Changes “Other Than Inconsequential” Require These Additional Reviews:

Radiological Controls:
Lee Livesey’s Organization

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-5</td>
<td>02/13/2018</td>
<td>Inconsequential Change</td>
<td>Inconsequential change to title of TFC-OPS-OPER-C-24 to “Occurrence Reporting” (Step 3.5.2).</td>
</tr>
<tr>
<td>H-4</td>
<td>01/22/2018</td>
<td>Operations Request</td>
<td>Modified NOTE in Section 3.1 in AOP/ERP to one consistent statement.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“Steps in this procedure may be performed simultaneously or in any logical order, depending on situational needs.”</td>
</tr>
<tr>
<td>H-3</td>
<td>12/11/2017</td>
<td>Operations Request</td>
<td>Added Step 3.2.4 and 3.2.7 to address recording step completion. Added new Step 4.1.1 for new EXIT criteria.</td>
</tr>
<tr>
<td>H-2</td>
<td>10/10/2017</td>
<td>Operations Request</td>
<td>Added &quot;NOTE – Abnormal Operating Procedures are not designed for, nor intended to be applied to, &quot;expected&quot; alarms generated by approved work activities or procedures.”</td>
</tr>
<tr>
<td>H-1</td>
<td>09/29/2016</td>
<td>Operations Request</td>
<td>Modified note – Clarification of duty card and Shift Manager responsibilities.</td>
</tr>
</tbody>
</table>
1.0 AFFECTED PERSONNEL, FACILITIES, EQUIPMENT, OR AREAS

This procedure applies to WRPS personnel operating the 242-A Evaporator steam system.

NOTE - Abnormal Operating Procedures are not designed for, nor intended to be applied to, "expected" alarms generated by approved work activities or procedures.
2.0 ENTRY CONDITIONS

2.1.1 Initial indications for a loss of steam to the facility are low steam pressure alarms, as follows:

- PI-EA1-1 (G13, F12/11) - REBOILER STEAM INLET PRESSURE LOW
- PI-STM-1 (G13, F12/0) - 10 PSI STEAM HEADER PRESSURE LOW
- PI-EA1-13 (G13, F12/1) - 90 PSI STEAM HEADER PRESSURE LOW & LOW-LOW.

2.1.2 Loss of steam to the Evaporator can be initiated by any one of the following:

- Loss of steam supply from JCI Boiler annex
- Lifting of a pressure relief valve resulting in venting steam pressure to atmosphere
- Inadvertent closure of a main steam line block valve
- Failure of a steam control valve
- Steam line/valve rupture
- Damage to an above ground steam line by vehicles, cranes, etc.
- Damage to steam lines due to natural emergencies (e.g., seismic event, high winds, tornado).
3.0 ACTIONS

3.1 Automatic Actions

3.1.1 The following alarms, do not activate an interlock:
- PI-STM-1 (G13, F12/0) - 10 PSI STEAM HEADER PRESSURE LOW - 10 psi steam header low pressure
- PI-EA1-13 (G13, F12/1) - 90 psi steam header pressure low & low-low - 90 psi steam header low pressure
- PI-CA1-11 (G10, F3/5) - EVAP VACUUM, 0-30 INHG LOW alarm (activates at 23 INHG)
- PIC-CA1-7 (G10, F3/6) - EVAP ABSOLUTE PRESSURE, Evaporator CA-1 vessel high pressure alarm - YELLOW (activates at 100 torr).

3.1.2 These alarms activate an interlock closing reboiler steam supply valve FV-EA1-1, which normally isolates reboiler steam supply.
- PI-EA1-1 (G13, F12/11) - REBOILER STEAM INLET PRESSURE LOW - Reboiler steam supply low pressure/flow
- PI-CA1-11 (G10, F3/5) - EVAP VACUUM, INHG LOW/LOW alarm (activates at 20 INHG)
- PSH-CA111 (G10, F3/4) - EVAP VACUUM, 0-30 INHG LOW/LOW alarm (activates at 18 INHG)
- PIC-CA1-7 (G10, F3/6) - EVAP ABSOLUTE PRESSURE, Evaporator CA-1 vessel high-high pressure alarm - RED (activates at 170 torr).

NOTE - Process air supplied to reboiler is to prevent slurry entering either the steam or process air system due to a leaking reboiler slurry tube.

3.1.3 Closure of reboiler steam valve activates process air supply valve HV-EA1-3 OPEN to supply 18 psig air to reboiler steam chest.
3.2 Immediate Actions

NOTE - This is a guide to assist the operator and Shift Manager in placing the facility in a safe configuration.
- Steps in this procedure may be performed simultaneously or in any logical order, depending on situational needs.
- The attached Duty Card is to be completed by the A-1 operator. Since not all procedural steps are included in the Duty Card, the Shift Manager will ensure that all procedural steps are reviewed and the necessary steps are performed.

WARNING
Failure to wear appropriate PPE during a loss of steam event can result in personnel injuries from burns.

3.2.1 WHEN operating steam valves, WEAR leather gloves.

3.2.2 WHEN working around steam lines, WEAR long-sleeved shirts or coveralls made of natural fibers.

3.2.3 WHEN responding to breached steam lines, DON ear plugs as minimum hearing protection.

242-A Shift Manager

3.2.4 WHEN performing Step 3.2.5, WRITE time of step completion on the laminated Duty Card AND RECORD time of step completion in the A-1 or Shift Manager logbook.

3.2.5 ENSURE Control Room operator performs required actions per Attachment 1 - 242-A Loss of Steam Duty Card.

3.2.6 NOTIFY ETF Control Room (373-9000) of changes in steam condensate status (stop/restart) and steam condensate monitoring status.

Control Room Operator

3.2.7 WHEN performing Step 3.2.5, WRITE time of step completion on the laminated Duty Card AND RECORD time of step completion in the A-1 or Shift Manager logbook.

3.2.8 PERFORM actions per Attachment 1 - 242-A Loss of Steam Duty Card.
3.3 Operator Actions

**WARNING**

Failure to wear appropriate PPE during a loss of steam event can result in personnel injuries from burns.

- **3.3.1** NOTIFY the JCI operator to INSPECT/RESTORE boiler operation by ENSURING the following:
  - Proper valve lineup
  - No leaks
  - Drains and vents CLOSED
  - Safety relief valves SHUT.

- **3.3.2** IF steam pressure has returned, EXIT this procedure.

- **3.3.3** NOTIFY Shift Manager.

NOTE - Compressed air required to perform action.

- **3.3.4** IF FV-EA1-1 does not indicate STM OFF:
  - **3.3.4.1** SELECT STM OFF for FV-EA1-1.
  - **3.3.4.2** IF FV-EA1-1 does not indicate STM OFF, CLOSE valve H-30.

- **3.3.5** IF 90# steam is LOST AND IF HVEC2/3-1 does not indicates CF-CLOSD,
  - **3.3.5.1** CLOSE HVEC2/3-1.
  - **3.3.5.2** IF HVEC2/3-1 does not indicate CF-CLOSD, CLOSE valve HV-H-40.

- **3.3.6** IF HV-EA1-4 does not close after 5 minutes, CLOSE HV-EA1-4.

- **3.3.7** PLACE Process Operations in recirculation with vacuum or recirculation without vacuum as directed by Shift Manager, per TO-600-060.

- **3.3.8** NOTIFY Shift Manager of event and plant status.
3.4 Follow-on Actions

NOTE - If steam is to be out of service for an extended period of time, Evaporator operations may be shutdown per direction of Shift Manager and in accordance with TO-600-060.

3.4.1 ENSURE process air is established to reboiler steam chest via FV-EA1-1 (G13/10, F12/3) reboiler steam flow valve indicating STM OFF status and by verifying 28 to 35 psia process air to reboiler steam chest via pressure indicator PI-EA1-1(G13, F12/11) REBOILER STEAM INLET PRESSURE.

3.4.1.1 IF there is no air pressure indication, LOCALLY VERIFY pressure indicator PI-EA1-7 (located next to TK-C-100) indicates 15 psig.

3.4.1.2 IF there is no local pressure indication, OBTAIN Maintenance and/or Engineering assistance.

3.5 Administrative Actions

NOTE - Actual steps taken for restoration are dependent on specific situation and facility configuration at the time of event. The following steps are general guidance and may be performed concurrently, in any order or omitted at discretion of Shift Manager to fit situation.

3.5.1 ENSURE that the CSM is notified of AOP entry AND REQUEST CSM to make notifications per TFC-OPS-OPER-C-57.

3.5.2 EVALUATE conditions per TFC-OPS-OPER-C-24, Occurrence Reporting.

3.5.3 REQUEST Shift Manager to evaluate the need to notify Environmental per TF-REC-001 and TFC-ESHQ-ENV_FS-C-01.

3.5.4 INITIATE repairs or work requests to systems that may have caused unexpected condition.
4.0 EXIT CRITERIA

4.1 Exit Actions/Criteria

4.1.1 Facility placed in shutdown per TO-600-060.

4.1.2 Loss of steam condition corrected.

4.1.3 **RESTART** steam operations per TO-600-055 or TO-600-056.

5.0 RECORDS

No records are generated during the performance of this procedure.
Response to 242-A Evaporator Loss of Steam System

Attachment 1 - 242-A Loss of Steam Duty Card

**TIME LINE**

- Loss of 10 or 90 # steam pressure.

**ENSURE** the following:
- Proper valve lineup
- No leaks
- Drains and vents CLOSED
- Safety relief valves SHUT.

**Is steam pressure Still low?**

- **NO** EXIT this procedure
- **YES** NOTIFY Shift Manager

**G-13**

- FV-EA1-1 Indicates STM OFF?
  - **NO** SELECT FV-EA1-1 TURN Steam OFF to Reboiler
  - **YES**
    - FV-EA1-1 Indicates STM OFF?
      - **NO**
        - **CLOSE Valve H-30**
      - **YES**
        - Is 90# Steam lost?
          - **NO**
          - **YES**
            - **CLOSE Valve HVEC2/3-1**
            - HVEC2/3-1 Indicates CF-CLOSD?
              - **NO**
                - **CLOSE Valve HV-H-40**
              - **YES**

**NOTE**
- Heavy line weight box indicates compressed air required to perform action.

**YES**
Response to 242-A Evaporator Loss of Steam System

Attachment 1 - 242-A Loss of Steam Duty Card (Cont.)

TIME LINE

A

G14

Is HV-EA1-4 CLOSED after 5 minutes?

NO

CLOSE HV-EA1-4

YES

PLACE Process Operations in Recirculation – With Vacuum or Recirculation Without Vacuum as directed by Shift Manager, per TO-600-060

NOTIFY Shift Manager of event and plant status

WHEN directed by Shift Manager PROCEED to Recovery Actions in TF-AOP-EVAP-005