all plastic wrapped filters are properly disposed of per TO-100-052.

5.7.4 **DIRECT** craft personnel to remove all tools and equipment from work site.

5.7.5 **REMOVE** paper and plastic from floor area **AND**

**DISPOSE** of per TO-100-052.

5.7.6 **REMOVE** material from around drain funnel **AND**

**DISPOSE** of per TO-100-052.

5.7.7 **DIRECT** HPT to perform a post-job survey of work area for contamination.

5.7.8 **DECONTAMINATE** work area to restore area to pre-work contamination levels and radiological postings **AND**

**DISPOSE** of waste per TO-100-052.

5.7.9 **CLOSE** Valve A2-4, RW to 1st Floor Hose Connection.
5.8 Records

5.8.1 **PERFORM** the following for records identified within this procedure.

5.8.1.1 **RECORD** the number of times the record was generated in applicable column

**OR**

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

5.8.1.2 **SUBMIT** the package for verification of completed records.

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<td>Step 5.2.1.2</td>
<td></td>
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<tr>
<td>Checklists</td>
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<tr>
<td>Checklist 1 - Initial Valve Lineup for F-C-1 Filter Change during Shutdown</td>
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<tr>
<td>Signature Sheet 1</td>
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<tr>
<td>FWS/OE/Shift Manager <strong>SEND</strong> the completed records to the Central Shift Office for records retention.</td>
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<tr>
<td>___________________________ / _______________________ / ___________________</td>
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</tr>
<tr>
<td>Signature</td>
<td>Print (First &amp; Last)</td>
<td>Date</td>
</tr>
<tr>
<td>FWS/OE/Shift Manager</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
Checklist 1 - Initial Valve Lineup for F-C-1 Filter Change during Shutdown

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<th>Valve</th>
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<th>Position</th>
<th>Description</th>
<th>P&amp;ID Loc.</th>
<th>Initial/Date</th>
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<td>1-9</td>
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<td>OPEN</td>
<td>P-C-100 Outlet</td>
<td>98990/1/B8</td>
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</tr>
<tr>
<td>1-11</td>
<td>4</td>
<td>CLOSED</td>
<td>F-C-1 Bypass</td>
<td>98990/1/F4</td>
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<tr>
<td>1-12</td>
<td>4</td>
<td>CLOSED</td>
<td>F-C-1 Isolation</td>
<td>98990/1/F4</td>
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<tr>
<td>1-15</td>
<td>4</td>
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<td>F-C-1 Isolation</td>
<td>98990/1/F4</td>
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<td>1-17</td>
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<td>PC Divert to TK-241-AW-102</td>
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<td>1-27</td>
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<td>OPEN</td>
<td>PC Sample Return to LERF</td>
<td>98990/1/C2</td>
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</tr>
<tr>
<td>1-28</td>
<td>6</td>
<td>CLOSED</td>
<td>PC Flow Path</td>
<td>98990/1/C2</td>
<td></td>
</tr>
<tr>
<td>1-29</td>
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<td>OPEN</td>
<td>PC Line to RC-3 Sampler</td>
<td>98990/1/C2</td>
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</tr>
<tr>
<td>1-37</td>
<td>7</td>
<td>OPEN</td>
<td>PC to Samp RC3-1 (up high)</td>
<td>98990/2/E7</td>
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(Continued on Next Page)
Checklist 2 - Initial Valve Lineup for F-C-1 Filter Change during Shutdown (cont.)

<table>
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<th>Valve</th>
<th>Loc.</th>
<th>Position</th>
<th>Description</th>
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<td>2-24</td>
<td>8</td>
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<td>2-25</td>
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<td>FV-C100-5 Bypass</td>
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<td>FIT C-100-5 Bypass</td>
<td>98990/1/E6</td>
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<td>FIT C-100-5 Isolation</td>
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<td>2-32</td>
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<td>PC Return to C-100 (low)</td>
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<td>PC to IX-D-1</td>
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<td>RW to IX-D-1</td>
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<td>2-36</td>
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<td>Eluant to IX-D-1</td>
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<td>2-38</td>
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<td>F-C-3 Isolation</td>
<td>98990/1/D3</td>
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<td>2-39</td>
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<td>CLOSED</td>
<td>F-C-3 Bypass</td>
<td>98990/1/D3</td>
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<td>2-40</td>
<td>13</td>
<td>OPEN</td>
<td>F-C-3 Isolation</td>
<td>98990/1/D3</td>
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Signature / Print (First & Last) / Date

Shift Manager /OE
Signature Sheet 1

All personnel performing signature required steps shall enter their printed name, signature, and initials below.

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<th>Signature</th>
<th>Initials</th>
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Evaluate and Change 242-A Process Condensate Filter F-C-1

Figure 1: F-C-1 Filter Valving Diagram

For accuracy and detail, See Drawing H-2-98990

Valve Key
- Check Valve
- Gate Valve
- 3-way Ball Valve
- Pressure Regulated 2-Way Ball

To LERF
- 1-16 To TK-C-100
- 1-17 To TK-241-AW-102
- 1-20 To TK-C-100
- 1-21 To PCV-RC3-1
- 1-27 To TK-C-100
- 1-28 To TK-C-100
- 1-29 To TK-C-100
- 1-30 To TK-C-100
- 1-31 To TK-C-100
- 1-32 To TK-C-100
- 1-33 To TK-C-100
- 1-34 To TK-C-100
- 1-35 To TK-C-100
- 1-36 To TK-C-100

Check Valve
- 1-10 Floor Drain
- 1-9

P-C-100
- 1-8

For accuracy and detail, See Drawing H-2-98990

3-way Ball Valve
Evaluate and Change 242-A Process Condensate Filter F-C-1

Figure 2: Condenser Room-First Level (Basement)