Changes “Other Than Inconsequential” Require These Additional Reviews:

Radiological Controls:
Lee Livesey’s Organization

USQ # EV-18-0425-S Rev. 1

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<td>G-7</td>
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<td>DOE-0359 Change Implementation</td>
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<td>G-6</td>
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<td>G-4</td>
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<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>G-3</td>
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<td>Added Step 3.1.3 to address recording step completion. Changed RECORD section to “generates no records”.</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 controlled by WRPS and the equipment in these areas.

This procedure provides guidance on actions to safely shutdown 242-A utility support systems by use of electrical breakers (electrical power supply, compressed air system, ventilation systems), isolation block valves (raw water system, sanitary water system, steam, and fire protection [sprinkler] system) followed by recovery actions to ensure safe configuration and preparation to return to the utility support system to normal operation.

This procedure provides instructions for emergency shutdown of 242-A Evaporator utility support systems under abnormal conditions:

- Electrical Power System
- Raw Water System
- Sanitary Water System
- Ventilation Systems (K1, K2, Control Room, and Shift Manager Office heat pump)
- Compressed Air System
- Steam System
- Fire Protection System.

This is a guide to assist the operator and Shift Manager in placing the facility in a safe configuration. Steps may be skipped, performed simultaneously, or out of order, depending on situational needs.

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 - Entry into this procedure may be based on subjective analysis of data obtained from the field and compared to past readings or trends. The determination that an abnormal condition is present requires a response to meet the subjective analytical results present at that time.

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. The Shift Manager has the responsibility to follow and complete all procedural steps. Not all procedural step are included in the duty card.

3.1 Immediate Actions

NOTE - The isolation of a utility may require the use of one or more loss-of-system duty cards to ensure the plant is in a safe configuration.

- Normally, Electricians de-energize electrical power by opening breakers equal to or greater than 480V AC. Under emergency conditions, Nuclear Chemical Operator (NCO) or Stationary Operating Engineer (SOE) have the authority to de-energize electrical power less than or equal to 480V AC.

- Under non-emergency conditions, 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 Immediate Actions (Cont.)

**De-Energize Electrical Power**

3.1.1 **DE-ENERGIZE** a 480V breaker as follows:

3.1.1.1 **POSITION** knife switch handle (using one hand) to the OFF/OPEN/TRIP position.

3.1.1.2 **IF** knife switch does not operate properly, or does not de-energize power, **CONTACT** Shift Manager/BED AND **REQUEST** assistance of Electricians.

3.1.1.3 **IF** Electricians cannot de-energize power, **CONTACT** Utility Dispatcher AND **REQUEST** power be removed at the source.

**Utility Disconnect Inoperable (Or cannot be reached) For Raw Water, Sanitary Water, or Steam:**

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**WARNING**

Failure to wear leather gloves, safety glasses, and long sleeve natural fiber shirts when operating steam systems could result in personnel injury.

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3.1.2 **PERFORM** isolation valving.

3.1.2.1 **DON** the following PPE:

- Leather gloves
- Safety Glasses
- Non-melting (untreated natural fiber) long-sleeve shirt.

3.1.2.2 **IF** an Evaporator utility isolation valve is inoperable or personnel cannot reach the isolation valve for raw water, sanitary water, or steam, **CONTACT** Shift Manager/BED AND **REQUEST** assistance of Stationary Operating Engineer (SOE) to close other upstream block valves to isolate the system from the Evaporator.
Response to Need For Emergency Shutdown of Utility Support Systems

3.1 Immediate Actions (Cont.)

3.1.3 WHEN performing Step 3.1.4, WRITE time of step completion on the laminated Duty Card AND

RECORD time of step completion in the A-1 or Shift Manager logbook.

WARNING
Tripping Main Feed breaker F8X193 will remove all power to 242-A facility but will not remove power to the Substation. Any attempt to perform maintenance at the substation without further electrical isolation could result in electrical shock/death

WARNING
Failure to wear leather gloves, safety glasses, and long sleeve natural fiber shirts when operating steam systems could result in personnel injury.

WARNING
Failure to wear hearing protection before performing a steam blowdown may result in personnel injury.

WARNING
Failure to shutdown K1 supply fan before shutting down K1 exhaust fan can result in pressurizing radiological areas and personnel contamination.

3.1.4 PERFORM the appropriate duty cards per Shift Manager or Control Room Operator direction:

- Attachment 1 - Emergency Shutdown of Electrical Power Duty Card
- Attachment 2 – Emergency Shutdown of Compressed Air System Duty Card
- Attachment 3 – Emergency Shutdown of Raw Water System Duty Card
- Attachment 4 – Emergency Shutdown of Sanitary Water System Duty Card
- Attachment 5 - Emergency Shutdown of K1 Ventilation System Duty Card
- Attachment 6 - Emergency Shutdown of K2 Ventilation System Duty Card
- Attachment 7 - Emergency Shutdown of Control Room Ventilation System and Shift Manager’s Office Heat Pump Duty Card
- Attachment 8 – Emergency Shutdown of 10# Steam System Duty Card
- Attachment 9 – Emergency Shutdown of 90# Steam System Duty Card
3.1 Immediate Actions (Cont.)

3.1.5 NOTIFY Shift Manager of emergency shutdown of utility systems.

3.2 Follow-on Actions

Verification of Isolation or Shutdown:

3.2.1 PERFORM a verification of isolation or shutdown by doing some or all of the following:

3.2.1.1 USE pressure/flow indicators showing zero or decreasing pressure or flow for water, steam, or compressed air systems.

3.2.1.2 USE visual observation that equipment is no longer operating.

3.2.1.3 IF indicator is available, USE remote amp indicators, power indicators, status indicators, flow/pressure indicators, etc. which indicate system is de-energized or otherwise no longer operating/pressurized.

3.3 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.

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

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

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

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

4.1 Exit Actions/Criteria

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

4.1.1 PRIOR to returning system to normal operation, PERFORM the following:

4.1.1.1 NOTIFY Shift Manager system is being returned to normal operations.

a. REMOVE tape from radiological area doors/entrances.

4.1.1.2 CONFIRM all repairs have been completed.

4.1.1.3 CONFIRM all Maintenance/Engineering tests have been completed.

4.1.1.4 CONFIRM all hazardous conditions have been cleaned up or removed.

4.1.1.5 RETURN isolated system to normal operations per the applicable operating procedure or other documented instructions.

5.0 RECORDS

The performance of this procedure generates no records.
DIRECTED by Shift Manager or 242-A Control Room Operator to ISOLATE Electrical System.

IF it is unsafe or impossible to isolate 242-A Facility electrical power at the substation, CONTACT Utility Dispatcher at 373-2321. AND, REQUEST their assistance with disconnection.

PLACE Substation Main Feed Breaker (F8X193) control switch in TRIP position to isolate normal BPA electrical power to 242-A Facility.

WARNING Tripping Main Feed breaker F8X193 will remove all power to 242-A facility but will not remove power to the Substation. Any attempt to perform maintenance at the substation without further electrical isolation could result in electrical shock/death.

PRIOR to operating any electrical breakers DON PPE per 3.1.

NOTIFY Shift Manager and 242-A Control Room Operator electrical power is isolated.

NOTIFY Tank Farm Shift Manager to stop transfers/water additions.
Attachment 1 - Emergency Shutdown of Electrical Power Duty Card (Cont.)

242-A Evaporator

Diesel Generator

Main Feed Breaker (F8X193)

Substation

Control Panel (behind door)

Entrance

N
Attachment 2 – Emergency Shutdown of Compressed Air System Duty Card

DIRECTED by Shift Manager/242-A Control Room Operator to ISOLATE Process Air System

CAUTION
Shutting down compressor may result in loss of compressed air to AW Tank Farm if systems are cross-connected.

Is electrical compressor in operation?
Yes
Is portable compressor in operation?
No

No

Yes

Is 242A supplying air to 241-AW Farm?
Yes
NOTIFY Tank Farm Operations of loss of compressed air.

No

Yes

NOTE
Loss of compressed air to 241-AW Farm will result in a tank pressurization alarm.

SECURE portable compressor.

Is 242A supplying air to 241-AW Farm?
Yes
NOTIFY Tank Farm Operations of loss of air.

No

SECURE portable compressor.

PUSH red button (OFF KEY) for Process Air Compressors CP-E-1 and CP-E-2.

NOTE
Air Compressors CP-E-1 and CP-E-2 red button (OFF KEY) is located on Sigma Control Display.
Response to Need For Emergency Shutdown of Utility Support Systems

Attachment 2 – Emergency Shutdown of Compressed Air System Duty Card (Cont.)

Time Line

IF Operating Process Air Compressor fails to shutdown
OR Backup Process Air Compressor starts
OPEN Process Air Compressor electrical breakers located on each compressor,

Breakers:
For CP-E-1 – CPE1-DS-1
For CP-E-2 – CPE2-DS-1

NOTIFY Shift Manager and Control Room Operator when Process Air System has been isolated.

PRIOR to operating any electrical breakers DON PPE Per 3.1.
Response to Need For Emergency Shutdown of Utility Support Systems

Attachment 3 – Emergency Shutdown of Raw Water System Duty Card

DIRECTED By Shift manager or Control Room operator to ISOLATE Process (Raw) Water System

CLOSE Raw Water isolation valves RW-40 and RW-20 located in Service Water Building

CONFIRM Raw Water System pressure decreases as indicated on PI - RW-4

DID Raw Water pressure decrease?

No


CONFIRM Raw Water System pressure decreases as indicated on PI - RW-4

IF pressure is still not decreasing NOTIFY Control Room operator

THEN CLOSE main isolation 117 - R located outside Service Water Building in underground valve pit (T- handle wrench is required to operate 117-R)

NOTIFY Shift Manager and Control Room operator Raw Water System is isolated .

CONTINUED ON NEXT PAGE
Attachment 3 – Emergency Shutdown of Raw Water System Duty Card (Cont.)

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**Diagram Description:**

- **Service Water Building:**
  - PI-RW-4
  - RW-40
  - RW-39
  - RW-31
  - RW-20
  - RW-21
  - RW-27
  - ENTRANCE
  - 117-R
  - Underground Valve Pit

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Response to Need For Emergency Shutdown of Utility Support Systems
DIRECTED by Shift Manager or 242-A Control Room Operator to ISOLATE Sanitary Water System.

PRIOR to operating any electrical breakers DON PPE Per 3.1.

CLOSE sanitary water isolation valve SW-1 located behind door in janitor’s closet. (Janitors closet is located by the East Main Entrance Door and the Lunch Room.)

CONFIRM sanitary water is isolated by opening sink water valves in janitor’s closet. (Water flow should decrease and stop.)

OPEN hot water heater circuit breakers 22/24 and 40/42 (Located on Panel “B” in the AMU.)

NOTIFY Shift Manager and 242-A Control Room Operator sanitary water system is isolated.

CONTINUED ON NEXT PAGE
Response to Need For Emergency Shutdown of Utility Support Systems

Attachment 4—Emergency Shutdown of Sanitary Water System Duty Card (Cont.)
 DIRECTED by Shift Manager or Control Room Operator to SHUTDOWN K1 ventilation system.

PRIOR to operating any electrical breakers DON electrical level zero (0) PPE Per 3.1

OPEN breaker labeled “Supply Fan K1-5-1 VFD” on cubicle E-4 in MCC-1.

OPEN breaker labeled “EXHAUST FAN K1-5-2 VFD” on cubicle A-2 in MCC-2.

OPEN breaker labeled “EXHAUST Fan K1-5-3 VFD” on cubicle E-1 in MCC-1.

REQUEST Control Room Operator CHECK K1 flow indication is zero (0) or decreasing. (G22, F43/0)

NOTIFY 242: A Shift Manager K1 ventilation system is shutdown.

IF directed by Shift Manager TAPE airlock doors and vent in condenser room.

NOTIFY Tank Farms Shift Manager K1 ventilation system is shutdown and all physically connected transfers, water additions, and/or flushes should be secured.

Warning
Failure to shutdown K1 supply fan before shutting down K1 exhaust fan can result in pressurizing radiological areas and personnel contamination.

PRIOR to operating any electrical breakers DON electrical level zero (0) PPE Per 3.1
DIRECTED by Shift Manager or 242-A Control Room Operator to SHUTDOWN K2 Ventilation System.

Warning
Failure to shutdown K2 exhausters before shutting down K2 Supply fan can result in personnel contamination if K1 ventilation is OFF.

PRIOR to operating any electrical breakers DON PPE Per 3.1

OPEN breaker labeled "K2-5-3 EXH FAN" on Panelboard H Breaker # 14.

OPEN breaker labeled "Exhaust Fan K2-5-2 VFD" on cubicle E-2 in MCC-1.

OPEN breaker labeled "Supply Fan K2-5-1 VFD" on cubicle E-3 in MCC-1.

CONFIRM K2 ventilation fans have shutdown by visual verification

NOTIFY Shift Manager and Control Room Operator K2 ventilation system is shutdown.

CONTINUED ON NEXT PAGE
Attachment 6 - Emergency Shutdown of K2 Ventilation System Duty Card (CONT.)
Response to Need For Emergency Shutdown of Utility Support Systems

Attachment 7 - Emergency Shutdown of Control Room Ventilation System and Shift Manager’s Office Heat Pump Duty Card

DIRECTED by Shift Manager or 242-A Control Room Operator to SHUTDOWN the Control Room Ventilation and Shift Manager Office Heat Pump.

PRIOR to operating any electrical breakers DON PPE Per 3.1

PLACE ACU-1 disconnect switch (located on A/C unit in electrical MUX Room) in OFF position.

PLACE ACU-2 disconnect switch (located on A/C unit in electrical MUX Room) in OFF position.

CONFIRM Control Room Ventilation Systems have shutdown via air flow through control room air vents.

IF ACU-2 failed to shutdown OPEN MCC-1 breaker labeled HVAC UNIT ACU-2. (Cubicle G5B) (MCC-1 is located in AMU Room.)

IF ACU-1 failed to shutdown OPEN MCC-2 breaker labeled HVAC UNIT ACU-1. (Cubicle A6) (MCC-2 is located in AMU Room.)

SHUTDOWN Office Heat Pump by opening Panelboard “A” breaker number 17. (Panel “A” is located in AMU Room.)

NOTIFY Shift Manager/Control Room Operator Control Room Ventilation System and Shift Manager Office Heat Pump are shutdown.

CONTINUED ON NEXT PAGE
Attachment 7 - Emergency Shutdown of Control Room Ventilation System and Shift Manager’s Office Heat Pump Duty Card (Cont.)
DIRECTED by Shift Manager or 242-A Control Room Operator to ISOLATE 10# steam system.

SLOWLY CLOSE valve H-16 in the HVAC Room

SLOWLY CLOSE valve H-25 in the HVAC Room

OPEN steam blowdown valve H-22.

VERIFY steam is isolated by decreasing pressure on local pressure indicator PI-EA1-6.

CLOSE steam valve MS-V-44 (Outside Steam Station).

WARNING Failure to wear leather gloves, safety glasses, and long sleeve natural fiber shirts when operating steam systems could result in personnel injury.

REQUEST Control Room Operator NOTIFY JCI to shutdown 10# steam to 242-A.

REQUEST Control Room Operator NOTIFY JCI to shutdown 10# steam to 242-A.

NOTIFY Shift Manager of 10# steam system status.

NOTIFY Shift Manager of 10# steam system status.

GO TO loss of steam duty card TF-AOP-EVAP-005.

Is 242-A in operation and processing material?

WARNING Failure to wear hearing protection before performing a blowdown may result in personnel injury.

Should boilers be shutdown?

NOTIFY Shift Manager of plant status.

REQUEST Control Room Operator NOTIFY JCI to shutdown 10# steam to 242-A.

REQUEST Control Room Operator NOTIFY JCI to shutdown 10# steam to 242-A.

NOTIFY Shift Manager of 10# steam system status.

NOTIFY Shift Manager of 10# steam system status.
NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.

NOTIFY the following personnel 10# steam system has been isolated:
· Shift Manager
· 242-A Control Room Operator
· JCI

Is 242-A in operation and processing material?

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

NOTIFY Shift Manager and JCI boilers need to be shut down.
DIRECTED by Shift Manager or 242-A Control Room Operator to ISOLATE 90# steam system.

CLOSE isolation valve S-409-70. (Chain Operated; possible pinch points)

CRACK OPEN blowdown valve S-409-73.

VERIFY steam supply is isolated by viewing steam from blowdown valve S-409-73.

Is Steam Pressure Decreasing?

REQUEST Control Room Operator NOTIFY JCI to shutdown 90# steam to 242-A.

NOTIFY Shift Manager of 90# steam system status.

Is 242-A in operation and processing material?

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.
NOTIFY the following personnel 90# steam system has been isolated:
- Shift Manager
- 242-A Control Room Operator
- JCI

Is 242-A in operation and processing material?

No

Should boilers be shutdown?

No

NOTIFY Shift Manager of plant status.

Yes

GO TO loss of steam duty card TF-AOP-EVAP-005.

Yes

NOTIFY Shift Manager and JCI boilers need to be shut down.
241-AW-102 is in imminent danger of overfilling beyond its maximum OSD limit of 409 inches due to activation of Fire Suppression system and action needs to be taken before the Hanford Fire Department can arrive.

**PROCEED** to red post-indicating valve 242-A 119-R located southeast of 242-A.

**CLOSE** 242-A 119-R using operating wrench.

**NOTIFY** the following the Fire Suppression System has been isolated:
- Hanford Fire department
- Shift Manager
- 242-A control room operator

**ESTABLISH** a Fire Surveillance per TFC-ESHQ-FP-STD-04.

**NOTE** - Isolation of the Fire Suppression System requires a fire watch be set.

CONTINUED ON NEXT PAGE
OPERATIONS OF A POST INDICATING VALVE

OPERATIONS
1. BREAK Seal.
2. REMOVE operating wrench and place on operating nut.
3. ROTATE operating nut until position indicating window displays SHUT.

OPEN

SHUT

Seal

Seal Broken

Position Indicating Window

Operating nut

Operating Wrench