Changes “Other Than Inconsequential” Require These Additional Reviews:

Radiological Controls:
Lee Livesey’s Organization

USQ # EV-18-1967-S, Rev. 0

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<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
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<tr>
<td>H-7</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>
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<td>H-6</td>
<td>03/12/2018</td>
<td>Operations Request</td>
<td>Modified Step 3.2.6 to close valve 5-47 and sub steps to shutdown raw water to facility if closure of valve 5-47 cannot be completed, if raw water cannot be shutdown to close valve 1.17-R</td>
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<td>H-5</td>
<td>01/22/2018</td>
<td>Operations Request</td>
<td>Modified NOTE in Section 3.1 in AOP/ERP to one consistent statement. “Steps in this procedure may be performed simultaneously or in any logical order, depending on situational needs.”</td>
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<td>H-4</td>
<td>12/19/2017</td>
<td>Operations Request</td>
<td>Added Step 3.2.1 to address recording step completion. Changed RECORD section to generate no records.</td>
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<td>H-3</td>
<td>10/10/2017</td>
<td>Operations Request</td>
<td>Added “NOTE – Abnormal Operating Procedures are not designed for, nor intended to be applied to, “expected” alarms generated by approved work activities or procedures.”</td>
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1.0 AFFECTED PERSONNEL, FACILITIES, EQUIPMENT, OR AREAS

This procedure applies to WRPS personnel and subcontractors doing work in the 242-A Evaporator.

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

NOTE - There are numerous different process and instrument air alarms which can result in entry into this AOP.

Loss of Compressed Air System Indications

Evaporator Shutdown

The 242-A Control Room Operator initial warnings for a loss of the compressed air system are the following alarms:

- PSLCPE1/2 - PROC AIR COMPRESR PRESSURE LOW
- PSL-IA-2 – 50 # PSI INST AIR PRESSURE LOW
- PI-IA-1 - INSTRMNT AIR HEADER PRESSURE
- PI-PA-1 - PROCESS AIR HEADER PRESSURE

Evaporator in Operation

During Evaporator operations, the initial warning indications (above) are followed immediately by numerous pneumatic valves failing in their shut down positions and "out of limit" parameter alarms (e.g., high/low temperature, pressure, flow, level, etc.): Examples are:

- PI-CA1-11 - EVAP VACUUM 0-30 IN HG (LOW)
- PIC-CA1-7 – EVAP ABSOLUTE PRESSURE (HIGH)
- PI-CA1-11 – EVAP VACUUM 0-30 IN HG (HIGH - HIGH)
- PIC-CA1-7 – EVAP ABSOLUTE PRESSURE
- PSH-CA111 - EVAP VESSEL PRESSURE HIGH
- PI-STM-1 – 10 PSI STEAM HEADER PRESSURE (LOW)
- FIC-EA1-1 - REBOILER STEAM FLOW (LOW)
- FIC-CA1-4 - EVAP SLURRY FLOW (LOW – LOW)
- LIC-CA1-1 - EVAP CA1-1 LEVEL CONTROL (LOW – LOW)
- LIC-CA1-2 - EVAP CA1-2 LEVEL CONTROL (LOW-LOW)
- PDI-K1-313- HEPA FILTER 1 K1-6-1 DP (LO)
- PDI-K1-307 - HEPA FILTER 1 K1-6-3 DP (LO)
- PDI-K1-310 - HEPA FILTER 1 K1-6-2 DP (LO)
- PDI-K1-314 - HEPA FILTER 2 K1-6-4 DP (LO)
- PDI-K1-311 - HEPA FILTER 2 K1-6-5 DP (LO)
- PDI-K1-308 - HEPA FILTER 2 K1-6-6 DP (LO).
3.0 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.

- All work will be performed in accordance with DOE 0359, Hanford Site Electrical Safety Program.

- Operation of Circuit Breakers, Electrical disconnect Switches, and Similar Switching Equipment shall be performed by a qualified person.

- Component operation requires completion of an Electrical Risk Assessment (ERA).

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

- When the clean and inspects are delinquent, the ERA for non-normal operating condition is applicable, for those workers interacting with electrical equipment.

3.1 Automatic Actions

3.1.1 Automatic actions will vary depending upon which event has occurred. See Section 2.0 under “Evaporator in Operation” for list of possible events.

3.1.2 During Operations loss of Compressed Air will cause SIS alarms to activate. If any SIS alarms activate respond per ARP-T-601-400, Respond to SIS Graphic #400 Alarms at the 242-A Evaporator in a timely manner then return to this procedure.
3.2 Immediate Actions

NOTE - Unless otherwise noted, activities within tasks may be performed in any order.

Special Instructions

- Long sleeve shirt and pants or coveralls made of natural fibers, safety glasses and leather gloves should be worn while operating steam system.

3.2.1 WHEN performing Step 3.2.2, WRITE time of step completion on the laminated Duty Card AND RECORD time of step completion in the A-1 or Shift Manager logbook.

3.2.2 ENSURE Control Room Operator performs required actions listed on Attachment 1 – Loss of Compressed Air Duty Card.

3.2.2.1 PRIOR to performing Attachment 1, DON appropriate PPE.

3.2.3 EVACUATE all personnel from radiological areas and restrict entry until confinement integrity can be confirmed.

3.2.4 NOTIFY Central Shift Office of potential vessel dump.

3.2.5 NOTIFY AW Farm ADM or CSM of Loss of Compressed Air to AW-Farm.

3.2.6 ENSURE valve 5-47 is closed to minimize Raw Water to the slurry tank.

3.2.6.1 IF this cannot be completed, shutdown raw water to the facility in accordance with procedure TO-600-130.

3.2.6.2 IF Step 3.2.6.1 cannot be completed, CLOSE valve 117-R.
3.3 Follow-on Actions

NOTE - Performance of a temporary round or notification to Environmental is not required for the diversion of process condensate to AW-102 if the loss of the compressed air system occurs when the facility is not actively generating process condensate.

3.3.1 REQUEST Shift Manager provide temporary round to perform each shift for an inspection of the IX Column room to monitor for leaks in the process condensate piping that has been placed in service as a result of the diversion.

3.4 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.

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

3.4.2 REQUEST Central Shift Manager to evaluate the need to notify Environmental per TF-REC-001 and TFC-ESHQ-ENV_FS-C-01.
4.0 EXIT CRITERIA

4.1 Exit Actions/Criteria

WHEN compressed air system is returned to service, PERFORM the following recovery actions.

4.1.1 CHECK 28 to 35 psia process air on the reboiler steam chest via pressure indicator PI-EA1-1 [G13, F12/11 REBOILER STEAM INLET PRESSURE]. (Pressurization of the reboiler steam chest with 28 to 35 psia compressed air requires a compressor to be in service. It takes approximately 15 to 20 minutes to achieve 28 to 35 psia on the reboiler steam chest once the condensate drain valves are closed.)

4.1.1.1 IF PI-EA1-1 indicates less than 28 psia, DIRECT an Operator to locally verify 13 psig on pressure indicator PI-EA1-7 located next to the TK-C-100 Condensate Tank.

4.1.1.2 IF PI-EA1-7 indicates less than 10 psig, OBTAIN assistance from Maintenance and Engineering.

4.1.2 ENSURE all diversion valves (e.g., steam condensate, process condensate, etc.) are in their normal shutdown positions.

4.1.3 IF compressed air is not returned to service before dump valves fail open, CONFIRM Evaporator vessel is empty.
Response to 242-A Evaporator Loss of Compressed Air System

5.0 RECORDS

The performance of this procedure generates no records.
Attachment 1 - Loss of Compressed Air System Duty Card

TIME LINE

NUMEROUS LOW PROCESS AND INSTRUMENT AIR ALARMS

DIRECT SOE to start an air compressor

Compressors OFF

YES

NO

G-21

DIRECT NCO/SOE to perform investigation of air system

Air System Returned to Normal

NO

YES

PERFORM Personnel Protective Actions

• NOTIFY Central Shift Manager of status and potential 241-AW pressurization alarm

• NOTIFY 242-A Shift Manager

SIS Alarms activated?

YES

NO

SELECT "STM OFF" for FV-EA1-1

FV-EA1-1 Indicated STM OFF?

YES

NO

G-13

HV-EA1-4 CLOSED?

YES

NO

G-14

HV-CA1-1 OPEN?

YES

NO

G-16

Feed Valve (HV-CA1-1) OPEN?

YES

NO

G-301

Feed Valve (HV-CA1-1) CLOSED?

YES

NO

CONTINUE

DIRECT operator to CLOSE 10# Steam H-30

DIRECT operator to CLOSE 90# Steam H-40

RESPOND per ARP-T-601-400 then return to this procedure.
Response to 242-A Evaporator Loss of Compressed Air System

Attachment 1 - Loss of Compressed Air System Duty Card (Cont.)

TIME LINE

CONTINUED FROM FRONT

PRIOR to operating any electrical breakers DON appropriate PPE.

SHUTDOWN P-102 AW Feed Pump via MCS

IF P-102 AW Feed Pump fails to shutdown, DIRECT an operator to OPEN 241-AW-P-102-1 (CS) breaker on MCC-1.

SHUTDOWN P-C-100 Condensate Pump

IF P-C-100 Condensate Pump fails to shutdown, DIRECT an operator to OPEN Condensate Pump P-C-100 (D1) breaker on MCC-1.

NOTE

Valves 5-16, 5-17, 5-18, and 5-19 need to be opened prior to starting either seal water pumps.

HV-CA1-10 is In FRW AND P-C-105 OR P-C-105A is running

SET HV-CA1-10 to CF-FRW AND START P-C-105 OR P-C-105A

SHUTDOWN P-B-1 Recirculation Pump via MCS

IF P-B-1 fails to shutdown, DIRECT an operator to OPEN Recirc Pump P-B-1 (A1) breaker on MCC-3.

PLACE P-B-1 BYPASS to ON

G-12

G-12

G-12

G-12

HV-CA1-7 and HV-CA1-9 OPEN

NO

YES

DIRECT an operator to CLOSE 5-60.

CLOSING 5-60 isolates water to 5-59 (Dump Line Flush) and 5-47 (HV-CA1-2 flush).

NOTE

G-15

P-B-2 OFF

SHUTDOWN P-B-2

SHUTDOWN

G-15

HV-CA1-2 BLOCKED

BLOCK HV-CA1-2

CLOSE

5-47

CLOSE manual valve 3-11

G-17

CLOSE FIC-EC1-1 URW Control Valves

G-16

CLOSE FIC-EC3-1

PROCEED to TF-AOP-EVAP-006 for additional actions.

Boxes outlined in heavy weight lines indicate air required to perform function