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>
</tr>
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<tbody>
<tr>
<td>F-2</td>
<td>07/16/2018</td>
<td>Operations Request</td>
<td>Modified note before 5.2.1 added &quot;PB-1 interlock will not change to BYPASS if LI-CA1-3 is in LO alarm. See &quot;OR&quot; statement under 5.2.1.4 on how to clear the LI-CA1-3 LO alarm.&quot; Modified Step 5.2.1.4 to add &quot;OR IF PB-1 software ILK 15 bypass will not engage, due to LI-CA1-3 being in LO alarm, INCREASE level in CA1 until LI-CA1-3 reads approximately 380 inches and alarm clears.&quot;</td>
</tr>
<tr>
<td>F-1</td>
<td>06/07/2016</td>
<td>Operations Request to allow flexibility during operation</td>
<td>Added steps to sections 5.1 &amp; 5.4 to allow dip tube flushing while in operation.</td>
</tr>
<tr>
<td>F-0</td>
<td>03/24/2016</td>
<td>Periodic Review</td>
<td>Incorporated comments/changes found in periodic review process</td>
</tr>
<tr>
<td>E-14</td>
<td>11/09/2015</td>
<td>Operations Request</td>
<td>Added: 5.2.7.3, 5.2.8.5, 5.2.15.5, 5.2.16.5, 5.2.22.2, 5.3.7-5.3.10, 5.3.16-5.3.20, 5.3.25-5.3.28, 5.3.34-5.3.37, 5.3.43-5.3.46 Modified: 5.2.7.6, 5.2.7.8, 5.2.8.6, 5.2.8.8, 5.2.15.6, 5.2.15.8, 5.2.16.6, 5.2.16.8, 5.2.22.6, 5.2.22.8, figure 2 drawing Deleted old: 5.3.10-5.3.12, 5.3.20-5.3.22, 5.3.28-5.3.30, 5.3.37-5.3.38, 5.3.43-5.3.46, Page 5 step 5.1.1 REMOVE &quot;FM-V-2 and FM-V-3&quot; from valve table, valves have been removed from system. Page 5 step 5.1.1 REMOVE &quot;Check Mark and Check Mark Column&quot; from valve table.</td>
</tr>
<tr>
<td>E-13</td>
<td>07/31/2015</td>
<td>Operations Request</td>
<td>Added Steps 5.2.17.14 through 5.2.17.20 on page 14</td>
</tr>
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# Weight Factor Dip Tube Flush

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Figure 1 – Three (3) Way Valve Positioning ........................................................................ 31

Figure 2 – FM-CA1 Dip Tube Flush Manifold Assembly ................................................................ 32
1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for flushing weight factor and other dip tubes into the C-A-1 vessel. The dip tube flush is performed to clear dip tube lines of potential impurities that may affect the accuracy of associated instruments.

1.2 Scope

This procedure applies to 242-A weight factor dip and other tubes and their associated valves.

2.0 INFORMATION

2.1 General Information

2.1.1 During a loss of vacuum or sudden change, it is not uncommon for the WFI or SpG instruments to go out of range. When vacuum is restored, readings are typically regained. This is likely caused by vapor lock in the transmitters; blowing down the dip tubes will not correct the problem as this is likely a legacy design issue.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Radiation and Contamination Control

3.1.1 When performed without a work package, this procedure is limited to radiological areas and work activities permitted by a radiological work permit.

3.1.2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactivity area, an approved work package must be developed which is reviewed by Radiological Control per ALARA work planning procedure TFC-ESHQ-RP_RWP-C-03.

3.2 Limits

HNF-15279, 242-A Evaporator Technical Safety Requirement

LCO 3.1 C-A-1 Vessel Flammable Gas Control System

LCO 3.2 C-A-1 Vessel Waste High Level Control System
4.0 **PREREQUISITES**

4.1 **Performance Documents**

The following procedures, drawings and permits may be needed to perform this procedure:

- TO-600-060, Shut Down 242-A Evaporator
- ARP-T-601-010, Respond to C-A-1 Graphic #10 Alarms at the 242-A Evaporator
- ARP-T-601-400, Respond to SIS Graphic #400 alarms at the 242-A Evaporator

4.2 **Field Preparations**

NOTE - Sections 5.5 and 5.6 in this procedure may be performed independently, in parallel or in any logical order at the discretion of Shift Manager.

The following conditions must be met before this procedure may commence:

4.2.1 **ENSURE** a current copy of applicable procedure TO-600-060 is available for performance during this procedure.

4.2.2 **AS** directed by procedure ARP-T-601-010 or Shift Manager, **PERFORM** weight factor dip tube flush.

4.2.3 **AS** directed by Shift Manager, **PERFORM** S-2 purge air line or lower de-entrainer pad dip tube flush.
5.0 PROCEDURE

NOTE - Alarm on FQA-RW-1 is an expected alarm during water flush operations.

5.1 System Set-up

NOTE Evaporator Volume control is considered as being in MANUAL (in Feed Flow Control) if FIC-CA1-1 is in AUTO with the Cascade OPEN. This mode controls Evaporator Volume by controlling the feed rate to the Evaporator.

5.1.1 IF directed by Shift Manager, PLACE Evaporator Volume controller in MANUAL Mode.

5.1.1.1 CALCULATE total feed flow rate by adding FI-EC1-2 (G16, F14) E-C-1 CONDENSR PC FLOW Condensate Flow value and FIC-CA1-4 (G15, 14) SLURRY TO FARMS Evap Slurry Flow value.

5.1.1.2 SET FIC-CA1-1 (G301/6, F0) EVAP FEED FLOW to AUTO and the setpoint to match the total feed flow determined in step 5.1.1.1.

5.1.1.3 IF the Cascade for FIC-CA1-1 is not OPEN (the Faceplate shows a green “C”), SET CASC to open the Cascade (a white “O”).

5.1.1.4 SET SETPOINT to the Condensate Flow value plus Evap Slurry Flow value determined in step 5.1.1.1.

NOTE FIC-CA1-1 setpoint may require some adjustment to correct for field device deficiencies to yield the correct flow value.

- FIC-CA1-1 will require readjustment if steam flow is changed, or if slurry flow is started.

5.1.1.5 ADJUST FIC-CA1-1 setpoint as necessary to maintain Evaporator Volume at 23,500 to 25,000 gallons or per the range specified in the Process Memo. (OSD T 151 00012, 2.2.1).
5.1 System Set-up (Cont.)

5.1.2 **ENSURE** equipment, located on the Condenser Room 5th level, are in the following positions:

<table>
<thead>
<tr>
<th>Equipment I.D #</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM-V-4</td>
<td>CLOSED</td>
</tr>
<tr>
<td>FM-V-1</td>
<td>OPEN</td>
</tr>
<tr>
<td>FM-V-7</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-32</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-33</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-49</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-50</td>
<td>CLOSED</td>
</tr>
</tbody>
</table>

**Water Valving to Flush Manifold**

<table>
<thead>
<tr>
<th>Equipment I.D #</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM-V-6</td>
<td>CLOSED</td>
</tr>
<tr>
<td>FM-V-5</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-103A</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5-102</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5-101</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-103</td>
<td>OPEN</td>
</tr>
<tr>
<td>FM-V-8</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

**Air Valving to Flush Manifold**

<table>
<thead>
<tr>
<th>Equipment I.D #</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-116C</td>
<td>Position 1 “Instrument to Process” (Figure 1)</td>
</tr>
<tr>
<td>5-110C</td>
<td>Position 1 “Instrument to Process” (Figure 1)</td>
</tr>
<tr>
<td>5-109C</td>
<td>Position 1 “Instrument to Process” (Figure 1)</td>
</tr>
<tr>
<td>5-111C</td>
<td>Position 1 “Instrument to Process” (Figure 1)</td>
</tr>
<tr>
<td>5-112C</td>
<td>Position 1 “Instrument to Process” (Figure 1)</td>
</tr>
</tbody>
</table>

5.1.3 **AT** PI-FM-1 (Located on the flush manifold), **ENSURE** water pressure reads between 60 and 110 psi.

5.1.4 **IF** vessel is empty, flush all five dip tubes at the same time, **GO TO** Section 5.3.
5.2 Flush Dip Tubes

NOTE - Step 5.2.1 and associated sub steps may be marked N/A if PB-1 is not running.

- PB-1 interlock will not change to BYPASS if LI-CA1-3 is in LO alarm. See “OR” statement under 5.2.1.4 on how to clear the LI_CA1-3 LO alarm.

5.2.1 ENSURE PB-1 Low Weight Factor Interlock BYPASS activates as follows:

5.2.1.1 TO call up pump EPN/faceplate, SELECT PB-1 (G12/6).

5.2.1.2 TO call up interlock pop-up graphic for PB-1, SELECT diamond indicator.

5.2.1.3 ON interlock pop-up graphic for PB-1, SELECT BYPASS button for “Software ILK 15”.

5.2.1.4 CONFIRM PB-1 in BYPASS by “Device state:” changes to BYPASS.

OR

IF PB-1 software ILK 15 bypass will not engage, due to LI-CA1-3 being in LO alarm, INCREASE level in CA1 until LI-CA1-3 reads approximately 380 inches and alarm clears.

NOTE - Step 5.2.2 and associated sub steps may be marked N/A if PB-2 is not running.

5.2.2 ENSURE PB-2 Low Weight Factor Interlock BYPASS activates as follows:

5.2.2.1 TO call up pump EPN/faceplate, SELECT PB-2 (G15/6).

5.2.2.2 TO call up interlock pop-up graphic for PB-2, SELECT diamond indicator.

5.2.2.3 ON interlock pop-up graphic for PB-2, SELECT BYPASS button for “Software ILK 15”.

5.2.2.4 CONFIRM PB-2 in BYPASS by “Device state:” changes to BYPASS.
### 5.2 Flush Dip Tubes (Cont.)

5.2.3 Shift Manager **IDENTIFY** individual dip tube(s) to be flushed per the following table.

<table>
<thead>
<tr>
<th>Initial</th>
<th>Dip Tube Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DI-CA1-2 Dip Tube I-CA1-5-M31 and WFT-CA1-2 Dip Tube I-CA1-7-M31 Step 5.2.4</td>
</tr>
<tr>
<td></td>
<td>DI-CA1-1 Dip Tube I-CA1-6-M31 and WFT-CA1-1 Dip Tube I-CA1-4-M31 Step 5.2.11</td>
</tr>
<tr>
<td></td>
<td>WFT-CA1-3 Dip Tube I-CA1-8-M31 Step 5.2.18</td>
</tr>
</tbody>
</table>

5.2.3.1 **GO TO** applicable Step(s) identified in table above AND **PERFORM** flushing activities.

**Flush Weight Factor Dip Tube */" I-CA1-5-M31 & I-CA1-7-M31**

5.2.4 **TO** Flush LIC-CA1-2 and DI-CA1-2, **ENSURE** the pair LI-CA1-1 AND DI-CA1-1 are **SELECTED** for level control.

5.2.5 **PLACE** password override key in keyboard AND **ENABLE** password override.

5.2.6 **DISABLE** density indicator as follows:

- **SELECT** “DI-CA1-2” (F2/13) EVAP CA1-2 SPG.
- **PRESS** “LOOP MAINTENANCE” twice.
- **PRESS** “QUICK SELECT 0” to select SB.
- **PRESS** “SELECT” “0” and “ENTER”.
- **PRESS** “MODIFY”.
- **CONFIRM** Scan status changes to OFF.
- **SELECT** “WFI-CA1-2” (F2/4).
- **PRESS** “LOOP MAINTENANCE” twice.
- **PRESS** “QUICK SELECT 0” to select SB.
- **PRESS** “SELECT”, “0” and “ENTER”.
Weight Factor Dip Tube Flush

5.2 Flush Dip Tubes (Cont.)

5.2.6.11 PRESS “MODIFY”.

5.2.6.12 CONFIRM Scan status changes to OFF.

5.2.6.13 SELECT “WFSH-CA12” (F2/12).

5.2.6.14 PRESS “LOOP MAINTENANCE” twice.

5.2.6.15 PRESS “SELECT”, “0” and “ENTER”.

5.2.6.16 PRESS “MODIFY”.

5.2.6.17 CONFIRM Scan status changes to OFF.

5.2.6.18 DISABLE password override.

5.2.6.19 REMOVE key from keyboard.

5.2.7 PERFORM flush on I-CA1-5-M31 as follows:

5.2.7.1 CLOSE isolation valve 5-109D.

5.2.7.2 PLACE 3 way valve 5-109C in Position 2 “Manifold to Process”. (See Figure 1)

5.2.7.3 OPEN FM-V-4 for ≥ 90 seconds to perform flush.

5.2.7.4 AFTER ≥ 90 seconds, CLOSE FM-V-4.

5.2.7.5 OPEN 242A-PA-V-001.

5.2.7.6 ADJUST FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.2.7.7 AT PI-FM-2 (located on the flush manifold), ENSURE air pressure reads between 15 and 25 psig.

a. IF the air pressure is not between 15 and 25 psig, UNTIL PI-FM-2 reads in range, ADJUST PCV-FM-1.

5.2.7.8 AFTER ≥ 30 seconds, CLOSE 242A-PA-V-001.

5.2.7.9 PLACE 3 way valve 5-109C in Position 1 “Instrument to Process”. (See Figure 1)

5.2.7.10 OPEN isolation valve 5-109D.
5.2 Flush Dip Tubes (Cont.)

5.2.8 PERFORM flush on I-CA1-7-M31 as follows:

5.2.8.1 CLOSE isolation valve 5-111D.

5.2.8.2 PLACE 3 way valve 5-111C in Position 2 “Manifold to Process”. (See Figure 1)

5.2.8.3 OPEN FM-V-4 for \( \geq 90 \) seconds to perform flush.

5.2.8.4 AFTER \( \geq 90 \) seconds, CLOSE FM-V-4.

5.2.8.5 OPEN 242A-PA-V-001.

5.2.8.6 ADJUST FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.2.8.7 AT PI-FM-2 (located on the flush manifold), ENSURE air pressure reads between 15 and 25 psig.

   a. IF the air pressure is not between 15 and 25 psig, UNTIL PI-FM-2 reads in range, ADJUST PCV-FM-1.

5.2.8.8 AFTER \( \geq 30 \) seconds, CLOSE 242A-PA-V-001.

5.2.8.9 PLACE 3 way valve 5-111C in Position 1 “Instrument to Process”. (See Figure 1)

5.2.8.10 OPEN isolation valve 5-111D.
5.2 Flush Dip Tubes (Cont.)

5.2.9 RETURN system to normal as follows:

5.2.9.1 SELECT “DI-CA1-2“(F2/13) EVAP CA1-2 SPG.

5.2.9.2 PRESS “LOOP MAINTENANCE” twice.

5.2.9.3 PLACE password override key in keyboard AND ENABLE password override.

5.2.9.4 PRESS “QUICK SELECT 0” to select SB.

5.2.9.5 PRESS “SELECT”, “0” and “ENTER”.

5.2.9.6 PRESS “MODIFY”.

5.2.9.7 CONFIRM Scan status changes to ON.

5.2.9.8 SELECT “WFI-CA1-2” (F2/4).

5.2.9.9 PRESS “LOOP MAINTENANCE” twice.

5.2.9.10 PRESS “QUICK SELECT 0” to select SB.

5.2.9.11 PRESS “SELECT”, “0” and “ENTER”.

5.2.9.12 PRESS “MODIFY”.

5.2.9.13 CONFIRM Scan status changes to ON.

5.2.9.14 SELECT “WFSH-CA12” (F2/12).

5.2.9.15 PRESS “LOOP MAINTENANCE” twice.

5.2.9.16 PRESS “SELECT”, “0” and “ENTER”.

5.2.9.17 PRESS “MODIFY”.

5.2.9.18 CONFIRM Scan status changes to ON.

5.2.9.19 DISABLE password override.

5.2.9.20 REMOVE key from keyboard.

5.2.10 IF no further flushing activities are required, GO TO Section 5.4.
5.2 Flush Dip Tubes (Cont.)

Flush Weight Factor Dip Tube ½ “I-CA1-6-M31 & I-CA1-4-M31

5.2.11 TO Flush LIC-CA1-1 and DI-CA1-1, ENSURE the pair LI-CA1-2 AND DI-CA1-2 are SELECTED for level control.

5.2.12 PLACE password override key in keyboard AND ENABLE password override.

5.2.13 DISABLE density indicator as follows:

5.2.13.1 SELECT “DI-CA1-1” (F2/9) EVAP CA1-1SPG.

5.2.13.2 PRESS “LOOP MAINTENANCE” twice.

5.2.13.3 PRESS “QUICK SELECT 0” to select SB.

5.2.13.4 PRESS “SELECT” “0” and “ENTER”.

5.2.13.5 PRESS “MODIFY”.

5.2.13.6 CONFIRM Scan status changes to OFF.

5.2.13.7 SELECT “WFI-CA1-1” (F2/0).

5.2.13.8 PRESS “LOOP MAINTENANCE” twice.

5.2.13.9 PRESS “QUICK SELECT 0” to select SB.

5.2.13.10 PRESS “SELECT”, “0” and “ENTER”.

5.2.13.11 PRESS “MODIFY”.

5.2.13.12 CONFIRM Scan status changes to OFF.

5.2.13.13 SELECT “WFSH-CA11” (F2/8).

5.2.13.14 PRESS “LOOP MAINTENANCE” twice.

5.2.13.15 PRESS “SELECT”, “0” and “ENTER”.

5.2.13.16 PRESS “MODIFY”.
5.2 Flush Dip Tubes (Cont.)

5.2.13.17 CONFIRM Scan status changes to OFF.

5.2.13.18 DISABLE password override.

5.2.13.19 REMOVE key from keyboard.

5.2.14 PERFORM flush on I-CA1-4-M31 as follows:

5.2.14.1 CLOSE isolation valve 5-112D.

5.2.14.2 PLACE 3 way valve 5-112C in Position 2 “Manifold to Process”. (See Figure 1)

5.2.14.3 OPEN FM-V-4 for ≥ 90 seconds to perform flush.

5.2.14.4 AFTER ≥ 90 seconds, CLOSE FM-V-4.

5.2.14.5 OPEN 242A-PA-V-001.

5.2.14.6 ADJUST FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.2.14.7 AT PI-FM-2 (located on the flush manifold), ENSURE air pressure reads between 15 and 25 psig.

a. IF the air pressure is not between 15 and 25 psig, UNTIL PI-FM-2 reads in range, ADJUST PCV-FM-1.

5.2.14.8 AFTER ≥ 30 seconds, CLOSE 242A-PA-V-001.

5.2.14.9 PLACE 3 way valve 5-112C in Position 1 “Instrument to Process”. (See Figure 1)

5.2.14.10 OPEN isolation valve 5-112D.
5.2 Flush Dip Tubes (Cont.)

5.2.15 **PERFORM** flush on I-CA1-6-M31 as follows:

5.2.15.1 **CLOSE** isolation valve 5-110D.

5.2.15.2 **PLACE** 3 way valve 5-110C in Position 2 “Manifold to Process”. (See Figure 1)

5.2.15.3 **OPEN** FM-V-4 for ≥ 90 seconds to perform flush.

5.2.15.4 **AFTER** ≥ 90 seconds, **CLOSE** FM-V-4.

5.2.15.5 **OPEN** 242A-PA-V-001.

5.2.15.6 **ADJUST** FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.2.15.7 **AT** PI-FM-2 (located on the flush manifold), **ENSURE** air pressure reads between 15 and 25 psig.

   a. **IF** the air pressure is not between 15 and 25 psig, **UNTIL** PI-FM-2 reads in range, **ADJUST** PCV-FM-1.

5.2.15.8 **AFTER** ≥ 30 seconds, **CLOSE** 242A-PA-V-001.

5.2.15.9 **PLACE** 3 way valve 5-110C in Position 1 “Instrument to Process”. (See Figure 1)

5.2.15.10 **OPEN** isolation valve 5-110D.
Weight Factor Dip Tube Flush

5.2 Flush Dip Tubes (Cont.)

5.2.16 RETURN system to normal as follows:

5.2.16.1 SELECT “DI-CA1-1“(F2/9) EVAP CA1-1 SPG.
5.2.16.2 PRESS “LOOP MAINTENANCE” twice.
5.2.16.3 PLACE password override key in keyboard AND enable password override.
5.2.16.4 PRESS “QUICK SELECT 0” to select SB.
5.2.16.5 PRESS “SELECT”, “0” and “ENTER”.
5.2.16.6 PRESS “MODIFY”.
5.2.16.7 CONFIRM Scan status changes to ON.
5.2.16.8 SELECT “WFI-CA1-1” (F2/0).
5.2.16.9 PRESS “LOOP MAINTENANCE” twice.
5.2.16.10 PRESS “QUICK SELECT 0” to select SB.
5.2.16.11 PRESS “SELECT”, “0” and “ENTER”.
5.2.16.12 PRESS “MODIFY”.
5.2.16.13 CONFIRM Scan status changes to ON.
5.2.16.14 SELECT “WFSH-CA11” (F2/8).
5.2.16.15 PRESS “Loop Maintenance” twice.
5.2.16.16 PRESS “Select”, “0” and “Enter.”
5.2.16.17 PRESS “Modify.”
5.2.16.18 CONFIRM Scan status changes to ON.
5.2.16.19 DISABLE password override.
5.2.16.20 REMOVE key from keyboard.

5.2.17 IF no further flushing activities are required, GO TO Section 5.4.
5.2 Flush Dip Tubes (Cont.)

**Flush Weight Factor Dip Tube ½" I-CA1-8-M31**

5.2.18 **PLACE** password override key in keyboard **AND**

**ENABLE** password override.

5.2.19 **PLACE** level indicator to manual as follows:

5.2.19.1 **SELECT** “LI-CA1-3” (F3/1) EVAP CA1-3 CORRECTED WT FACTR.

5.2.19.2 **PRESS** “LOOP MAINTENANCE” twice.

5.2.19.3 **PRESS** “QUICK SELECT 1” to select CAL.

5.2.19.4 **PRESS** “SELECT”, “7” and “ENTER”.

5.2.19.5 **PRESS** “MODIFY”.

**NOTE** - When placing LI-CA1-3 to LOCAL with new values the SOFTWARE ILK 15 for PB-1 may reset to NORMAL.

5.2.19.6 **CONFIRM** status changes to LOCAL.

5.2.19.7 **PRESS** “SELECT” “8” and “ENTER”.

5.2.19.8 **PRESS** “MODIFY” **AND**

**ENTER** 550 inches,

**OR**

**ENTER** inches designated by Shift Manager **AND**

**RECORD** Shift Manager designated inches in Shift Log.
5.2 Flush Dip Tubes (Cont.)

5.2.20 **DISABLE** weight factor indicator as follows:

5.2.20.1 **SELECT** “WFI-CA1-3“(F3/0).

5.2.20.2 **PRESS** “LOOP MAINTENANCE” twice.

5.2.20.3 **PRESS** “QUICK SELECT 0” to select SB.

5.2.20.4 **PRESS** “SELECT” “0” and “ENTER”.

5.2.20.5 **PRESS** “MODIFY”.

5.2.20.6 **CONFIRM** scan status changes to OFF.

5.2.20.7 **DISABLE** password override.

5.2.20.8 **REMOVE** key from keyboard.

5.2.21 **PERFORM** flush on I-CA1-8-M31 as follows:

5.2.21.1 **CLOSE** isolation valve 5-116D.

5.2.21.2 **PLACE** 3 way valve 5-116C in Position 2 “Manifold to Process”. (See Figure 1)

5.2.21.3 **OPEN** FM-V-4 for ≥ 90 seconds to perform flush.

5.2.21.4 **AFTER** ≥ 90 seconds, **CLOSE** FM-V-4.

5.2.21.5 **OPEN** 242A-PA-V-001.

5.2.21.6 **ADJUST** FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.2.21.7 AT PI-FM-2 (located on the flush manifold), **ENSURE** air pressure reads between 15 and 25 psig.

  a. **IF** the air pressure is not between 15 and 25 psig, **UNTIL** PI-FM-2 reads in range, **ADJUST** PCV-FM-1.

5.2.21.8 **AFTER** ≥ 30 seconds, **CLOSE** 242A-PA-V-001.

5.2.21.9 **PLACE** 3 way valve 5-116C in Position 1 “Instrument to Process”. (See Figure 1)
5.2 Flush Dip Tubes (Cont.)

5.2.21.10 OPEN isolation valve 5-116D.

5.2.22 RETURN system to normal as follows:

5.2.22.1 SELECT “WFI-CA1-3” (F3/0)

5.2.22.2 PRESS “LOOP MAINTENANCE” twice.

5.2.22.3 PLACE password override key in keyboard AND ENABLE password override.

5.2.22.4 PRESS “QUICK SELECT 0” to select SB.

5.2.22.5 PRESS “SELECT”, “0” and “ENTER”.

5.2.22.6 PRESS “MODIFY”.

5.2.22.7 CONFIRM scan status changes to ON.

5.2.22.8 SELECT “LI-CA1-3” (F3/1) EVAP CA1-3 CORRECTED WT FACTR.

5.2.22.9 PRESS “LOOP MAINTENANCE” twice.

5.2.22.10 PRESS “QUICK SELECT 1” to select CAL.

5.2.22.11 PRESS “SELECT”, “7,” and “ENTER”.

5.2.22.12 PRESS “MODIFY”.

5.2.22.13 CONFIRM status changes to REMOTE.

5.2.22.14 DISABLE password override.

5.2.22.15 REMOVE key from keyboard.

5.2.23 IF no further flushing activities are required, GO TO Section 5.4.
5.3 **Flush all Five Dip Tubes Using Dip Tube Flush Manifold**

NOTE - This section can be performed only if the vessel is empty.

5.3.1 **CONFIRM** evaporator vessel is empty.

5.3.2 **ENSURE** the valves, located on the Condenser Room 5th level, are in the following positions.

<table>
<thead>
<tr>
<th>Equipment ID#</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-109D</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5-110D</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5-111D</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5-112D</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5-116D</td>
<td>CLOSED</td>
</tr>
</tbody>
</table>
5.3 Flush all Five Dip Tubes Using Dip Tube Flush Manifold (Cont.)

5.3.3 **POSITION** valve 5-109C to Position 2 “Manifold to Process”.

5.3.4 **OPEN** valve FM-V-4.

5.3.5 **OBSERVE** water to flow for approximately two minutes before proceeding.

5.3.6 **CLOSE** valve FM-V-4.

5.3.7 **OPEN** 242A-PA-V-001.

5.3.8 **ADJUST** FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.3.9 **AT** PI-FM-2 (located on the flush manifold), **ENSURE** air pressure reads between 15 and 25 psig.

5.3.9.1 **IF** the air pressure is not between 15 and 25 psig, **UNTIL** PI-FM-2 reads in range, **ADJUST** PCV-FM-1.

5.3.10 **AFTER** ≈ 2 minutes, **CLOSE** 242A-PA-V-001.

5.3.11 **POSITION** valve 5-109C to Position 1 “Instrument to Process”.

5.3.12 **POSITION** valve 5-110C to Position 2 “Manifold to Process”.

5.3.13 **OPEN** valve FM-V-4.

5.3.14 **OBSERVE** water to flow for approximately two minutes before proceeding.

5.3.15 **CLOSE** valve FM-V-4.

5.3.16 **OPEN** 242A-PA-V-001.

5.3.17 **ADJUST** FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.3.18 **AT** PI-FM-2 (located on the flush manifold), **ENSURE** air pressure reads between 15 and 25 psig.

5.3.18.1 **IF** the air pressure is not between 15 and 25 psig, **UNTIL** PI-FM-2 reads in range, **ADJUST** PCV-FM-1.

5.3.19 **AFTER** ≈ 2 minutes, **CLOSE** 242A-PA-V-001.
5.3 Flush all Five Dip Tubes Using Dip Tube Flush Manifold (Cont.)

5.3.20 **POSITION** valve 5-110C to Position 1 “Instrument to Process”.

5.3.21 **POSITION** valve 5-111C to Position 2 “Manifold to Process”.

5.3.22 **OPEN** valve FM-V-4.

5.3.23 **OBSERVE** water to flow for approximately two minutes before proceeding.

5.3.24 **CLOSE** valve FM-V-4.

5.3.25 **OPEN** 242A-PA-V-001.

5.3.26 **ADJUST** FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.3.27 **AT** PI-FM-2 (located on the flush manifold), **ENSURE** air pressure reads between 15 and 25 psig.

- 5.3.27.1 **IF** the air pressure is not between 15 and 25 psig, **UNTIL** PI-FM-2 reads in range, **ADJUST** PCV-FM-1.

5.3.28 **AFTER** ≥ 2 minutes, **CLOSE** 242A-PA-V-001.

5.3.29 **POSITION** valve 5-111C to Position 1 “Instrument to Process”.

5.3.30 **POSITION** 5-112C to Position 2 “Manifold to Process”.

5.3.31 **OPEN** valve FM-V-4.

5.3.32 **OBSERVE** water to flow for approximately two minutes before proceeding.

5.3.33 **CLOSE** valve FM-V-4.

5.3.34 **OPEN** 242A-PA-V-001

5.3.35 **ADJUST** FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.3.36 **AT** PI-FM-2 (located on the flush manifold), **ENSURE** air pressure reads between 15 and 25 psig.

- 5.3.36.1 **IF** the air pressure is not between 15 and 25 psig, **UNTIL** PI-FM-2 reads in range, **ADJUST** PCV-FM-1.

5.3.37 **AFTER** ≥ 2 minutes, **CLOSE** 242A-PA-V-001
5.3 **Flush all Five Dip Tubes Using Dip Tube Flush Manifold (Cont.)**

5.3.38 **POSITION** valve 5-112C to Position 1 “Instrument to Process”.

5.3.39 **POSITION** valve 5-116C to Position 2 “Manifold to Process”.

5.3.40 **OPEN** valve FM-V-4.

5.3.41 **OBSERVE** water to flow for approximately two minutes before proceeding.

5.3.42 **CLOSE** valve FM-V-4.

5.3.43 **OPEN** 242A-PA-V-001.

5.3.44 **ADJUST** FM-V-6 until flow indicator FI-FM-1 reads between 25 and 40 percent flow.

5.3.45 AT PI-FM-2 (located on the flush manifold), **ENSURE** air pressure reads between 15 and 25 psig.

5.3.45.1 **IF** the air pressure is not between 15 and 25 psig, **UNTIL** PI-FM-2 reads in range, **ADJUST** PCV-FM-1.

5.3.46 **AFTER** ≧ 2 minutes, **CLOSE** 242A-PA-V-001.

5.3.47 **POSITION** valve 5-116C to Position 1 “Instrument to Process”.

5.3.48 **POSITION** valves as follows:

<table>
<thead>
<tr>
<th>Equipment ID#</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-109D</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-110D</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-111D</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-112D</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-116D</td>
<td>OPEN</td>
</tr>
</tbody>
</table>
5.4 Restore System

Relieving Pressure

5.4.1 OPEN valve FM-V-4 for approximately 5 seconds.

5.4.2 CLOSE valve FM-V-4.

5.4.3 CLOSE valve 5-101.

NOTE - Valve 5-101 may leak through slightly. A tiny amount of air from valve 5-103A is expected, even after pressure is relieved.

5.4.4 OPEN valve 5-103A, until pressure is relieved.

5.4.5 CLOSE valve 5-103A.

5.4.6 CLOSE valve FM-V-8.

5.4.7 CLOSE valve 5-103.
5.4 Restore System (Cont.)

NOTE - Steps 5.4.8 and 5.4.10 only need to be performed if Section 5.2 was used to blow down the dip tubes.

Return to Normal

NOTE Volume control is considered in AUTO (in Evaporator Level Control) if FIC-CA1-1 is operating in AUTO with the Cascade CLOSED. This controls Evaporator Vessel volume via the setpoint of the Level Controller LIC-CA1-1 or LIC-CA1-2.

5.4.8 IF Evaporator Volume controller was placed in MANUAL Mode, PLACE Evaporator Controller in AUTOMATIC Mode as follows:

5.4.8.1 SET SELECT-WF (G10/8, F2) POT WF SELECTOR FOR LEVL CONTROL to LIC-CA1-1 or LIC-CA1-2 as desired.

NOTE Normally, DI-CA1-1 is used with LIC-CA1-1 and DI-CA1-2 is used with LIC-CA1-2, for ease of maintenance; however, either DI can be used with either LIC.

5.4.8.2 SET SELECT-DI (G10/11, F2) POT SPG SELECTOR FOR LEVL CONTROL to DI-CA1-1 or DI-CA1-2 as desired.

5.4.8.3 SET FIC-CA1-1 (G301/6, F0) EVAP FEED FLOW to AUTO mode.

a. IF the Cascade for FIC-CA1-1 is OPEN (showing a white "O"), SET CASC to close the Cascade (displays a green "C").

5.4.8.4 SET the Level Controller selected in Step 5.4.8.1 to AUTO mode with a setpoint of 24,500 gallons or level specified by Process Memo.
5.4 Restore System (Cont.)

5.4.9 **PLACE** PB-1 Low Weight Factor Interlock BYPASS to NORMAL as follows:

5.4.9.1 **TO** call up pump EPN/faceplate, **SELECT** PB-1 (G12/6).

5.4.9.2 **TO** call up interlock pop-up graphic for PB-1, **SELECT** diamond indicator.

5.4.9.3 **ON** interlock pop-up graphic for PB-1, **SELECT** BYPASS button for “Software ILK 15”.

5.4.9.4 **CONFIRM** PB-1 in NORMAL by “Device state:” changes to NORMAL.

5.4.10 **PLACE** PB-2 Low Weight Factor Interlock BYPASS to NORMAL as follows:

5.4.10.1 **TO** call up pump EPN/faceplate, **SELECT** PB-2 (G15/6).

5.4.10.2 **TO** call up interlock pop-up graphic for PB-2, **SELECT** diamond indicator.

5.4.10.3 **ON** interlock pop-up graphic for PB-2, **SELECT** BYPASS button for “Software ILK 15”.

5.4.10.4 **CONFIRM** PB-2 in NORMAL by “Device state:” changes to NORMAL.
5.5 **Flush S-2 Air Purge Line into C-A-1**

NOTE - 242-A must be in Shutdown Mode or C-A-1 vessel pressure less than 190 torr to perform Section 5.5.

- Flush will affect pressure and flow to PB-1 / PB-2 seals. Starting flush slowly will lessen this impact. Monitoring of current trends 8 and 47 will provide signs of impact.

- Closing valves HV-CA1-21 and 5-3F will secure purge air flow to C-A-1. If vessel vacuum >190 torr, a 30 minute timer will start. Steps 5.5.1 through 5.5.2.6 must be completed in less than 30 minutes to avoid activation of the S2 interlock.

5.5.1 **IF** directed to perform flush using PC, **THEN** perform the following steps:

5.5.1.1 **CLOSE** the following valves:

- HV-CA1-21
- 5-3F.

5.5.1.2 **ENSURE** the following valves are **OPEN**:

- 5-77A
- 5-77B.

**NOTE**- When 5-69C is initially opened, local gauge PI-CA1-18 (downstream 5-77A) is expected to increase to line pressure, a drop in pressure should indicate the plugging is reduced and additional flow may be added.

5.5.1.3 **SLOWLY OPEN** 5-69C **AND WAIT** time specified by the Shift Manager **THEN CLOSE** 5-69C.

5.5.1.4 **CLOSE** 5-77B

5.5.1.5 **OPEN** the following valves:

- HV-CA1-21
- 5-3F.
5.5 **Flush S-2 Air Purge Line into C-A-1 (Cont.)**

5.5.2 **IF DIRECTED** to flush using FRW, **ENSURE** FRW system is on line per TO-600-210. (LCO 3.1)

**NOTE** Seal water must be on FRW with PC-105 or PC-105A online to maintain PB-1 and PB-2 seal water pressures.

5.5.2.1 **REDUCE** steam flow FV-EA1-1 (G13/8) to < 12,000 LB/H (LCO 3.1)

5.5.2.2 **SHUT DOWN** de-entrainer sprays as follows (LCO 3.1)

a. **SET** HV-PDSPRY (G10/4, F3) DE-ENTRN PADSPRAY VALVES to OFF.

b. **SET** FIC-CA1-6 (G10/5, F3) UPPER DE-ENTRN SPRAY FLOW to MANUAL and 100% output.

5.5.2.3 **CLOSE** the following valves: (LCO 3.1)

- HV-CA1-21
- 5-3F.

5.5.2.4 **ENSURE** the position of the following valves as indicated: (LCO 3.1)

<table>
<thead>
<tr>
<th>Valve Number</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-77A</td>
<td>OPEN</td>
</tr>
<tr>
<td>5-77B</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

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5.5  **Flush S-2 Air Purge Line into C-A-1 (Cont.)**

**NOTE**  When 5-69C is initially opened, local gauge PI-CA1-18 (downstream 5-77A) is expected to increase to line pressure, a drop in pressure should indicate the plugging is reduced and additional flow may be added.

5.5.2.5  **CRACK OPEN 5-69C AND WAIT** for when local gauge PI-CA1-18 (downstream of 5-77A) pressure drops. *(LCO 3.1)*

5.5.2.6  **SLOWLY OPEN 5-69C AND WAIT** time specified by Shift Manager **THEN**

   **CLOSE 5-69C.** *(LCO 3.1)*

5.5.2.7  **CLOSE 5-77B.** *(LCO 3.1)*

5.5.2.8  **OPEN** the following valves: *(LCO 3.1)*

   - HV-CA1-21.
   - 5-3F.

5.5.2.9  **START** De-Entrainer Sprays per TO-600-030. *(LCO 3.1)*
5.6 Flush Lower De-Entrainer Pad Dip Tube

NOTE - 242-A must be in Shutdown Mode or in LCO 3.2 to perform step 5.6.
- This operation will secure sensing line airflow through PDT-CA1-4 and cause a S1 trip in 1 minute. PB-1 and AW-P-102 will shutdown, HV-EA1-5 and FV-EA1-1 will close, and HV-EC1-5 and HV-EC1-1 will open and HV-CA1-1 will open beginning slow dump of the pot.

5.6.1 IF the C-A-1 vessel contains waste or water, PERFORM the following: (LCO 3.2)

5.6.1.1 ENSURE Tank Farms monitoring (leak detectors, tank temperatures, and ventilation) is being conducted per applicable transfer procedure.

5.6.1.2 ENSURE steps 5.6.2 through 5.6.10 are complete in less than 25 minutes.

5.6.1.3 ENSURE PB-1 is off

5.6.1.4 ENSURE C-A-1 is not under vacuum (HV-CA1-1 open)

NOTE – Adjusting FIC-CA1-13 to zero and closing 5-113 will secure sensing line airflow through PDT-CA1-4 and cause a S1 trip in 1 minute, HV-CA1-7 and HV-CA1-9 will open ~29 minutes later.

5.6.2 ADJUST FIC-CA1-13 rotameter to zero. (LCO 3.2)

5.6.3 CLOSE 5-113. (LCO 3.2)

5.6.4 CONNECT Hose from 5-64 to flush port line on valve 5-113. (LCO 3.2)

5.6.5 OPEN 5-64 to flush line with water for time specified by shift manager AND CLOSE 5-64. (LCO 3.2)

5.6.6 REMOVE hose from flush port. (LCO 3.2)

5.6.7 ALLOW flush line to drain for ~1 minute AND REPLACE flush port pipe cap. (LCO 3.2)
5.6 **Flush Lower De-Entrainer Pad Dip Tube (Cont.)**

5.6.8 **OPEN 5-113.** *(LCO 3.2)*

5.6.9 **ADJUST FIC-CA1-13 rotameter to 1.5 – 1.8 scfh.** *(LCO 3.2)*

5.6.10 **ENSURE** the following return to expected values: *(LCO 3.2)*

- PDI-CA1-4 *(G400, F32/13)*
- PDI-CA1-1 *(G10, F3/12)*.

5.7 **Records**

**NOTE** - No records are generated during the performance of this procedure.

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 – Three (3) Way Valve Positioning

Instrument Transmitters to Process (C-A-1) Position

Flush Manifold to Process (C-A-1) Position

Valve Handle Positioning

Flush Manifold

Process (C-A-1)

Stop

Instrument Transmitters

Valve Port Positioning

Flush Manifold

Process (C-A-1)

Instrument Transmitters

Valve Handle Positioning

Flush Manifold

Process (C-A-1)

Stop

Instrument Transmitters

Valve Port Positioning

Flush Manifold

Process (C-A-1)

Instrument Transmitters
Figure 2 – FM-CA1 Dip Tube Flush Manifold Assembly