TP-2009-301 Scenario #1 Event Description

Facility: Turkey Point

Scenario No.: 1 NEW

Op Test No.: 2009-301

Examiners:

Candidates:

US

RO

BOP

Initial Conditions: Mode 1, 50% MOL. 3C charging pump out of service due to packing leakage.

Turnover: Equipment OOS: 3C charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. Thunder storms are in the area.

Maintain 50%

Online risk – green

B train protected both units

Event No.		Event Type*	Event Description
1	TCE6DS1C=0	(C)RO (C)BOP (TS,C)SRO	Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.
2	TFB1LTLV = T	(I)RO (I)SRO	LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM
3	TFKCSMB = T	(C)BOP (TS,C)SRO	The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019 and 3-OP-019 to start the standby pump. TS 3.7.3.b
4		(R)RO (N)BOP (TS,R)SRO	RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.
5	TFP8SWYD = T TFQ5GAFS = T TFQ5B20A = T TFG1B86S = T TCE2E01T= -1 TCE2E07T=T	(M)ALL	A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. The crew responds per 3-EOP-E-0 and 3-EOP-ECA-0.0 3A EDG fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie. Transition is made to 3-EOP-ECA-0.2 following power restoration.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

TP-2009-301 Scenario #1 Event Description

Facility: Turkey Point Scenario No.: 1 Op Test No.: 2009-301

Examiners:

US
RO
BOP

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* ~~2~~	~~TFB1LTLV = T~~	(I)RO ~~(I)SRO~~	LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs ~~them to 3-ONOP-046.4, MALFUNCTION OF BORON~~ CONCENTRATION CONTROL SYSTEM
* ~~3~~	~~TFKCSMB = T~~	(C)BOP ~~(TS,C)SRO~~	The 3B Intake Cooling Water (ICW) pump experiences a ~~sheared shaft. The crew responds per 3-ONOP-019 and 3-OP-~~ 019 to start the standby pump. TS 3.7.3.b
* ~~4~~		(R)RO ~~(N)BOP~~ (TS,R)SRO	RV-1400 and RV-1401, main steam code safety valves ~~reported inoperable, requiring the crew to reduce power to~~ below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.
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(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

* Unit Tripped on Event #1, Events 2, 3, & 4 were not run.

TP-2009-301 Scenario #1 Event Description

Facility: Turkey Point **Scenario No.:** 1 **Op Test No.:** 2009-301

Examiners:

US
RO
BOP

Initial Conditions: Mode 1, 50% MOL. 3C charging pump out of service due to packing leakage.

Turnover: Equipment OOS: 3C charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. Thunder storms are in the area.

Maintain 50%

Online risk – green

B train protected both units

Event No.		Event Type*	Event Description
1	TCE6DS1C=0	(C)RO (C)BOP (TS,C)SRO	Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.
* ~~2~~	~~TFB1LTLV = T~~	(I)RO ~~(I)SRO~~	LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs ~~them to 3-ONOP-046.4, MALFUNCTION OF BORON~~ CONCENTRATION CONTROL SYSTEM
* ~~3~~	~~TFKCSMB = T~~	(C)BOP ~~(TS,C)SRO~~	The 3B Intake Cooling Water (ICW) pump experiences a ~~sheared shaft. The crew responds per 3-ONOP-019 and 3-OP-~~ 019 to start the standby pump. TS 3.7.3.b
* ~~4~~		(R)RO ~~(N)BOP~~ (TS,R)SRO	RV-1400 and RV-1401, main steam code safety valves ~~reported inoperable, requiring the crew to reduce power to~~ below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.
5	TFP8SWYD = T TFQ5GAFS = T TFQ5B20A = T TFG1B86S = T TCE2E01T= -1 TCE2E07T=T	(M)ALL	A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. The crew responds per 3-EOP-E-0 and 3-EOP-ECA-0.0 3A EDG fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie. Transition is made to 3-EOP-ECA-0.2 following power restoration.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

* Unit Tripped on Event #1, Events 2, 3, & 4 were not run.

Turkey Point 2009-301 Scenario #1

Event 1 - Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Event 2 - LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Event 3 – The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019 and 3-OP-019 to start the standby pump. TS 3.7.3.b

Event 4 - RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Event 5 – A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. The crew responds per 3-EOP-E-0 and 3-EOP-ECA-0.0 3A EDG fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie. Transition is made to 3-EOP-ECA-0.2 following power restoration.

Scenario XXIV NRC 1

Simulator Operating Instructions

Setup

IC-2 (50% MOL)

Open & execute lesson file SRO_XXIV_NRC_1.lsn

Place simulator in run

Start 3B charging pump and secure 3C charging pump

Trigger lesson step: SETUP – 3C Charging pump OOS (actuates TAB1POSM = RACKOUT)

Place simulator in freeze.

Place clearance info tag on 3C Charging Pump start switch

Provide shift turnover checklists

Select 3A QSPDS to page 211 (SAT) and 3B QSPDS to page 212 (RVL). Set ERDADS on VPA and at the RCO desk to the Utilities screen

Fill in blender & shutdown boron addition placards at console blender station. Data for each IC may be found in the ECC & Shutdown Guidelines Book in the simulator I/F.

Event 1 – Loss of 3P06

Initiated immediately after shift turnover.

Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

When directed - Trigger lesson step **EVENT 1 – LOSS OF 3P06** (actuates TCE6DS1C=0)

After one minute call the control room and report the inadvertent opening of 3P06 main breaker due to operator tripping and hitting the breaker.

Respond as FS/TO, acknowledge direction to perform attachment 1 and 4 of 3-ONOP-003.6

Attachment 1 actions:

1. 2 minutes after direction to perform attachment 1, **Trigger** lesson step **EVENT 1 – STRIP 3P06.**
2. After step 7of 3-ONOP-003.6 has been read, Inform the control room circuits on 3P06 are about to be energized.
3. **Trigger** lesson step **EVENT 1 – RECLOSE 3P06 MAIN** and **EVENT 1 – RECLOSE 3P06 BREAKERS 4 – 8.**
4. **Trigger** lesson step, **EVENT 1 – RECLOSE 3P06 BREAKERS 1 THRU 14.** When 1 thru 14 are closed, then **Trigger** lesson step, **EVENT 1 – RECLOSE 3P06 BREAKERS 15 THRU 24.**
5. When breakers 15 thru 24 are closed, **Trigger** lesson step, **EVENT 1 – RECLOSE 3P21 BREAKERS.** When complete inform control room all breakers are closed.

Attachment 4 actions:

1. Call the control room and have them verify Pressurizer PORVs are closed and the Pressurizer level control selector switch is in position 3.
2. After verification, **Trigger** lesson step, **EVENT 1 – HOLD IN RELAY LC-460CX**. Report to control room relay LC-460CX is being held in.
3. When power is restored to 3P06 and direction given to release relays, inform control room relay has been released.

Event 2 – LT-3-115 FAIL LOW

LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

After CVCS M/U restored to automatic- Trigger lesson step **EVENT 2 – LT-3-115 FAIL LOW** (actuates TFB1LTLV = T)

The Crew responds per 3-ARP097.CR

Step 1.b.2. – Respond as SNPO; acknowledge direction to check Local reading from LI-3-112 in the Charging Pump room. After 2-3 minutes report 3-LT-112 local reading from CVCS VOLUME CONTROL TANK screen.

3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Step 41 – Respond as responsible supervisor; acknowledge failure of LT-3-115 low

Step 42 – Respond as SM and acknowledge entry into 3-ONOP-046.4 for LT-3-115 failure

Event 3 – 3B ICW PUMP SHAFT SHEAR

The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019 and 3-OP-019 to start the standby pump.

Trigger lesson step **EVENT 3 – 3B ICW PUMP SHAFT SHEAR** (actuates TFKCSMB = T)

The Crew responds per 3-ONOP-019 Intake Cooling Water Malfunction and ARP I 4/4

ARP I 4/4

ARP - Respond as NSO to determine total ICW flow
Respond as ANPO to check requested pump for starting per OP-019 below

5.2 ICW Pump Start (System in Operation)

5.2.1 Initial Conditions

1. All applicable prerequisites as listed in Section 3.0 are satisfied.
2. At least one other ICW Pump running.
3. **IF** the ICW Pump required for operation has a stationary screen installed in that intake bay, **THEN** verify Precautions/Limitations 4.12 and 4.13 are met.

5.2.2 Procedure Steps

1. Inform the ANPO of which pump to be checked out for starting.

NOTE

The square Allis-Chalmers motor has only one oil level sightglass; the others have an upper and a lower sightglass.

2. Verify the oil level is visible in the sightglass(es) of the motor of the pump to be started.
3. Check the discharge valve for the pump to be started is open (mark the unaffected valves N/A):
   a. 3A ICW PP Disch Isol, 3-50-312
   b. 3B ICW PP Disch Isol, 3-50-322
   c. 3C ICW PP Disch Isol, 3-50-332
4. Start the ICW Pump that has been checked out at VPA in the Control Room.
5. Check that the pump motor amps decrease to less than 49 amps.
6. Check that the discharge pressure of the pump started is between 11 psig and 35 psig.

NOTE

Packing leakoff less than specified should have a PWO initiated, but does not affect pump Operability.

- *ICW Pumps 3A and 3B have packing leakoff lines. Observable packing leakoff should be at least 20 dpm.*
- *ICW Pump 3C does not have a packing leakoff line. Observable packing leakoff should be at least 120 dpm.*

7. Check ICW Pump seal packing leakoff following pump start.
8. Verify all log entries specified in Subsection 2.2 have been recorded.
9. Complete the QA Record Page for this subsection.

3-ONOP-019

Step 8b. Respond as NSO, Acknowledge direction to check TPCW supply header temperature, TI-3-1432 less than 110Fand trend. Report back temp. 89F and stable.

If directed to rack out 3B ICW pump breaker. Wait 10 minutes then **Trigger** lesson step **EVENT 3 – RACKOUT 3B ICW PP BKR**. And report when completed.

Event 4 – RV-1400 and RV-1401 out of service

RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

When directed call 4906, inform the control room that you are the Operations Manager. Engineering has informed you that a review of the "as left" lift settings for the main steam code safety valves RV-1400 and RV-1401 are outside the 1% tolerance of the lift settings.

If asked, the documented "as left" setting for RV-1400 is 1115 psig and RV-1401 is 1130 psig.

3-ONOP-100

Following US determination that power should be lowered to <33% and the ramp rate, if not at least 15MW/min then call as the Operations Manager and request the unit ramped down to 30% within an hour.

Step 3 - Respond as system dispatcher; acknowledge TP unit 3 load reduction to 30%.

Step 7 – If call, respond as SM and acknowledge request to refer to 0-EPIP-20101 and 0-ADM-115

Event 5 – Loss of all AC

A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie to power unit 3.

Following 5-10% power reduction **Trigger** lesson step, **EVENT 5 – LOSS OF ALL AC**(actuates TFP8SWYD = T, TFQ5GAFS = T, TFQ5B20A = T, TFG1B86S = T, TCE2E01T=-1, TCE2E07T=T)

3-EOP-ECA-0.0

Step 7.a – Respond as NSO, Acknowledge direction to locally reset 3A EDG lockout relay. After 2 minutes **TRIGGER** lesson step **EVENT 5 – 3A EDG LOCKOUT RESET**. Report back lockout will not reset.

Step 9.d – Respond as NSO, Acknowledge direction to locally synchronize 3B emergency diesel generator to 3B 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE.

a. after 10 minutes, notify CR per step 14 and 15 of 3-ONOP-023.2 that the 3B EDG is running sat and you would like permission to locally energize 3B 4KV bus.

Step 10a - following permission, **TRIGGER** lesson step **EVENT 5 – 3A EDG LOCAL OPERATION.** After 3 minutes inform CR 3A EDG output breaker will not close.

Step 11 - Respond as NSO, Acknowledge direction to locally open breaker 30806 on MCC 3D. After 2 minutes **TRIGGER** lesson step **EVENT 5 – OPEN 30806 BREAKER.**

Step 12.e – Respond as NSO; acknowledge direction to locally open MOV-3-843A or MOV-3-843B. After 10 minutes if not directed to stop, **TRIGGER** lesson step **EVENT 5 – MOV-3-843A OPEN**. Report when completed.

Step 13 - Respond as NSO; acknowledge direction to locally close:

- 3-297A, RCP A Seal Injection Manual Isolation Valve
- 3-297B, RCP B Seal Injection Manual Isolation Valve
- 3-297C, RCP C Seal Injection Manual Isolation Valve
- MOV-3-381, RCP Seal Water Return And Excess Letdown Isolation Valve
- MOV-3-626, RCP Seal Cooling Water Outlet Valve

No triggers are needed prior to end of scenario

Step 24 - Respond as NSO; acknowledge direction to reduce DC bus loading as necessary using ATTACHMENT 3.

3-ONOP-04.2

Step 12 – Respond as unit 4 RO, confirm 4D 4KV bus powered from 4B 4KV bus. 4B 4KV bus is being powered from unit 4 .

Step 13 – Respond as unit 4 RO, acknowledge request to place all non running safeguards equipment on 4B 4KV bus in off or pull to lock. Report back in 1 minute that all non running safeguards equipment is in stop or pull to lock.

Step 14.b – Respond as unit 4 RO, acknowledge direction to close 4AD07 breaker. After 15 sec **TRIGGER** lesson step **EVENT 5 – CLOSE 4AD07**. Report 4AD07 breaker closed.

Step 17 – Respond as NSO, acknowledge direction to locally verify no breaker targets exist on 3A 4KV bus breakers. After 4 minutes report no targets exist on 3A 4KV bus breakers.

3-EOP-ECA-0.2

Step 7 RNO a.2 - Respond as NSO, acknowledge direction to perform attachment 1of 3-EOP-ECA-0.2 to align unit 4 RWST to unit 3 SI pumps.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 1 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
Trigger lesson step, Event 1 – LOSS OF 3P06		
	RO / BOP	Determines and reports loss of 3P06 based upon: • Loss of power to channel 1 instrumentation and indications • S/G A FW control shift to manual • S/G C FW control in lockup • M/A stations for Pressurizer pressure and spray in lockup • Loss of pressurizer heaters • Letdown isolation • Numerous alarms associated with the loss of power
	US	Directs response per 3-ONOP-003.6, loss of 120V supply 3P06
		CAUTION ***If the pressurizer spray valves were open prior to the loss of 3P06, a Reactor Trip may occur due to OTΔT or low pressurizer pressure.*** *NOTES* • *Step 1 is an immediate action step.* • *All 3P06 (RED) channel indication/controls are affected by failure of 3P06. Enclosure 1 provides a listing of lost functions, indications, and controls.*
	RO	1 **Check If A Reactor Trip Has Occurred** Perform the following: a. **IF** a reactor trip is required, **THEN** manually trip the reactor **AND** perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. b. **IF** reactor trip is **NOT** required, **THEN** go to Step 2.
		Evaluator Note: Crew should be able to control plant during restoration of power without the need to trip the unit. Foldout page directs restoration of power.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 2 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	US	***FOLDOUT PAGE FOR PROCEDURE 3-ONOP-003.6*** 1. Dispatch an operator to restore power to 3P06 using Attachment 1. 2. Dispatch an operator to restore pressurizer pressure **AND** level controls using Attachment 4. 3. **IF** a Reactor Trip has occurred, **THEN** perform the following: a. Close MOV-3-1407 b. Close MOV-3-1408 b. Close MOV-3-1409
	BOP	Directs FS / TO to perform attachments 1 and 4.
		ATTACHMENT 1 (Page 1 of 2) **RESTORATION OF 3P06 VITAL INSTRUMENT AC BUS** 1. In the Inverter Room, perform the following: a. Proceed to the 3C inverter. b. Open the 3C inverter System Output breaker, CB6. 2. In the Cable Spreading Room, perform the following: a. At Vital Instrument Panel 3P06, place **ALL** breakers to OFF, including main panel breaker. b. At Subpanel 3P21, place all breakers to OFF. 3. Check 4P06 being powered by CS Inverter at 4P06A Vital Instrument AC Selector Switch in the Cable Spreading Room. 4. **IF** 4P06 is powered by the CS Inverter, **THEN** notify the Nuclear Plant Supervisor. ***CAUTION*** ***DO NOT proceed with this procedure if 4P06 is powered by the CS Inverter.*** 5. **IF** 4P06 is **NOT** powered from CS Inverter, **THEN** place SPARE inverter CS in service to supply 3P06 Vital Instrument AC Bus load as follows: a. At Vital Instrument Panel 3P06A in the Cable Spreading Room, place Vital Instrument AC Selector Switch 3P06A to the ALTERNATE SUPPLY STANDBY STATIC INVERTER CS (AC LINE) position.

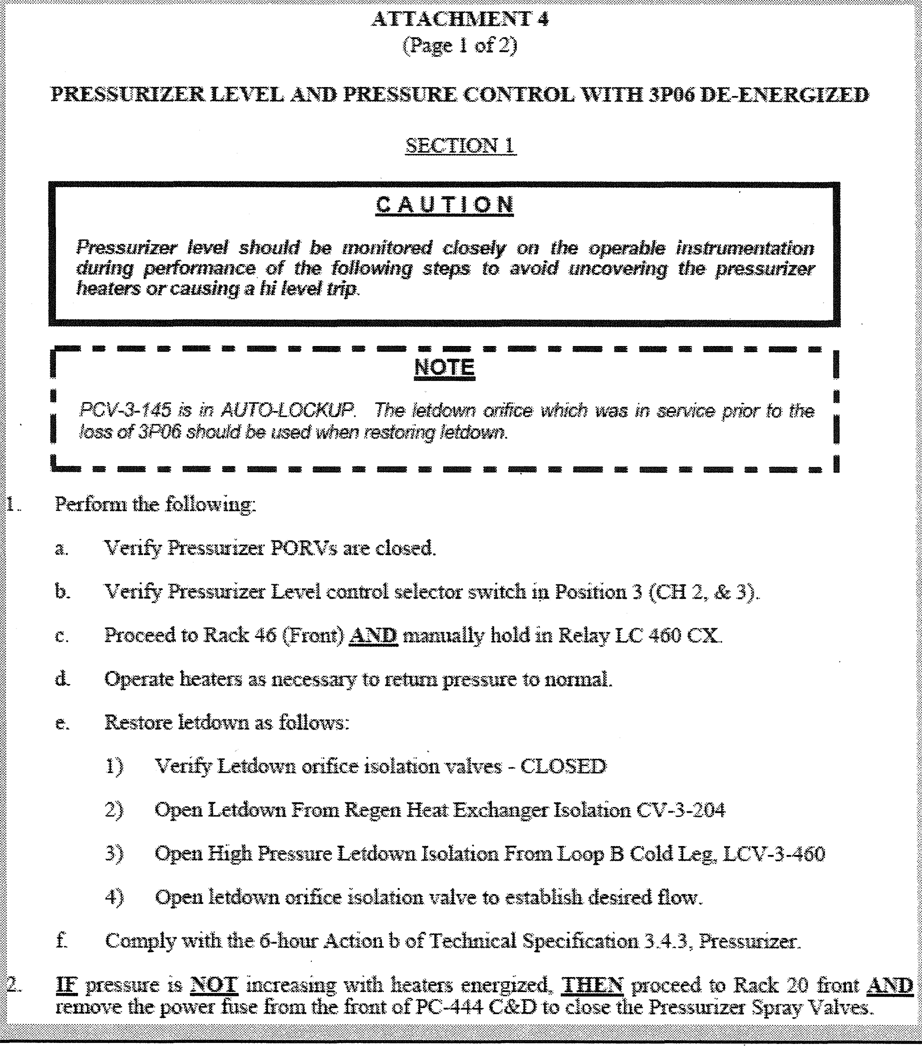
Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 3 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
		ATTACHMENT 1 (Page 2 of 2) **RESTORATION OF 3P06 VITAL INSTRUMENT AC BUS** **CAUTION** ***If System Output Breaker, CB6, has tripped, this would indicate an overcurrent condition and the amps should be monitored when each breaker on the Vital and Subpanel is closed. Amps should stabilize at less than 63. This will require a second operator at the CS inverter or at ERDADS to monitor amperage.*** 6. Notify the Control Room that circuits on 3P06 are about to be energized. 7. At Vital Instrument Panel 3P06, place the following breakers in the ON position: a. 3P06 - Main b. 3P06-4, (energizes LC460CX). c. 3P06-8, (energizes AUTO/MANUAL station for Steam Generator C). 8. At Panel 3P06, place the remaining breakers in the ON position using Attachment 2, **AND** allowing five (5) seconds between each breaker. 9. At Subpanel 3P21, place breakers in the ON position using Attachment 3 **AND** allowing five (5) seconds between each breaker. 10. In the Inverter Room, at the (locked) Alternate Source Transfer Switch 3Y05B, perform the following: a. Unlock Alternate Source Transfer Switch **AND** place in the BACKUP TO SPARE INVERTER CS position. 11. At Spare Inverter CS (3Y06), place the Synch Selector Switch inside the inverter panel in the NORMAL (down) position. 12. Notify the Control Room when all breakers are closed.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 4 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	RO	

ATTACHMENT 4
(Page 1 of 2)

PRESSURIZER LEVEL AND PRESSURE CONTROL WITH 3P06 DE-ENERGIZED

SECTION 1

CAUTION

Pressurizer level should be monitored closely on the operable instrumentation during performance of the following steps to avoid uncovering the pressurizer heaters or causing a hi level trip.

NOTE

PCV-3-145 is in AUTO-LOCKUP. The letdown orifice which was in service prior to the loss of 3P06 should be used when restoring letdown.

1. Perform the following:
   - a. Verify Pressurizer PORVs are closed.
   - b. Verify Pressurizer Level control selector switch in Position 3 (CH 2, & 3).
   - c. Proceed to Rack 46 (Front) **AND** manually hold in Relay LC 460 CX.
   - d. Operate heaters as necessary to return pressure to normal.
   - e. Restore letdown as follows:
     - 1) Verify Letdown orifice isolation valves - CLOSED
     - 2) Open Letdown From Regen Heat Exchanger Isolation CV-3-204
     - 3) Open High Pressure Letdown Isolation From Loop B Cold Leg, LCV-3-460
     - 4) Open letdown orifice isolation valve to establish desired flow.
   - f. Comply with the 6-hour Action b of Technical Specification 3.4.3, Pressurizer.
2. **IF** pressure is **NOT** increasing with heaters energized, **THEN** proceed to Rack 20 front **AND** remove the power fuse from the front of PC-444 C&D to close the Pressurizer Spray Valves.

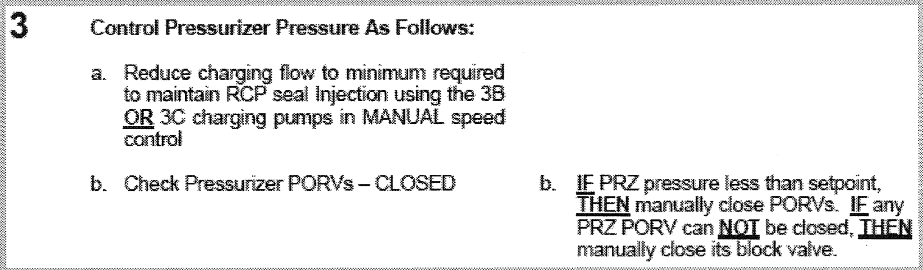
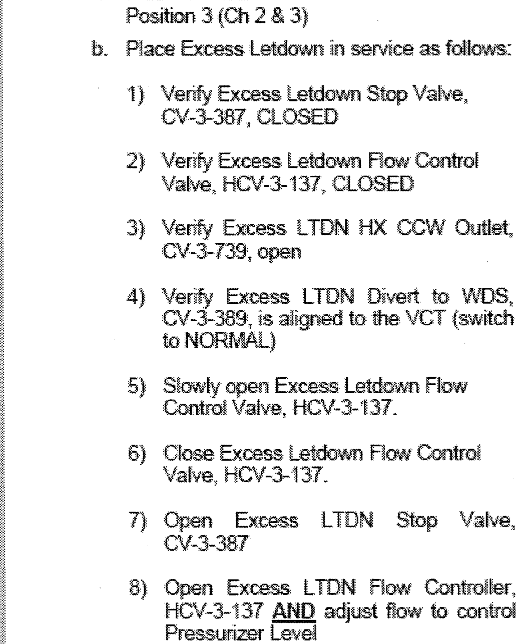
Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 5 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
		ATTACHMENT 4 (Page 2 of 2) **PRESSURIZER LEVEL AND PRESSURE CONTROL WITH 3P06 DE-ENERGIZED** 3. **IF** the above preferred method of energizing pressurizer heaters **AND** restoring letdown flow is **NOT** successful, **THEN** proceed as follows: a. Proceed to the Unit 3 West electrical penetration room **AND** perform the following: 1) Select LOCAL control of 3A Backup Group Pressurizer heaters. 2) Push START/STOP pushbuttons as necessary to control heater operation. b. **IF** necessary, **THEN** restore Letdown flow by holding valve handswitches in the OPEN position to initiate normal letdown. SECTION 2 1. **WHEN** power to the Vital AC bus is restored, **THEN** perform the following: a. **IF** relay LC460CX in Rack 46 is being held in, **THEN** release hold on relay. b. **IF** the power fuses for Pressurizer Spray valves were removed in Section 1, Step 2, **THEN** replace the power fuses for PC-444C and PC-444D in Rack 20. c. Restore pressure control using 3-OP-041.2, PRESSURIZER SYSTEM.
	RO	**2** **Check Unit Operating In Modes 1 Through 3 Prior To Loss Of 3P06** Perform the following: a. **IF** RCS solid, **THEN** perform the following to prevent RCP damage **AND** maintain RCS pressure: 1) Stop All RCPs 2) Stop and start charging pumps as necessary to maintain RCS pressure. b. **IF** RHR cooling is in service, **AND** MOV-3-750 is closed or stroking closed, **THEN** stop the operating RHR pump(s) **AND** go to 3-ONOP-050, LOSS OF RHR, while continuing with this procedure. c. **IF** OMS is in LOW PRESSURE OPS **AND** PORV-3-456 is required to be open for pressure control, **THEN** manual action shall be taken to control RCS pressure.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 6 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	RO	 **3** **Control Pressurizer Pressure As Follows:** a. Reduce charging flow to minimum required to maintain RCP seal Injection using the 3B OR 3C charging pumps in MANUAL speed control b. Check Pressurizer PORVs – CLOSED b. IF PRZ pressure less than setpoint, THEN manually close PORVs. IF any PRZ PORV can NOT be closed, THEN manually close its block valve.
		NOTES • *VCT Temperature indication, TI-3-116, should be monitored in lieu of Excess Letdown, TI-3-139, which is de-energized.* • *Excess letdown flow must be established slowly to minimize thermal stresses on the Excess LTDN Heat Exchanger (5 to 10 minutes).*
	RO	 **4** **Maintain Pressurizer Level As Follows:** a. Place Pressurizer Level control switch in Position 3 (Ch 2 & 3) b. Place Excess Letdown in service as follows: 1) Verify Excess Letdown Stop Valve, CV-3-387, CLOSED 2) Verify Excess Letdown Flow Control Valve, HCV-3-137, CLOSED 3) Verify Excess LTDN HX CCW Outlet, CV-3-739, open 4) Verify Excess LTDN Divert to WDS, CV-3-389, is aligned to the VCT (switch to NORMAL) 5) Slowly open Excess Letdown Flow Control Valve, HCV-3-137. 6) Close Excess Letdown Flow Control Valve, HCV-3-137. 7) Open Excess LTDN Stop Valve, CV-3-387 8) Open Excess LTDN Flow Controller, HCV-3-137 AND adjust flow to control Pressurizer Level

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Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
		CAUTIONS • ***Reducing feed flow to less than steam flow by 655,000 lbs/hr will result in a reactor trip due to low level trip logic on Channel 1 of each steam generator.*** • ***Steam Generator 3A level controls are in MANUAL and 3A FW Bypass Valve fails closed.*** • ***3A Steam Generator Level Recorder is DE-ENERGIZED.*** • ***Steam Generator 3C level controls are in AUTO LOCKUP.*** • ***Main Generator load should be maintained as stable as possible until all FW Control Valves are restored to Automatic control.*** **NOTE** *3B Steam Generator Level Controller should remain in AUTOMATIC.*

	BOP	**5** Control Steam Generator Water Levels As Follows:
		• 3A Steam Generator by manual control of Feedwater flow
		• 3C Steam Generator by adjusting the following parameters:
		  • Blowdown flow
		  • Feed flow
		  • Turbine load
		  • Steam Flow

	RO / BOP	**6** Maintain The Following Plant Parameters - STABLE: • Tavg • Reactor power • Pressurizer Pressure • Pressurizer Water level • Steam Generator Water level <u>IF</u> any reactor trip setpoint is approached or exceeded, <u>THEN</u> manually trip the reactor <u>AND</u> perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 8 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	US	**7** **Check Power Restored To 3P06** Perform the following: a. Continue efforts to restore power to 3P06. b. IF power can NOT be restored to 3P06 within 1 hour, THEN perform the actions required by Technical Specifications as directed by the NPS. c. Return to Step 1.
		Evaluator Note: Steps 1 thru 7 will be reviewed until power is restored. Control room will be called to restore power after step seven.
		CAUTION ***Auto/Manual controllers should NOT be returned to AUTO until vital power has been completely restored.*** ***NOTE*** *When power is restored to a Manual/Auto station, the AUTO light should turn on, after approximately 15 seconds the MANUAL light should turn on. When the MANUAL light turns on, manual control of the process is available.*

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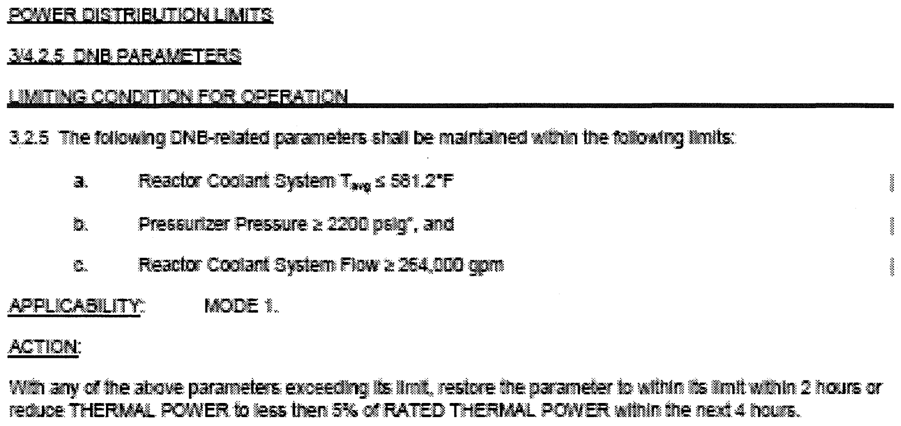
Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	**8** **Restore Equipment To AUTOMATIC Controls As Follows:** a. Pressurizer Pressure Control using section 2 of ATTACHMENT 4 b. Steam Generator Level control as follows: 1) Manually control feed flow to return steam generator to required band for plant operating mode 2) Manually adjust feed flow to match steam flow 3) Place the steam generator level controls to AUTO 4) Repeat Steps 8.b.1) through 8.b.3) until all steam generator controls are in AUTO c. Direct the Operators to return all controls listed on ENCLOSURE 1 to AUTOMATIC using appropriate plant procedures c. **IF** AUTOMATIC control is **NOT** available **OR** desired, **THEN** maintain controls in MANUAL. d. Verify all annunciators indicate correctly for the current plant status d. Perform the actions of the appropriate Annunciator Response procedure for the affected alarms.
	US	**9** **Go To Appropriate Procedure As Determined By The Nuclear Plant Supervisor**
		Evaluator Note: Enclosure 1 and TS references listed next
		Evaluator Note: TS that apply: • 3.3.2 function 6d action 23 – AFW actuation • 3.3.2 functions 7a,b,and c – 3B sequencer • 3.8.1.1 – bus stripping • 3.2.5 – DNB • 3.8.3.1 – Vital AC power • 3.4.3.a – pressurizer heaters lost

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 10 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	US	TS 3.2.5 applies while RCS pressure is <2200 psig. 2 Hr action.
		 POWER DISTRIBUTION LIMITS 3/4.2.5 DNB PARAMETERS LIMITING CONDITION FOR OPERATION 3.2.5 The following DNB-related parameters shall be maintained within the following limits: a. Reactor Coolant System $T_{avg} \leq 581.2°F$ b. Pressurizer Pressure ≥ 2200 psig*, and c. Reactor Coolant System Flow ≥ 264,000 gpm APPLICABILITY: MODE 1. ACTION: With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less then 5% of RATED THERMAL POWER within the next 4 hours.

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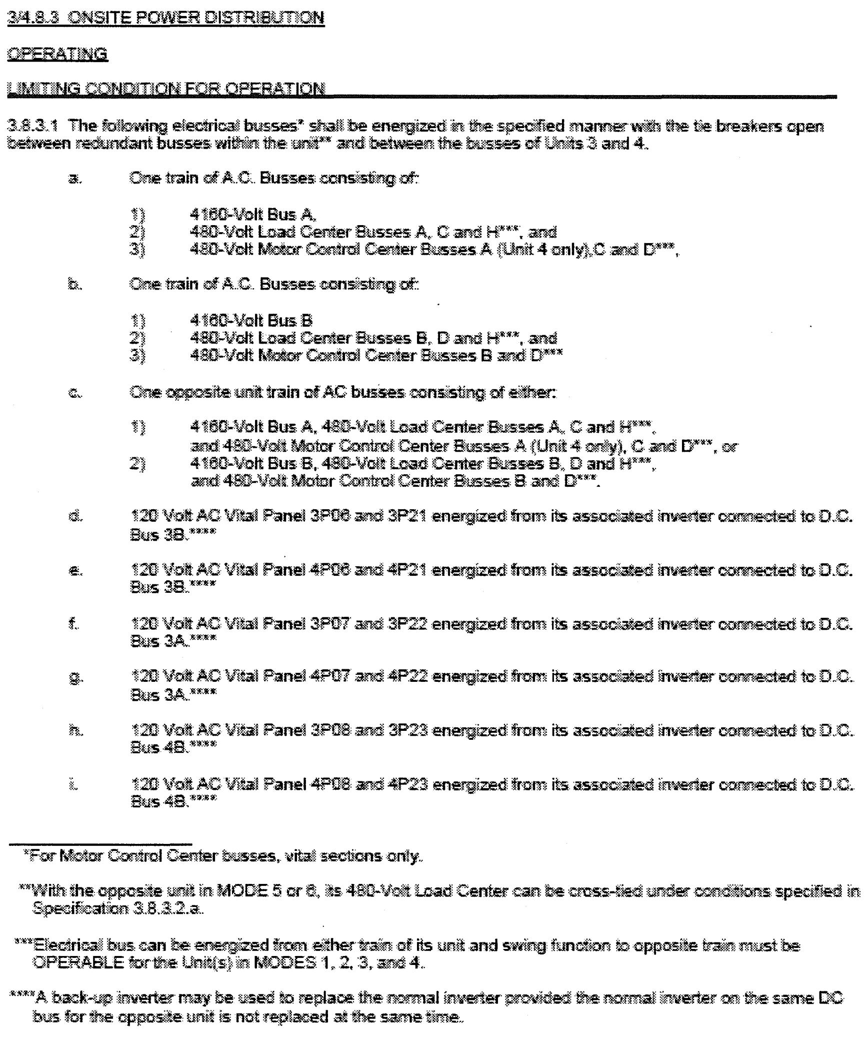
Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	US	TS 3.8.3.1.d applies. Action c



3/4.8.3 ONSITE POWER DISTRIBUTION

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.3.1 The following electrical busses* shall be energized in the specified manner with the tie breakers open between redundant busses within the unit** and between the busses of Units 3 and 4.

a. One train of A.C. Busses consisting of:

1) 4160-Volt Bus A,
2) 480-Volt Load Center Busses A, C and H***, and
3) 480-Volt Motor Control Center Busses A (Unit 4 only),C and D***,

b. One train of A.C. Busses consisting of:

1) 4160-Volt Bus B
2) 480-Volt Load Center Busses B, D and H***, and
3) 480-Volt Motor Control Center Busses B and D***

c. One opposite unit train of AC busses consisting of either:

1) 4160-Volt Bus A, 480-Volt Load Center Busses A, C and H***, and 480-Volt Motor Control Center Busses A (Unit 4 only), C and D***, or
2) 4160-Volt Bus B, 480-Volt Load Center Busses B, D and H***, and 480-Volt Motor Control Center Busses B and D***.

d. 120 Volt AC Vital Panel 3P06 and 3P21 energized from its associated inverter connected to D.C. Bus 3B.****

e. 120 Volt AC Vital Panel 4P06 and 4P21 energized from its associated inverter connected to D.C. Bus 3B.****

f. 120 Volt AC Vital Panel 3P07 and 3P22 energized from its associated inverter connected to D.C. Bus 3A.****

g. 120 Volt AC Vital Panel 4P07 and 4P22 energized from its associated inverter connected to D.C. Bus 3A.****

h. 120 Volt AC Vital Panel 3P08 and 3P23 energized from its associated inverter connected to D.C. Bus 4B.****

i. 120 Volt AC Vital Panel 4P08 and 4P23 energized from its associated inverter connected to D.C. Bus 4B.****

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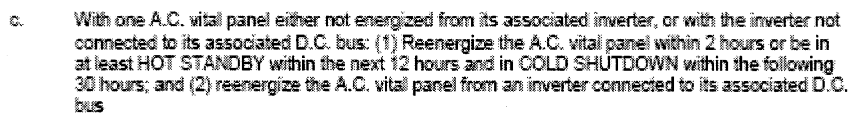
*For Motor Control Center busses, vital sections only.

**With the opposite unit in MODE 5 or 6, its 480-Volt Load Center can be cross-tied under conditions specified in Specification 3.8.3.2.a.

***Electrical bus can be energized from either train of its unit and swing function to opposite train must be OPERABLE for the Unit(s) in MODES 1, 2, 3, and 4.

****A back-up inverter may be used to replace the normal inverter provided the normal inverter on the same DC bus for the opposite unit is not replaced at the same time.



c. With one A.C. vital panel either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) Reenergize the A.C. vital panel within 2 hours or be in at least HOT STANDBY within the next 12 hours and in COLD SHUTDOWN within the following 30 hours; and (2) reenergize the A.C. vital panel from an inverter connected to its associated D.C. bus

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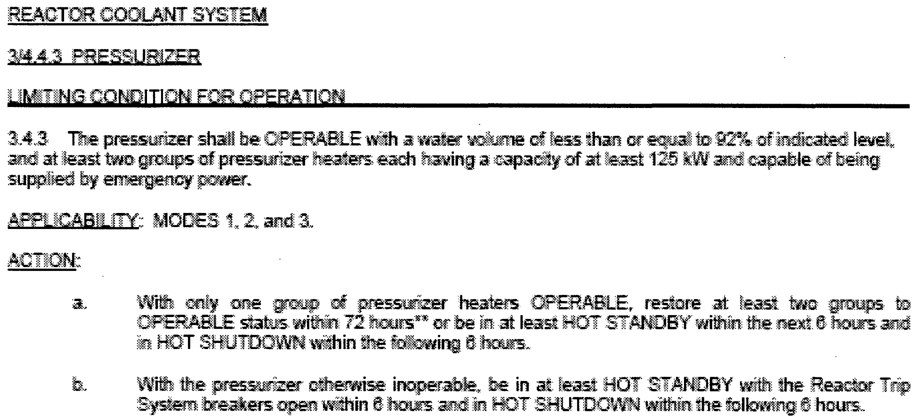
Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	US	3.4.3 action a. applies
		 REACTOR COOLANT SYSTEM 3/4.4.3 PRESSURIZER LIMITING CONDITION FOR OPERATION 3.4.3 The pressurizer shall be OPERABLE with a water volume of less than or equal to 92% of indicated level, and at least two groups of pressurizer heaters each having a capacity of at least 125 kW and capable of being supplied by emergency power. APPLICABILITY: MODES 1, 2, and 3. ACTION: a. With only one group of pressurizer heaters OPERABLE, restore at least two groups to OPERABLE status within 72 hours** or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. b. With the pressurizer otherwise inoperable, be in at least HOT STANDBY with the Reactor Trip System breakers open within 6 hours and in HOT SHUTDOWN within the following 6 hours.

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Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
	US	TS 3.3.2.6.d bus stripping, action 23 and 7a,b,c.AFW action 18

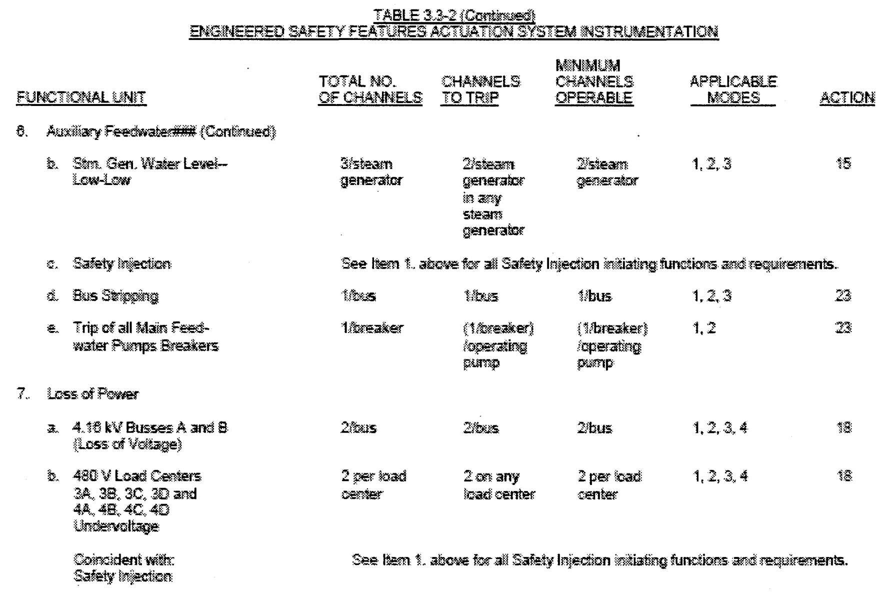
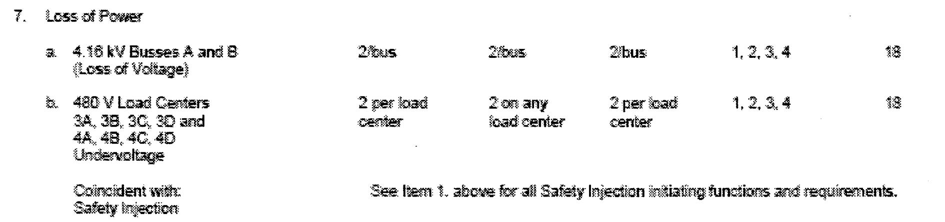


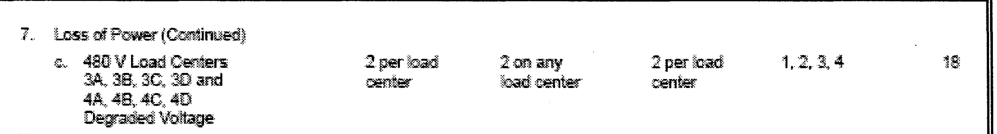
TABLE 3.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. Auxiliary Feedwater### (Continued)					
b. Stm. Gen. Water Level-- Low-Low	3/steam generator	2/steam generator in any steam generator	2/steam generator	1, 2, 3	15
c. Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
d. Bus Stripping	1/bus	1/bus	1/bus	1, 2, 3	23
e. Trip of all Main Feed-water Pumps Breakers	1/breaker	(1/breaker) /operating pump	(1/breaker) /operating pump	1, 2	23
7. Loss of Power					
a. 4.16 kV Busses A and B (Loss of Voltage)	2/bus	2/bus	2/bus	1, 2, 3, 4	18
b. 480 V Load Centers 3A, 3B, 3C, 3D and 4A, 4B, 4C, 4D Undervoltage	2 per load center	2 on any load center	2 per load center	1, 2, 3, 4	18
Coincident with: Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				

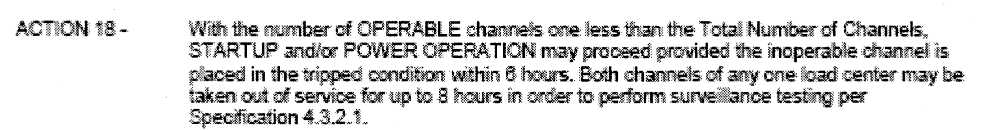
ACTION 23 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, comply with Specification 3.0.3.



7. Loss of Power					
a. 4.16 kV Busses A and B (Loss of Voltage)	2/bus	2/bus	2/bus	1, 2, 3, 4	18
b. 480 V Load Centers 3A, 3B, 3C, 3D and 4A, 4B, 4C, 4D Undervoltage	2 per load center	2 on any load center	2 per load center	1, 2, 3, 4	18
Coincident with: Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				



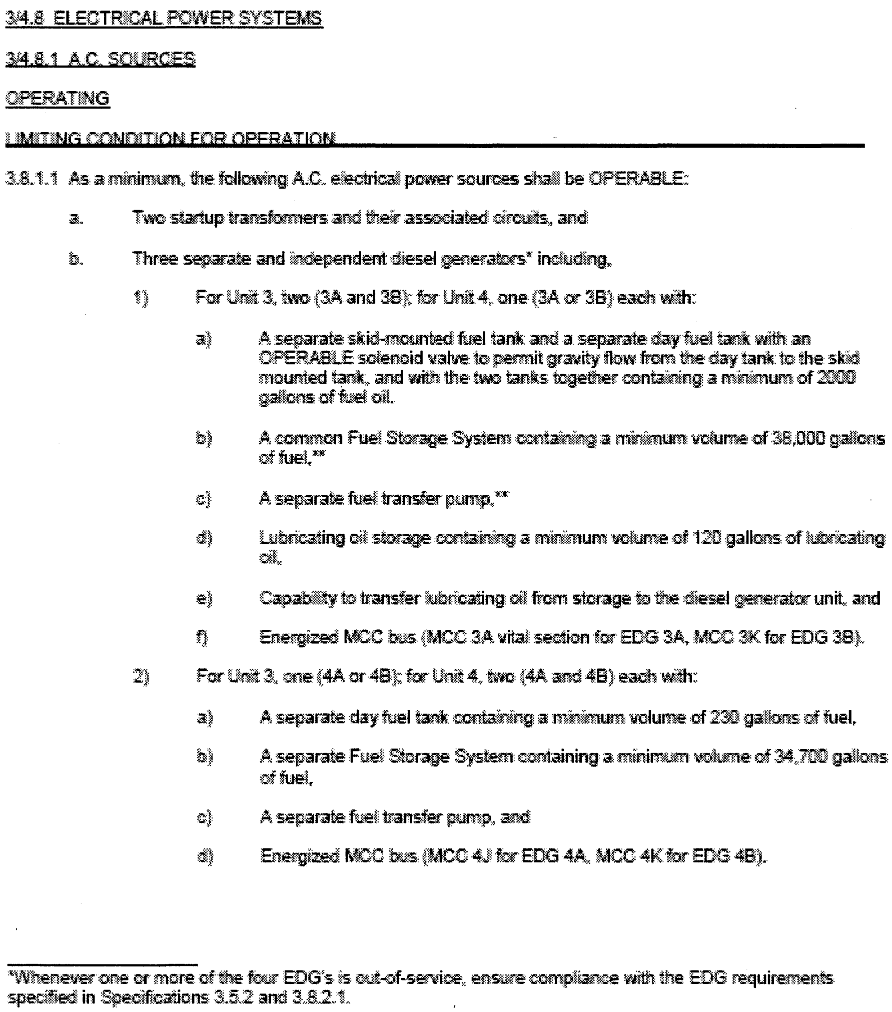
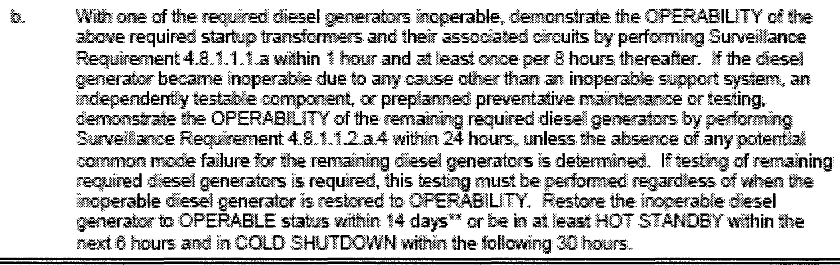
7. Loss of Power (Continued)					
c. 480 V Load Centers 3A, 3B, 3C, 3D and 4A, 4B, 4C, 4D Degraded Voltage	2 per load center	2 on any load center	2 per load center	1, 2, 3, 4	18



ACTION 18 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours. Both channels of any one load center may be taken out of service for up to 8 hours in order to perform surveillance testing per Specification 4.3.2.1.

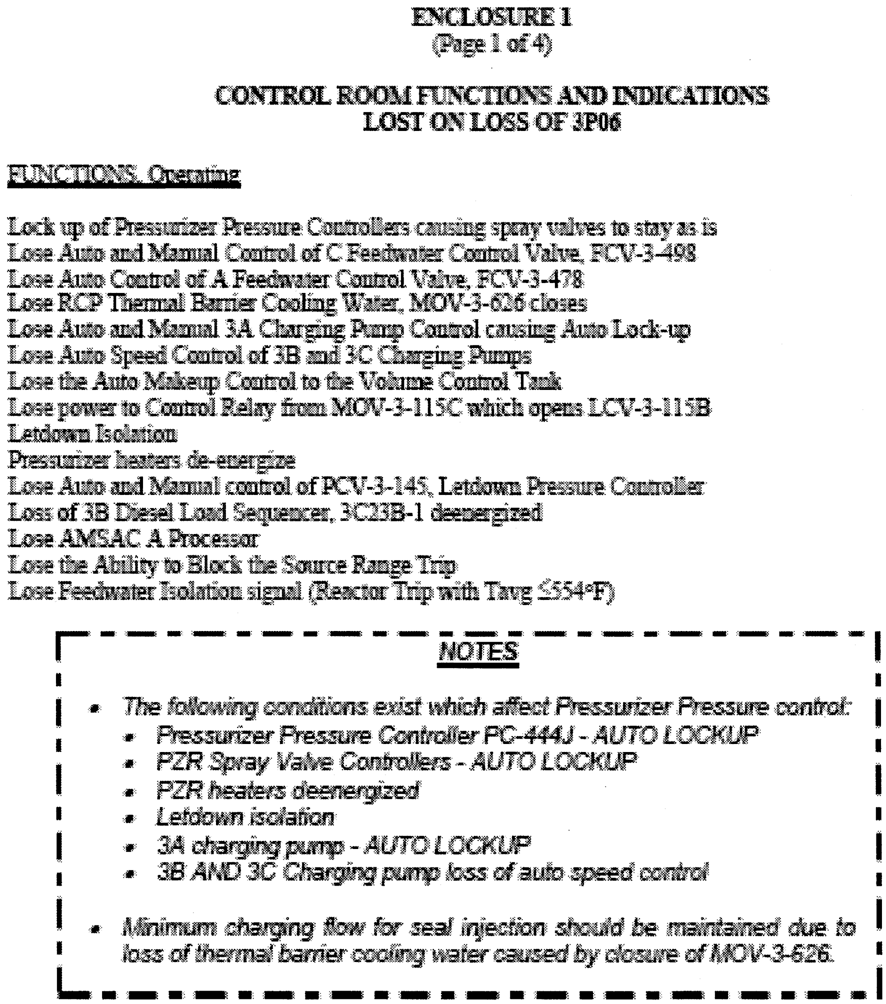
Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 14 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
		 3/4.8 ELECTRICAL POWER SYSTEMS 3/4.8.1 A.C. SOURCES OPERATING LIMITING CONDITION FOR OPERATION 3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE: a. Two startup transformers and their associated circuits, and b. Three separate and independent diesel generators* including, 1) For Unit 3, two (3A and 3B); for Unit 4, one (3A or 3B) each with: a) A separate skid-mounted fuel tank and a separate day fuel tank with an OPERABLE solenoid valve to permit gravity flow from the day tank to the skid mounted tank, and with the two tanks together containing a minimum of 2000 gallons of fuel oil. b) A common Fuel Storage System containing a minimum volume of 38,000 gallons of fuel,** c) A separate fuel transfer pump,** d) Lubricating oil storage containing a minimum volume of 120 gallons of lubricating oil, e) Capability to transfer lubricating oil from storage to the diesel generator unit, and f) Energized MCC bus (MCC 3A vital section for EDG 3A, MCC 3K for EDG 3B). 2) For Unit 3, one (4A or 4B); for Unit 4, two (4A and 4B) each with: a) A separate day fuel tank containing a minimum volume of 230 gallons of fuel, b) A separate Fuel Storage System containing a minimum volume of 34,700 gallons of fuel, c) A separate fuel transfer pump, and d) Energized MCC bus (MCC 4J for EDG 4A, MCC 4K for EDG 4B). *Whenever one or more of the four EDG's is out-of-service, ensure compliance with the EDG requirements specified in Specifications 3.5.2 and 3.8.2.1.
		 b. With one of the required diesel generators inoperable, demonstrate the OPERABILITY of the above required startup transformers and their associated circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining required diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours, unless the absence of any potential common mode failure for the remaining diesel generators is determined. If testing of remaining required diesel generators is required, this testing must be performed regardless of when the inoperable diesel generator is restored to OPERABILITY. Restore the inoperable diesel generator to OPERABLE status within 14 days** or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 1 Page 15 of 18

Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
		 **ENCLOSURE 1** (Page 1 of 4) **CONTROL ROOM FUNCTIONS AND INDICATIONS LOST ON LOSS OF 3P06** FUNCTIONS, Operating Lock up of Pressurizer Pressure Controllers causing spray valves to stay as is Lose Auto and Manual Control of C Feedwater Control Valve, FCV-3-498 Lose Auto Control of A Feedwater Control Valve, FCV-3-478 Lose RCP Thermal Barrier Cooling Water, MOV-3-626 closes Lose Auto and Manual 3A Charging Pump Control causing Auto Lock-up Lose Auto Speed Control of 3B and 3C Charging Pumps Lose the Auto Makeup Control to the Volume Control Tank Lose power to Control Relay from MOV-3-115C which opens LCV-3-115B Letdown Isolation Pressurizer heaters de-energize Lose Auto and Manual control of PCV-3-145, Letdown Pressure Controller Loss of 3B Diesel Load Sequencer, 3C23B-1 deenergized Lose AMSAC A Processor Lose the Ability to Block the Source Range Trip Lose Feedwater Isolation signal (Reactor Trip with Tavg ≤554°F) ***NOTES*** • *The following conditions exist which affect Pressurizer Pressure control:* • *Pressurizer Pressure Controller PC-444J - AUTO LOCKUP* • *PZR Spray Valve Controllers - AUTO LOCKUP* • *PZR heaters deenergized* • *Letdown isolation* • *3A charging pump - AUTO LOCKUP* • *3B AND 3C Charging pump loss of auto speed control* • *Minimum charging flow for seal injection should be maintained due to loss of thermal barrier cooling water caused by closure of MOV-3-626.*

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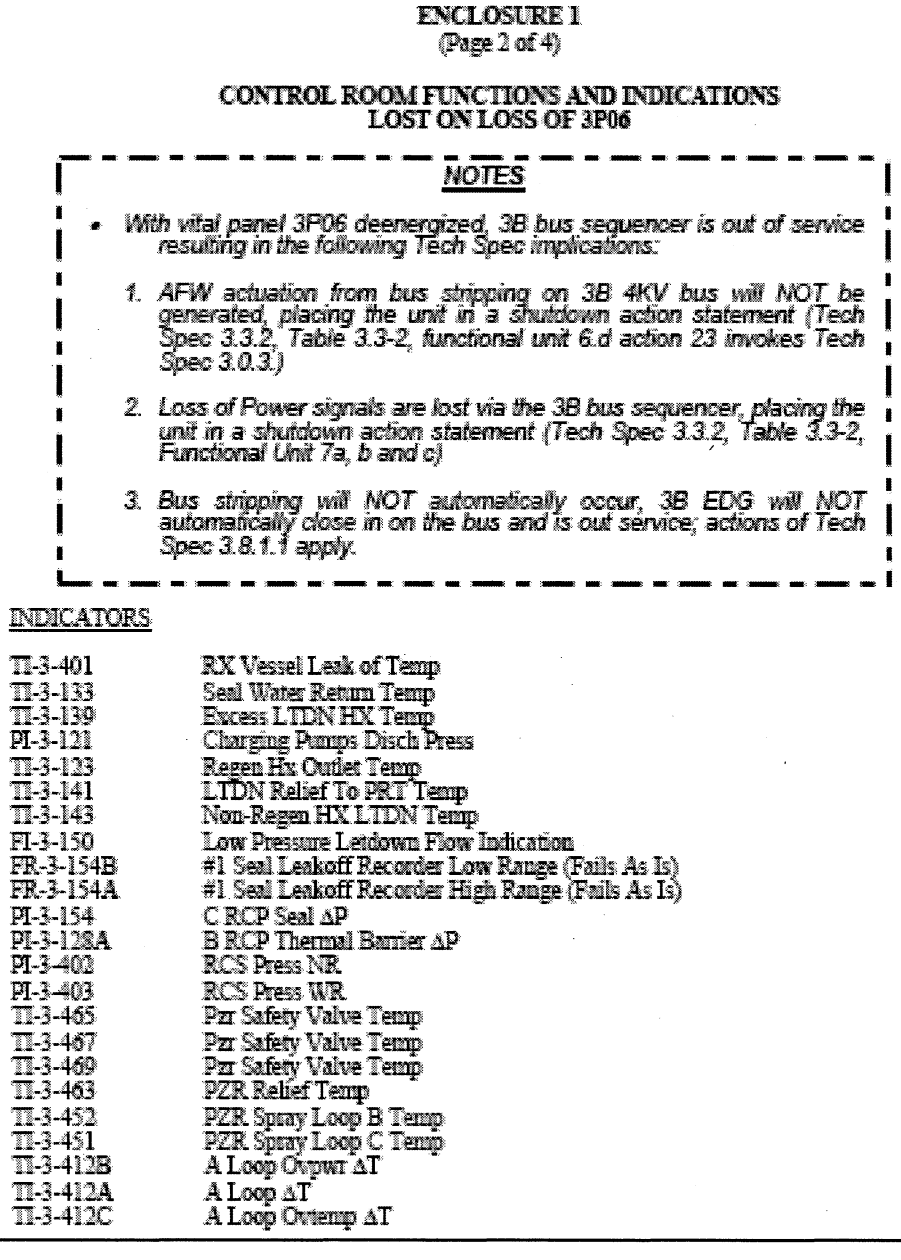
Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
		

ENCLOSURE 1
(Page 2 of 4)

CONTROL ROOM FUNCTIONS AND INDICATIONS LOST ON LOSS OF 3P06

NOTES

- *With vital panel 3P06 deenergized, 3B bus sequencer is out of service resulting in the following Tech Spec implications:*

  1. *AFW actuation from bus stripping on 3B 4KV bus will NOT be generated, placing the unit in a shutdown action statement (Tech Spec 3.3.2, Table 3.3-2, functional unit 6.d action 23 invokes Tech Spec 3.0.3.)*
  2. *Loss of Power signals are lost via the 3B bus sequencer, placing the unit in a shutdown action statement (Tech Spec 3.3.2, Table 3.3-2, Functional Unit 7a, b and c)*
  3. *Bus stripping will NOT automatically occur, 3B EDG will NOT automatically close in on the bus and is out service; actions of Tech Spec 3.8.1.1 apply.*

INDICATORS

TI-3-401	RX Vessel Leak of Temp
TI-3-133	Seal Water Return Temp
TI-3-139	Excess LTDN HX Temp
PI-3-121	Charging Pumps Disch Press
TI-3-123	Regen Hx Outlet Temp
TI-3-141	LTDN Relief To PRT Temp
TI-3-143	Non-Regen HX LTDN Temp
FI-3-150	Low Pressure Letdown Flow Indication
FR-3-154B	#1 Seal Leakoff Recorder Low Range (Fails As Is)
FR-3-154A	#1 Seal Leakoff Recorder High Range (Fails As Is)
PI-3-154	C RCP Seal ΔP
PI-3-128A	B RCP Thermal Barrier ΔP
PI-3-402	RCS Press NR
PI-3-403	RCS Press WR
TI-3-465	Pzr Safety Valve Temp
TI-3-467	Pzr Safety Valve Temp
TI-3-469	Pzr Safety Valve Temp
TI-3-463	PZR Relief Temp
TI-3-452	PZR Spray Loop B Temp
TI-3-451	PZR Spray Loop C Temp
TI-3-412B	A Loop Ovpwr ΔT
TI-3-412A	A Loop ΔT
TI-3-412C	A Loop Ovtemp ΔT

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Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td></td><td>
ENCLOSURE 1
(Page 3 of 4)

CONTROL ROOM FUNCTIONS AND INDICATIONS
LOST ON LOSS OF 3P06

<u>INDICATORS</u>
<table>
<tr><td>TI-3-412D</td><td>A Loop Temp Avg</td></tr>
<tr><td>PI-3-455</td><td>PZR Press Ch I</td></tr>
<tr><td>LI-3-459A</td><td>PZR Level Prot/Cont.</td></tr>
<tr><td>FI-3-414</td><td>RCS Flow Loop A</td></tr>
<tr><td>FI-3-424</td><td>RCS Flow Loop B</td></tr>
<tr><td>FI-3-434</td><td>RCS Flow Loop C</td></tr>
<tr><td>TR-3-412</td><td>Delta-T Recorder</td></tr>
<tr><td>NR-3-46</td><td>NIS Overpower Recorder</td></tr>
<tr><td>LI-3-474</td><td>A Stm Gen Level</td></tr>
<tr><td>LI-3-484</td><td>B Stm Gen Level</td></tr>
<tr><td>LI-3-494</td><td>C Stm Gen Level</td></tr>
<tr><td>LR-3-477</td><td>Stm Gen Wide Range Level (Fails As Is)</td></tr>
<tr><td>FR-3-478</td><td>3A Steam Generator Recorder</td></tr>
<tr><td>LI-3-470</td><td>Pzr Relief Tk Level</td></tr>
<tr><td>TI-3-471</td><td>Pzr Relief Tk Temp</td></tr>
<tr><td>PI-3-472</td><td>PZR Relief Tank Pressure</td></tr>
<tr><td>PC-3-444H</td><td>Auto Manual Station for Pzr Spray Valve PCV-3-455B</td></tr>
<tr><td>PC-3-444G</td><td>Auto Manual Station for Pzr Spray Valve PCV-3-455A</td></tr>
<tr><td>PC-3-444J</td><td>Auto Manual Station for Pressurizer Pressure Controller</td></tr>
<tr><td>SC-3-151A</td><td>Auto Manual Station Charging Pump A Control</td></tr>
<tr><td>PC-3-145B</td><td>Auto Manual Station Low Pressure Letdown Pressure</td></tr>
<tr><td>FC-3-113A</td><td>Auto Manual Station Boric Acid to Blend System</td></tr>
<tr><td>NI-3-6649B1/B2</td><td>Gammametrics Backup NIS</td></tr>
<tr><td>N-3-31</td><td>Source Range Counts and Source Range Startup Rate</td></tr>
<tr><td>N-3-35</td><td>Inter Range Current Current and Startup Rate</td></tr>
<tr><td>N-3-41</td><td>Power Range and Axial Flux Difference</td></tr>
<tr><td>LC-3-478A</td><td>Stm Gen A Control Valve Controller, Lose Inst, MAN Control Only</td></tr>
<tr><td>FCV-3-479</td><td>3A FW Bypass Valve</td></tr>
<tr><td>U-3</td><td>Pressurizer Safety Valve Acoustic Monitoring System</td></tr>
<tr><td>NIS Rack Ch 1</td><td>(N-31, N-35, N-41)</td></tr>
<tr><td>RI-3-6311B</td><td>Containment High Radiation</td></tr>
<tr><td>TI-3-610B</td><td>CCW Pump Inlet Temp</td></tr>
<tr><td>TI-3-607B</td><td>B CCW HX Outlet Temp</td></tr>
<tr><td>FI-3-613B</td><td>B CCW HX HDR Flow</td></tr>
<tr><td>RI-3-6311B</td><td>Containment High Radiation (VPC)</td></tr>
</table>
<u>ALARMS</u>

A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW
A 1/5, RCP SEAL LEAKOFF HI FLOW (C RCP only)
A 6/4, RCP SEAL WATER LO DP (C RCP)
C 6/1, SG A LEVEL DEVIATION
G 9/2 SI PUMP 3B LO SUCTION PRESSURE
H 1/2, SFP HI TEMP
H 7/3, RHR PP A COOLING WATER LO FLOW
H 7/5, CSP A/B COOLING WATER LO FLOW
X 3/6, SI PP COOLING WATER LO FLOW
UNIT 4 G 9/2 SI PUMP 3B LO SUCTION PRESSURE
</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

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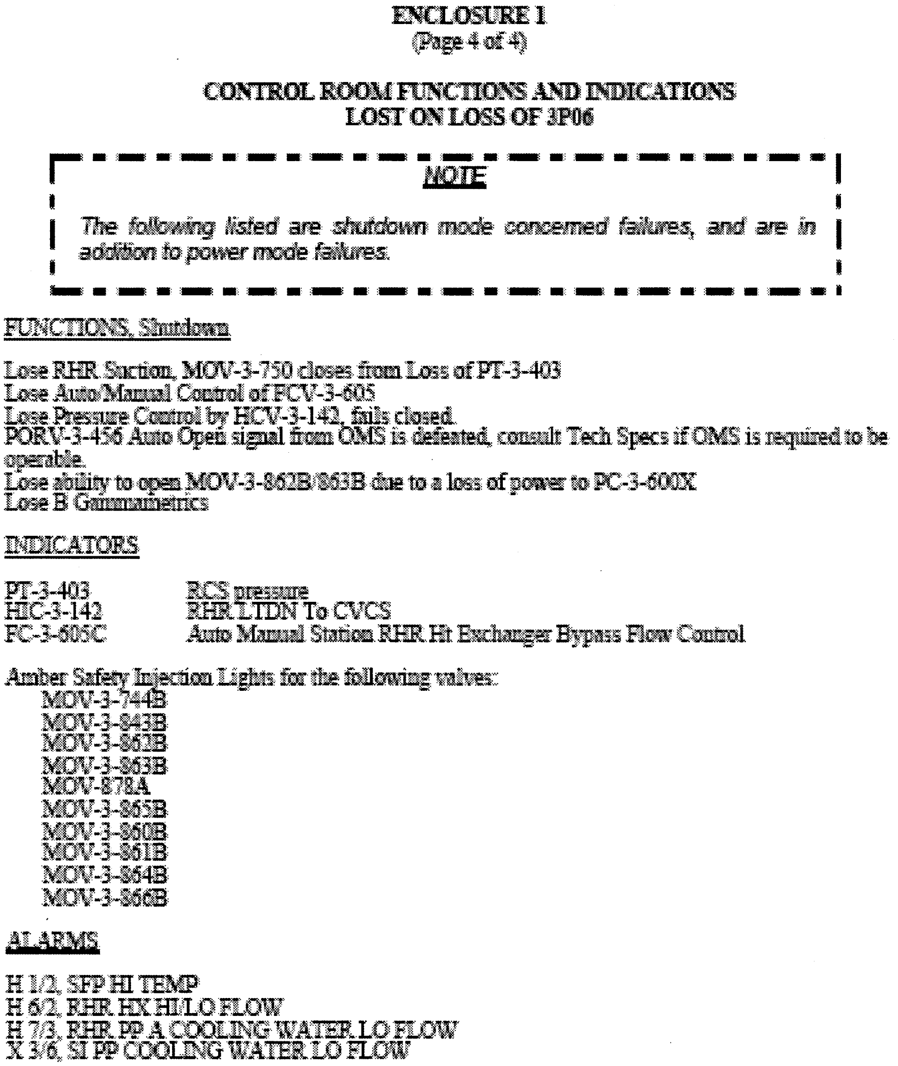
Event Description: Unit experiences a loss of 3P06 due to operator inadvertent operation of supply breaker. Crew maintains control of plant and enters 3-ONOP-003.6 to restore power. TS 3.2.5, 3.8.3.1, 3.4.3.b.

Time	Position	Applicant's Actions or Behavior
		 **ENCLOSURE 1** (Page 4 of 4) **CONTROL ROOM FUNCTIONS AND INDICATIONS** **LOST ON LOSS OF 3P06** NOTE *The following listed are shutdown mode concerned failures, and are in addition to power mode failures.* FUNCTIONS, Shutdown Lose RHR Suction, MOV-3-750 closes from Loss of PT-3-403 Lose Auto/Manual Control of FCV-3-605 Lose Pressure Control by HCV-3-142, fails closed. PORV-3-456 Auto Open signal from OMS is defeated, consult Tech Specs if OMS is required to be operable. Lose ability to open MOV-3-862B/863B due to a loss of power to PC-3-600X Lose B Gammametrics INDICATORS PT-3-403 RCS pressure HIC-3-142 RHR LTDN To CVCS FC-3-605C Auto Manual Station RHR Ht Exchanger Bypass Flow Control Amber Safety Injection Lights for the following valves: MOV-3-744B MOV-3-843B MOV-3-862B MOV-3-863B MOV-878A MOV-3-865B MOV-3-860B MOV-3-861B MOV-3-864B MOV-3-866B ALARMS H 1/2, SFP HI TEMP H 6/2, RHR HX HI/LO FLOW H 7/3, RHR PP A COOLING WATER LO FLOW X 3/6, SI PP COOLING WATER LO FLOW
		Evaluator Note: Following restoration of all controllers to automatic, and CVCS aligned for auto M/U, event 2 may be initiated.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 1 of 7

Event Description: LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Time	Position	Applicant's Actions or Behavior
After auto m/U restored to auto, trigger lesson step EVENT 2 – LT-3-115 FAIL LOW		
	RO	Recognizes/reports unexpected alarm A 4/6, VCT HI/LO LEVEL to the unit supervisor (US).
	BOP	Performs actions of 3-ARP097.CR
		Evaluator Note: US may enter 3-ONOP-046.4 (page 5 of 7)prior to ARP actions.
		NOTE *LT-3-112 and LT-3-115 share common dry reference leg and a common wet variable leg. A false high level will be produced if the common dry reference leg fails.*
	RO	Step 1. Verify alarm by checking the following: a. Check VCT level on LI-3-115 (VP-A). b. Check VCT level on LT-3-112 by at least one of the following methods: (1) LT112 on ERDADS Chemical & Volume Control System display. (2) Local reading from LI-3-112 in the Charging Pump room. (3) Adjust LC-3-112 AUTO setpoint potentiometer until demand begins to indicate greater than zero, read the pot setting, then return to previous setting.
	RO	Step 2. Corrective actions: a. IF LT-3-115 has failed high, THEN take LCV-3-115A control switch to VCT position. b. IF actual HI level, THEN perform the following: (1) Verify LC-3-112 adjustable setpoint at 37% - 40% AND LCV-3-115A diverts to HUT according to program. (2) Verify LCV-3-115A fully diverts at 86% (reset 76%)

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 2 of 7

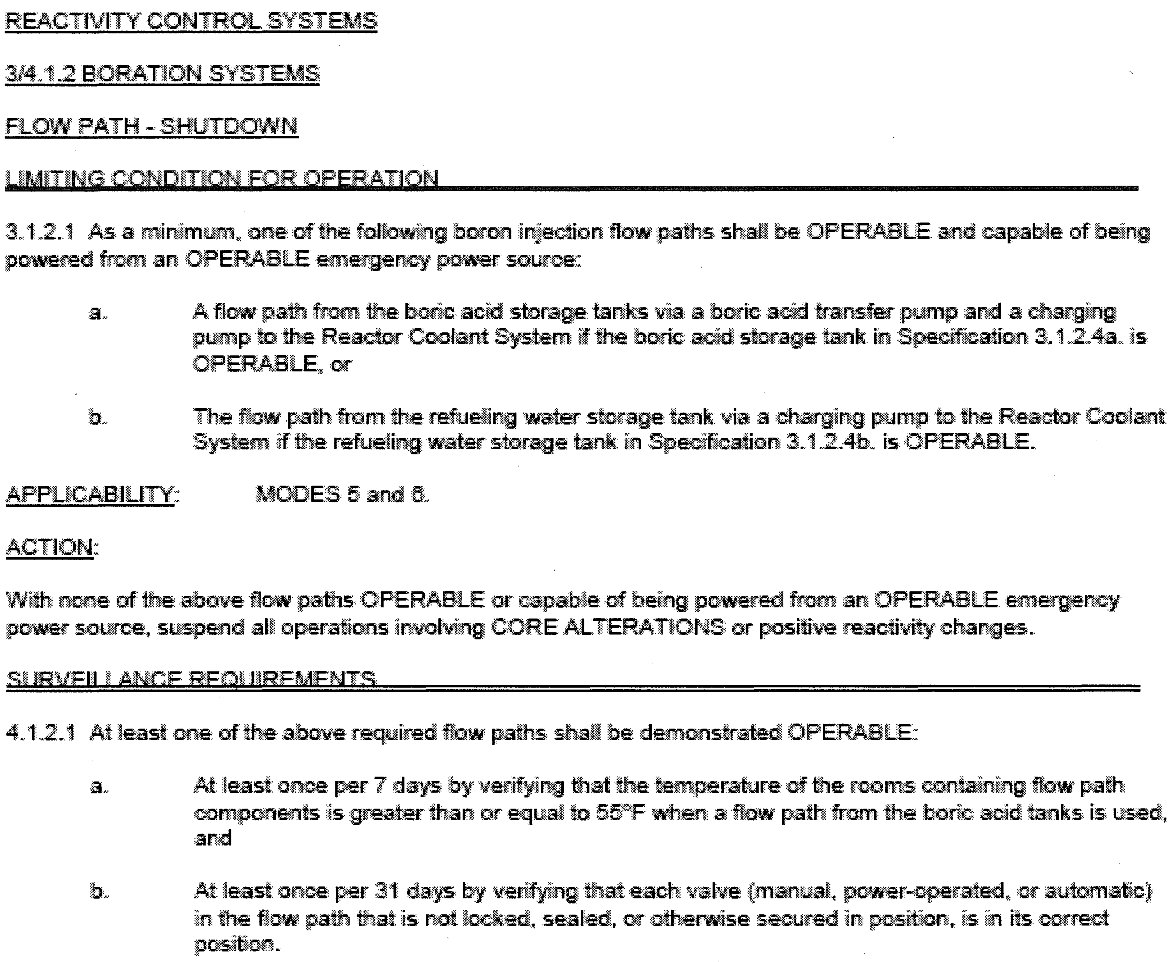
Event Description: LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Time	Position	Applicant's Actions or Behavior
		a. IF LT-3-115 has failed high, THEN take LCV-3-115A control switch to VCT position. b. IF actual HI level, THEN perform the following: (1) Verify LC-3-112 adjustable setpoint at 37% - 40% AND LCV-3-115A diverts to HUT according to program. (2) Verify LCV-3-115A fully diverts at 86% (reset 76%) (3) Verify proper charging-letdown flow balance. c. IF actual LO level, THEN perform the following: (1) At 4%, verify charging pump suction swaps to RWST, LCV-3-115B opens AND LCV-3-115C closes. (2) Verify auto makeup rate is greater than charging flow. (3) Verify suction source swaps back to VCT at 11%. d. IF LT-3-112 or -115 failed, THEN take action using 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM. e. Refer to Tech Spec 3.1.2.1 and 3.1.2.2.
		Evaluator Note: RO verifies based on LT-3-112 indication on ERDADS and LT-3-115 indication on VPA that LT-3-115 has failed low. May direct SNPO to check LT-3-112 local indication
	US	Refers to T.S 3.1.2.1.and 3.1.2.2
		Evaluator Note: T.S. listed below for reference

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 3 of 7

Event Description: LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Time	Position	Applicant's Actions or Behavior



REACTIVITY CONTROL SYSTEMS

3/4.1.2 BORATION SYSTEMS

FLOW PATH - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE and capable of being powered from an OPERABLE emergency power source:

a. A flow path from the boric acid storage tanks via a boric acid transfer pump and a charging pump to the Reactor Coolant System if the boric acid storage tank in Specification 3.1.2.4a. is OPERABLE, or

b. The flow path from the refueling water storage tank via a charging pump to the Reactor Coolant System if the refueling water storage tank in Specification 3.1.2.4b. is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above flow paths OPERABLE or capable of being powered from an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

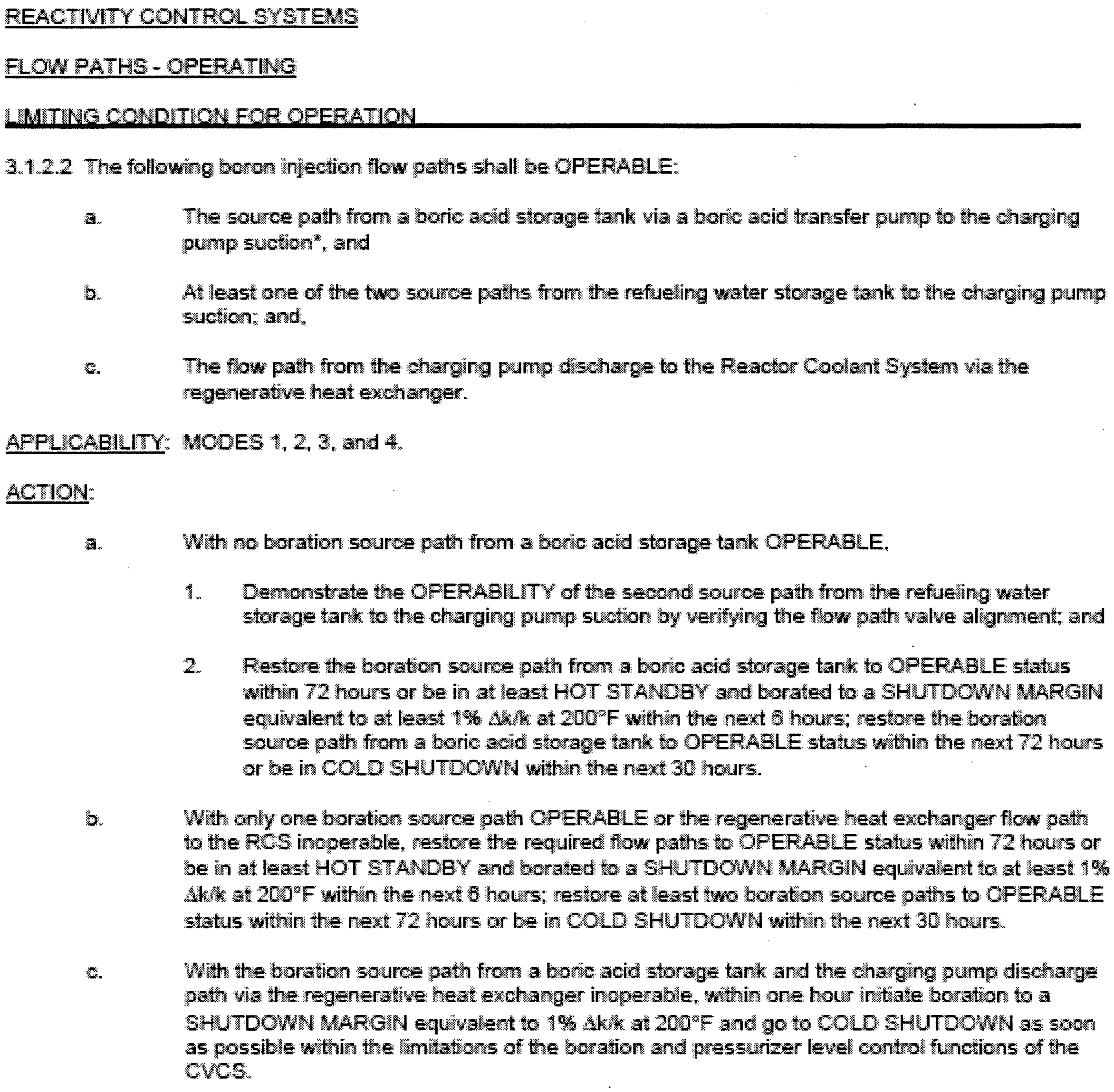
a. At least once per 7 days by verifying that the temperature of the rooms containing flow path components is greater than or equal to 55°F when a flow path from the boric acid tanks is used, and

b. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 4 of 7

Event Description: Event Description: LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Time	Position	Applicant's Actions or Behavior



REACTIVITY CONTROL SYSTEMS

FLOW PATHS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.2 The following boron injection flow paths shall be OPERABLE:

a. The source path from a boric acid storage tank via a boric acid transfer pump to the charging pump suction*, and

b. At least one of the two source paths from the refueling water storage tank to the charging pump suction; and,

c. The flow path from the charging pump discharge to the Reactor Coolant System via the regenerative heat exchanger.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With no boration source path from a boric acid storage tank OPERABLE,

1. Demonstrate the OPERABILITY of the second source path from the refueling water storage tank to the charging pump suction by verifying the flow path valve alignment; and

2. Restore the boration source path from a boric acid storage tank to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% Δk/k at 200°F within the next 6 hours; restore the boration source path from a boric acid storage tank to OPERABLE status within the next 72 hours or be in COLD SHUTDOWN within the next 30 hours.

b. With only one boration source path OPERABLE or the regenerative heat exchanger flow path to the RCS inoperable, restore the required flow paths to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% Δk/k at 200°F within the next 6 hours; restore at least two boration source paths to OPERABLE status within the next 72 hours or be in COLD SHUTDOWN within the next 30 hours.

c. With the boration source path from a boric acid storage tank and the charging pump discharge path via the regenerative heat exchanger inoperable, within one hour initiate boration to a SHUTDOWN MARGIN equivalent to 1% Δk/k at 200°F and go to COLD SHUTDOWN as soon as possible within the limitations of the boration and pressurizer level control functions of the CVCS.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 5 of 7

Event Description: LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Time	Position	Applicant's Actions or Behavior
	US	Determines T.S. 3.1.2.1 does not apply, and T.S. 3.1.2.2 is satisfied.
	US	Directs actions per 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM
	RO	Step 1 Check Boric Acid OR Primary Water Makeup Flow Rates - ABNORMAL Observe note prior to Step 28 and go to Step 28.
		Evaluator Note: FR-113 and FR-114 on the console used to determine BA flow 9.4 gpm and PW flow 55 gpm both normal. Transitions to step 28.
		NOTES • *LT-3-112 and LT-3-115 share a common wet variable leg and a common dry reference leg. A false high level will be produced if the common dry reference leg fails.* • *Steps 28 through 38 assume stable charging and letdown flow; therefore, a transient could mask the symptoms being used to determine which level transmitter has failed.*
	RO	Step 28 Check For VCT Level Transmitter, LT-3-115, Failing Or Failed High Go to Step 31. • LI-3-115 - ABNORMALLY HIGH • LI-3-112 - DECREASING DUE TO FULL DIVERT OF LCV-3-115A
	RO	Step 31 Check for LI-3-115 Failing Or Failed Low Go to Step 34. • LI-3-115 - ABNORMALLY LOW • LI-3-112 - INCREASING DUE TO AUTO MAKEUP OR STABLE DUE TO LCV-3-115A DIVERTING

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 6 of 7

Event Description: LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Time	Position	Applicant's Actions or Behavior
		CAUTION ***With no operator action, LT-3-115 failed low with makeup flow greater than charging flow could result in overpressurization of the VCT.*** **NOTE** *Failure of LT-3-115 low will result in the following:* • *Annunciator Alarm A 4/6 VCT HI/LO LEVEL.* • *Auto makeup starts, but does not stop automatically.* • *LCV-3-115A modulating open to attempt to control level at the VCT Level Controller, LC-3-112, setpoint.*
	RO	Step 32 Turn RCS makeup control switch to stop
	US	Step 33 GO to step 41
	US	Step 41 Report All Equipment Failures OR Malfunctions To The Responsible Supervisor
		Evaluator Note: Informs WCC and SM of failure of LT-3-115
	US	Step 42 Notify The Nuclear Plant Supervisor To Evaluate Plant Conditions a. Refer to 0-ONOP-046.3, LOSS OF BORATION FLOW PATHS b. Review Technical Specifications

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 7 of 7

Event Description: LT-3-115 fails low initiating a continuous automatic makeup. The crew responds to annunciator alarm A 4/6 that directs them to 3-ONOP-046.4, MALFUNCTION OF BORON CONCENTRATION CONTROL SYSTEM

Time	Position	Applicant's Actions or Behavior	
	RO	Step 43 Check Repairs To Equipment Complete	Perform the following: a. Maintain VCT level by performing one of the following: • IF due to VCT level transmitter failure, THEN perform manual makeup as necessary using 0-OP-046, CVCS - BORON CONCENTRATION CONTROL. OR • IF due to primary water or boric acid flow related problems, THEN repeat Steps 4 Through 26 as necessary to maintain VCT level and proper boron concentration. b. WHEN repairs are complete, THEN continue with Step 44.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 1 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
Trigger lesson step EVENT 3 – 3B ICW SHAFT SHEAR		
	BOP	Identifies / Reports indication of 3B ICW pump sheared shaft
		Evaluator Note: Sheared shaft is identified by the following: ▪ *3B ICW pump current dropping to 14 amps* ▪ *Red indicating lamp lit* ▪ *Green indicating lamp out* ▪ *ICW HDR A/B LO PRESS alarm I 4/4*
	BOP	Refers to ARP for I 4/4
	BOP	Checks ICW header pressure indicators, PI-3-1619 and 1620 less than or equal to 10 psig (VPA)
	BOP	Dispatches NSO to determine total ICW flow
	BOP	Starts second ICW pump using 3-OP-019, Intake Cooling Water System.
		Evaluator Note: Coordinates with the NSO to start the second ICW pump. If pump is started using OP, pump start section of OP listed for reference next page. *Evaluator Note: Crew may elect to use 3-ONOP-019 to start second pump. If ONOP is use skip to page 3 of 10*

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 2 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
		5.2 <u>ICW Pump Start (System in Operation)</u> 5.2.1 <u>Initial Conditions</u> 1. All applicable prerequisites as listed in Section 3.0 are satisfied. 2. At least one other ICW Pump running. 3. **<u>IF</u>** the ICW Pump required for operation has a stationary screen installed in that intake bay, **<u>THEN</u>** verify Precautions/Limitations 4.12 and 4.13 are met. 5.2.2 <u>Procedure Steps</u> 1. Inform the ANPO of which pump to be checked out for starting. **<u>NOTE</u>** *The square Allis-Chalmers motor has only one oil level sightglass; the others have an upper and a lower sightglass.* 2. Verify the oil level is visible in the sightglass(es) of the motor of the pump to be started. 3. Check the discharge valve for the pump to be started is open (mark the unaffected valves N/A): a. 3A ICW PP Disch Isol, 3-50-312 b. 3B ICW PP Disch Isol, 3-50-322 c. 3C ICW PP Disch Isol, 3-50-332 4. Start the ICW Pump that has been checked out at VPA in the Control Room. 5. Check that the pump motor amps decrease to less than 49 amps. 6. Check that the discharge pressure of the pump started is between 11 psig and 35 psig. **<u>NOTE</u>** *Packing leakoff less than specified should have a PWO initiated, but does not affect pump Operability.* • *ICW Pumps 3A and 3B have packing leakoff lines. Observable packing leakoff should be at least 20 dpm.* • *ICW Pump 3C does not have a packing leakoff line. Observable packing leakoff should be at least 120 dpm.* 7. Check ICW Pump seal packing leakoff following pump start. 8. Verify all log entries specified in Subsection 2.2 have been recorded. 9. Complete the QA Record Page for this subsection.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 3 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
	US	Directs response per 3-ONOP-019
		CAUTIONS • *If the cause of the Intake Cooling Water Malfunction is determined to be due to high differential pressure on the traveling screens, then 3-ONOP-011, SCREEN WASH SYSTEM/INTAKE MALFUNCTION, should be used.* • *If an Intake Cooling Water Pump is stopped in this procedure and the reason for stopping the pump has not been corrected, that pump is not available for starting in subsequent procedure steps.* • *Monitoring Main Generator RTDs is required if TPCW flow or temperature is changed due to the effect on Main Generator hydrogen leakage. An increase in hydrogen leakage is expected if the gas temperature to rotor temperature gradient increases. (Reference CR 2008-803)*
	BOP	Step 1 Verify All Intake Cooling Water Pump Alarms - OFF • I 4/1, ICWP A/B/C MOTOR OVERLOAD • I 4/2, ICWP A/B/C TRIP • I 4/3, ICWP A/B/C MOTOR BRG HI TEMP Perform the following: 1. Have operator check pump(s) locally 2. Determine affected intake cooling water pump. 3. Start standby intake cooling water pump. 4. Stop affected intake cooling water pump.
	BOP	Step 2 Check Traveling Screens - CLEAN • Alarm I 3/3, Traveling Screen HI ΔP - OFF • Traveling Screen DP - LESS THAN 7.5 INCHES OF WATER Go to 3-ONOP-011, SCREEN WASH SYSTEM/INTAKE MALFUNCTION

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 4 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior		
	BOP	3	Verify Intake Cooling Water Pumps - AT LEAST ONE RUNNING	Perform the following: a. Manually start one intake cooling water pump. b. IF pump can NOT be started from the Control Room, THEN dispatch an operator to locally perform the following: 1) Proceed to the 4160 volt switchgear room associated with the affected intake cooling water pump. 2) IF no relay targets exist on breaker, THEN locally start the affected intake cooling water pump from its supply breaker. * 3AA19 for 3A ICW pump. * 3AB17 for 3B ICW pump. * 3AD05 for 3C ICW pump.
				c. IF no intake cooling water pumps can be started, THEN perform the following: 1) Maintain component cooling water temperatures using 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION. 2) Remove reactive load from main generator. 3) Shut down components cooled by turbine plant cooling water using 3-ONOP-008, TURBINE PLANT COOLING WATER MALFUNCTION. 4) Return to procedure AND step in effect.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 5 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 4 Verify Intake Cooling Water Pumps - TWO RUNNING — Perform the following: a) Manually start any available Intake Cooling Water Pump to establish TWO RUNNING. b) IF only one ICW Pump is operating AND total ICW flow is greater than 19,000 GPM, THEN immediately reduce total ICW flow by: * Throttling TPCW HX Outlet Combined ICW Iso Vlv 3-50-401 while maintaining TPCW Heat Exchanger outlet temperature less than 110 degrees.
		* Throttle 3-50-406, CCW HX Outlet Spool Piece Bypass Valve, and/or 3-50-407, CCW HX Outlet Spool Piece Iso Vlv, while maintaining minimum ICW flows through the CCW Heat Exchangers as determined by Enclosure 1 of 3-OP-019, INTAKE COOLING WATER SYSTEM. c) IF unable to reduce total ICW flow through a single ICW Pump to less than 19,000 GPM, THEN reduce Unit Load using 3-GOP-103, POWER OPERATION TO HOT STANDBY, to limit heat input into the TPCW system and throttle ICW flow to the TPCW Heat Exchangers using TPCW HX Outlet Combined ICW Iso Vlv 3-50-401 until total ICW flow is less than 19,000 GPM. d) IF a single ICW Pump has operated at flows greater than 19,000 GPM, THEN refer to 3-OP-019, INTAKE COOLING WATER SYSTEM.
		Evaluator Note: BOP starts 3A ICW PP and secures 3B ICW PP

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 6 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
		NOTE *An operable intake cooling water header consists of an intact header being supplied by at least one intake cooling water pump.*
	BOP	Step 5 Verify Adequate Intake Cooling Water Header Flow: — Perform the following: a. Check alarm I 4/4, ICW HEADER A/B LO PRESS - OFF — 1. Dispatch operator to investigate for intake cooling water system leakage. b. Check Intake Cooling Water Header Pressure - GREATER THAN 10 PSIG • PI-3-1619 • PI-3-1620 — 2. IF starting an available intake cooling water pump will NOT overload an EDG, THEN start available intake cooling water pump(s) as follows: a) IF offsite power is NOT available AND diesel generator load is greater than 2250 KW, THEN shed smaller loads until diesel generator load is less than 2250 KW. b) Start available intake cooling water pump(s). c) Restart any loads which were shed to allow intake cooling water pump start.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 7 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
		3. IF leakage is found, THEN perform the following: a) Isolate affected portion of intake cooling water system. b) Start intake cooling water pumps and align valves as necessary to establish at least one operable intake cooling water header.
	BOP	Step 6 Verify Intake Cooling Water Header Pressure - LESS THAN OR EQUAL TO 35 PSIG • PI-3-1619 • PI-3-1620 Perform the following: a. Dispatch operator to investigate for intake cooling water system blockage. b. IF blockage is found, THEN align valves and start intake cooling water pumps as necessary to establish at least one operable intake cooling water header.
		CAUTIONS ***If POV-3-4882 or POV-3-4883 must be locally opened using the handwheel, then the Technical Specification 72-hour action statement for an inoperable ICW header is required to be entered.***
	BOP	Step 7 Verify proper intake cooling water lineup to turbine plant cooling water heat exchangers: a. Check Safety Injection on Unit 3 – terminated b. Verify both ICW to TPCW Heat Exchanger valves – open ▪ POV -3-4882 ▪ POV-3-4883

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 8 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
		CAUTIONS ***If not corrected promptly, reduced intake cooling water flow to the Turbine Plant Cooling Water Heat Exchangers may result in damage to vital plant equipment.***
	BP	Step 8 Verify Cooling To Turbine Plant Cooling Water Heat Exchangers: a. Check alarm I 5/4, TPCW HI TEMP/LO PRESS - OFF b. Locally check Turbine Plant Cooling Water Supply Header Temperature, TI-3-1432 - LESS THAN 110°F c. Locally check Turbine Plant Cooling Water Supply Header Temperature, TI-3-1432 - STABLE OR DECREASING Direct operator to locally perform the following: 1. IF flow was not reduced due to high ICW Pump flow, THEN open TPCW HX Outlet Combined ICW Isolation Valve 3-50-401 as necessary to maintain Turbine Plant Cooling Water Supply Header Temperature less than 110°F AND maintaining required minimum ICW flow through the CCW HXs. 2. Verify proper heat exchanger alignment.
		CAUTIONS ***If not corrected promptly, reduced intake cooling water flow to the Component Cooling Water Heat Exchangers may result in damage to vital plant equipment.***
	RO	Step 9 Verify Cooling To Component Cooling Water Heat Exchangers a. Check alarm H 8/5, CCW HX OUTLET HI TEMP - OFF Direct operator to locally perform the following: 1. Verify proper heat exchanger alignment.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 9 of 11

Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
		b. Check Component Cooling Water Supply Header Temperatures - LESS THAN 120°F • TI-3-607A • TI-3-607B 2. IF basket strainer differential pressure is greater than 1.5 psid, THEN refer to 3-OP-019, Section 7.0, for backwashing instructions c. Check Component Cooling Water Supply Header Temperatures - STABLE OR DECREASING • TI-3-607A • TI-3-607B d. Check basket strainer differential pressure - LESS THAN 1.5 PSID • dPI-3-1400 • dPI-3-1401 • dPI-3-1402 • dPI-3-1403
	BOP	Step 10 Maintain Cooling For Turbine Plant Cooling Water Heat Exchangers: a. Check alarm I 5/4, TPCW HI TEMP/LO PRESS-OFF b. Locally check Turbine Plant Cooling Water Supply Header Temperature, TI-3-1432 - LESS THAN 110°F c. Locally check Turbine Plant Cooling Water Supply Header Temperature, TI-3-1432 - STABLE OR DECREASING Perform the following: 1. Remove reactive load from main generator. 2. Decrease turbine load as necessary to maintain Turbine Plant Cooling Water Supply Header Temperature less than 110°F.

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Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
		3. IF any component cooled by turbine plant cooling water is overheating, THEN restore cooling to component using 3-ONOP-008, TURBINE PLANT COOLING WATER MALFUNCTION, while continuing with this procedure.
	RO	Step 11 Maintain Cooling For Component Cooling Water Heat Exchangers: a. Check alarm H 8/5, CCW HX OUTLET HI TEMP-OFF b. Check Component Cooling Water Supply Header Temperatures - LESS THAN 120°F • TI-3-607A • TI-3-607B IF component cooling water temperature can NOT be maintained, THEN restore component cooling water temperatures using 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION while continuing with this procedure. c. Check Component Cooling Water Supply Header Temperatures - STABLE OR DECREASING • TI-3-607A • TI-3-607B
	US	Step 12 Verify Current Plant Alignment Meets Technical Specification Requirements
	US	Step 13 Return To Procedure AND Step In Effect

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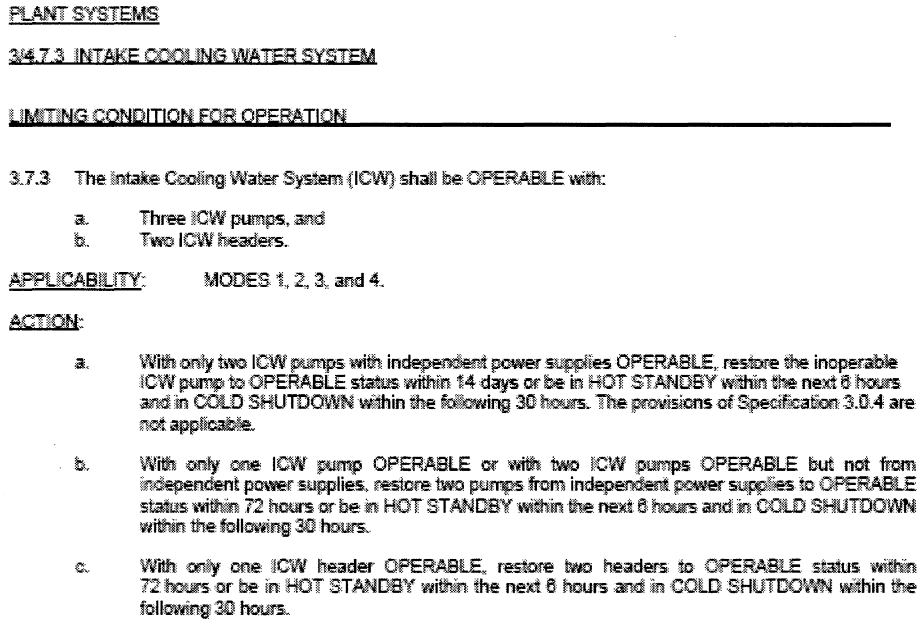
Event Description: The 3B Intake Cooling Water (ICW) pump experiences a sheared shaft. The crew responds per 3-ONOP-019.

Time	Position	Applicant's Actions or Behavior
	US	TS 3.7.3.b applies
	→	 PLANT SYSTEMS 3/4.7.3 INTAKE COOLING WATER SYSTEM LIMITING CONDITION FOR OPERATION 3.7.3 The Intake Cooling Water System (ICW) shall be OPERABLE with: a. Three ICW pumps, and b. Two ICW headers. APPLICABILITY: MODES 1, 2, 3, and 4. ACTION: a. With only two ICW pumps with independent power supplies OPERABLE, restore the inoperable ICW pump to OPERABLE status within 14 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable. b. With only one ICW pump OPERABLE or with two ICW pumps OPERABLE but not from independent power supplies, restore two pumps from independent power supplies to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. c. With only one ICW header OPERABLE, restore two headers to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>US</td><td>Receives call from the Operations Manager determines both RV-1400 and RV-1401 are associated with the 3A S/G and refers to T.S. 3.7.1.1.b

Evaluator Note: determines with 2 code safeties OOS on one S/G, a power reduction to < 33% is required. T.S. 3.7.1.1 included next for reference.</td></tr>
<tr><td></td><td></td><td>3.7.1.1 All main steam line Code safety valves associated with each steam generator shall be OPERABLE with lift settings as specified in Table 3.7-2.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With (3) reactor coolant loops and associated steam generators in operation and with one or more main steam line Code safety valves inoperable, and

a. in MODES 1 and 2, with a positive Moderator Temperature Coefficient, operation may continue provided that, within 4 hours, either the inoperable valve(s) are restored to OPERABLE status or the Power Range Neutron Flux High Trip Setpoint is reduced to the maximum allowable percent of RATED THERMAL POWER listed In Table 3.7-1; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 12 hours, or

b. in MODES 1 and 2, with a negative or zero Moderator Temperature Coefficient; or in Mode 3, with a positive, negative or zero Moderator Temperature Coefficient, operation may continue provided that, within 4 hours, either the inoperable valve(s) are restored to OPERABLE status or reactor power is reduced to less than or equal to the maximum allowable percent of RATED THERMAL POWER listed in Table 3.7-1; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 12 hours.</td></tr>
<tr><td></td><td></td><td>TABLE 3.7-1

MAXIMUM ALLOWABLE POWER LEVEL WITH INOPERABLE STEAM LINE SAFETY VALVES DURING THREE LOOP OPERATION

<table><tr><th>MAXIMUM NUMBER OF INOPERABLE SAFETY VALVES ON ANY OPERATING STEAM GENERATOR</th><th>MAXIMUM ALLOWABLE POWER LEVEL (PERCENT OF RATED THERMAL POWER)</th></tr><tr><td>1</td><td>53</td></tr><tr><td>2</td><td>33</td></tr><tr><td>3</td><td>14</td></tr></table></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 2 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td></td><td>TABLE 3.7-2
STEAM LINE SAFETY VALVES PER LOOP
<table>
<tr><th></th><th colspan="3">VALVE NUMBER</th><th>LIFT SETTING (±3%)* **</th><th>ORIFICE SIZE SQUARE INCHES</th></tr>
<tr><th></th><th>Loop A</th><th>Loop B</th><th>Loop C</th><th></th><th></th></tr>
<tr><td>1.</td><td>RV1400</td><td>RV1405</td><td>RV1410</td><td>1085 psig</td><td>16</td></tr>
<tr><td>2.</td><td>RV1401</td><td>RV1406</td><td>RV1411</td><td>1100 psig</td><td>16</td></tr>
<tr><td>3.</td><td>RV1402</td><td>RV1407</td><td>RV1412</td><td>1115 psig</td><td>16</td></tr>
<tr><td>4.</td><td>RV1403</td><td>RV1408</td><td>RV1413</td><td>1130 psig</td><td>16</td></tr>
</table></td></tr>
<tr><td></td><td></td><td>*The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.
**All valves tested must have "as left" lift setpoints that are within ±1% of the lift setting value listed in Table 3.7-2.</td></tr>
<tr><td></td><td>US</td><td>Directs response per 3-ONOP-100</td></tr>
<tr><td></td><td>US</td><td>Step
1 Brief Control Room Personnel Using Attachment 3</td></tr>
<tr><td></td><td></td><td>*Evaluator Note: A 2%/min rate should be used as directed by the Operations Manager. 9 gallons per % should be used for the boron calculation to determine 180 gallons required at a rate of 18 gallons per minute. The remainder of attachment 3 will be reviewed with the crew. Attachment 3 included next for reference.*</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 3 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior

ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction T.S 3.7.1.1.b

2. Target power level 30 % Power

Time to Shutdown from 100%	25 min	50 min	75 min	110 min
Load Reduction Rate MW/min	30 MW/min	15 MW/min	10 MW/min	7 MW/min
Load Reduction Rate %/min	4 % / min	2 % / min	1.33 % / min	1 % / min
Expected Tavg/Tref ΔT	4 °F	3 °F	2 °F	1 °F

3. Load reduction rate 15 Mw / minute

NOTES

- *Suggested boration is 9 gallons per % with control rods completely withdrawn and available, 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).*
- *The Unit Supervisor may change the boration as desired during the load reduction.*

4. Boration Rate: 180 total gallons / 10 minutes = 18 gallons/minute.

5. Plant Control Parameters and Contingency Actions
   - Tavg / Tref expected ΔT band, not to exceed ±1 °F of expected, slow ramp to restore band.
   - If Annunciator B 8/1, ROD BANK LO LIMIT alarms, the load reduction shall be slowed.

6. EOP E-0 transition criteria – Manual reactor and turbine trip:
   - Tave > 578 °F
   - Tave 6 °F > Tref
   - Rod Insertion Limits (RIL) are exceeded

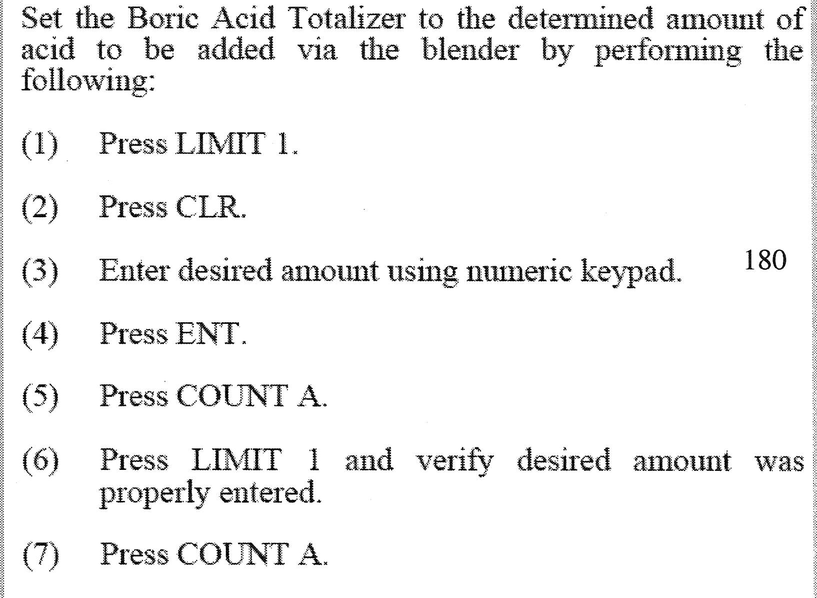
7. Review required actions from other procedures currently in effect (example, stop RCP).

8. Questions or crew input?

9. End of Brief

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 4 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior
	RO	Step 2 Begin Boration — IF boration is not required, THEN go to Step 3. a. Set the Boric Acid Totalizer to value determined using Attachment 3 b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0 c. Place the Reactor Makeup Selector Switch to BORATE d. Place the RCS Makeup Control Switch to START
		Evaluator Note: Step 2.a , boric acid totalizer is set as follows:  Set the Boric Acid Totalizer to the determined amount of acid to be added via the blender by performing the following: (1) Press LIMIT 1. (2) Press CLR. (3) Enter desired amount using numeric keypad. 180 (4) Press ENT. (5) Press COUNT A. (6) Press LIMIT 1 and verify desired amount was properly entered. (7) Press COUNT A.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 5 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 3 Notify The Following • System Dispatcher • Plant personnel using the Page Boost
	RO / BOP	Step 4 Reduce Unit Load a. Check for boration effects (reducing Tavg) — a. IF boration is used, THEN wait for effects before starting load reduction. b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate c. Initiate and maintain load reduction rate to the target power level d. Monitor load reduction and auto rod control to ensure that the expected Tavg/Tref ΔT identified in Attachment 3 is maintained — d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.
		Evaluator Note: After a 5 to 10 % reduction in load go event 5
	RO	Step 5 Monitor Annunciator B 8/1, ROD BANK LO LIMIT – RESET — Perform the following: a. Slow load reduction until alarm is reset. b. Re-evaluate boration amount and rate and make adjustments as necessary.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 6 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior
	US	Step 6 Notify The Shift Manager To Refer To The Following Procedures • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS
		Evaluator Note: Respond as SM to refer to procedures if directed
		NOTE *Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space.*
	RO / BOP	Step 7 Check Plant Response a. Check pressurizer level following program a. IF directed by the Unit Supervisor, THEN increase charging flow as follows: 1) Throttle open TCV-144, NRHX Temp Control Valve, bypass valve 3-834 to raise flow to approximately 600 gpm. 2) Start an additional charging pump. 3) Place an additional letdown orifice in service. b. Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3 b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 7 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior
	RO	Step 8 Energize Pressurizer Backup Heaters
		Evaluator Note: step 9 does not apply, only one feed pump running.
		NOTE *Boration should be stopped above the target power level to prevent excessive boration*
	RO	Step 10 Monitor Turbine Load Within 10% Of Target Power Level Stop the boration as follows: — Go to Step 11. a. Place the Reactor Makeup Selector Switch to AUTO b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired c. Place the RCS Makeup Control Switch to START
		Evaluator Note: Should place reactor makeup switch in STOP due to LT-3-115 failure.
	BOP	Step 11 Check Target Load – LESS THAN 450 Mwe
	BOP	Step 12 Check Station Service Loads Supplied From The Startup Transformer — WHEN directed by the Unit Supervisor, THEN transfer station service from the Auxiliary Transformers to the Startup Transformer using Attachment 2.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 8 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 13 Check Auxiliary Steam Supplied From Another Unit — WHEN directed by the Unit Supervisor, THEN align auxiliary steam supply from another unit using Attachment 1.
		NOTES • *Boration should be stopped above the target power level to prevent excessive boration, or at ≥ 25% power if the unit is to be taken off line.* • *Remaining procedure steps should be taken as appropriate for the intended power level.*
	BOP	Step 14 Continue Load Reduction a. Verify Turbine load less than – 450 MWE • Stop one heater drain pump b. Verify Turbine load less than – 400 MWE 1) Place the Feedwater Pump Turbine Runback Defeat switch to DEFEAT 2) Stop the SGFP with recirculation valves open 3) Place SGFP recirculation valves control switch in the CLOSED/AUTO position c. Verify Turbine load less than – 300 MWE • Stop the remaining heater drain pump d. Verify Turbine load less than – 275 MWE • Stop one Condensate Pump e. Verify Turbine load less than – 200 MWE • Place the running SGFP recirculation valves control switch in the OPEN position
		Evaluator Note: may secure 3A heater drain pump and 3B condensate pump

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 9 of 9

Event Description: RV-1400 and RV-1401, main steam code safety valves reported inoperable, requiring the crew to reduce power to below 33% to comply with TS. 3.7.1.1. The crew will use 3-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior
		f. Verify Turbine load less than – 150 MWE 1) Place Turbine Drain Valves control switch to the OPEN position 2) Align Steam Generator Blowdown Recovery System to atmosphere as follows: a) Place Control Switch HIS-3-6267A in the OPEN position. b) Place Control Switch HIS-3-6267B in the CLOSED position.
		Evaluator Note: Event 4 is terminated with the initiation of event 5 following 5-10% load change.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 1 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	US	Directs response per 3-EOP-E-0
	RO	Step 1(IOA) -Verify Reactor Trip • Rod bottom lights – ON • Reactor trip and bypass breakers –OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING Evaluator Note: One AFW pp in train 2 should be secured in <60min
	BOP	Step 2 (IOA)Verify Turbine Trip a. All turbine stop or associated control valves – CLOSED a. Manually trip turbine. IF unable to verify turbine trip, THEN close main steamline isolation and bypass valves. b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs b. Manually close valves. IF any valve can NOT be closed, THEN close main steamline isolation and bypass valves. • Reheater Timing Valves • MSR Purge Steam Valves c. Check Mid and East GCBs – OPEN (Normally 30 second delay) c. Manually open breakers. IF breakers do NOT open, THEN actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 2 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 3 (IOA)Verify Power To Emergency 4 KV Buses a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED a. Perform the following: 1) Attempt to emergency start any Unit 3 available diesel generator. 2) IF neither 3A nor 3B 4 KV bus is energized, THEN go to3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1.
		Evaluator Note: Emergency start will be unsuccessful A EDG is locked out, B EDG breaker will not close. transition to 3-EOP-ECA-0.0
	US	Directs response per 3-EOP-ECA-0.0
		NOTE • *Steps 1 and 2 are IMMEDIATE ACTION steps.* • *CSF Status Trees are required to be monitored for information only. FRPs shall NOT be implemented.*
	RO	Step 1(IOA) -Verify Reactor Trip • Rod bottom lights – ON • Reactor trip and bypass breakers –OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 3 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 2 Verify Turbine Trip	
		a. All turbine stop valves - CLOSED	a. Manually trip turbine. IF turbine will NOT trip, THEN close main steamline isolation and bypass valves.
		b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves	b. Manually close valves. IF any valve can NOT be closed, THEN close main steam isolation and bypass valves.
		c. Mid and East GCBs - OPEN (Normally 30 seconds delay)	c. WHEN approximately one minute has elapsed, THEN verify Mid and East GCBs – OPEN. 1) IF breakers do NOT open, THEN actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s). 2) IF breaker position indication is NOT available AND turbine speed is NOT decreasing, THEN direct Turbine Operator to perform the following: a) Obtain key 17 from Shift Manager key locker. b) Locally trip Mid and East GCBs from the switchyard. • 8W33 • 8W68
		Evaluator Note: MSIVs may be closed in step 2.b.	

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 4 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Step 3 Check If RCS Is Isolated a. PRZ PORVs – CLOSED — a. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. b. Letdown isolation valves - CLOSED — b. Manually close valves. c. Excess letdown isolation valves – CLOSED — c. Manually close valves. • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller
		Evaluator Note: RO will manually close CV-200A and B and CV-460 to isolate letdown
	BOP	Step 4 Verify Proper AFW Flow a. Check AFW pumps - AT LEAST TWO RUNNING — a. IF both units require AFW, THEN perform the following: 1) Establish 270 gpm flow to each unit. 2) Use a setpoint of 270 gpm for required AFW flow instead of the 345 gpm specified in subsequent steps AND procedures.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 5 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		b. Verify total AFW flow – GREATER THAN 345 GPM b. Perform the following: 1) Verify AFW pump running. IF AFW pump NOT running, THEN manually open steam supply valves. 2) Verify proper alignment of AFW valves. IF alignment NOT proper, THEN manually align valves as necessary to establish proper lineup. 3) IF AFW can NOT be established, THEN restore AFW using 3-ONOP-075, AUXILIARY FEEDWATER SYSTEM MALFUNCTION, while continuing with Step 5.
		Evaluator Note: Tripping AFW pump B or C within 60 minutes of initial start following a loss of main feedwater when both pumps are running on AFW train 2 is required.
		CAUTIONS • *If SI has been reset or SI actuation occurs on the other unit, safeguards equipment needs to be restored to the required configuration.* • *If an SI signal exists or is actuated during this procedure, it must be reset to ensure restoration of a power source and to ensure controlled loading of equipment on the 4KV Bus.*

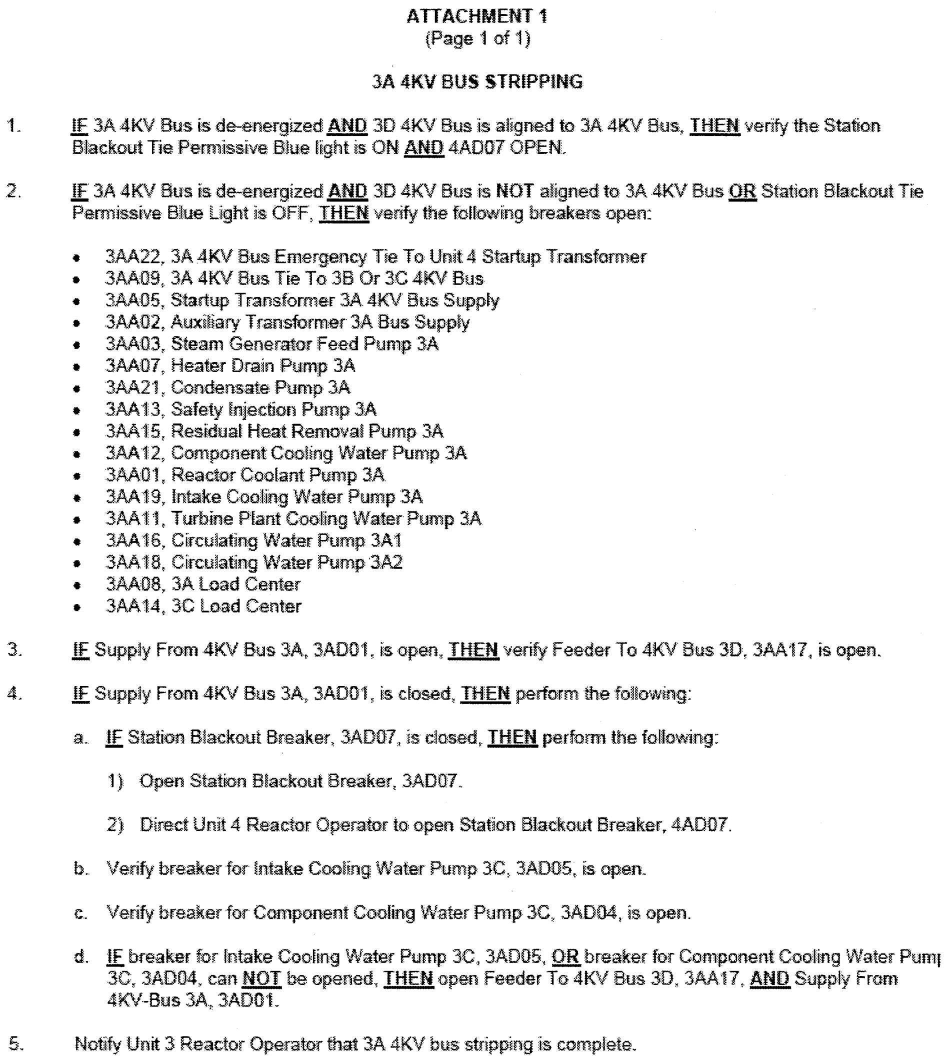
Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 6 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
		NOTES • *Attachment 5 provides a reference for Emergency Diesel Generator loads.* • *If a Sequencer failure has occurred and SI has actuated, the associated EDG output breaker may not close unless SI is reset.*	
	BOP	Step 5 Verify 4KV Bus Stripping	
		a. Verify 4KV bus stripping using ATTACHMENTS 1 and 2	
		b. Verify SI - RESET	
		c. Check the A and B 4KV buses - AT LEAST ONE ENERGIZED	c. Go to Step 6.
		d. Verify required safeguards equipment - OPERATING	d. Manually start equipment as required.
		e. Check if 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES being monitored FOR INFORMATION ONLY prior to entering 3-EOP-ECA-0.0, LOSS OF ALL AC POWER	e. Implement FRPs as required, unless this procedure was directly entered from outside the EOP network.
		f. Return to procedure AND step in effect	
		Evaluator Note: BOP uses attachments 1 and 2 to verify bus stripping then transitions to step 6 from 5.c RNO. Attachments 1 and 2 listed next.	

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 7 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	 **ATTACHMENT 1** (Page 1 of 1) **3A 4KV BUS STRIPPING** 1. <u>IF</u> 3A 4KV Bus is de-energized **<u>AND</u>** 3D 4KV Bus is aligned to 3A 4KV Bus, **<u>THEN</u>** verify the Station Blackout Tie Permissive Blue light is ON **<u>AND</u>** 4AD07 OPEN. 2. <u>IF</u> 3A 4KV Bus is de-energized **<u>AND</u>** 3D 4KV Bus is **NOT** aligned to 3A 4KV Bus **<u>OR</u>** Station Blackout Tie Permissive Blue Light is OFF, **<u>THEN</u>** verify the following breakers open: • 3AA22, 3A 4KV Bus Emergency Tie To Unit 4 Startup Transformer • 3AA09, 3A 4KV Bus Tie To 3B Or 3C 4KV Bus • 3AA05, Startup Transformer 3A 4KV Bus Supply • 3AA02, Auxiliary Transformer 3A Bus Supply • 3AA03, Steam Generator Feed Pump 3A • 3AA07, Heater Drain Pump 3A • 3AA21, Condensate Pump 3A • 3AA13, Safety Injection Pump 3A • 3AA15, Residual Heat Removal Pump 3A • 3AA12, Component Cooling Water Pump 3A • 3AA01, Reactor Coolant Pump 3A • 3AA19, Intake Cooling Water Pump 3A • 3AA11, Turbine Plant Cooling Water Pump 3A • 3AA16, Circulating Water Pump 3A1 • 3AA18, Circulating Water Pump 3A2 • 3AA08, 3A Load Center • 3AA14, 3C Load Center 3. <u>IF</u> Supply From 4KV Bus 3A, 3AD01, is open, **<u>THEN</u>** verify Feeder To 4KV Bus 3D, 3AA17, is open. 4. <u>IF</u> Supply From 4KV Bus 3A, 3AD01, is closed, **<u>THEN</u>** perform the following: a. <u>IF</u> Station Blackout Breaker, 3AD07, is closed, **<u>THEN</u>** perform the following: 1) Open Station Blackout Breaker, 3AD07. 2) Direct Unit 4 Reactor Operator to open Station Blackout Breaker, 4AD07. b. Verify breaker for Intake Cooling Water Pump 3C, 3AD05, is open. c. Verify breaker for Component Cooling Water Pump 3C, 3AD04, is open. d. <u>IF</u> breaker for Intake Cooling Water Pump 3C, 3AD05, **<u>OR</u>** breaker for Component Cooling Water Pum 3C, 3AD04, can **<u>NOT</u>** be opened, **<u>THEN</u>** open Feeder To 4KV Bus 3D, 3AA17, **<u>AND</u>** Supply From 4KV-Bus 3A, 3AD01. 5. Notify Unit 3 Reactor Operator that 3A 4KV bus stripping is complete.
		Evaluator Note: BOP will perform the verifications of step 2 and 3 then notify RO 3A 4KV bus stripping is complete.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>BOP</td><td>

ATTACHMENT 2
(Page 1 of 1)

3B 4KV BUS STRIPPING

1. **IF** 3B 4KV Bus is de-energized **AND** 3D 4KV Bus is aligned to 3B 4KV Bus, **THEN** verify the Station Blackout Tie Permissive Blue light is ON **AND** 4AD07 OPEN.

2. **IF** 3B 4KV Bus is de-energized **AND** 3D 4KV Bus is **NOT** aligned to 3B 4KV Bus **OR** Station Blackout Tie Permissive Blue Light is OFF, **THEN** verify the following breakers open:

- 3AB22, 3B 4KV Bus Tie To 3A Or 3C 4KV Bus
- 3AB05, Startup Transformer 3B 4KV Bus Supply
- 3AB02, Auxiliary Transformer 3B Bus Supply
- 3AB10, Heater Drain Pump 3B
- 3AB21, Condensate Pump 3B
- 3AB12, Safety Injection Pump 3B
- 3AB15, Residual Heat Removal Pump 3B
- 3AB13, Component Cooling Water Pump 3B
- 3AB01, Reactor Coolant Pump 3B
- 3AB06, Reactor Coolant Pump 3C
- 3AB17, Intake Cooling Water Pump 3B
- 3AB11, Turbine Plant Cooling Water Pump 3B
- 3AB16, Circulating Water Pump 3B1
- 3AB18, Circulating Water Pump 3B2
- 3AB09, 3B Load Center
- 3AB14, 3D Load Center

3. **IF** Supply From 4KV Bus 3B, 3AD06, is open, **THEN** verify Feeder To 4KV Bus 3D, 3AB19, is open.

4. **IF** Supply From 4KV Bus 3B, 3AD06, is closed, **THEN** perform the following:

   a. **IF** Station Blackout Breaker, 3AD07, is closed, **THEN** perform the following:

      1) Open Station Blackout Breaker, 3AD07.

      2) Direct Unit 4 Reactor Operator to open Station Blackout Breaker, 4AD07.

   b. Verify breaker for Intake Cooling Water Pump 3C, 3AD05, is open.

   c. Verify breaker for Component Cooling Water Pump 3C, 3AD04, is open.

   d. **IF** breaker for Intake Cooling Water Pump 3C, 3AD05, **OR** breaker for Component Cooling Water Pump 3C, 3AD05, can **NOT** be opened, **THEN** open Feeder To 4KV Bus 3D, 3AB19, **AND** Supply From 4KV-Bus 3B, 3AD06.

5. Notify Unit 3 Reactor Operator that 3B 4KV bus stripping is complete.

</td></tr>
<tr><td></td><td></td><td>*Evaluator Note: BOP will perform the verifications of steps 1 and 3 then notify RO 3A 4KV bus stripping is complete.*</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 6 Verify The A And B 4KV Bus Lockout Relays – RESET Perform the following: a. Reset lockout relay(s). b. IF neither lockout relay can be reset, THEN go to Step 10.
		Evaluator Note: 3B EDG lockout relay is rest
	BOP	Step 7 Verify 3A And 3B Emergency Diesel Generator Lockout Relays - RESET Perform the following: a. Locally reset affected emergency diesel start failure relay by depressing the alarm reset pushbutton. b. Reset affected emergency diesel lockout relay. c. IF neither lockout relay can be reset, THEN go to Step 10.
		Evaluator Note: 3A EDG lockout relay will not reset, NSO will be set to attempt local reset but will not reset.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 8 Try To Reenergize The A 4KV Bus From 3A Emergency Diesel Generator a. Manually start 3A emergency diesel generator from Control Room — a. Go to Step 9. * Emergency start OR * Rapid start OR * Normal start b. Verify 3A 4KV bus stripping from ATTACHMENT 1 - COMPLETED — b. IF any load can NOT be disconnected from 3A 4KV bus, THEN go to Step 9. c. Verify SI – RESET d. Manually synchronize 3A emergency diesel generator to 3A 4KV bus — d. Locally synchronize 3A emergency diesel generator to 3A 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE, while continuing with Step 9.
		Evaluator Note: 8.a RNO transitions to step 9.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 9 Try To Reenergize The B 4KV Bus From 3B Emergency Diesel Generator a. Manually start 3B emergency diesel generator from Control Room * Emergency start OR * Rapid start OR * Normal start a. Go to Step 10. b. Verify 3B 4KV bus stripping from ATTACHMENT 2 - COMPLETED b. IF any load can NOT be disconnected from 3B 4KV bus, THEN go to Step 10. c. Verify SI - RESET d. Manually synchronize 3B emergency diesel generator to 3B 4KV bus d. Locally synchronize 3B emergency diesel generator to 3B 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE, while continuing with Step 10.
		Evaluator Note: 3B EDG breaker will not close from the console and operator will be sent to the EDG to try locally. Operator will report back breaker will not close locally after 13 minutes.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior		
	BOP	Step		
		10	Check If AC Power Has Been Restored	
			a. Check the 3A and 3B 4KV buses - AT LEAST ONE ENERGIZED	a. Perform the following:
				1) Restore AC power using the following procedures: • 3-ONOP-004.2, LOSS OF 3A 4KV BUS • 3-ONOP-004.3, LOSS OF 3B 4KV BUS
				2) WHEN power is restored to the 3A or 3B 4KV bus, THEN observe the CAUTIONS prior to Step 32 and go to Step 32 to perform recovery actions.
				3) Observe CAUTION prior to Step 11 AND continue with Step 11.
			b. Verify required safeguards equipment – OPERATING	b. Manually start equipment as required.
			c. Check if 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES being monitored FOR INFORMATION ONLY prior to entering 3-EOP-ECA-0.0, LOSS OF ALL AC POWER	c. Implement FRPs as required, unless this procedure was directly entered from outside the EOP network.
			d. Return to procedure AND step in effect	

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		Evaluator Note: 3A 4KV bus should be reenergized per 3-ONOP-04.2 while 3B 4KV bus is being energized locally per 3-ONOP-023.2. 3-ONOP-04.2 is listed next, to continue with 3-EOP-ECA-0.0, skip to event 6 page 24 of 40.
	BOP	Continues per 3-ONOP-04.2
		CAUTION ***The CCW System load requirements of 3-OP-030, COMPONENT COOLING WATER SYSTEM, shall not be exceeded.*** **NOTES** • *If 0-ONOP-105, CONTROL ROOM EVACUATION, is in effect, this procedure shall NOT be used.* • *If emergency operating procedures are NOT in effect, the plant should be stabilized using 3-ONOP-004, LOSS OF OFFSITE POWER, while performing this procedure.* • *When 3A 4KV bus is supplying power to Unit 4 and offsite power to 3A 4KV bus is lost, 3A Emergency Diesel Generator output breaker will NOT close until the Station Blackout Breaker, 3AD07, has been manually opened.*
	BOP	Step 1 Verify Bus Stripping On 3A 4KV Bus a. Verify 3A 4KV bus stripping using ATTACHMENT 1 b. Check 3A 4KV bus - AUTOMATICALLY REENERGIZED — b. Observe CAUTION prior to Step 2 AND go to Step 2. c. Return to procedure and step in effect
		Evaluator Note: attachment 1 completed earlier

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		CAUTION ***Emergency Diesel Generators should NOT be run unloaded for more than 4.5 hours.***
	BOP	Step 2 Check 3A 4KV Bus Lockout Relay - RESET Perform the following: a. IF the 3A and 3B 4KV buses are both deenergized, THEN reset 3A 4KV bus lockout relay. b. IF 3B 4KV bus is energized, THEN perform the following: 1) Determine and correct cause of 3A 4KV bus lockout relay actuation. 2) WHEN cause of 3A 4KV bus lockout relay actuation is determined and corrected, THEN reset lockout relay. c. WHEN 3A 4KV bus lockout relay is reset, THEN observe CAUTION prior to Step 3 AND go to Step 3.
		CAUTION ***If an SI signal exists or is actuated while performing this procedure, it is required to be reset to ensure restoration of a power source and to ensure controlled loading of equipment on the 4KV bus.***

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 3 Verify SI Reset — Reset SI.
		CAUTION ***The affected EDG may Auto-Start when the Lockout Relay is reset in Step 4.***
	BOP	Step 4 Check 3A Emergency Diesel Lockout Relay - RESET — Perform the following: a. IF 3B 4KV bus is energized, THEN try to determine and correct cause of 3A Emergency Diesel Lockout Relay actuation. b. Locally reset 3A Emergency Diesel Start Failure Relay. c. IF the 3A and 3B 4KV buses are both deenergized, THEN reset 3A Emergency Diesel Lockout Relay. d. IF 3A Emergency Diesel Lockout Relay can NOT be reset, THEN observe NOTE prior to Step 6 AND go to Step 6.
		Evaluator Note: local relay and lockout reset already attempted will not reset, transition to step 6.
		NOTE *Verifying that SI is reset prior to closing Startup Transformer bus supply breakers should help to ensure the breakers will close.*

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior		
	BOP	Step		
		6	Try To Reenergize 3A 4KV Bus From Unit 3 Startup Transformer	
			a. Check Unit 3 Startup Transformer Potential White Light on VPA – ON	a. Observe CAUTION and NOTE prior to Step 7 AND go to Step 7.
			b. Check Unit 3 Startup Transformer Lockout Relay – RESET	b. Perform the following: 1) Try to restore offsite power to Unit 3 Startup Transformer using 3-ONOP-092.3, STARTUP TRANSFORMER MALFUNCTION. 2) Observe CAUTION and NOTE prior to Step 7 AND go to Step 7.
			c. Verify 3A 4KV bus stripping from ATTACHMENT 1 – COMPLETE	c. WHEN bus stripping is complete, THEN go to Step 6d.
			d. Verify SI – RESET	d. Reset SI.
			e. Place Startup Transformer Sync To 3A 4KV Bus 3AA05 to ON	
			f. Close Startup Transformer 3A 4KV Bus Supply, 3AA05	f. Locally close breaker.
			g. Place Startup Transformer Sync To 3A 4KV Bus 3AA05 to OFF AND remove handle	
			h. Check 3A 4KV bus – ENERGIZED	h. Observe CAUTION and NOTE prior to Step 7 AND go to Step 7.
			i. Go to Step 16	

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		CAUTION *Loading on the opposite unit startup transformer shall NOT exceed 600 amps.* **NOTE** *When Unit 3 startup transformer is available, offsite power to the 3A 4KV bus should be restored using 3-OP-004.1, SYSTEM RESTORATION FOLLOWING LOSS OF OFFSITE POWER.*
	BOP	Step 7 Try To Reenergize 3A 4KV Bus From Unit 4 Startup Transformer a. Check Unit 4 Startup Transformer Potential White Light on VPA - ON a. Observe CAUTION and NOTE prior to Step 8 AND go to Step 8.
	Critical Task	**CAUTION** *The Station Blackout Tie Line may be used only when both the 3A and 3B 4KV buses are deenergized.* **NOTE** *If the 3A and 3B 4KV buses are both deenergized because offsite power and Unit 3 Emergency Diesel Generators are NOT available, power needs to be restored to at least one of these 4KV buses within 10 minutes to satisfy station blackout requirements.*
		Evaluator Note: critical task: (TC-SBO Analysis) Failure to restore power to 4KV bus from the opposite unit via the SBO within 10 minutes after reading the caution in 3-ONOP-004.2. *Time starts from when the caution above is read and ends when 3AD07 breaker is closed to power the 3A 4KV bus.*

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 8 Determine If Station Blackout Tie Line May Be Used • Check 3B 4KV bus – DEENERGIZED • Check 4A and 4B 4KV buses – AT LEAST ONE ENERGIZED Perform the following: a. Determine if the Shift b. Manager wants to energize 3A 4KV bus from 3C 4KV bus using ATTACHMENT 2, while continuing with this procedure. Continue efforts to reenergize 3A 4KV bus from the following: * 3A Emergency Diesel using Steps 4 and 5. OR * Unit 3 Startup Transformer using Step 6. OR * Unit 4 Startup Transformer using Step 7. c. WHEN 3A 4KV bus is energized, THEN go to Step 16.
	BOP	Step 9 Check 3D 4KV Bus Lockout Relay - RESET Perform the following: a. Reset 3D 4KV bus lockout relay. b. IF 3D 4KV bus lockout relay can NOT be reset, THEN go to Step 15.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 10 Check 3D 4KV Bus - ALIGNED TO 3A 4KV BUS • Supply From 4KV Bus 3A, 3AD01 – CLOSED • Feeder To 4KV Bus 3D, 3AA17 – CLOSED Perform the following: a. Open Feeder To 4KV Bus 3D, 3AB19 b. Open Supply From 4KV Bus 3B, 3AD06 c. Close Supply From 4KV Bus 3A, 3AD01 d. Close Feeder To 4KV Bus 3D, 3AA17 e. IF 3D 4KV bus can NOT be aligned to 3A 4KV bus, THEN go to Step 15.
		Evaluator Note: realigns 3D 4KV bus power
	BOP	Step 11 Verify Station Blackout Permissive Blue Light For Station Blackout Breaker, 3AD07 – ON Perform the following: a. Open the following breakers: • 3AA02, Auxiliary Transformer 3A 4KV Bus Supply • 3AA05, Startup Transformer 3A 4KV Bus Supply • 3AA20, 3A Emergency Diesel To 3A 4KV Bus • 3AA22, 3A 4KV Bus Emergency Tie To Unit 4 Startup Transformer

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		• All load breakers on 3A and 3D 4KV buses b. IF station blackout permissive can NOT be satisfied, THEN go to Step 15.
	BOP	Step 12 Check 4D 4KV Bus – ENERGIZED Perform the following: a. Request Unit 4 RO to reenergize 4D 4KV bus using 4-ONOP-004.5, LOSS OF 4D 4KV BUS. b. IF 4D 4KV bus can NOT be energized, THEN go to Step 15.
		CAUTIONS • *When a station blackout condition exists, loading on each Unit 4 Emergency Diesel Generator shall be limited to 3095 KW.* • *If the Unit 4 4KV bus supplying power to the 4D 4KV bus is energized by an EDG AND Station Blackout Breaker 4AD07 is closed, non-running safeguards equipment on the bus supplying power should be placed in PULL-TO-LOCK or STOP to prevent autostart and possible overload of the EDG.*
		Evaluator Note: 4B 4KV bus is being powered from unit 4

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 13 Check 4KV Bus Supplying Power To 4D 4KV Bus - ENERGIZED BY OFFSITE POWER Perform the following: a. IF only one Unit 4 4KV bus is energized AND from an EDG, THEN perform one of the following: 1) Check that the Unit 4 RO has completed Step 2 of Attachment 2 of 4-EOP-ES-0.1. OR 2) Check that Unit 4 RO has completed Step 3 of Attachment 2 of 4-ONOP-004. b. IF the Unit 4 RO has not completed one of the above, THEN wait until complete AND go to Step 14. c. Have the Unit 4 RO place non-running safeguards equipment in PULL-TO-LOCK or STOP on the Unit 4 4KV bus supplying the 4D 4KV Bus. d. IF loads can NOT be reduced, THEN go to Step 15.
		CAUTION ***If offsite power to the Unit 4 4KV bus supplying power to the 4D 4KV Bus is lost after Station Blackout Breaker 4AD07 is closed, the associated EDG output breaker will NOT close until 4AD07 has been opened.***

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
Time bus restored	BOP **Critical Task**	Step 14 Try To Re-energize 3A 4KV Bus From Station Blackout Tie Line a. Close Station Blackout Breaker 3AD07 using keylock switch (Key Number 82) — a. Go to Step 15. b. Direct Unit 4 RO to close Station Blackout Breaker 4AD07 using keylock switch (Key Number 82)
	BOP	Step 15 Verify 3A 4KV bus energized *Evaluator Note: Reports to US 3A 4KV bus is energized.*
	BOP	Step 16 Verify SI - RESET
		CAUTION ***If this is the first bus restored following a loss of offsite power, Load Centers shall be reenergized as directed in the applicable Emergency Operating Procedures or in 3-ONOP-004, LOSS OF OFFSITE POWER.***
	BOP	Step 17 Locally verify no breaker targets exist on 3A 4KV bus breakers

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	US	Step 18 Verify 3A 4KV Bus Is The First Bus Energized — Go to Step 19. a. Go to procedure in effect to energize Load Centers • 3-ONOP-004, LOSS OF OFFSITE POWER • 3-EOP-ECA-0.0, LOSS OF ALL AC POWER
		Evaluator Note: BOP returns to 3-EOP-ECA-0.0

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		Evaluator Note: US continues in 3-EOP-ECA-0.0, WHEN power is restored to the 3A 4KV bus, Transition will be made to step 32 to perform recovery actions.
		CAUTION ***When power is restored to 3A or 3B 4KV bus, recovery actions should continue by observing CAUTIONS prior to Step 32 and then performing Step 32.***
	RO	Step 11 Place Non-Running Equipment Switches In PULL-TO-LOCK Or STOP As Follows • Unit 3 high-head SI pumps – PTL • Containment spray pumps – PTL • Emergency containment coolers – STOP • Emergency containment filter fans – STOP AND OPEN Breaker 30806, Emergency Containment Filter Fan 3B, on MCC 3D • RHR pumps – PTL • CCW pumps – PTL
		Evaluator Note: RO places all listed pumps and coolers / fans in pull to lock. Directs NSO to open breaker 30806 on MCC3D.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
	RO	Step	
		12 Check Status Of Unit 4 High Head SI Pumps	
		a. Check CCW supply for Unit 4 High Head SI Pumps - ALIGNED TO UNIT 3	a. Go to Step 12d.
		b. Place Unit 4 High Head SI Pumps in PULL-TO-LOCK	
		c. IF Unit 4 CCW System is in service, THEN have Unit 4 operator align CCW to Unit 4 High Head SI Pumps using 4-OP-030, COMPONENT COOLING WATER SYSTEM, Subsection 7.3	
		d. Check if SI required • Any SI actuation setpoint exceeded OR • RCS Subcooling based on CETs less than 30°F [210°F] OR • PRZ Level - can NOT be maintained greater than 17% [50%]	d. WHEN CCW is aligned to Unit 4 High Head SI Pumps, THEN place the Unit 4 High Head SI Pumps in Standby. Go to Step 13.
		e. WHEN CCW is aligned to Unit 4 High Head SI pumps, THEN verify MOV-3-843A OR MOV-3-843B open AND start the Unit 4 High Head SI Pumps as required	

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		Evaluator Note: CCW to unit 4 SI pumps is aligned to unit 4. *Evaluator Note: MOV-3-843A and MOV-3-843B were closed prior to power loss. Opening requires local action.*
	RO	Directs NSO to locally open MOV-3-843A or MOV-3-843B.
	RO **Critical Step**	**Step** **13 Locally Close Valves To Isolate RCP Seals** **• 3-297A, RCP A Seal Injection Manual Isolation Valve** **• 3-297B, RCP B Seal Injection Manual Isolation Valve** **• 3-297C, RCP C Seal Injection Manual Isolation Valve** **• MOV-3-381, RCP Seal Water Return And Excess Letdown Isolation Valve** **• MOV-3-626, RCP Seal Cooling Water Outlet Valve**
		Evaluator Note: critical step: (WOG) Failure to isolate RCP seal injection to the RCPs prior to starting a charging pump. (ECA-0.0, task H).
	RO	Step 14 Check S/G Status a. Main steamline isolation and bypass valves - CLOSED b. Main feedwater control and bypass valves - CLOSED c. S/G blowdown isolation valves – CLOSED Manually close valves. IF valves can NOT be manually closed, THEN locally close valves.
		CAUTIONS *A faulted or ruptured S/G that is isolated shall remain isolated.* *Steam supply to the AFW pumps must be maintained from at least one intact S/G.*

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 15 Check If S/Gs Are NOT Faulted a. Check pressures in all S/Gs • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	
		CAUTION *If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heat sink.*	
	RO	Step 16 Maintain Intact S/G Levels	
		a. Narrow range level – GREATER THAN 6%[32%]	a. Maintain maximum AFW flow until narrow range level greater than 6%[32%] in at least one S/G.
		b. Control AFW flow to maintain narrow range level between 15%[32%] and 50%	
		c. Narrow range level - LESS THAN 50%	c. Stop feed flow to any S/G with narrow range level greater than 50%. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to Step 19.

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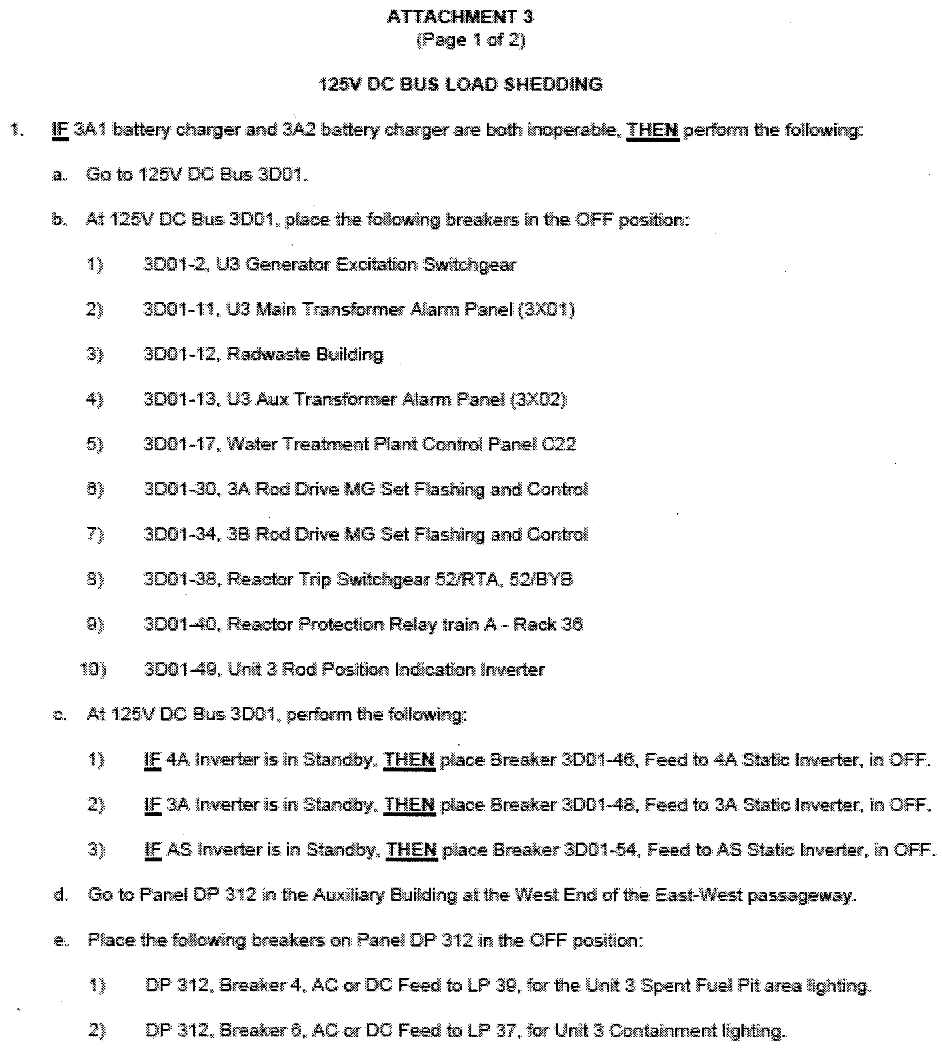
Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Step 17 Check If S/G Tubes Are NOT Ruptured — Go to Step 19. • Condenser air ejector radiation, R-15 - NORMAL • S/G blowdown radiation, R-19 - NORMAL • ERDADS or local DAM1 monitor readings - NORMAL • Local steamline radiation readings - NORMAL
	RO	Step 18 Go to step 24.
		CAUTION ***Step 1 of ATTACHMENT 3 is required to be performed within the first 60 minutes of a loss of all AC power event if both the 3A1 and 3A2 battery chargers are inoperable.***
	RO	Step 24 Check DC Bus Loads a. Direct operator to reduce DC bus loading as necessary using ATTACHMENT 3. b. Dispatch personnel to periodically monitor DC power supply voltage
		Evaluator Note: Attachment 3 listed next for reference. Only step 3 currently applies. No communication will be given back during scenario.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 29 of 42

Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		 **ATTACHMENT 3** (Page 1 of 2) **125V DC BUS LOAD SHEDDING** 1. IF 3A1 battery charger and 3A2 battery charger are both inoperable, **THEN** perform the following: a. Go to 125V DC Bus 3D01. b. At 125V DC Bus 3D01, place the following breakers in the OFF position: 1) 3D01-2, U3 Generator Excitation Switchgear 2) 3D01-11, U3 Main Transformer Alarm Panel (3X01) 3) 3D01-12, Radwaste Building 4) 3D01-13, U3 Aux Transformer Alarm Panel (3X02) 5) 3D01-17, Water Treatment Plant Control Panel C22 6) 3D01-30, 3A Rod Drive MG Set Flashing and Control 7) 3D01-34, 3B Rod Drive MG Set Flashing and Control 8) 3D01-38, Reactor Trip Switchgear 52/RTA, 52/BYB 9) 3D01-40, Reactor Protection Relay train A - Rack 36 10) 3D01-49, Unit 3 Rod Position Indication Inverter c. At 125V DC Bus 3D01, perform the following: 1) IF 4A Inverter is in Standby, **THEN** place Breaker 3D01-46, Feed to 4A Static Inverter, in OFF. 2) IF 3A Inverter is in Standby, **THEN** place Breaker 3D01-48, Feed to 3A Static Inverter, in OFF. 3) IF AS Inverter is in Standby, **THEN** place Breaker 3D01-54, Feed to AS Static Inverter, in OFF. d. Go to Panel DP 312 in the Auxiliary Building at the West End of the East-West passageway. e. Place the following breakers on Panel DP 312 in the OFF position: 1) DP 312, Breaker 4, AC or DC Feed to LP 39, for the Unit 3 Spent Fuel Pit area lighting. 2) DP 312, Breaker 6, AC or DC Feed to LP 37, for Unit 3 Containment lighting.

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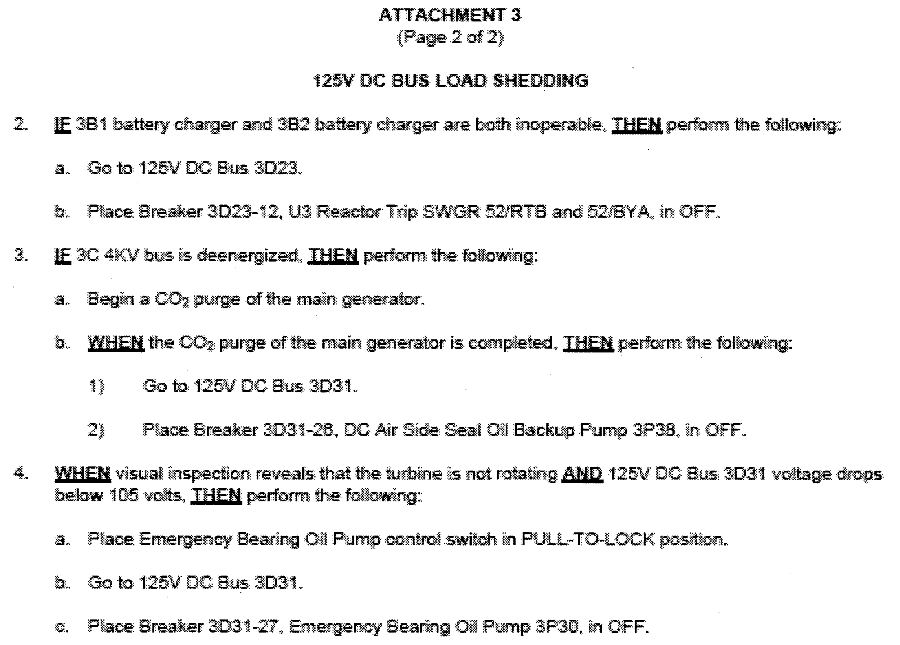
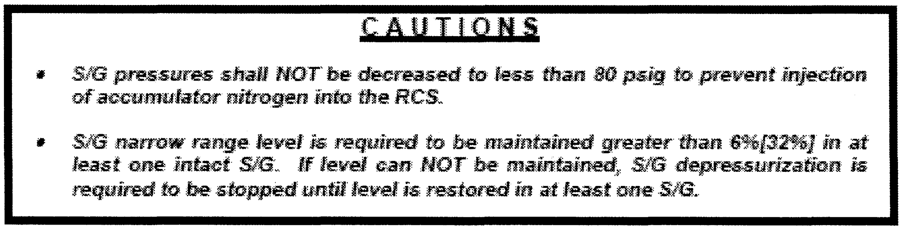
Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		 **ATTACHMENT 3** (Page 2 of 2) **125V DC BUS LOAD SHEDDING** 2. **IF** 3B1 battery charger and 3B2 battery charger are both inoperable, **THEN** perform the following: a. Go to 125V DC Bus 3D23. b. Place Breaker 3D23-12, U3 Reactor Trip SWGR 52/RTB and 52/BYA, in OFF. 3. **IF** 3C 4KV bus is deenergized, **THEN** perform the following: a. Begin a CO_2 purge of the main generator. b. **WHEN** the CO_2 purge of the main generator is completed, **THEN** perform the following: 1) Go to 125V DC Bus 3D31. 2) Place Breaker 3D31-28, DC Air Side Seal Oil Backup Pump 3P38, in OFF. 4. **WHEN** visual inspection reveals that the turbine is not rotating **AND** 125V DC Bus 3D31 voltage drops below 105 volts, **THEN** perform the following: a. Place Emergency Bearing Oil Pump control switch in PULL-TO-LOCK position. b. Go to 125V DC Bus 3D31. c. Place Breaker 3D31-27, Emergency Bearing Oil Pump 3P30, in OFF.
	RO	Step 25 Check CST Level - GREATER THAN 10% Add makeup to the CST from any available source using 3-OP-018.1, CONDENSATE STORAGE TANK, OR consult with the TSC for available methods for filling CST.
		 **CAUTIONS** • *S/G pressures shall NOT be decreased to less than 80 psig to prevent injection of accumulator nitrogen into the RCS.* • *S/G narrow range level is required to be maintained greater than 6%[32%] in at least one intact S/G. If level can NOT be maintained, S/G depressurization is required to be stopped until level is restored in at least one S/G.*

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
		NOTES - *S/Gs are required to be depressurized at maximum rate to minimize RCS inventory loss.* - *Although PZR level may be lost and reactor vessel upper head voiding may occur due to depressurization of SGs, depressurization shall NOT be stopped to prevent this.*	
	RO	Step 26 Depressurize All Intact S/Gs To 180 Psig	
		a. Check S/G narrow range levels - GREATER THAN 6%[32%] IN AT LEAST ONE S/G	a. Perform the following: 1) Maintain maximum AFW flow until narrow range level greater than 6%[32%] in at least one S/G. 2) WHEN narrow range level greater than 6%[32%] in at least one S/G, THEN do Steps 26b, 26c, 26d and 26e. Continue with Step 27.
		b. Manually dump steam at maximum rate using S/G steam dump to atmosphere valves	
		c. Check RCS cold leg temperatures - GREATER THAN 350°F	c. Perform the following: 1) Control S/G steam dump to atmosphere valves to stop S/G depressurization.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		d. Check S/G pressures - LESS THAN 180 PSIG d. 2) Go to Step 27. WHEN S/G pressures decreased to less than 180 psig, THEN manually control S/G steam dump to atmosphere to maintain S/G pressures at 180 psig. Continue with Step 27. e. Manually control S/G steam dump to atmosphere to maintain S/G pressures at 180 psig
	RO	Step 27 Check Reactor Subcritical Control S/G steam dump to atmosphere valves to stop S/G depressurization and allow RCS to heat up. • Intermediate range channels - ZERO OR NEGATIVE STARTUP RATE • Source range channels - ZERO OR NEGATIVE STARTUP RATE
		NOTE *Depressurization of S/Gs will result in SI actuation. SI is required to be reset to permit manual loading of equipment on 4KV buses.*
	RO	Step 28 Check SI Signal Status a. SI - HAS BEEN ACTUATED a. WHEN SI actuated, THEN do Steps 28b, 29, 30 and 31. Continue with Step 32. b. Verify SI - RESET

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 29 Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT	Perform the following: a. Manually actuate containment isolation phase A. b. IF any containment isolation phase A valve is NOT closed, THEN manually close valve. IF valve(s) can NOT be manually closed, THEN manually or locally isolate affected containment penetration.
	RO	Step 30 Verify Containment And Control Room Ventilation Isolation a. Unit 3 containment purge exhaust and supply fans - OFF b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT	a. Manually stop fans. b. Manually align equipment for Control Room emergency recirculation.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Step 31 Check Containment Pressure – HAS REMAINED LESS THAN 20 PSIG • PR-3-6306A • PR-3-6306B Perform the following: a. Verify containment isolation phase B- ACTUATED. b. Verify containment isolation phase B valve white lights on VPB - ALL BRIGHT. c. IF any containment isolation phase B valve is NOT closed, THEN manually close valve. IF valve(s) can NOT be manually closed THEN manually or locally isolate the affected containment penetration. d. Reset containment spray signal.
		CAUTIONS • *These cautions apply to AFW pump operation throughout all of the EOPs.* • *If two AFW pumps are operating on a single train, one of the pumps needs to be shut down within one hour of the initial start signal using 3-OP-075, AUXILIARY FEEDWATER SYSTEM, Subsection 6.2.* • *If two AFW trains are operating and one of the AFW pumps has been operating with an average flow of less than 60 gpm, the pump should be shut down within one hour of operating at less than 60 gpm using 3-OP-075, AUXILIARY FEEDWATER SYSTEM, Subsection 6.2.*
	RO	Step 32 Check Core Exit TCs - LESS THAN 1200°F IF core exit temperatures greater than 1200°F AND increasing, THEN go to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, Step 1.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 33 Check If 4KV Bus Power Is Restored a. Check 3A and 3B 4KV buses - AT LEAST ONE ENERGIZED FROM THE 3A OR 3B EDG a. IF the energized Unit 3 4KV bus is being fed from the Station Blackout Tie AND ONLY ONE Unit 4 4KV bus is energized AND from an EDG, THEN perform the following: 1) Stabilize S/G pressures by setting S/G steam dump to atmosphere valve controllers to maintain S/G pressures stable OR by manually controlling S/G steam dump to atmosphere valves to maintain stable S/G pressure. 2) Go to Attachment 4 of this procedure. Continue to control RCS conditions and monitor plant status: b. Check 3A and 3B 4KV buses - AT LEAST ONE ENERGIZED b. 1) Check status of local actions: • 4KV bus power restoration • RCP seal isolation • DC power supply

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		2) IF boric acid storage tank room temperature less than 55°F, THEN consult TSC staff for possible boric acid concentration reduction or drainage of the boric acid storage tanks. 3) IF spent fuel pit low level alarm is ON, THEN initiate makeup to the spent fuel pit using 3-ONOP-033.1, SPENT FUEL PIT (SFP) COOLING SYTEM MALFUNCTION. 4) Locally perform 0-ONOP-025.3, DC EQUIPMENT AND INVERTER ROOM SUPPLEMENTAL COOLING. 5) Observe CAUTION prior to Step 15 AND return to Step 15.
	BOP	Step 34 Stabilize S/G Pressures a. Set S/G steam dump to atmosphere valve controllers to maintain S/G pressures - STABLE a. Manually control S/G steam dump to atmosphere valve(s) to maintain stable S/G pressure.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
		CAUTIONS • *Steady state loading on each Unit 3 Emergency Diesel Generator shall NOT exceed 2500 KW. Load transients up to 2750 KW are acceptable when starting additional equipment.* • *Steady state loading on each Unit 4 Emergency Diesel Generator shall NOT exceed 2874 KW. Load transients up to 3162 KW are acceptable when starting additional equipment.*	
	BOP	Step 35 Verify The Following Equipment Loaded On Energized 4KV Buses a. 480 volt load centers b. Battery chargers c. Instrumentation and control d. Communications e. HVAC Equipment • Computer Room Chiller • Battery Room Air Conditioners * E16E (30609) * E16F (40625) f. One Auxiliary Building Exhaust Fan g. Spent Fuel Pit Exhaust Fan h. Spent Fuel Pit Cooling Water Pump i. Radiation Monitors • Unit 3 SFP SPING • Plant Vent SPING • SJAE SPING	a. Manually close load control center breakers to energize 480 volt load centers.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Step 36 Select Recovery Procedure a. Verify SI NOT required • RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F] • Check PRZ level – GREATER THAN 17%[50%] • Check SI - HAS NOT ACTUATED a. Go to 3-EOP-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1. b. Go to 3-EOP-ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Step 1
		Evaluator Note: transition is made to 3-EOP-ECA-0.2
	US	Directs response per 3-EOP-ECA-0.2
		CAUTION ***If SI is reset and either offsite power is lost or SI actuation occurs on the other unit, manual action may be required to restore safeguards equipment to the required configuration.*** NOTE *CSF status trees are required to be monitored for information only. FRPs shall NOT be implemented prior to completion of Step 15.*
	RO	Step 1 Verify SI reset

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 2 Check RWST Level - GREATER THAN 155,000 GALLONS	Perform the following: a. IF cold leg recirculation has previously been established, THEN verify cold leg recirculation lineup. Refer to 3-EOP-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION. b. IF cold leg recirculation has NOT been established, THEN go to 3-EOP-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION. c. Go to Step 3.
	RO	Step 3 Check SI Valve Amber Lights On VPB - ALL BRIGHT	Manually align valves to establish proper SI alignment.
		Step 4 Check RCP Thermal Barrier CCW Isolation Status	
		a. CCW pumps - ALL STOPPED	a. Observe CAUTION prior to Step 5 AND go to Step 5.
		b. RCP Thermal Barrier CCW Outlet, MOV-3-626 - CLOSED	b. Manually isolate CCW from RCP thermal barriers: • Close RCP Thermal barrier CCW Outlet, MOV-3-626. OR • Locally close CCW return manual isolation valve outside containment, 3-736.

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
		CAUTION ***Steady state loading on each Unit 3 emergency diesel generator shall NOT exceed 2500 KW. Load transients up to 2750 KW are acceptable when starting additional equipment.***
	BOP	Step 5 Manually Load Intake Cooling Water Pumps On Energized Buses a. Start two intake cooling water pumps b. Verify ICW To TPCW Heat Exchanger – ISOLATED • POV-3-4882 • POV-3-4883 b. Manually close valve(s). IF valve(s) can NOT be closed, THEN locally close the following valve(s): • 3-50-319 for POV-3-4882 • 3-50-339 for POV-3-4883 c. Check intake cooling water headers - TIED TOGETHER c. IF both intake cooling water headers are intact, THEN direct operator to tie headers together.
		Evaluator Note: starts A and C ICW pumps
		CAUTION ***CCW System load requirements of 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION, SHALL NOT be exceeded.***

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Step 6 Manually Load Component Cooling Water Pumps On Energized Buses a. CCW Heat Exchangers - THREE IN SERVICE — a. Perform the following: 1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP. 2) If only two CCW Heat Exchangers are in service and MOV-3-749A and MOV-3-749B are open, two CCW Pumps are required to be maintained in PULL-TO-LOCK. 3) Go to Step 6c. b. CW Pumps – ONLY TWO RUNNING — b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS. c. Check CCW headers – TIED TOGETHER — c. IF both CCW headers are intact, THEN direct operator to tie headers together.
		Evaluator Note: Starts A and C CCW pumps

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Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Step 7 Realign SI System a. Verify Unit 3 high-head SI pumps - TWO RUNNING a. Perform the following: 1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps. 2) Direct Unit 4 RCO to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure. 3) Go to Step 8. b. Stop both Unit 4 high-head SI pumps AND place in STANDBY
		Evaluator Note: Can not establish 2 HHSI pumps from unit 3, directs attachment 1 to be completed.

Take shift from crew to end scenario

NRC XXIV_NRC_SEN_1

OPERATIONS SHIFT TURNOVER REPORT

ONCOMING CREW ASSIGNMENTS

Shift Mgr:			**Inside SNPO:**	
Field Supv.:			**Outside SNPO:**	
Admin RCO:			**ANPO:**	
Unit 3			**Unit 4**	
Unit Supv.:			**Unit Supv.:**	
RCO:			**RCO:**	
NPO:			**NPO:**	

Plant Status

Unit 3			**Unit 4**	
Mode:	1		**Mode:**	1
Power:	50		**Power:**	100
MWe:	334		**MWe:**	758
Gross Leakrate:	.02		**Gross Leakrate:**	.02
RCS Boron Conc:	831		**RCS Boron Conc:**	120

Operational Concerns:

Maintaining 50% MOL at System request. Scheduled to return to 100% tomorrow.
3C charging pump is out of service for repairs. Due back in 14 hours.
Thunderstorms are in the area

U3 Anticipated LCO Actions:

U4 Anticipated LCO Actions:

Results of Offgoing Focus Area:

Maintain 50% MOL

Unit 3 Status

Reactor Operator

Mode:	1
Power:	50
MWe:	334
Tavg:	558.2
RCS Pressure:	2251
RCS Boron Conc:	831

RCS Leakrate	
Gross:	.02
Unidentified	.01
Charging Pps:	.01

Accumulator Ref Levels	
A	6614
B	6630
C	6620

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

Unit 3 Status

Changes to Risk Significant Equipment:

B train protected both units
Online risk is green

Upcoming Reactivity Management Activities:

Upcoming Major POD Activities:

Upcoming ECOs to Hang and /or Release:

Evolutions or Compensatory Actions in Progress:

General Information, Remarks, and Operator Work Around Status:

Aux. steam supply aligned from unit 3.
Condenser inleakage 0 scfm.

TP-2009-301 Scenario #2 Event Description

Facility: Turkey Point
Scenario No.: 2 mod
Op Test No.: 2009-301

Examiners: ______________________
____
____

Candidates: ______________________ US
______________________ RO
______________________ BOP

Initial Conditions: Mode 1, 100% MOL

Turnover: Equipment OOS: 3C charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. Thunder storms are in the area.

Maintain 100%

On line risk is green

B train protected

Event No.		Event Type*	Event Description
1	TFF1MACL=T	(I)BOP/SRO	LT-3-498 fails low opening 3C S/G feed regulating valve. BOP will take manual control of 3C S/G level. 3-ONOP-049.1 is used to remove the channel from service.
2	TFH1TV59 = T	(I)RO (C)BOP (TS,C)SRO	LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.
3	TVFCLK1 = 0.020000	(N)BOP (R)RO (C)SRO	The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.
4	TFS1MAML = T	(I)RO (TS,I)SRO	Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond per 3-ONOP-028 and then 3-ONOP-049.1 to address the failed channel.
5	TVHHSGC=0.003	(C)BOP (R)RO (TS,N)SRO	3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit.
6	TVSBVL15 = 0.2600 TVHHSGC = 3.0000 TFKC882A = T TFF5AFAF = T TFF5AFBF = T	(M)ALL	After load reduction determined, 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry. The crew will respond per 3-EOP-E-0, Reactor Trip or Safety Injection and transition to 3-EOP-E-2, Faulted Steam Generator Isolation to isolate the faulted steam generator. The steam generator rupture will be addressed per 3-EOP-E-3, Steam Generator Tube Rupture.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Turkey Point 2009-301 Scenario #2

Event 1 - LT-3-498 fails low opening 3C S/G feed regulating valve. BOP will take manual control of 3C S/G level. 3-ONOP-049.1 is used to remove the channel from service.

Event 2 – LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.

Event 3 - The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Event 4 – Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond per 3-ONOP-028 and then 3-ONOP-049.1 to address the failed channel.

Event 5 - 3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit.

Event 6 - After load reduction determined, 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Scenario XXIV NRC 2

Simulator Operating Instructions

Setup

Restore IC-1 (Mode 1 MOL)

Open & execute lesson file SRO_XXIV_NRC_2.lsn

Place simulator in run

Start 3B charging pump and secure 3C charging pump

Trigger lesson step: **SETUP – 3C Charging pump OOS.** Removes 3C charging pump from service, blocks AFW auto start, and fails POV-4882 as is. (Actuates TAB1POSM = RACKOUT, TABM270 = 0, TABM291 = 0, TABM290 = 0, TFKC882A = T, TFF5AFAF = T, TFF5AFBF = T)

Place simulator in freeze.

Place clearance info tag on 3C Charging Pump start switch

Provide shift turnover checklists

Select 3A QSPDS to page 211 (SAT) and 3B QSPDS to page 212 (RVL). Set ERDADS on VPA and at the RCO desk to the Utilities screens.

Fill in blender & shutdown boron addition placards at console blender station. Data for each IC may be found in the ECC & Shutdown Guidelines Book in the simulator I/F.

Event 1 – LT-3- 498 FAIL LOW

Initiated immediately after shift turnover.
LT-3-498 fails low opening 3C S/G feed regulating valve. BOP will take manual control of 3C S/G level. 3-ONOP-049.1 is used to remove the channel from service.

When directed - Trigger lesson step **EVENT 1 LT-3-498 FAIL LOW**
(Actuates TFF1MACL = T)

If called – Respond as AOM or WCC, Acknowledge LT-3-498 failure.

Event 2 – LT-3- 459 FAIL LOW

LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction

When directed - Trigger lesson step **EVENT 2 - LT- 3- 459 FAIL LOW**
(Actuates TFH1TV59 = T)

If called – Respond as AOM or WCC, Acknowledge LT-3-459 failure.

Event 3 should be triggered during the bistable brief for event 2.

Event 3 – LOSS OF CONDENSER VACUUM

The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

When directed, **Trigger** lesson step **EVENT 3 – LOSS OF CONDENSER VACUUM**
(actuates TVFCLK1 = .020000)

The Crew responds per 3-ONOP-014 Main Condenser Loss of Vacuum

3-ONOP-014

Step 4.1 – Respond as Turbine Operator, Acknowledge direction to place the steam jet air ejector (SJAE) hogging jet in service. Wait one minute then **Trigger** lesson step, **EVENT 3 – PLACE SJAE IN SERVICE**. Inform control room hogging jet in service after 3 minutes.

Step 5.1 - Respond as Turbine Operator, Acknowledge direction to close hogging jet drain, 3-30-045. No action required. Report complete after 3 minutes.

Standby air ejectors are in service

3-ONOP-100

Step 3 – Respond as System Dispatcher, acknowledge unit 3 load reduction to stabilize condenser vacuum.

Step 6 – Respond as SM, Acknowledge direction to refer to 0-EPIP-20101 and 0-ADM-115.

Following a 3 to 5% load reduction, **Trigger** lesson step, **EVENT 3 – RESTORE VACUUM**.

Event 4 – PT-3-447 FAIL LOW

Following the load reduction, PT-3-447 fails low resulting in continuous control rod insertion. The crew will respond per per 3-ARP097.CR to place rod control in manual and then 3-ONOP-049.1 to address the failed channel.

When directed - Trigger lesson step **EVENT 4 – PT-3-447 FAIL LOW** (actuates TFS1MAML=T)

If called – Respond as AOM or WCC, Acknowledge PT-3-447 failure.

Event 5 – 3C S/G TUBE LEAK

3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit.

When directed - Trigger lesson step **EVENT 5 – 3C S/G TUBE LEAK** (actuates TVHHSGC 0.003)

Event 6 – 3C S/G FAULT

After load reduction determined, 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

When directed - Trigger lesson step **EVENT 6 – 3C S/G FAULT** (actuates TVSBVL15 = 0.2600)

When directed - Trigger lesson step **EVENT 6 – 3C SG TUBE RUPTURE** (actuates TVHHSGC 3.0)

3-EOP-E-0 attachment 3

Step 17 – acknowledge direction to place PAHM in service per 3-OP-094

- **Trigger** lesson step, **PLACE PAHM IN SERVICE**
- After 5 minutes inform CR steps 7.1.2.1 through 3 are complete
- Request CR continue with step 7.1.2.4
- Acknowledge direction to complete lineup after step 7.1.2.4 is completed
- After 5 minutes report to CR that PAHM is in service.

3-EOP-FR-P.1

Step 3.3 RNO – Acknowledge direction to close AFSS-3-006 and open AFSS-3-007. After 5 minutes, **Trigger** lesson step, **ALIGN TRAIN 1 AFW.** Report to CR when completed.

Step 3.f - Acknowledge direction to open MOV-3-1405 breaker 3D01-27 and verify valve closed locally, After 2 minutes, **Trigger** lesson step, **OPEN MOV-3-1405 BREAKER**. Inform CR when completed.

Step 6.a/b – Respond as Chemistry, Acknowledge direction to take periodic activity samples of all S/Gs and to check Dam 1 readings.

Step 6.c – Respond as Health Physics, Acknowledge direction to take radiation readings on main steam lines.

3-EOP-E- 3

Step 2.a - Respond as Radiation Protection, Acknowledge direction to take radiation readings on main steam lines.

Step 2.b - Respond as Chemistry, Acknowledge direction to sample steam lines for activity

Step 5.b RNO – Respond as NSO, Acknowledge direction to use 3-EOP-E-3 attachment 5 to align aux. steam supply from unit 4. After 5 minutes, Report to CR attachment 5 alignment complete. No action required.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 1 Page 1 of 1

Event Description: LT-3-498 fails low opening 3C S/G feed regulating valve. BOP will take manual control of 3C S/G level. 3-ONOP-049.1 is used to remove the channel from service.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step EVENT 1 – LT-3-498 FAIL LOW
	BOP	Recognizes / Reports the failure of LT-3-498 based upon: • Alarm C 6/3 – SG C level deviation • LI-3-498 indication • Rising level 3C S/G
	US	Directs manual control of 3C S/G level and enters 3-ONOP-049.1 to remove the channel from service
	BOP	Takes manual control of 3C S/G feed regulating valve
	BOP	Step 5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.
	BOP	Step 5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.
	BOP	Step 5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
		Examiner Note: LT-3-496 will be selected as controlling channel
	BOP	Step 5.4 IF a control function was placed in manual control due to the failure, THEN verify the control function is returned to automatic.
		Examiner Note: FC-3-498 placed back in automatic
	US	Step 5.5 Refer to Technical Specifications 3/4.3, Instrumentation, AND verify the minimum channels operable.
		Examiner Note: minimum channels are operable

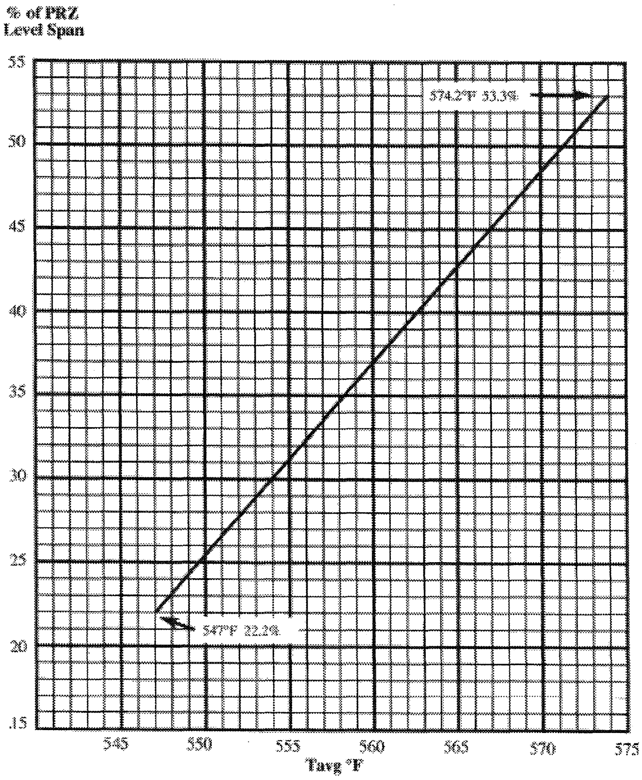
Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 1 of 6

Event Description: LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step EVENT 2 – LT-3-459 FAIL LOW
	RO	Recognizes the failure of LT-3-459 based upon the following indications and informs the US: ▪ Alarm A 9/3, Pzr control hi/low level ▪ Alarm A 9/4, Pzr low lvl htr off & letdown secured ▪ Alarm A 8/4, Pzr lo-lo level alert ▪ Alarm A 6/6, Seal wtr inj fltr hi Δ P ▪ Alarm G 1/2, Chg pump hi speed ▪ Alarm B 3/1, Pzr heater contr fan off ▪ CV-3-200A , letdown orfice stop valve, closure ▪ CV-3-460, Hi pressure letdown isolation, closure ▪ Pressurizer heaters secure ▪ LI-3-459, Pzr level protection/control channel, pegged low
	BOP	References ARPs. A 9/3 and A 9/4 direct response for failed level channel to 3-ONOP-041.6 Pzr level control malfunction.
	US	Directs response per 3-ONOP-041.6
		NOTES • *If Pressurizer Level Malfunction is a result of a failure of the 3-459CX or 3-460CX relays (as indicated by a loss of letdown flow with a loss of Pressurizer Heaters with no concurrent failure of Level Transmitters 3-459A, 3-460, 3-461), use 3–ONOP–003.6 Attachment 4, for 3-460CX failure,* ***OR*** *3–ONOP–003.9 Attachment 4, for 3-459CX failure as guidance for establishing Letdown flow and Pressurizer Heaters.* • *If the button on relays 3-459CX or 3-460CX are used to restore Letdown flow and Pressurizer Heaters, comply with Tech Spec Action Statement 3.4.3 Action b.* • *If the manual control of Heaters from the Electrical penetration room is used, comply with Tech Spec Action Statement 3.4.3 Action a.*
	RO	Step 5.1 Check pressurizer level indicators LI-3-459A, LI-3-460 AND LI-3-461, 5.1.1 IF one level indicator deviates significantly from the others, THEN place CHANNEL SELECT PRESSURIZER LEVEL CONTROL switch in a position that will NOT include the defective channel.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 2 of 6

Event Description: LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.

Time	Position	Applicant's Actions or Behavior
		Evaluator Note: RO will select channel 2 to remove the failed channel
	RO	Step 5.2 IF pressurizer level does not follow programmed level, THEN place MASTER CHARGING PUMP CONTROLLER, LC-3-459G in MANUAL AND maintain programmed level per Enclosure 1. 5.2.1 IF individual charging pump controllers are not following LC-3-459G, THEN place individual CHARGING PUMP CONTROLLERS in MANUAL AND maintain programmed level per Enclosure 1.
		Evaluator Note: pressurizer level is rising due to letdown isolation. Charging pump speed may be reduced to limit Pzr level rise.
		ENCLOSURE 1 (Page 1 of 1) PRESSURIZER PROGRAMMED LEVEL 

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 3 of 6

Event Description: LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.

Time	Position	Applicant's Actions or Behavior
	RO	Step 5.4 IF LR-3-459 is selected to a defective channel, THEN place CHANNEL SELECT PRESSURIZER LEVEL RECORDER in another position.
		Evaluator Note : LR-3-459 is selected to an alternate channel
	RO	Step 5.5 IF control malfunction caused letdown isolation, THEN re-establish flow as follows: 5.5.1 Throttle Low Pressure LTDN Controller, PCV-3-145, as necessary to prevent LTDN relief valve from lifting, (approximately 50 percent open). 5.5.2 Manually control Low Pressure Letdown Control Valve, PCV-3-145, to limit pressure spike. 5.5.3 OPEN High Pressure L/D Isol Vlv from Loop B Cold Leg LCV-3-460. 5.5.4 OPEN L/D Isolation Valves, CV-3-200 A, B OR C as required to restore pressurizer level to programmed level. 5.5.5 Return Lower Pressure Letdown Control Valve, PCV-3-145 to automatic.
	RO	Step 5.7 IF control malfunction caused pressurizer heaters to deenergize, THEN restore PRZ heaters to automatic operation or take manual control.
		Evaluator Note: resets control group heaters
	RO	Step 5.8 Maintain pressurizer level to be consistent with programmed level as indicated in Enclosure 1.
	US	Step 5.9 Perform actions required by 3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CHANNELS.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 4 of 6

Event Description: LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.

Time	Position	Applicant's Actions or Behavior
	US	Directs the actions of 3-ONOP-049.1
		NOTES - *Momentary spiking of a channel that quickly returns to normal may be a precursor of imminent channel failure. The bistables for that channel should be placed in the tripped position as soon as possible, with a maximum delay time of 6 hours, to allow for further investigation by I&C.* - *Instrumentation failure may occur in such a manner as to cause a particular instrumentation loop to deviate from the actual monitored parameter by either a finite or extreme amount. Such a deviation may be in a direction such that a reactor protection or safety related trip function may not occur on that instrument loop, even though the setpoint for the trip function has been reached by the actual parameter.*
	BOP	Step 5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.
	BOP	Step 5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.
	BOP	Step 5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
		Evaluator Note: LR-3-459 is in an alternate channel
	BOP	Step 5.4 IF a control function was placed in manual control due to the failure, THEN verify the control function is returned to automatic.
		Evaluator Note: LC-459G will stay in manual until Pzr level is restored to program
	US	Step 5.5 Refer to Technical Specifications 3/4.3, Instrumentation, AND verify the minimum channels operable.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 5 of 6

Event Description: LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.

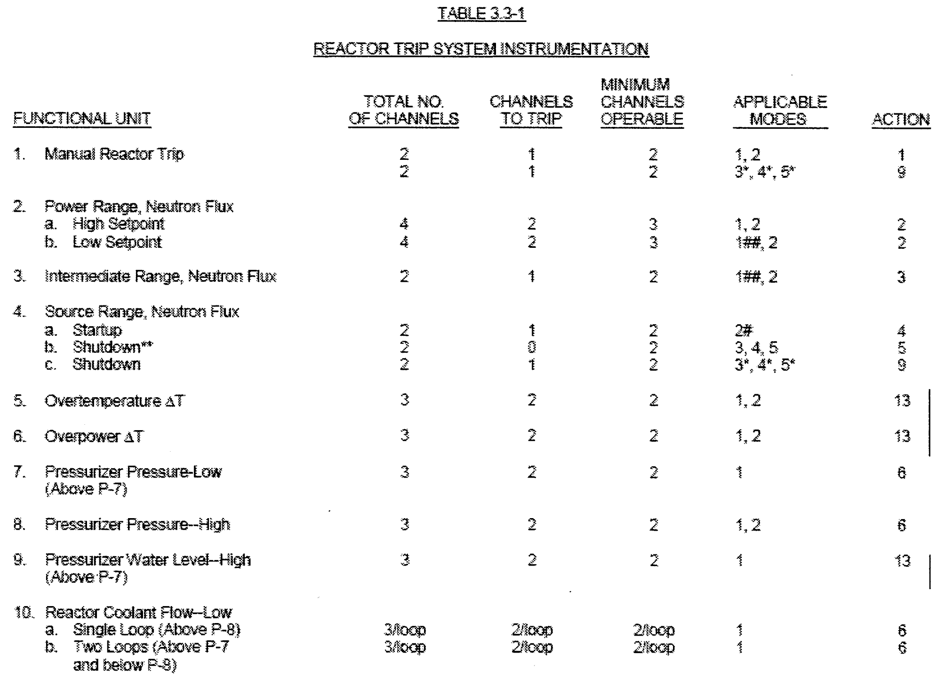
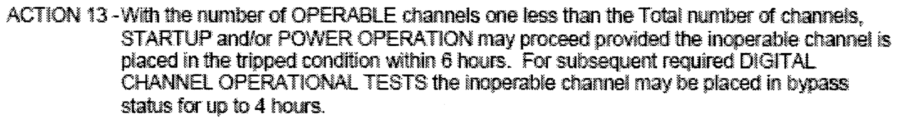
Time	Position	Applicant's Actions or Behavior
	→	

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2 2	1 1	2 2	1, 2 3*, 4*, 5*	1 9
2. Power Range, Neutron Flux					
a. High Setpoint	4	2	3	1, 2	2
b. Low Setpoint	4	2	3	1##, 2	2
3. Intermediate Range, Neutron Flux	2	1	2	1##, 2	3
4. Source Range, Neutron Flux					
a. Startup	2	1	2	2#	4
b. Shutdown**	2	0	2	3, 4, 5	5
c. Shutdown	2	1	2	3*, 4*, 5*	9
5. Overtemperature ΔT	3	2	2	1, 2	13
6. Overpower ΔT	3	2	2	1, 2	13
7. Pressurizer Pressure-Low (Above P-7)	3	2	2	1	6
8. Pressurizer Pressure--High	3	2	2	1, 2	6
9. Pressurizer Water Level--High (Above P-7)	3	2	2	1	13
10. Reactor Coolant Flow--Low					
a. Single Loop (Above P-8)	3/loop	2/loop	2/loop	1	6
b. Two Loops (Above P-7 and below P-8)	3/loop	2/loop	2/loop	1	6



ACTION 13 - With the number of OPERABLE channels one less than the Total number of channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours. For subsequent required DIGITAL CHANNEL OPERATIONAL TESTS the inoperable channel may be placed in bypass status for up to 4 hours.

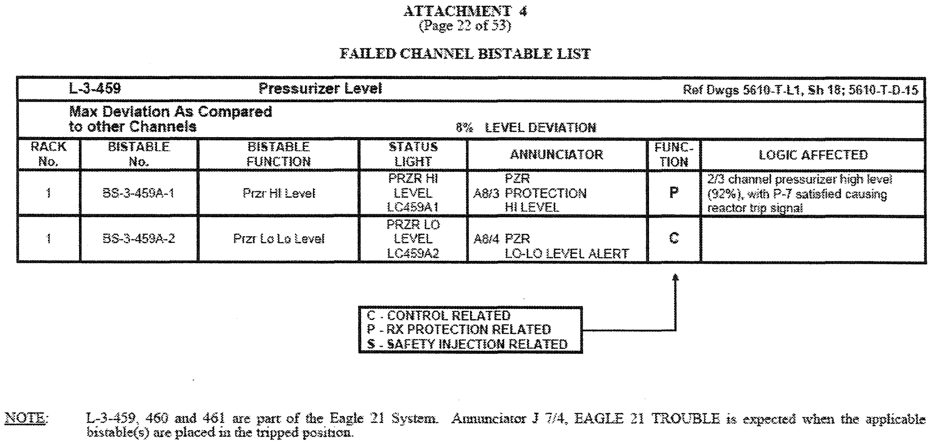
Time	Position	Applicant's Actions or Behavior
		Evaluator Note: functional unit # 9, action 13. 6 hrs. to trip bistables
	RO	Step 5.5.1 Take appropriate actions as specified in Technical Specifications.

CAUTION

The failed channel bistable(s) is required to be placed in the tripped mode within 6 hours of the failure determination, except if other channel bistable(s) are in the tripped or test position and would result in an undesired Engineered Safety Features actuation or Reactor Trip actuation. The overall effect of a failure of this type is a reduction of instrumentation redundancy and, therefore, a possible reduction in plant protection.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 6 of 6

Event Description: LT-3-459 fails low isolating letdown, deenergizing pressurizer heaters, and driving 3B charging pump to full speed. The crew responds per the ARPs and 3-ONOP-041.6 Pressurizer level control malfunction.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 5.11 IF any other channel has failed, THEN perform the following to trip bistables for the failed channel. 5.11.1 IF plant conditions are such that all required bistables associated with the failed channel may be tripped without an undesired RPS or ESF actuation, THEN perform the following: 1. Place all bistable switches for the affected loop in test position using Attachment 4. 2. Verify bistables tripped by observing corresponding status light (VPB) lit.
		
		Evaluator Note: Allow BOP to trip bistables prior to continuing to next event.

ATTACHMENT 4
(Page 22 of 53)

FAILED CHANNEL BISTABLE LIST

L-3-459	Pressurizer Level			Ref Dwgs 5610-T-L1, Sh 18; 5610-T-D-15		
Max Deviation As Compared to other Channels			8% LEVEL DEVIATION			
RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNC-TION	LOGIC AFFECTED
1	BS-3-459A-1	Przr HI Level	PRZR HI LEVEL LC459A1	A8/3 PZR PROTECTION HI LEVEL	P	2/3 channel pressurizer high level (92%), with P-7 satisfied causing reactor trip signal
1	BS-3-459A-2	Przr Lo Lo Level	PRZR LO LEVEL LC459A2	A8/4 PZR LO-LO LEVEL ALERT	C	

C - CONTROL RELATED
P - RX PROTECTION RELATED
S - SAFETY INJECTION RELATED

NOTE: L-3-459, 460 and 461 are part of the Eagle 21 System. Annunciator J 7/4, EAGLE 21 TROUBLE is expected when the applicable bistable(s) are placed in the tripped position.

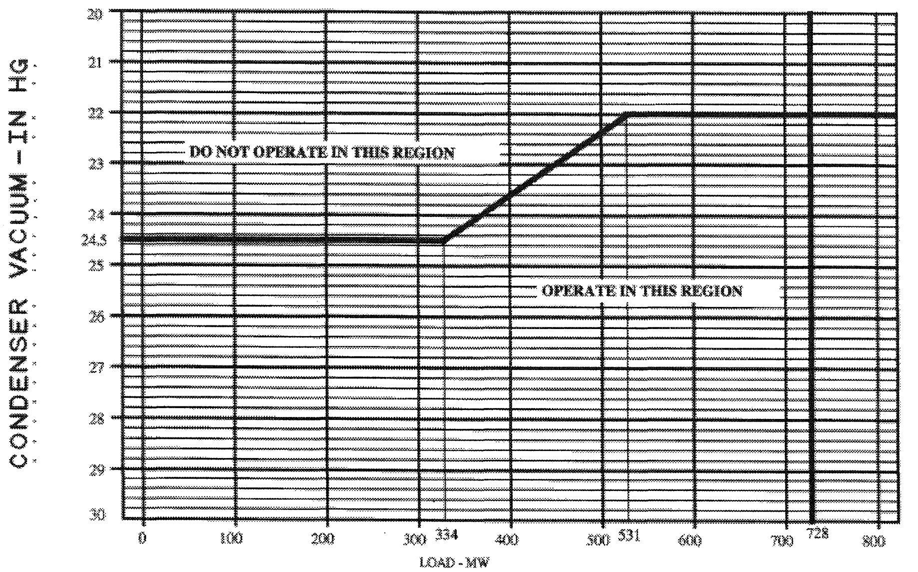
Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 1 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior
Trigger lesson step EVENT 3 – LOSS OF CONDENSER VACUUM		
	BOP	Determines condenser vacuum lowering by diverse indications: • Main condenser vacuum lowering • Main Generator load decreasing • Main condenser air in-leakage increasing
	US	Directs response per 3-ONOP-014
		CAUTION ***Hot water may be emitted from the silencer causing the potential for personnel injury.***
	BOP	Directs the turbine operator to place the hogging jet in service: Step 4.1 Place the SJAE hogging jet in service as follows: 4.1.1 Open the Steam Supply to Hogging Jet Valve, 3-30-043. 4.1.2 Slowly open Steam Supply to Hogging Jet Valve, 3-30-44, to obtain 250 to 260 psig (3-PI-1597) hogging jet supply pressure. 4.1.3 Open the Condenser Air Removal to Hogging Jet Valve, 3-30-010.
		NOTES • *For the remainder of this procedure, the most conservative of the following three indications of Main Condenser vacuum should be used to determine the appropriate actions:* *PI-3-1612 and PI-3-1406 on VPA* *DDPSA105-3 on ERDADS/R*Time* • *DDPSA105-3 on R*Time indicates Main Condenser backpressure. To determine vacuum from backpressure:* *Main Condenser vacuum = 30 inHg – DDPSA105-3*
	BOP	Step 5.1 Close Hogging Jet Drain, 3-30-045
	BOP	Step 5.2 **<u>IF</u>** only one set of SJAEs is in service, **<u>THEN</u>** place the standby set in service using Attachment 1.
		Evaluator Note: all SJAEs are in service.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 2 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 5.3 IF vacuum can NOT be maintained by the SJAE hogging jet, THEN reduce turbine load as necessary using 3-GOP-103, Power Operation to Hot Standby, OR 3-ONOP-100, Fast Load Reduction, to maintain condenser vacuum greater than required by Enclosure 1.
		Evaluator Note: Condenser vacuum will continue to lower requiring turbine load to be reduced. 3-ONOP-100 will be used to stabilize condenser vacuum using enclosure 1 shown below.
		ENCLOSURE 1 (Page 1 of 1) CONDENSER VACUUM LIMITATIONS 
	US	5.4 **IF** reactor power is greater than 10% (At Power Trips enabled) **AND** vacuum can **NOT** be maintained greater than required by Enclosure 1, **THEN** perform the following: 5.4.1 Trip the Reactor. 5.4.2 Trip the Turbine. 5.4.3 Go to 3-EOP-E-0, Reactor Trip and Safety Injection.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 3 of 9

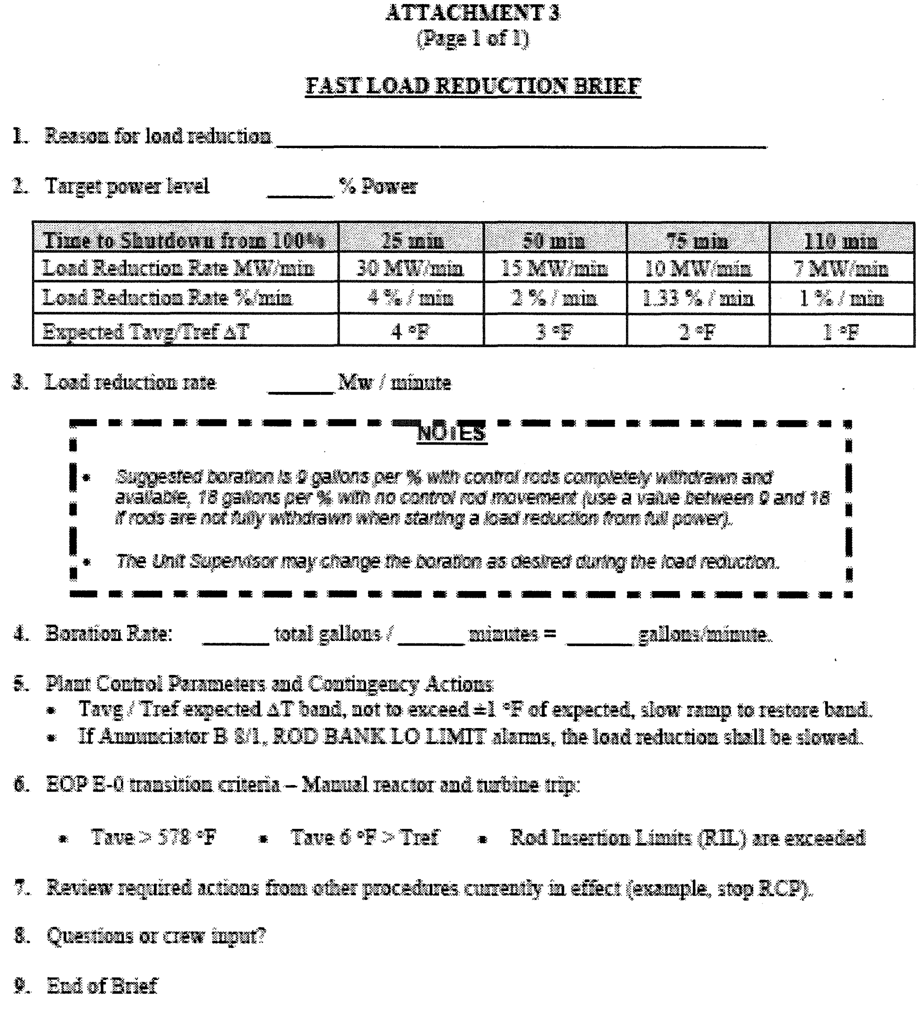
Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	US	5.5 IF reactor power is less than or equal to 10% (At Power Trips blocked) AND vacuum is less than or equal to 24.5 inches Hg, THEN trip the Turbine AND stabilize the plant.
	US	5.6 Attempt to identify the cause of the decreasing vacuum by checking the following: 5.6.1 Verify proper operation of the Circulating Water Pumps. 5.6.2 Verify that steam is being supplied and regulated at 260 to 275 psig to both sets of SJAEs. 5.6.3 Verify that the SJAE loop seal is full of water. a. IF the SJAE loop seal is NOT full, THEN open Loop Seal Fill Line Isol, 3-30-081, as necessary to fill the loop seal.
		NOTE *CV-3-2210 is maintaining control if the vent on the SGFP Seal Water Collection Tank is NOT sucking air or overflowing.*
	BOP	5.6.4 Check the SGFP Seal Water Collection Tank Drain to Condenser valve, CV-3-2210, for proper operation. a. IF CV-3-2210 is NOT maintaining adequate level in the SGFP Seal Water Collection Tank, as indicated by air bring sucked into the tank through the vents, THEN throttle closed SGFP Seal Water Collecting Tank LCV-3-2210 outlet Isol valve, 3-20-176, as necessary to stop air from being sucked into the tank.
		NOTE *Turbine seal area slop drain is capped off. See PC/M 05-092.*
	BOP	5.6.5 Check the Turbine seal area slop drain for air in leakage due to failure of the line inside the condenser. 5.6.6 Inspect the intake for evidence of stoppage AND start a screenwash pump if traveling screen differential is greater than 7 inches water. 5.6.7 Verify the condenser water boxes are primed. 1. IF the water boxes are not primed, OR indicate low vacuum, THEN prime the water boxes using 3-OP-010, Circulating Water System, Subsection 5.2. 5.6.8 Verify the Turbine steam seal regulator is maintaining greater than or equal to 3 psig on the glands.
		Evaluator Note: Efforts will continue to locate source of air leak.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 4 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	US	Directs response per 3-ONOP-100
	US	Step 1 Brief Control Room Personnel Using Attachment 3



ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction ______________________________

2. Target power level ______ % Power

Time to Shutdown from 100%	25 min	50 min	75 min	110 min
Load Reduction Rate MW/min	30 MW/min	15 MW/min	10 MW/min	7 MW/min
Load Reduction Rate %/min	4 % / min	2 % / min	1.33 % / min	1 % / min
Expected Tavg/Tref ΔT	4 °F	3 °F	2 °F	1 °F

3. Load reduction rate ______ Mw / minute

NOTES

- *Suggested boration is 9 gallons per % with control rods completely withdrawn and available, 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).*
- *The Unit Supervisor may change the boration as desired during the load reduction.*

4. Boration Rate: ______ total gallons / ______ minutes = ______ gallons/minute.

5. Plant Control Parameters and Contingency Actions
   - Tavg / Tref expected ΔT band, not to exceed ±1 °F of expected, slow ramp to restore band.
   - If Annunciator B 8/1, ROD BANK LO LIMIT alarms, the load reduction shall be slowed.

6. EOP E-0 transition criteria – Manual reactor and turbine trip:

   - Tave > 578 °F
   - Tave 6 °F > Tref
   - Rod Insertion Limits (RIL) are exceeded

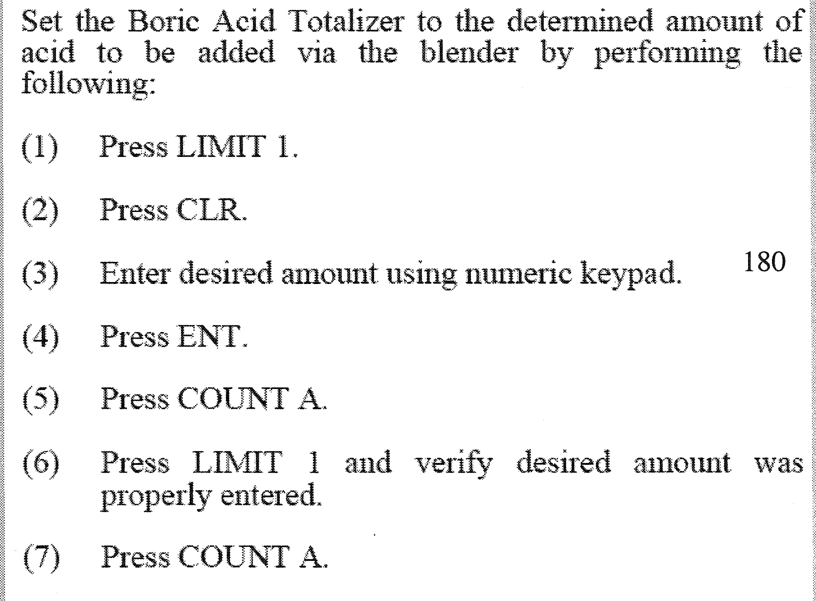
7. Review required actions from other procedures currently in effect (example, stop RCP).

8. Questions or crew input?

9. End of Brief

Op-Test No.: 2009-301	Scenario No.: 2	Event No.: 3 Page 5 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	RO	Step 2 Begin Boration — IF boration is not required, THEN go to Step 3. a. Set the Boric Acid Totalizer to value determined using Attachment 3 b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0 c. Place the Reactor Makeup Selector Switch to BORATE d. Place the RCS Makeup Control Switch to START
		Evaluator Note: Step 2.a , boric acid totalizer is set as follows:  Set the Boric Acid Totalizer to the determined amount of acid to be added via the blender by performing the following: (1) Press LIMIT 1. (2) Press CLR. (3) Enter desired amount using numeric keypad. 180 (4) Press ENT. (5) Press COUNT A. (6) Press LIMIT 1 and verify desired amount was properly entered. (7) Press COUNT A.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 6 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 3 Notify The Following • System Dispatcher • Plant personnel using the Page Boost	
	BOP	Step 4 Reduce Unit Load a. Check for boration effects (reducing Tavg) b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate c. Initiate and maintain load reduction rate to the target power level	a. IF boration is used, THEN wait for effects before starting load reduction.
		d. Monitor load reduction and auto rod control to ensure that the expected Tavg/Tref ΔT identified in Attachment 3 is maintained	d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.
	RO	Step 5 Monitor Annunciator B 8/1, ROD BANK LO LIMIT – RESET	Perform the following: a. Slow load reduction until alarm is reset. b. Re-evaluate boration amount and rate and make adjustments as necessary.
		Evaluator Note: Restore vacuum after 3 to 5% load reduction	

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 7 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior	
	US	Step 6 Notify The Shift Manager To Refer To The Following Procedures • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS	
		Evaluator Note: Respond as SM to refer to procedures if directed	
		NOTE *Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space.*	
	RO / BOP	Step 7 Check Plant Response	
		a. Check pressurizer level following program	a. IF directed by the Unit Supervisor, THEN increase charging flow as follows: 1) Throttle open TCV-144, NRHX Temp Control Valve, bypass valve 3-834 to raise flow to approximately 600 gpm. 2) Start an additional charging pump. 3) Place an additional letdown orifice in service.
		b. Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3	b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 8 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	RO	Step 8 Energize Pressurizer Backup Heaters
	BOP	Step 9 Verify Turbine Load Less Than 570 MWE — WHEN turbine load is less than 570 MWe, THEN open the SGFP recirculation valves for the first feedwater pump to be stopped. Open the SGFP recirculation valves for the first feedwater pump to be stopped
		NOTE *Boration should be stopped above the target power level to prevent excessive boration*
	RO	Step 10 Monitor Turbine Load Within 10% Of Target Power Level Stop the boration as follows: — Go to Step 11. a. Place the Reactor Makeup Selector Switch to AUTO b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired c. Place the RCS Makeup Control Switch to START
	BOP	Step 11 Check Target Load – LESS THAN 450 Mwe
	BOP	Step 12 Check Station Service Loads Supplied From The Startup Transformer — WHEN directed by the Unit Supervisor, THEN transfer station service from the Auxiliary Transformers to the Startup Transformer using Attachment 2.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 9 of 9

Event Description: The unit develops a south condenser shell leak to atmosphere resulting in lowering condenser vacuum. The crew responds per 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 13 Check Auxiliary Steam Supplied From Another Unit WHEN directed by the Unit Supervisor, THEN align auxiliary steam supply from another unit using Attachment 1.
		NOTES • *Boration should be stopped above the target power level to prevent excessive boration, or at ≥ 25% power if the unit is to be taken off line.* • *Remaining procedure steps should be taken as appropriate for the intended power level.*
	BOP	Step 14 Continue Load Reduction a. Verify Turbine load less than – 450 MWE • Stop one heater drain pump b. Verify Turbine load less than – 400 MWE 1) Place the Feedwater Pump Turbine Runback Defeat switch to DEFEAT 2) Stop the SGFP with recirculation valves open 3) Place SGFP recirculation valves control switch in the CLOSED/AUTO position c. Verify Turbine load less than – 300 MWE • Stop the remaining heater drain pump d. Verify Turbine load less than – 275 MWE • Stop one Condensate Pump e. Verify Turbine load less than – 200 MWE • Place the running SGFP recirculation valves control switch in the OPEN position
		Evaluator Note: Following load reduction and stable vacuum trigger low failure of PT-3-447.

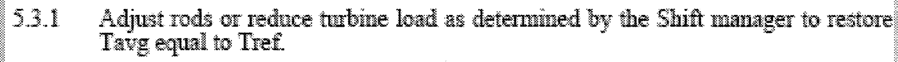
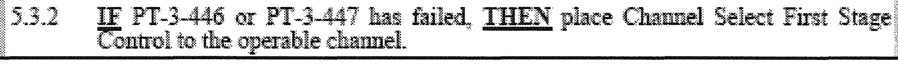
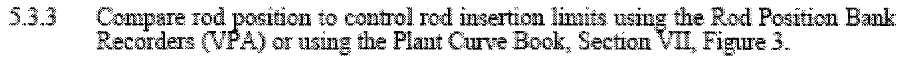
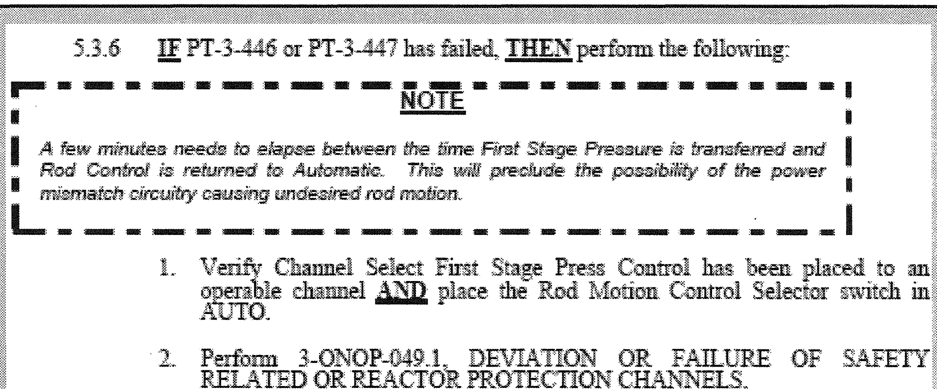
Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 4 Page 1 of 4

Event Description: Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond per 3-ONOP-028 and then 3-ONOP-049.1 to address the failed channel.

Time	Position	Applicant's Actions or Behavior
	RO	RO identifies the failure of PT-3-447 based upon the following: • Alarm B 4/4 Tave / Tref deviation • Alarms C 6/1, 6/2, 6/3 level deviations • Alarms C 7/1, 7/2, 7/3 Hi steam flows • Alarm C 8/3 Steam dump armed • Alarm D 7/6 AMSAC trouble • PT-3-447 indication failed low • Continuous control rod insertion in automatic
	RO	Places control rods in manual to stop control rod insertion.
	US	Directs response per 3-ONOP-028, Rod Control System Malfunction
		CAUTIONS • *If the Rod Control System is inoperable due to Urgent Failure or other cause, the Shift Manager shall be notified immediately.* • *If a transient occurs and the Reactor cannot be stabilized by boration/dilution or changes in turbine load, the Reactor shall be tripped and a transition made to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.* **NOTES** • *Boration/dilution or changes in turbine load will effect shutdown margin and axial offset. If plant conditions permit, the Shift Manager shall be consulted for methods used to achieve and maintain stable plant conditions.* • *Failure of RCC(s) to move when demanded, (e.g., ROD CONTROL URGENT FAILURE), constitutes inoperability of the associated RCC(s). The requirements of T.S. 3.1.3.1 apply.*
	RO	4.3 Continuous Insertion of an RCC Control Bank 4.3.1 Place the Rod Motion Control Selector switch to the MAN position. 4.3.2 IF RCC control cannot be maintained manually, THEN trip the Reactor and Turbine and go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 4 Page 2 of 4

Event Description: Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond per 3-ONOP-028 and then 3-ONOP-049.1 to address the failed channel.

Time	Position	Applicant's Actions or Behavior
	RO	 5.3.1 Adjust rods or reduce turbine load as determined by the Shift manager to restore Tavg equal to Tref.
	RO	 5.3.2 **IF** PT-3-446 or PT-3-447 has failed, **THEN** place Channel Select First Stage Control to the operable channel.
	BOP	 5.3.3 Compare rod position to control rod insertion limits using the Rod Position Bank Recorders (VPA) or using the Plant Curve Book, Section VII, Figure 3.
	RO	 5.3.6 **IF** PT-3-446 or PT-3-447 has failed, **THEN** perform the following: **NOTE** *A few minutes needs to elapse between the time First Stage Pressure is transferred and Rod Control is returned to Automatic. This will preclude the possibility of the power mismatch circuitry causing undesired rod motion.* 1. Verify Channel Select First Stage Press Control has been placed to an operable channel **AND** place the Rod Motion Control Selector switch in AUTO. 2. Perform 3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CHANNELS.
	US	Directs response per 3-ONOP-049.1
		NOTES • *Momentary spiking of a channel that quickly returns to normal may be a precursor of imminent channel failure. The bistables for that channel should be placed in the tripped position as soon as possible, with a maximum delay time of 6 hours, to allow for further investigation by I&C.* • *Instrumentation failure may occur in such a manner as to cause a particular instrumentation loop to deviate from the actual monitored parameter by either a finite or extreme amount. Such a deviation may be in a direction such that a reactor protection or safety related trip function may not occur on that instrument loop, even though the setpoint for the trip function has been reached by the actual parameter.*
	BOP	Step 5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.
	BOP	Step 5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 4 Page 3 of 4

Event Description: Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond per 3-ONOP-028 and then 3-ONOP-049.1 to address the failed channel.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
	BOP	Step 5.4 IF a control function was placed in manual control due to the failure, THEN verify the control function is returned to automatic.
	US	Step 5.5 Refer to Technical Specifications 3/4.3, Instrumentation, AND verify the minimum channels operable.
	→	

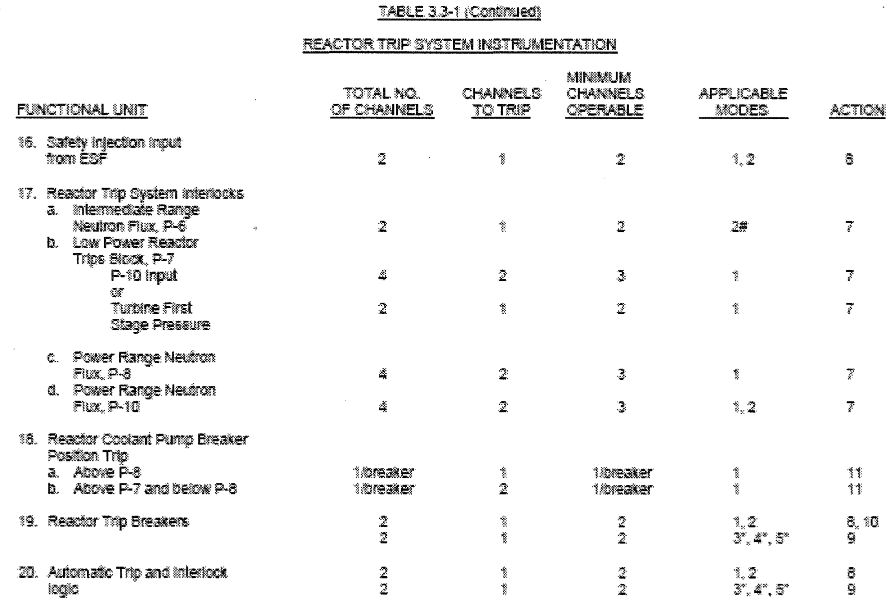


TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
16. Safety Injection Input from ESF	2	1	2	1, 2	8
17. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2	1	2	2#	7
b. Low Power Reactor Trips Block, P-7					
P-10 Input	4	2	3	1	7
or					
Turbine First Stage Pressure	2	1	2	1	7
c. Power Range Neutron Flux, P-8	4	2	3	1	7
d. Power Range Neutron Flux, P-10	4	2	3	1, 2	7
18. Reactor Coolant Pump Breaker Position Trip					
a. Above P-8	1/breaker	1	1/breaker	1	11
b. Above P-7 and below P-8	1/breaker	2	1/breaker	1	11
19. Reactor Trip Breakers	2 2	1 1	2 2	1, 2 3*, 4*, 5*	8, 10 9
20. Automatic Trip and Interlock logic	2 2	1 1	2 2	1, 2 3*, 4*, 5*	8 9

ACTION 7 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

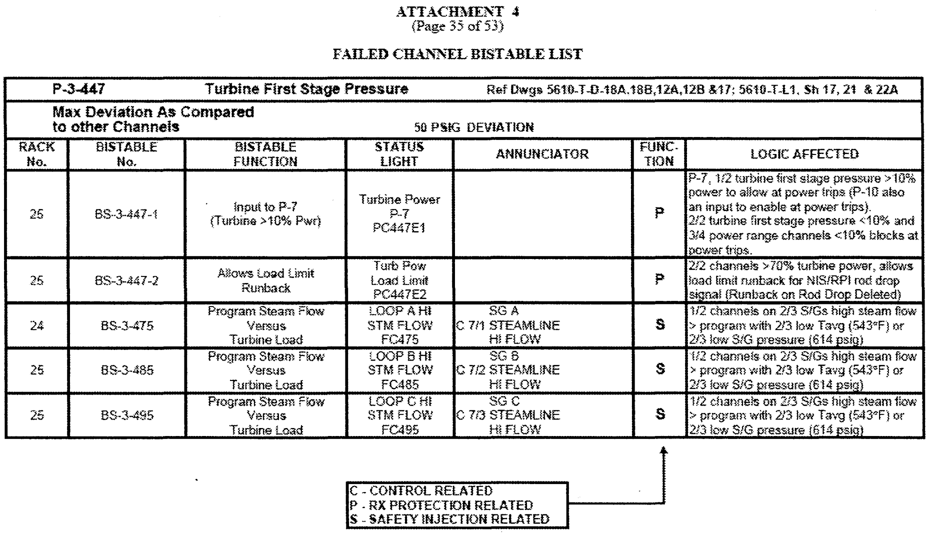
NOTE

If I&C determines a Test Sequence Processor for an Eagle-21 Channel has failed, then that associated Eagle-21 Channel may remain in service if Attachment 6 is performed once per 4 hours. (Reference Safety Evaluation JPN-PTN-SEIS-95-001)

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 4 Page 4 of 4

Event Description: Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond per 3-ONOP-028 and then 3-ONOP-049.1 to address the failed channel..

Time	Position	Applicant's Actions or Behavior
	BOP	Step 5.11.1 IF plant conditions are such that all required bistables associated with the failed channel may be tripped without an undesired RPS or ESF actuation, THEN perform the following: 1. Place all bistable switches for the affected loop in test position using Attachment 4. 2. Verify bistables tripped by observing corresponding status light (VPB) lit.
		Evaluator Note: attachment 4 listed below



ATTACHMENT 4
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FAILED CHANNEL BISTABLE LIST

P-3-447	Turbine First Stage Pressure	Ref Dwgs 5610-T-D-18A,18B,12A,12B &17; 5610-T-L1, Sh 17, 21 & 22A				
Max Deviation As Compared to other Channels		50 PSIG DEVIATION				
RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNCTION	LOGIC AFFECTED
25	BS-3-447-1	Input to P-7 (Turbine >10% Pwr)	Turbine Power P-7 PC447E1		P	P-7, 1/2 turbine first stage pressure >10% power to allow at power trips (P-10 also an input to enable at power trips). 2/2 turbine first stage pressure <10% and 3/4 power range channels <10% blocks at power trips.
25	BS-3-447-2	Allows Load Limit Runback	Turb Pow Load Limit PC447E2		P	2/2 channels >70% turbine power, allows load limit runback for NIS/RPI rod drop signal (Runback on Rod Drop Deleted)
24	BS-3-475	Program Steam Flow Versus Turbine Load	LOOP A HI STM FLOW FC475	C 7/1 SG A STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)
25	BS-3-485	Program Steam Flow Versus Turbine Load	LOOP B HI STM FLOW FC485	C 7/2 SG B STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)
25	BS-3-495	Program Steam Flow Versus Turbine Load	LOOP C HI STM FLOW FC495	C 7/3 SG C STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)

C - CONTROL RELATED
P - RX PROTECTION RELATED
S - SAFETY INJECTION RELATED

		Evaluator Note: Following T.S and bistable identification, continue with next event.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 5 Page 1 of 5

Event Description: 3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, EVENT 5 – 3C S/G TUBE LEAK
	RO / BOP	Recognize / Report 3C S/G tube leak as determined by: • R-15 alarm • Increased charging pump speed • Charging letdown mismatch • 3C S/G level
	US	Directs response per 3-ONOP-071.2
		NOTE *Foldout Page shall be monitored throughout this procedure.*
	BOp	**1 Check High Alarm ON For The Following PRMS Channels** * R-15 High Alarm light – ON * R-19 High Alarm light - ON Go to Step 3.
		NOTE *A PRMS source check on a channel with a HIGH Alarm may be inconclusive since the effect of the source may not cause a noticeable change in the readout.*
	BOP	**2 Check Affected PRMS Channel Alarm Valid As Follows** a. Check readout on affected channel - GREATER THAN OR EQUAL TO ALARM SETPOINT b. Check channel operability as follows 1) Depress and hold the FAIL/TEST pushbutton on the affected PRMS Channel 2) Check readout equal to 288K OR 289K 3) Release the FAIL/TEST pushbutton c. Observe CAUTION prior to Step 6 AND go to Step 6 Perform the following: 1) Notify the Shift Manager of problem with PRMS channel. 2) Direct RPSS to conduct radiological surveys to confirm validity of alarm. 3) Direct Chemistry to perform sampling to confirm alarm validity. 4) Continue with procedure until affected systems verified normal. 5) Go to Step 3.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 5 Page 2 of 5

Event Description: 3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit

Time	Position	Applicant's Actions or Behavior
		CAUTIONS • ***Maximum allowed specific activity of secondary coolant is less than or equal to 0.10 μCi/gm Dose Equivalent I-131. (Reference T.S. 3.7.1.4.)*** • ***Use of the Steam Dump to Atmospheric valves should be limited to minimize uncontrolled release of radionuclides to the environment. If S/G Steam Dumps to Atmosphere must be used, use only the unaffected S/G dump valves if possible.***
	RO	**6 Monitor Affected Plant Parameters** a. Check PRZ level – STABLE **OR** INCREASING a. Perform the following: 1) Start additional charging pumps as required. 2) Reduce letdown flow as necessary. b. Maintain PRZ level – MAINTAIN STABLE **OR** INCREASING b. Manually trip reactor and go to 3-EOP–E-0, REACTOR TRIP OR SAFETY INJECTION. c. Check R-3-19 HI ALARM – CLEAR c. Perform the following: 1) Verify S/G Blowdown Flow Control Valves FCV-3-6278A, B, and C – CLOSED. 2) Blowdown Tank to Canal Level Control Valve, LCV-3-6265B – CLOSED. 3) Verify S/G Sample Total Flow Indicator at the Cold Chem Lab Bldg indicate flow has stopped. (Ensures Blowdown Sample Valves, SV–3–2800, 2801, 2802 are CLOSED.)
	BOP	**7 Direct The Shift Engineer To Approximate Tube Leakage Using All Of The Following** • 3-OSP-041.1, RCS LEAK RATE CALCULATION • Unit 3 SJAE SPING Primary to Secondary Leak Rate Graph in the Plant Curve Book (Section 5, Figure 14) **AND** record on Attachment 5 • Unit 3 R-15 Primary to Secondary Leak Rate Graph in the Plant Curve Book (Section 5, Figure 15) **AND** record on Attachment 5

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 5 Page 3 of 5

Event Description: 3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit

Time	Position	Applicant's Actions or Behavior
		NOTES • *Additional Chemistry personnel may be needed for sampling and analysis.* • *SJAE SPING and R-15 are the quickest indications of increasing leak due to radioactive gases being carried over in the steam to the condenser. Air in–leakage greater than 5.5 SCFM will dilute this indication.* • *DAM-1 and R-19 are slower and may take several hours to stabilize for accurate indication due to the process delay times.*
	BOP	**8 Identify Leaking S/G** a. Monitor the following for S/G tube leak indications * Unexplained increase in any S/G level * High radiation detected on a S/G sample * High radiation detected on a main steam line * High radiation detected on AFW steam supply line (if running) * High radiation detected from a S/G Blowdown line * Unexplained difference between steam flow and feedwater flow * Increasing radiation levels indicated on R-15, R-19, SPING, AND DAM-1 b. Direct Radiation Protection to perform the following • Monitor radiation levels on Main Steam Lines • Monitor radiation levels on AFW steam supply line (if running) • Monitor radiation levels on S/G Blowdown lines • Monitor airborne activity at Steam Jet Air Ejectors c. Direct Nuclear Chemistry to perform the following • Perform 0-NCAP-104, PRIMARY TO SECONDARY LEAK RATE CALCULATION • Increase S/G sampling frequency as determined by Nuclear Chemistry • Monitor DAM-1 and SJAE SPING readings
		Evaluator Note: identifies 3C S/G as affected

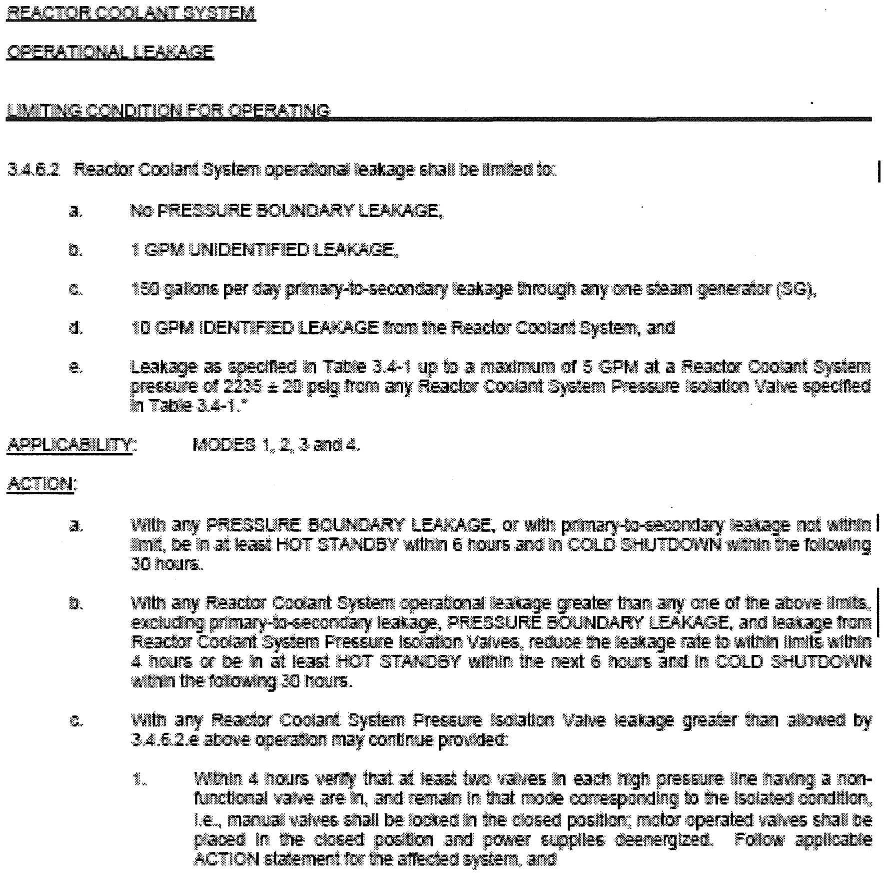
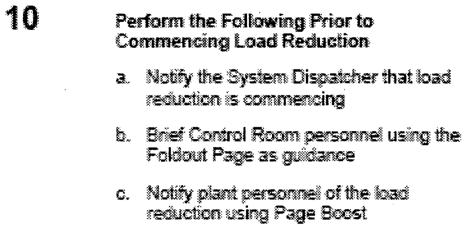
Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 5 Page 4 of 5

Event Description: 3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit

Time	Position	Applicant's Actions or Behavior
		NOTES • *Sampling of Condenser water for activity is required prior to dumping/rejecting water.* • *The following step is to provide guidance for continued unit operation when Primary-to-Secondary leakage has been **CONFIRMED**. **These actions are to ensure that an identified leak is isolated prior to S/G tube failure.*** • *Any tube leakage rate-of-change determination should be performed over at least a 30-minute period to eliminate the possibility of inappropriate actions being taken in the case of instrument spikes.*
	US	**9** **Determine If Operation May Continue** a. S/G Tube Leakage – LESS THAN Tech Spec Limits (Tech Spec 3.4.6.2.c) — a. Go to Step 10 **AND** be in Mode 3 within 3 hours. b. S/G Tube Leakage – LESS THAN Values required by Attachment 1 — b. Increase monitoring S/G Tube Leakage **AND** reduce load **OR** remove the unit from service as directed by the Shift Manager. Go to Step 10. c. Return to procedure and step in effect
		Evaluator Note: US determines leakage is greater than the allowed limits. TS next page

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 5 Page 5 of 5

Event Description: 3C S/G develops a 3 gpm tube leak. 3-ONOP-071.2 will be used to shutdown the unit

Time	Position	Applicant's Actions or Behavior
		REACTOR COOLANT SYSTEM OPERATIONAL LEAKAGE LIMITING CONDITION FOR OPERATING 3.4.6.2 Reactor Coolant System operational leakage shall be limited to: a. No PRESSURE BOUNDARY LEAKAGE, b. 1 GPM UNIDENTIFIED LEAKAGE, c. 150 gallons per day primary-to-secondary leakage through any one steam generator (SG), d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and e. Leakage as specified in Table 3.4-1 up to a maximum of 5 GPM at a Reactor Coolant System pressure of 2235 ± 20 psig from any Reactor Coolant System Pressure Isolation Valve specified in Table 3.4-1." APPLICABILITY: MODES 1, 2, 3 and 4. ACTION: a. With any PRESSURE BOUNDARY LEAKAGE, or with primary-to-secondary leakage not within limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours. b. With any Reactor Coolant System operational leakage greater than any one of the above limits, excluding primary-to-secondary leakage, PRESSURE BOUNDARY LEAKAGE, and leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. c. With any Reactor Coolant System Pressure Isolation Valve leakage greater than allowed by 3.4.6.2.e above operation may continue provided: 1. Within 4 hours verify that at least two valves in each high pressure line having a non-functional valve are in, and remain in that mode corresponding to the isolated condition, i.e., manual valves shall be locked in the closed position; motor operated valves shall be placed in the closed position and power supplies deenergized. Follow applicable ACTION statement for the affected system, and
	BOP	**10** **Perform the Following Prior to Commencing Load Reduction** a. Notify the System Dispatcher that load reduction is commencing b. Brief Control Room personnel using the Foldout Page as guidance c. Notify plant personnel of the load reduction using Page Boost
		Evaluator Note: Following determination for plant shutdown continue with faulted SG.

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, EVENT 4 – 3C S/G FAULT
	RO	Trips the reactor due to faulted S/G
	US	Directs response per 3-EOP-E-0
	RO	Step 1(IOA) -Verify Reactor Trip • Rod bottom lights – ON • Reactor trip and bypass breakers –OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING
	BOP	Step 2 (IOA)Verify Turbine Trip a. All turbine stop or associated control valves – CLOSED — a. Manually trip turbine. IF unable to verify turbine trip, THEN close main steamline isolation and bypass valves. b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs — b. Manually close valves. IF any valve can NOT be closed, THEN close main steamline isolation and bypass valves. • Reheater Timing Valves • MSR Purge Steam Valves c. Check Mid and East GCBs – OPEN (Normally 30 second delay) — c. Manually open breakers. IF breakers do NOT open, THEN actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).
		Evaluator Note: MSR main steam supply stop valves closed by BOP

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 3 Verify Power To Emergency 4 KV Buses a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED — a. Perform the following: 1) Attempt to emergency start any Unit 3 available diesel generator. 2) IF neither 3A nor 3B 4 KV bus is energized, THEN go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1. b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED — b. Attempt to emergency start the de-energized Unit 3 bus diesel generator. c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS — c. Perform the following: 1) IF lockout of 3D 4 KV bus NOT present, THEN perform the following: a) Verify 3C CCW pump - BREAKER OPEN. b) Verify 3C ICW pump – BREAKER OPEN. c) Operate bus supply breakers to restore power.

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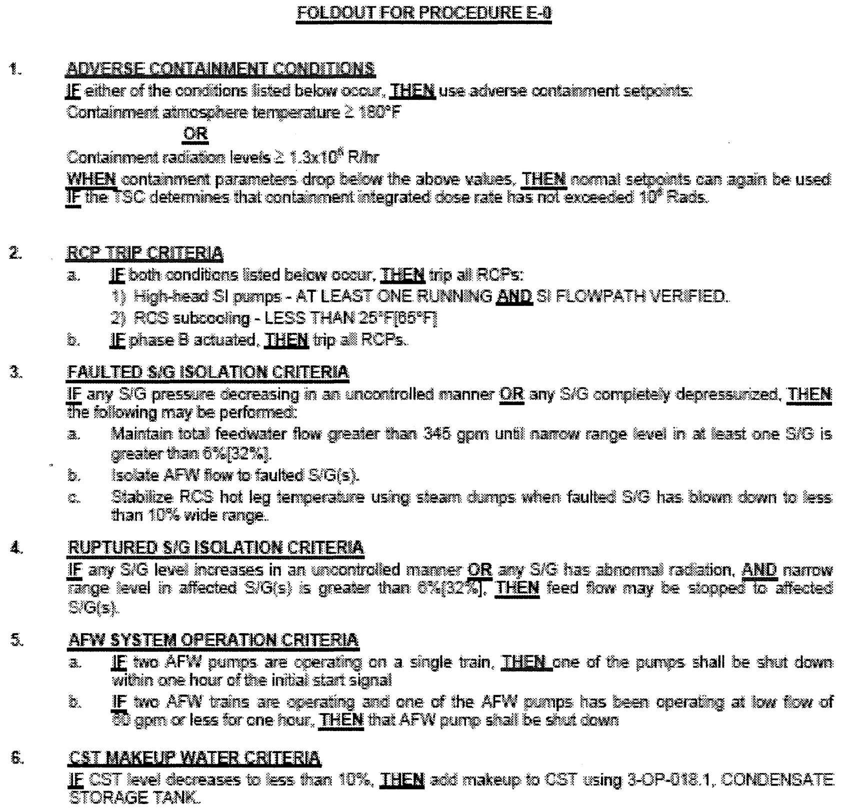
Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	RO	Step 4 Check If SI Is Actuated * SI Annunciators - ANY ON OR * Safeguards equipment – AUTO STARTED
	US	**NOTE** *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	US	 FOLDOUT FOR PROCEDURE E-0 1. ADVERSE CONTAINMENT CONDITIONS IF either of the conditions listed below occur, THEN use adverse containment setpoints: Containment atmosphere temperature ≥ 180°F OR Containment radiation levels ≥ $1.3x10^6$ R/hr WHEN containment parameters drop below the above values, THEN normal setpoints can again be used IF the TSC determines that containment integrated dose rate has not exceeded 10^6 Rads. 2. RCP TRIP CRITERIA a. IF both conditions listed below occur, THEN trip all RCPs: 1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED. 2) RCS subcooling - LESS THAN 25°F[65°F] b. IF phase B actuated, THEN trip all RCPs. 3. FAULTED S/G ISOLATION CRITERIA IF any S/G pressure decreasing in an uncontrolled manner OR any S/G completely depressurized, THEN the following may be performed: a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6%[32%]. b. Isolate AFW flow to faulted S/G(s). c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range. 4. RUPTURED S/G ISOLATION CRITERIA IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, AND narrow range level in affected S/G(s) is greater than 6%[32%], THEN feed flow may be stopped to affected S/G(s). 5. AFW SYSTEM OPERATION CRITERIA a. IF two AFW pumps are operating on a single train, THEN one of the pumps shall be shut down within one hour of the initial start signal b. IF two AFW trains are operating and one of the AFW pumps has been operating at low flow of 80 gpm or less for one hour, THEN that AFW pump shall be shut down 6. CST MAKEUP WATER CRITERIA IF CST level decreases to less than 10%, THEN add makeup to CST using 3-OP-018.1, CONDENSATE STORAGE TANK.

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
		Evaluator Note: Actions per the fold out page will be performed based on the following: *1. Adverse containment conditions are met.* *2. RCP trip criteria is met all RCPs will be secured* *3. Faulted S/G isolation criteria is met.* *4. Ruptured S/G isolation criteria is met.*
	RO **Critical task**	**Secures all RCPs** Critical task:(TC-WOG) Failure to trip RCPs within 5 minutes of reaching EOP RCP trip criteria on containment isolation Phase B. (WOG E-0/E-1 discussion)
____ ____ Start time for AFW ops	**BOP** **Critical task**	**Determines AFW auto start failure:** • **Opens MOV-1403 and MOV-1404 to establish AFW feed flow.** • HIC-1458B adjusted to zero to isolate flow to 3C S/G. • **HIC-1401B and HIC-1457B adjusted to establish >345 gpm total flow.** *Critical task: (WOG) Failure to establish minimum AFW flow before transitioning out of E-0. (E-0, task F).*
		Evaluator Note: If 3C S/G not identified as ruptured initially feed flow may be established until identified as ruptured.
	BOP	Stabilizes RCS hot leg temp. using steam dumps when 3C wide range level is less than 10%.
	BOP	Step 5 Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure
		Evaluator Note: Attachment 3 listed at end of scenario.

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	RO	Step 6 Check AFW Pumps - AT LEAST TWO RUNNING Perform the following: a. Manually open valves to establish two AFW pumps running. b. IF an AFW pump is tripped, THEN dispatch an operator to locally reset the AFW turbine trips. c. IF both units require AFW AND only one AFW pump is available, THEN perform the following: 1) Verify all RCPs - TRIPPED 2) Establish 270 gpm AFW flow to each unit. 3) Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.
		Evaluator Note: Pumps were started per 3-EOP-E-0 foldout page
	RO	Step 7 Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT Manually align valves to establish proper AFW alignment.

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	RO	Step 8 Verify Proper AFW Flow a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%] a. Perform the following: 1) Verify AFW flow greater than 345 gpm. 2) IF AFW flow less than 345 gpm, THEN manually start pumps AND THEN manually start pumps AND align valves to establish greater than 345 gpm flow. 3) IF total feed flow from all sources greater than 345 gpm can NOT be established, THEN perform the following: a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1. b. Maintain feed flow to S/G narrow range levels between 15%[32%] and 50%.

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 9 Check RCP Seal Cooling	
		a. Check all RCP thermal barrier alarms – OFF • A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW • A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP • A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW	a. IF CCW to an RCP thermal barrier is lost, THEN: 1) Trip the affected 2) RCP(s). Go to Step 9c.
		b. Go to Step 10	
		c. Check all RCP seal return temperatures are less than 235 F	c. Go to Step 10.
		d. Verify SI - RESET	d. Reset SI.
		e. IF offsite power is NOT available, THEN check diesel capacity adequate to run one charging pump. IF adequate diesel capacity is NOT available, THEN shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating	
		f. Start one charging pump at minimum speed for seal injection	
		g. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow	
		Evaluator Note: Step 9.b transitions to step 10	

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 10 Maintain RCS Cold Leg Temperature * STABLE AT OR TRENDING TO 547°F IF ANY RCP RUNNING OR * LESS THAN 547°F AND STABLE IF NO RCP RUNNING	Perform the following: a. IF temperature is decreasing, THEN perform the following: 1) Stop dumping steam. 2) Limit total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. 3) IF cooldown is due to excessive steam flow, THEN close main steamline isolation and bypass valves. b. IF temperature greater than 547°F AND increasing, THEN perform the following: * Dump steam to condenser. OR * Dump steam using S/G steam dump to atmosphere valves.
		Evaluator Note: RCS continues to Cooldown due to SI flow	

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	RO	Step 11 Check PRZ PORVs, Spray Valves And Excess Letdown Isolated a. PORVs – CLOSED a. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. IF any PRZ PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. b. Normal PRZ spray valves – CLOSED b. IF PRZ pressure less than 2260 psig, THEN manually close valves. IF valve(s) can NOT be closed, THEN stop RCP(s) as necessary to stop spray flow. c. Auxiliary Spray Valve, CV-3-311 – CLOSED c. Manually close auxiliary spray valve. IF auxiliary spray valve can NOT be closed, THEN close Charging Flow to Regen Heat Exchanger, HCV-3-121.

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
		d. Excess letdown isolation valves – CLOSED • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller d. Manually close valve(s).
	RO	Step 12 Check If RCPs Should Be Stopped a. Check RCPs - ANY RUNNING — a. Go to Step 13. b. Check RCS subcooling – LESS THAN 25°F[65°F] — b. Go to Step 13. c. High-Head SI Pump – AT LEAST ONE RUNNING AND FLOWPATH VERIFIED — c. Go to Step 13. d. Stop all RCPs
		Evaluator Note: RCPs were secured earlier from fold out page

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	RO	Step 13 Check If S/Gs Are Faulted a. Check pressures in all SGs – * ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR * ANY SG COMPLETELY DEPRESSURIZED a. Go to Step 14. b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1
		Evaluator Note: Red path on Integrity transitions to 3-EOP-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition. Response listed at end of scenario.
		Evaluator Note: On e-2 transition, TRIGGER lesson step EVENT 6 – 3C SG TUBE RUPTURE

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	US	Directs actions per 3-EOP-E-2.
		CAUTIONS - ***At least one S/G must be maintained available for RCS cooldown.*** - ***Any faulted S/G or secondary break is required to be maintained isolated during subsequent recovery actions unless needed for RCS cooldown.*** **NOTE** *RCS hot leg temperature should be stabilized using steam dumps when the faulted S/G has blown down to less than 10% S/G wide range indication.*
	BOP	**1** **Verify The Main Steamline Isolation AND Bypass Valves On Faulted S/G(s) - CLOSED** — Manually close valves.
	BOP	**2** **Check If Any S/G Is NOT Faulted** a. Check pressures in all S/Gs - ANY STABLE OR INCREASING — a. IF all S/G pressures decreasing in an uncontrolled manner, THEN go to 3-EOP-ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, Step 1.
	BOP	**3** **Identify Faulted SG(s)** a. Check pressure in all S/G • ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR • ANY S/G COMPLETELY DEPRESSURIZED a. Search for initiating break: • Main Steamlines • Main Feedlines • Other secondary piping Go to Step 5
		CAUTION ***If the AFW pumps are the only available source of feed flow, a steam supply to the AFW pumps must be maintained from at least one S/G.***

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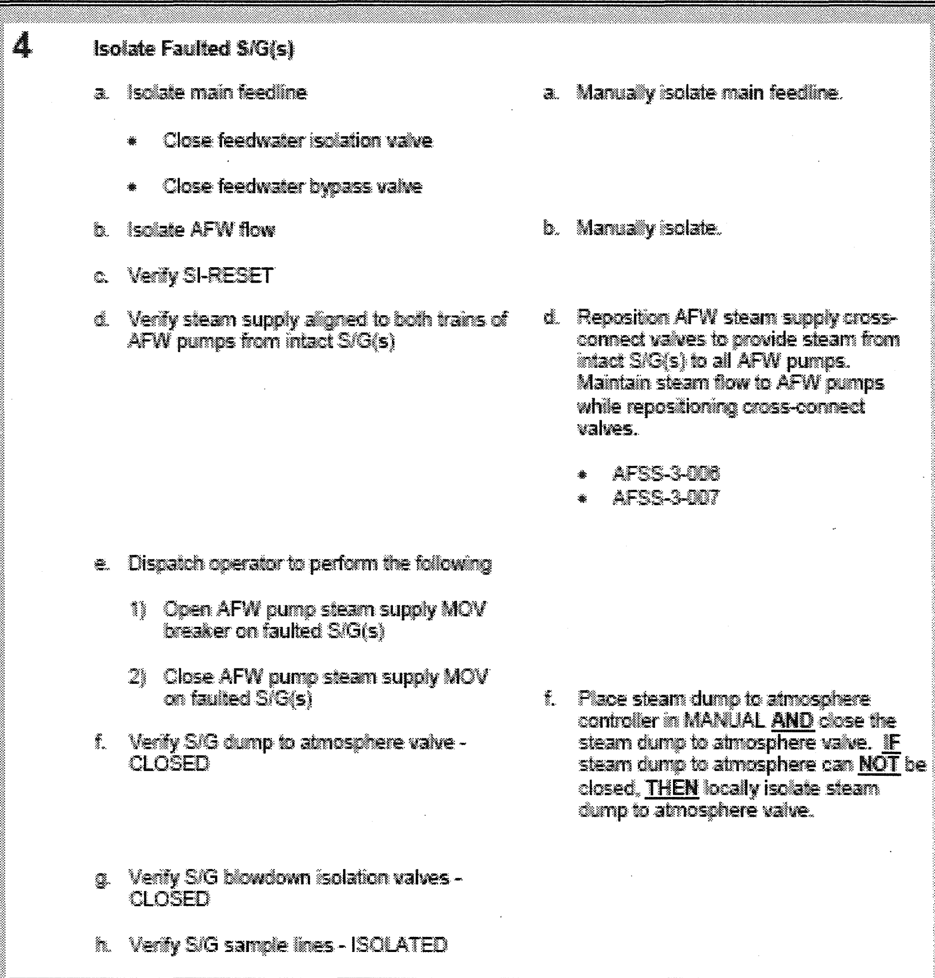
Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	BOP **Critical Task**	 4 **Isolate Faulted S/G(s)** a. Isolate main feedline • Close feedwater isolation valve • Close feedwater bypass valve a. Manually isolate main feedline. b. Isolate AFW flow b. Manually isolate. c. Verify SI-RESET d. Verify steam supply aligned to both trains of AFW pumps from intact S/G(s) d. Reposition AFW steam supply cross-connect valves to provide steam from intact S/G(s) to all AFW pumps. Maintain steam flow to AFW pumps while repositioning cross-connect valves. • AFSS-3-008 • AFSS-3-007 e. Dispatch operator to perform the following 1) Open AFW pump steam supply MOV breaker on faulted S/G(s) 2) Close AFW pump steam supply MOV on faulted S/G(s) f. Verify S/G dump to atmosphere valve - CLOSED f. Place steam dump to atmosphere controller in MANUAL **AND** close the steam dump to atmosphere valve. **IF** steam dump to atmosphere can **NOT** be closed, **THEN** locally isolate steam dump to atmosphere valve. g. Verify S/G blowdown isolation valves - CLOSED h. Verify S/G sample lines - ISOLATED
		Evaluator Note: Completes isolation of 3C S/G ***Evaluator Note: Critical Task, (WOG) Failure to isolate feed and steam for a faulted SG prior to transitioning from E-2. (E-2, Task A)*** ***Critical steps are 4a, 4b, 4e, 4f, 4g, 4h***

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	BOP BOP	**5** **Check CST Level - GREATER THAN 10%** — Add to makeup to CST using 3-OP-018.1, CONDENSATE STORAGE TANK. **6** **Check Secondary Radiation** a. Direct Nuclear Chemistry to take periodic activity samples of all S/Gs b. Direct Nuclear Chemistry to check DAM 1 monitor reading c. Direct Health Physics to take radiation readings on main steam lines d. Secondary radiation - NORMAL NEAR ROUTINE OPERATION VALUE — d. Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
	US	Transitions to 3-EOP-E-3 due to secondary radiation
		NOTES • *FOLDOUT Page shall be monitored for the remainder of this procedure.* • *Personnel will be necessary for sampling during this procedure.*
	RO	**1** **Monitor Conditions To Determine If RCPs Should Be Stopped** a. RCPs - ANY RUNNING — a. Go to Step 2. b. High-head SI pumps - AT LEAST ONE RUNNING — b. Go to Step 2. c. RCS subcooling - LESS THAN 25°F[65°F] — c. Go to Step 2. d. Controlled plant cooldown – **NOT** INITIATED — d. Go to Step 2. e. Stop all RCPs

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	BOP	**2 Identify Ruptured S/G(s)** a. Direct Radiation Protection to take radiation readings on main steam lines **AND** blowdown lines b. Direct Chemistry to sample the steamlines for activity c. Determine which S/G(s) is ruptured * Unexpected mismatch between steamflow and feedflow **OR** * Unexpected increase in any S/G narrow range level **OR** * High radiation from any S/G steamline sample **OR** * High radiation from any S/G blowdown line sample **OR** * High radiation on RP local readings of main steamlines **OR** blowdown lines c. **WHEN** ruptured S/G(s) identified, **THEN** observe CAUTIONS prior to Step 3 **AND** do Steps 3 through 11. Continue with Steps 12 through 18.
		Evaluator Note: Identifies 3C S/G as ruptured and Faulted
		CAUTIONS • *If the AFW pumps are the only available source of feedwater flow, the steam supply to the AFW pumps must be maintained from at least one S/G.* • *At least one S/G must be maintained available for RCS cooldown.*

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	BOP	**3** **Control Ruptured S/G(s) Steam Dump To Atmosphere Valve** a. Adjust ruptured S/G(s) steam dump to atmosphere controller setpoint to 1060 psig b. Check ruptured S/G(s) steam dump to atmosphere - CLOSED b. **WHEN** ruptured S/G pressure is less than 1060 psig, **THEN** perform the following: 1) Verify S/G steam dump to atmosphere – CLOSED. 2) **IF** S/G steam dump to atmosphere does **NOT** close, **THEN** place steam dump to atmosphere controller in MANUAL **AND** close the steam dump to atmosphere. 3) **IF** steam dump to atmosphere can **NOT** be closed, **THEN** locally close affected steam dump to atmosphere isolation valve: * 3-10-001 for S/G A * 3-10-002 for S/G B * 3-10-003 for S/G C
	BOP	**4** **Isolate Steam From Ruptured S/G(s) To AFW Pumps** a. Verify SI - RESET a. Reset SI. b. Verify AMSAC - RESET b. Reset AMSAC. c. Verify steam supply aligned to both trains of AFW pumps from intact S/G(s) c. Reposition AFW steam supply cross-connect valves to provide steam from intact S/G(s) to all AFW pumps. Maintain steam flow to AFW pumps while repositioning cross-connect valves. * AFSS-3-006 * AFSS-3-007 d. Close AFW pump steam supply MOV on ruptured S/G(s) e. Dispatch an operator to perform the following 1) Open AFW pump steam supply MOV breaker on ruptured S/G(s) 2) Verify AFW pump steam supply MOV on ruptured S/G(s) - CLOSED

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	BOP	**5** **Isolate Miscellaneous Flowpaths From Ruptured S/G(s)** a. Verify blowdown isolation valve(s) from ruptured S/G(s) - CLOSED a. Locally close associated manual isolation valve: * SGB-3-007 for S/G A * SGB-3-008 for S/G B * SGB-3-009 for S/G C b. Check auxiliary steam - SUPPLIED FROM ANOTHER UNIT b. Perform Attachment 5 while continuing with Step 6.
		Evaluator Note: Aux. steam supply aligned from unit 3, Directs NSO to use attachment 5 to align aux. steam from unit 4.
	BOP	**6** **Close Ruptured S/G(s) Main Steamline Isolation <u>AND</u> Bypass Valves**
		<u>CAUTION</u> ***All steam generator blowdown sample lines must be isolated within the first 30 minutes of a Steam Generator Tube Rupture event to prevent release of contaminated fluid through unmonitored vent paths.***
	BOP	**7** **Verify S/G Blowdown Sample Stop Valves - CLOSED** • MOV-3-1427 • MOV-3-1426 • MOV-3-1425
		<u>CAUTION</u> ***If any ruptured S/G is also faulted and is NOT needed for RCS cooldown, feed flow to that S/G is required to be maintained isolated during subsequent recovery actions.***

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Event Description: 3C S/G experiences a fault in containment requiring a unit trip. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 3C S/G tube rupture occurs after 3C S/G blows dry.

Time	Position	Applicant's Actions or Behavior
	BOP	**8** **Control Ruptured S/G(s) Level** a. Narrow range level – GREATER THAN 6%[32%] a. Perform the following: 1) Maintain feed flow to ruptured S/G until level is greater than 6%[32%]. 2) **WHEN** ruptured S/G level is greater than 6%[32%], **THEN** stop feed flow to ruptured S/G(s). 3) Continue with Step 9. b. Stop feed flow to ruptured S/G(s)
	BOP	**9** **Verify Ruptured S/G(s) – ISOLATED FROM INTACT S/Gs** • Ruptured S/G(s) Main Steamline Isolation and Bypass Valves - CLOSED • Ruptured S/G(s) AFW Steam Supply MOV(s) - CLOSED Do **NOT** continue until each ruptured S/G(s) is isolated from at least one intact S/G(s) to be used for RCS cooldown. **IF** any ruptured S/G(s) can **NOT** be isolated from at least one intact S/G, **THEN** go to 3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT-SUBCOOLED RECOVERY DESIRED, Step 1.
		Evaluator Note: Critical Task, (WOG) Failure to isolate feed and steam for a faulted SG prior to transitioning from E-2. (E-2, Task A) should have been completed earlier.
	BOP	**10** **Check Ruptured S/G(s) Pressure - GREATER THAN 500 PSIG** Go to 3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT-SUBCOOLED RECOVERY DESIRED, Step 1.
	US	Transitions to 3-EOP-ECA-3.1

Inform the crew you now have the shift, remain in place and not to discuss the scenario.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 1 Check The Load Centers Associated With The Energized 4 KV Buses – ENERGIZED — Close the Load Center supply breakers. • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC
	BOP	Step 2. Check If Main Steamlines Should Be Isolated a. Check main steamline isolation and bypass valves - ANY OPEN — a. Go to Step 3. b. Check if either main steam isolation signal has actuated — b. Go to Step 3. • High steam flow with either low S/G pressure 614 psig OR low Tavg 543 F OR • Hi-Hi containment pressure 20 PSIG c. Verify main steam isolation and bypass valves - CLOSED — c. Push manual Steamline Isolation push buttons on VPB OR manually close valves.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 3. Verify Feedwater Isolation	
		a. Place main feedwater pump switches in STOP	
		b. Feedwater control valves – CLOSED	b. Manually close valves.
		c. Feedwater bypass valves – CLOSED	c. Manually close valves.
		d. Close feedwater isolation MOVs	d. Locally close valves.
		e. Verify standby feedwater pumps – OFF	e. IF standby feedwater is aligned to Unit 3, THEN stop standby feedwater pump(s).
	BOP	Step 4. Verify Proper ICW System Operation	
		a. Verify ICW pumps - AT LEAST TWO RUNNING	a. Start ICW pump(s) to establish at least two running.
		b. Verify ICW to TPCW Heat Exchanger – ISOLATED	b. Manually close valve(s). IF valve(s) can NOT be closed, THEN locally close the following valves:
		• POV-3-4882 – CLOSED	• 3-50-319 for POV-3-4882
		• POV-3-4883 – CLOSED	• 3-50-339 for POV-3-4883
		c. Check ICW headers - TIED TOGETHER	c. IF both ICW headers are intact, THEN direct operator to tie headers together.
		Evaluator Note: BOP closes POV-3-4882	

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 5. Verify Proper CCW System Operation	
		a. CCW Heat Exchangers – THREE IN SERVICE	a. Perform the following: 1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP. 2) Verify Emergency Containment Coolers - ONLY TWO RUNNING 3) Go to Step 5c.
		b. CCW pumps - ONLY TWO RUNNING	b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.
		c. CCW headers - TIED TOGETHER	c. IF both CCW headers are intact, THEN direct a field operator to tie the headers together.
		d. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN	d. IF containment isolation phase B NOT actuated AND CCW radiation levels are normal, AND RCP number one seal leak-off temperature is less than 235°F, THEN manually open MOV-3-626. IF MOV-3-626 can NOT be manually opened, THEN direct operator to open MOV-3-626 locally.
	BOP	Step 6. Verify Containment Cooling	
		a. Check emergency containment coolers - ONLY TWO RUNNING	a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING.
		b. Verify emergency containment filter fans - AT LEAST TWO RUNNING	b. Manually start emergency containment filter fans.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 4 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 7. Verify SI Pump Operation a. At least two high head pumps running — a. Manually start high-head pump(s). b. Both RHR pumps running — b. Manually start RHR pump(s).
	BOP	Step 8. Verify SI Flow a. RCS pressure - LESS THAN 1600 PSIG[2000 PSIG] — a. Go to Step 9. b. High-head SI pump flow indicator – CHECK FOR FLOW — b. Manually start pumps AND align valves to establish an injection flowpath. c. RCS pressure - LESS THAN 250 PSIG[650 PSIG] — c. Go to Step 9. d. RHR pump flow indicator - CHECK FOR FLOW — d. Manually start pumps AND align valves to establish an injection flowpath.
	BOP	Step 9. Realign SI System a. Verify Unit 3 high-head SI pumps - TWO RUNNING — a. Perform the following: 1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps. 2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure. 3) Go to Step 10. b. Stop both Unit 4 high-head SI pumps AND place in standby

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 5 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT Perform the following: a. Manually actuate Containment Isolation Phase A. b. IF any Containment Isolation Phase A valve is NOT closed, THEN manually close valve. IF valve(s) can NOT be manually closed, THEN manually or locally isolate affected containment penetration.
	BOP	Step 11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	Step 12. Verify SI – RESET Reset SI
	BOP	Step 13. Verify Containment Phase A – RESET Reset Phase A
		Evaluator Note: BOP is required to go back to the containment isolation racks and rest the six phase A lockout relays, (three lockout relays on each rack)

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 6 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 14. Reestablish RCP Cooling a. Check RCPs – AT LEAST ONE RUNNING a. Go to step 15. b. Open CCW to normal containment cooler valves b. Stop all RCPs • MOV-3-1417 • MOV-3-1418 c. Reset and start normal containment coolers c. Stop all RCPs
	BOP	Step 15. Monitor Containment Pressure To Verify Containment Spray NOT Required a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG • PR-3-6306A AND • PR-3-6306B a. Perform the following: 1) IF containment spray NOT initiated, THEN manually initiate containment spray. 2) Verify Containment Isolation Phase B- ACTUATED. 3) Verify Containment Isolation Phase B valve white lights on VPB – ALL BRIGHT.
		4) IF any Containment Isolation Phase B valve did NOT close, THEN manually or locally isolate affected containment penetration. 5) Stop all RCPs.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 7 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 16. Verify Containment and Control Room Ventilation Isolation a. Unit 3 containment purge exhaust and supply fans – OFF — a. Manually stop fans. b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT — b. Manually align equipment for Control Room emergency recirculation.
		NOTE *Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.*
	BOP	Step 17. Place Hydrogen Monitors In Service Using 3-OP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM
		Evaluator Note: BOP will call NSO to align PAHM. 3-OP-094 steps listed below.

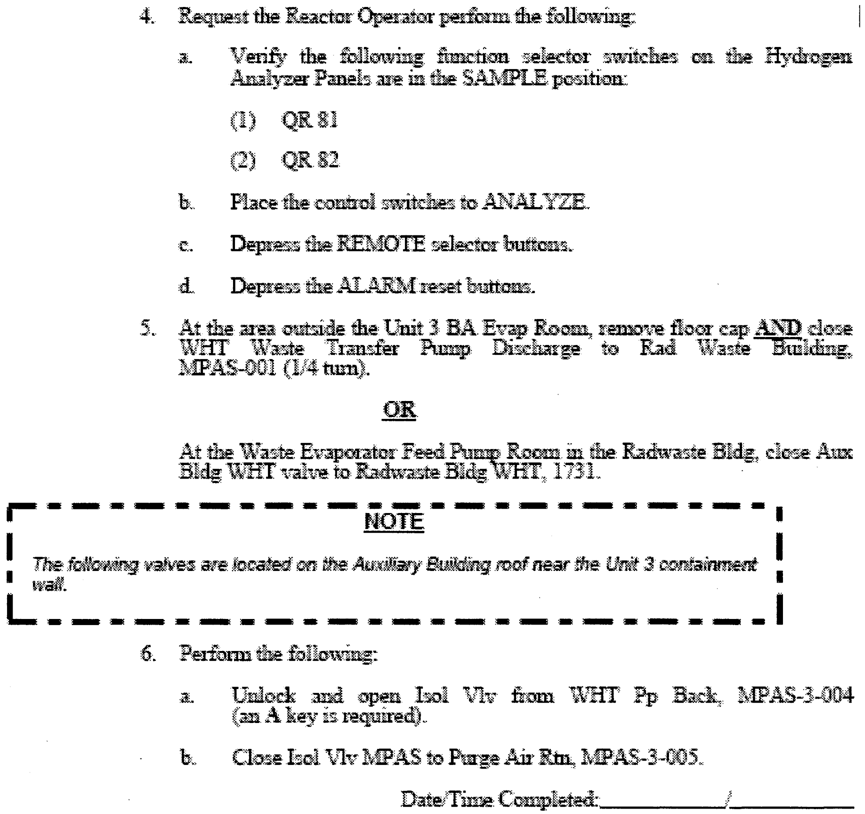
Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 8 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
		7.1 Post Accident H_2 Monitor Startup NOTE *Hydrogen Monitors should be in service within 30 minutes of a valid SI signal.* 7.1.1 Initial Conditions 1. All applicable prerequisites listed in Section 3.0 are satisfied. 7.1.2 Procedure Steps NOTES • *Valves PASS-3-008, 3-001A, 3-001B, 3-002A and 3-002B are located in the floor outside the Unit 3 Sample Room.* • *Full travel for valves is provided in parenthesis and should not be exceeded or damage to reach rod assemblies may occur.* 1. Remove the floor caps **AND** open the following valves using the reach rods located in the Auxiliary Building: a. Post Accident Sampling System Return Line Isolation Valve, PASS-3-008 (2 1/4 turns) b. H_2 Analyzer 3A Outlet Isol, PAHM-3-001A (6 turns) c. H_2 Analyzer 3B Outlet Isol, PAHM-3-001B (6 turns) d. PACV Vent and Sample System to PAHM Header Isolation Valve (RR), PAHM-3-002A (6 turns) e. PACV Vent and Sample System to PAHM Header Isolation Valve (RR), PAHM-3-002B (5 turns) 2. Unlock **AND** open PACVS Isol Vlv Penet 53, HV-3-3, in front of the Unit 3 Containment Spray Pump Room. (An A key is required for this lock.) 3. Unlock **AND** open PACVS Isol Vlv Penet 16, HV-3-1, located in the north Aux Bldg hallway. (An A key is required for this lock.)

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 9 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
		 4. Request the Reactor Operator perform the following: a. Verify the following function selector switches on the Hydrogen Analyzer Panels are in the SAMPLE position: (1) QR 81 (2) QR 82 b. Place the control switches to ANALYZE. c. Depress the REMOTE selector buttons. d. Depress the ALARM reset buttons. 5. At the area outside the Unit 3 BA Evap Room, remove floor cap **AND** close WHT Waste Transfer Pump Discharge to Rad Waste Building, MPAS-001 (1/4 turn). **OR** At the Waste Evaporator Feed Pump Room in the Radwaste Bldg, close Aux Bldg WHT valve to Radwaste Bldg WHT, 1731. **NOTE** *The following valves are located on the Auxiliary Building roof near the Unit 3 containment wall.* 6. Perform the following: a. Unlock and open Isol Vlv from WHT Pp Back, MPAS-3-004 (an A key is required). b. Close Isol Vlv MPAS to Purge Air Rtn, MPAS-3-005. Date/Time Completed:________/________
	BOP	Step 18. Verify All Four EDGs – RUNNING EMERGENCY START any available EDG NOT running.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 10 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 19. Verify Power To Emergency 4 KV Buses and Load Centers a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED a. Perform the following: 1) Inform the Unit Supervisor that Attachment 3 is complete with the exception of the de-energized bus or buses. 2) IF the Unit Supervisor decides not to energize the de-energized bus or buses, THEN go to Step 20. 3) IF the Unit Supervisor decides to energize 3A, 3B, or 3D bus, THEN perform the following: a) IF 3A 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS. b) IF 3B 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS. c) IF 3D 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 att.3 Page 11 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Note Any Actions That Had To Be Taken
		Evaluator Note: BOP informs US of completion and manual closure of POV-3-4882 was required. *Evaluator Note: BOP should receive a turnover from the RO and continue in the EOP network.*
		END OF ATTACHMENT

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: ___ Page 1 of 5

Event Description: 3-EOP-FR-P.1 response

Time	Position	Applicant's Actions or Behavior
	US	Directs response per 3-EOP-FR-P.1
		CAUTION *If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heatsink.*
	RO	Step 1 Check RCS Pressure - GREATER THAN 250 PSIG[650 PSIG] IF RHR Flow greater than 1000 gpm, THEN return to procedure AND step in effect.
		CAUTIONS • *Low range flow indication is NOT available when using main feedwater instrumentation and an alternate source of feedwater. Changes in RCS temperature and S/G level may be used to control feedwater flow.* • *If the AFW pumps are the only available source of feed flow, the steam supply to the AFW pumps needs to be maintained from at least one S/G.*

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: ___ Page 2 of 5

Event Description: 3-EOP-FR-P.1 response

Time	Position	Applicant's Actions or Behavior
		NOTE *If RCPs are NOT running and Steps 19 through 28 of 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, are in effect, this procedure shall not be performed.*
		Step 2 Check RCS Cold Leg Temperatures -STABLE OR INCREASING Try to stop RCS cooldown: a. Verify S/G steam dump to atmosphere valves - CLOSED. b. Verify steam dump to condenser valves - CLOSED. c. IF RHR system in service, THEN stop any cooldown from RHR system. d. Control feed flow to non-faulted S/G(s) to stop RCS cooldown. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6%[32%] in at least one non-faulted S/G.
		NOTE *A faulted S/G is any S/G that is depressurizing in an uncontrolled manner or is completely depressurized.*

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: ___ Page 3 of 5

Event Description: 3-EOP-FR-P.1 response

Time	Position	Applicant's Actions or Behavior
	BOP	**3 Minimize Cooldown From Faulted S/G(s)** a. Check S/Gs - ANY FAULTED a. Go to Step 4. b. Check RCS cold leg temperatures – DECREASING b. Go to Step 4. c. Verify main steamline isolation and bypass valves closed for each faulted S/G d. Verify SI - RESET e. Verify steam supply aligned to both trains of AFW pumps from intact S/G(s) e. Reposition AFW steam supply cross-connect valves to provide steam from intact S/G(s) to all AFW pumps. Maintain steam flow to AFW pumps while repositioning cross-connect valves. • AFSS-3-006 • AFSS-3-007 f. Dispatch operator to perform the following 1) Open AFW pump steam supply MOV breaker on faulted S/G(s) 2) Close AFW pump steam supply MOV on faulted S/G(s) g. Check all S/Gs - ANY S/G <u>NOT</u> FAULTED g. <u>IF</u> all S/Gs faulted, <u>THEN</u> control feed flow at 25 gpm to each S/G <u>AND</u> go to Step 4. h. Control feed flow at 25 gpm to any faulted S/G(s) needed for RCS temperature control i. Isolate feedwater to all faulted S/G(s) <u>NOT</u> needed for RCS temperature control
	BOP	*Evaluator Note: Directs NSO to close AFSS-3-006 and open AFSS-007 to supply train 1 AFW from 3B S/G.*
	BOP	*Evaluator Note: Places HIC-1458A and HIC-1458B in manual closed to isolate feed to 3C S/G .*

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: ___ Page 4 of 5

Event Description: 3-EOP-FR-P.1 response

Time	Position	Applicant's Actions or Behavior
	RO	**4** **Check PRZ PORV Block Valves** a. Power to block valves - AVAILABLE a. Restore power to block valves. b. Block valves - AT LEAST ONE OPEN b. Open one block valve unless it was closed to isolate an open PORV.
	RO	**CAUTION** ***If any PRZ PORV opens because of high PRZ pressure, step 5 should be repeated after pressure decreases to less than the setpoint.*** **5** **Check If PRZ PORVs Should Be Closed** a. Check Overpressure Mitigation System (OMS) - IN SERVICE a. Go to Step 5d. b. Check RCS pressure - LESS THAN 460 PSIG b. Verify at least one PRZ PORV open. <u>WHEN</u> pressure less than 460 psig, <u>THEN</u> verify all PRZ PORVs closed or isolated. Continue with Step 6. c. Go to Step 5e d. Check PRZ pressure - LESS THAN 2335 PSIG d. Verify at least one PRZ PORV open. <u>WHEN</u> pressure less than 2335 psig, <u>THEN</u> verify all PRZ PORVs closed or isolated. Continue with Step 6. e. PRZ PORVs - CLOSED e. Manually close PORV. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
	RO RO	**6** **Check High-Head SI Pumps – ANY RUNNING** Go to Step 13. **7** **Check If SI Should Be Terminated** Go to Step 27. - RCS subcooling based on core exit TCs - GREATER THAN 80°F[280°F] - RVLMS (QSPDS) plenum indication - GREATER THAN 0%
	US	*Evaluator Note: transitions to step 27*

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: ___ Page 5 of 5

Event Description: 3-EOP-FR-P.1 response

Time	Position	Applicant's Actions or Behavior
	RO	**27** **Check If An RCP Should Be Started** — Go to Step 32. • All RCPs - STOPPED • RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F]
	US	*Evaluator Note: transitions to step 32*
	US	**32** **Determine If RCS Temperature Soak Is Required** a. Cooldown rate in RCS cold legs - GREATER THAN 100°F IN ANY 60-MINUTE PERIOD — a. Go to Step 33. b. Perform all of the following 1) Record start time of soak:__________ 2) Do **NOT** cool down RCS until temperature has been stable for 1 hour 3) Do **NOT** increase RCS pressure during the 1 hour soak 4) Perform actions of other procedures in effect which do **NOT** cool down **OR** increase RCS pressure until the RCS temperature soak has been completed 5) RCS cooldown is permitted after 1 hour soak has been completed 6) Maintain RCS pressure **AND** cold leg temperatures within the limits of FIGURE 1 7) Maintain cooldown rate in RCS cold legs less than 50°F in any 60-minute period during subsequent recovery actions
	US	**33** **Return To Procedure AND Step In Effect**
	US	Transitions back to 3-EOP-E-2 on page 37.

NRC XXIV_NRC_SEN_2

OPERATIONS SHIFT TURNOVER REPORT

ONCOMING CREW ASSIGNMENTS

Shift Mgr:			**Inside SNPO:**	
Field Supv.:			**Outside SNPO:**	
Admin RCO:			**ANPO:**	

Unit 3			**Unit 4**	
Unit Supv.:			Unit Supv.:	
RCO:			**RCO:**	
NPO:			**NPO:**	

Plant Status

Unit 3			**Unit 4**	
Mode:	1		**Mode:**	1
Power:	100%		**Power:**	100%
MWe:	760		**MWe:**	760
Gross Leakrate:	.02 gpm		**Gross Leakrate:**	.02 gpm
RCS Boron Conc:	670 ppm		**RCS Boron Conc:**	200 ppm

Operational Concerns:

3C charging pump out of service due to packing leakage. Due back in 14 hours.
Thunderstorms reported in the area.

U3 Anticipated LCO Actions:

U4 Anticipated LCO Actions:

Results of Offgoing Focus Area:

Maintain 100% MOL

Unit 3 Status

Reactor Operator

Mode:	1
Power:	100%
MWe:	760
Tavg:	574.2ºF
RCS Pressure:	2250 psig
RCS Boron Conc:	670 ppm

RCS Leakrate	
Gross:	.02 gpm
Unidentified	.01 gpm
Charging Pps:	.01 gpm

Accumulator Ref Levels	
A	6615 gal
B	6641 gal
C	6627 gal

Abnormal Annunciators:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Annunciator:
Comp Actions:

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component:
Reason:
Entry Date:

T.S.A.S / Component:
Reason:
Entry Date:

T.S.A.S / Component:
Reason:
Entry Date:

T.S.A.S / Component:
Reason:
Entry Date:

T.S.A.S / Component:
Reason:
Entry Date:

T.S.A.S / Component:
Reason:
Entry Date:

Unit 3 Status

Changes to Risk Significant Equipment:

B train protected both units
Online risk is green

Upcoming Reactivity Management Activities:

Upcoming Major POD Activities:

Upcoming ECOs to Hang and /or Release:

Evolutions or Compensatory Actions in Progress:

General Information, Remarks, and Operator Work Around Status:

Aux. steam supply aligned from unit 3.
Condenser inleakage 0 scfm.

TP-2009-301 Scenario #3 Event Description

Facility: Turkey Point Scenario No.: 3 mod Op Test No.: 2009-301

Examiners: ______________________ Candidates: ______________________ US

______________________ ______________________ RO

______________________ ______________________ BOP

Initial Conditions: Mode 1, 100% BOL

Turnover: Equipment OOS: 3C charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. Thunderstorms are in the area.

Maintain 100%

On line risk is green

B train protected

Event No.		Event Type*	Event Description
1	TFK1A611 = T TFK1S611 = T	(C)RO (TS,C)SRO	3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.
2	TFS1MWEH = T	(I)BOP (TS,I)SRO	FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.
3	TVHNL1A = .00101	(R)RO (N)BOP (R)SRO	3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal.
4	TFBVC18=T	(C)RO (C)SRO	FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4
5	V8CD36ON=T TVFABP6B 1.0000 TFF1ZB21=T TFF1D6BT=T TFU1LRRD=T	(C)BOP (C)SRO	When power is <75%, the 3B condensate pump trips due to bearing failure. 3C condensate pump fails to auto start. The 3B SGFP may trip automatically running the turbine back.
6	TVSBVL10 = 0.2500 TFM2D3AS = T TFK2A19S = T TFK2B17T = T	(M)ALL	A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Turkey Point 2009-301 Scenario #3

Event 1 - 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Event 2 – FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

Event 3 - 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal.

Event 4 – FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Event 5 - When power is <75%, the 3B condensate pump trips due to bearing failure. 3C condensate pump fails to auto start. The 3B SGFP may trip automatically running the turbine back.

Event 6 - A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Scenario XXIV NRC 3

Simulator Operating Instructions

Setup

Restore IC-11 (Mode 1 BOL)

Open & execute lesson file SRO_XXIV_NRC_3.lsn

Place simulator in run

Start 3B charging pump and secure 3C charging pump

Trigger lesson step: **SETUP – 3C Charging pump OOS.** Removes 3C charging pump from service, blocks CCW auto starts, fails 3A SI PP as is. (Actuates TAB1POSM = RACKOUT, TABM270 = 0, TABM291 = 0, TABM290 = 0, TFK1A611 = T, TFK1S611 = T, TFM2D3AS = T,)

Trigger lesson step: **SETUP – SI ICW MSIV TRIP FAILURE**. Removes 3A SI and 3A ICW pumps auto starts, blocks auto reactor trip, blocks 3B MSIV auto close (Actuates TFK2A19S = T, TFM2D3AS = T, TFL2XBSE = T, TFL2XASE = T, TCE6DQ7C = T, TCE6DQ8C = T, TFSVVX6C = T)

Place simulator in freeze.

Place clearance info tag on 3C Charging Pump start switch

Provide shift turnover checklists

Select 3A QSPDS to page 211 (SAT) and 3B QSPDS to page 212 (RVL). Set ERDADS on VPA and at the RCO desk to the Utilities screens.

Fill in blender & shutdown boron addition placards at console blender station. Data for each IC may be found in the ECC & Shutdown Guidelines Book in the simulator I/F.

Event 1 – 3B CCW PUMP TRIP

Initiated immediately after shift turnover.

3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction..

When directed - Trigger lesson step **EVENT 1 – 3B CCW PUMP TRIP**
(Actuates TFK1B13T = T)

When directed, to rack out 3B CCW pump breaker, wait 10 minutes and **Trigger** lesson step **EVENT 1 – RACK OUT 3B CCW PP BKR**. Report when completed.

3-ONOP- 030

Step 34.d. – Respond as NSO, Acknowledge direction to verify CCW flow to CCW heat exchangers using FI-3-1407, 1408, and 1409. After 2 minutes report to CR flow verified on all CCW heat exchangers. IF asked flows indicate as follows:

- FI-3-1407 329 gpm
- FI-3-1408 297 gpm
- FI-3-1409 324 gpm

Step 45.a - Respond as NSO, Acknowledge direction to verify CCW flow from charging pumps on FI-3-660. After 2 minutes report to CR flow on FI-3-660 verified.

Step 53 - Respond as NSO, Acknowledge direction to verify CCW flow from seal water heat exchanger on FI-3-618. After 2 minutes report to CR flow on FI-3-618 verified.

Step 54 - Respond as NSO, Acknowledge direction to verify CCW flow from spent fuel pool heat exchanger on FI-3-622. After 2 minutes report to CR flow on FI-3-622 verified.

Step 55 – Respond as SM, acknowledge direction to check 0-EPIP-20101 and tech. specs. satisfied.

Event 2 – FT-3-474, 3A S/G Steam Flow Fail High

FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

When directed - Trigger lesson step **EVENT 2 FT-3-474 FAIL HIGH**
(Actuates TFS1MWEH = T)

3-0NOP-049.1

Step 5.16 – Respond as work control; acknowledge the failure of FT-3-474 and the direction to initiate a PWO, and to inform I&C Supervisor.

Event 3 – 3A RCP #1 SEAL FAILURE

3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal.

When directed - Trigger lesson step **EVENT 3, 3A RCP #1 SEAL FAILURE**
(Actuates TVHNL1A = .00101)

3-ONOP-041.1

Step 1 – Respond as NSO, acknowledge direction to check local seal injection, report back all seal injection. Flows aprox. 8 gpm.

3-ONOP-100

Step 3 – Respond as System Dispatcher, acknowledge unit 3 shutdown for RCP seal failure.

Step 6 – Respond as SM, Acknowledge direction to refer to 0-EPIP-20101 and 0-ADM-115.

If called respond as chemistry to take samples. No response back required.

If called respond as FS/NSO to align aux steam per attachment 1. No response back required.

Event 4 – FCV-3-113B FAILS CLOSED

FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Event 5 – 3B CONDENSATE PUMP TRIP

When power is <75%, the 3B condensate pump trips due to bearing failure. 3C condensate pump fails to auto start. The 3B SGFP may trip automatically running the turbine back.

When directed - Trigger lesson step **EVENT 5 – 3B CONDENSATE PP TRIP**

(Actuates V8CD360N=T, TVFABP6B 1.0, TFF1ZB21=T, TFU1LRRD=T)

Event 6 – STEAM BREAK DOWNSTREAM MSIV

A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

When directed - Trigger lesson step **EVENT 6 – STEAM BREAK DOWNSTREAM MSIV** (actuates TVSBVL10 = 0.25000)

3-EOP-E-0

Step 19.a - Respond as Chemistry, Acknowledge direction to take periodic activity samples of all S/Gs

Step 19.b - Respond as Radiation Protection, Acknowledge direction to take radiation readings on main steam lines.

3-EOP-E-0 attachment 3

Step 9.a RNO – Respond as unit 4 RO, acknowledge direction to align unit 4 high-head SI pump suction to unit 3 RWST using attachment 1 of 3-EOP-E-0.

Step 14a. – Respond as HP; acknowledge direction to survey MS lines. Report back after 10 minutes, all steam lines at background readings.

Step 17 – acknowledge direction to place PAHM in service per 3-OP-094

- **Trigger** lesson step, **PLACE PAHM IN SERVICE**
- After 5 minutes inform CR steps 7.1.2.1 through 3 are complete
- Request CR continue with step 7.1.2.4
- Acknowledge direction to complete lineup after step 7.1.2.4 is completed After 5 minutes report to CR that PAHM is in service.

3-EOP-E-0 attachment 5

Step 3 - Respond as NSO, confirm 3A SFP cooling pump running.

Step 15 - Respond as NSO, acknowledge direction to shutdown MSRs using 3-OP-072.1 and perform 3-OSP-089 main turbine valves operability test.

3-EOP-ES-1.1

Step 16.d – Respond as NSO, Acknowledge direction to reset group A backup pzr heater lockout relay in the unit 3 west electrical penetration room. After 2 minutes **Trigger** lesson step, **RESET GP A BACKUP HEATERS**, inform CR when complete.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 1 Page 1 of 10

Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, EVENT 1 – 3B CCW PUMP TRIP
	RO	RO recognizes and reports the loss of 3B CCW pump as evident by the following: • Annunciator alarms A1/3, H 7/3, H 7/4, H 7/5, H 9/5, X 3/6 • 3B CCW pump amps • 3B CCW breaker indication • Failure of 3A or 3C CCW pumps to start on low pressure
____ Start	**RO Critical Task**	**May start another CCW pump as a prudent operator action per 0-ADM-211 and US direction or wait for direction in 3-ONOP-030.**
	RO	May place the 3B CCW pump in pull-to-lock per 0-ADM-211.
		Evaluator Note: 0-ADM-211 allows prudent operator action to manually operate equipment when automatic actions fail to operate.
	BOP	Reviews ARPs. Guidance to enter 3-ONOP-030 is provided in ARPs H 7/3, H 7/4, and H 7/5 if a CCW pump is not started as prudent action. IF MOV-3-626 closes on high flow ARP guidance will be used to reopen.
	US	Directs actions of 3-ONOP-030 Component Cooling Water Malfunction
		CAUTION *If any RCP bearing temperature annunciator alarm actuates AND its associated motor bearing temperature is greater than 195°F, trip the reactor and stop the affected RCPs.* **NOTE** *Foldout page should be monitored throughout this procedure.*
	US	Reviews the following foldout page

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 1 Page 2 of 10

Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	US	**FOLDOUT FOR 3-ONOP-030** 1. **TOTAL LOSS OF CCW FLOW** A. Manually trip the reactor, verify reactor trip using the EOP network, **THEN** stop the RCPs. B. Isolate letdown and excess letdown. C. Establish one charging pump running at maximum speed **AND** dispatch operator to establish emergency cooling water to one of the remaining two charging pumps using Attachment 1. Monitor RCS pressure closely while running charging pump at maximum speed. D. **WHEN** Attachment 1 is complete, **THEN** operate charging pump supplied with emergency cooling as necessary to maintain RCP seal cooling. 2. **LOSS OF CCW TO ANY COMPONENT** **IF** component cooling water flow to any component cooled by CCW is lost, **THEN** shut down the affected component. 3. **CHARGING PUMP EMERGENCY COOLING CRITERIA** **IF** Cooling Water is **NOT** available to charging pumps, **THEN** charging pump operation shall be at maximum speed until cooling is restored from CCW System or using Attachment 1. 4. **CCW PUMP STOPPING CRITERIA** **IF** any Component Cooling Water Pump is cavitating, **THEN** stop the affected Component Cooling Water Pumps and place in Pull-To-Lock. 5. **REACTOR TRIP CRITERIA** **IF** tripping a RCP is required, **THEN** manually trip the reactor prior to stopping the RCP. 6. **RCP STOPPING CRITERIA** **IF** any RCP bearing temperature annunciator alarm actuates **AND** its associated motor bearing temperature is greater than 195°F, **THEN** trip reactor and stop the affected RCPs. 7. CCW System operation once CCW System Hdr has been restored shall be within the operating restrictions of 3-OP-030 summarized as follows: [Commitment - Step 3.3.2] CCW Pumps, Heat Exchangers, and Flows/Loads. • N-1 CCW Pumps (where N = number of CCW Hxs aligned to CCW) • All CCW Hxs in service when RHR in service **OR** with only 2 CCW Hxs in service, place 2 CCW Pumps in Pull-To-Lock. • Maximum of 5 out of 6 CCW Heat Loads.

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Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	BOP	**1 Verify Power To 4KV Bus 3D** a. Maintain 4KV Bus 3D energized - ALIGNED TO AN ENERGIZED 4KV BUS a. IF lockout of 4KV Bus 3D NOT present, THEN perform the following: 1. Verify 3C CCW Pump - BREAKER OPEN 2. Verify 3C ICW Pump - BREAKER OPEN 3. Operate bus supply breakers to energize bus.
Start	**RO** **Critical Task**	**2 Verify Component Cooling Water Pumps In Service** a. IF starting an idle CCW pump will NOT overload an EDG, THEN start CCW pumps as necessary to establish flow in both headers.
		Critical Task :(TC-PRA) Failure to start CCW pump (s) within 5 minutes after auto start failure. Can be accomplished in 3-ONOP-030.
		Evaluator Note: Ro will start a CCW pump if one was not started earlier.
	RO	**3 Verify Flow In Both Component Cooling Water Headers - NORMAL** • FT-3-613A for header A • FT-3-613B for header B Perform the following: a. IF CCW flow to RCPs can NOT be established, THEN manually trip the reactor AND verify reactor trip using the EOP Network, AND then stop all RCPs AND perform the following: 1. Isolate Letdown and Excess Letdown 2. IF any charging pump is running, THEN operate at maximum speed until Attachment 1 is completed. 3. Dispatch an operator to establish emergency cooling water to desired charging pump using Attachment 1.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 1 Page 4 of 10

Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	US	**NOTES** • *The top of the component cooling water surge tank divider plate is located at approximately 25% indicated level.* • *If a cross tie valve between the units is leaking or open, the surge tank on the opposite unit may be experiencing level control problems.* • *If in Modes 1 through 3, and CCW System level is NOT maintained within the CCW Head Tank, restore CCW System level to be within the CCW Head Tank within 24 hours.* • *LI-3-613A and LI-3-614A are NOT overlapping (i.e., LI-3-614A will go off scale low before LI-3-613A comes off its high peg with decreasing level).*
	RO	**4 Verify Component Cooling Water Surge Tank Level Being Maintained** a. Component Cooling Water Surge Tank Level, LI-3-613A - • GREATER THAN 25% AND • STABLE OR INCREASING Perform the following: 1. Open Component Cooling Water Surge Tank Makeup, MOV-3-832 as necessary to add makeup. 2. IF Component Cooling Water Surge Tank Level can NOT be maintained, THEN perform the following: a) Trip the reactor. b) Stop all RCPs. c) Perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. 3. Observe NOTES prior to Step 8 and go to Step 8.
	RO	**5 Check If Component Cooling Water Headers Should Be Tied Together** a. Check CCW headers - SPLIT b. Check if flow has been lost in any CCW header * FT-3-613A for header A * FT-3-613B for header B a. Go to Step 34. b. IF flow in both CCW headers is normal, THEN go to Step 34.
		Evaluator Note: CCW headers are tie together, RNO applies to go to step 34.

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Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>RO</td><td>
34 Verify Component Cooling Water From Unit 4 - NOT REQUIRED
<table>
<tr><td>a. Unit 3 CCW headers filled and intact</td><td>a. Return to Step 4.</td></tr>
<tr><td>b. Verify CCW pumps - AT LEAST ONE RUNNING</td><td>b. Start a Standby CCW pump.</td></tr>
<tr><td>c. Verify flow in at least one intact CCW header
* FI-3-613A for header A
* FI-3-613B for header B</td><td>c. Perform the following:
1) Try to establish flow in at least one intact CCW header.
2) <u>IF</u> flow in at least one intact CCW header can <u>NOT</u> be established, <u>THEN</u> observe NOTE prior to Step 36 and go to Step 36.</td></tr>
<tr><td>d. Verify intake cooling water flow to all in service CCW heat exchangers
* FI-3-1407 for Hx A
* FI-3-1408 for Hx B
* FI-3-1409 for Hx C</td><td>d. Perform the following:
1) Try to establish intake cooling water flow to in-service CCW heat exchangers.
2) Stop components cooled by component cooling water as necessary to stabilize component cooling water temperature.
3) <u>IF</u> any component cooled by component cooling water must be operated <u>AND</u> stable component cooling water temperature can <u>NOT</u> be maintained, <u>THEN</u> observe NOTE prior to Step 36 and go to Step 36.</td></tr>
</table>
</td></tr>
<tr><td></td><td>US</td><td>35 Observe CAUTION Prior To Step 43 And Go To Step 43</td></tr>
<tr><td></td><td>US</td><td><u>CAUTION</u>
<i>If component cooling water to any component has been lost and can not be restored, that component shall be maintained in Pull-To-Lock or Off to prevent equipment damage.</i></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 1 Page 6 of 10

Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	RO	**43** **Verify Component Cooling Water Is Being Supplied To The Following Components** • High-head SI pumps • RHR pumps • Containment spray pumps • Emergency containment coolers Perform the following: a. Verify headers are not leaking, **THEN** locally align valves as necessary to establish component cooling water flow to each component. Refer to 3-OP-030, COMPONENT COOLING WATER SYSTEM, for proper valve alignment. b. **IF** component cooling water can **NOT** be established to any component, **THEN** perform the following: 1) Place the affected components in Pull-To-Lock or Off. 2) DO NOT START AFFECTED COMPONENTS in subsequent steps. 3) DO NOT PLACE AFFECTED COMPONENTS IN STANDBY in subsequent steps.
		Evaluator Note: low flow alarms for components cleared when a CCW pump was started.
	RO	**44** **Verify Proper Component Alignment** a. Restart previously running components * High-head SI pumps * RHR pumps * Containment spray pumps * Emergency containment coolers b. Place idle components in standby * High-head SI pumps * RHR pumps * Containment spray pumps * Emergency containment coolers

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Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	**45** **Establish Charging Flow** a. Locally verify component cooling water flow from charging pumps, FI-3-660 a. Verify emergency cooling water has been established to desired charging pump using Attachment 1. b. Check charging pumps - AT LEAST ONE RUNNING b. <u>IF</u> any charging pumps were running prior to component cooling water malfunction, <u>THEN</u> start one charging pump. c. Maintain minimum charging flow for RCP seal injection
		Evaluator Note: calls NSO for local flow reading
	RO	**46** **Verify CCW To RCPs - AVAILABLE** a. Verify component cooling water to RCPs - AVAILABLE b. Verify CCW inlet valves - OPEN • MOV-3-716A • MOV-3-716B Perform the following: 1. Verify reactor - TRIPPED 2. Verify all RCPs - STOPPED 3. Close RCP Thermal Barrier CCW Outlet, MOV-3-626. 4. Adjust charging flow and Charging Flow to Regen Heat Exchanger, HCV-3-121, to maintain thermal barrier ΔP greater than 0 inches of water. 5. Verify natural circulation. 6. Go to Step 49.
	RO	**47** **Verify RCP Bearing CCW Outlet, MOV-3-730 - OPEN** Perform the following: a. Verify reactor - TRIPPED b. Verify all RCPs - STOPPED c. Verify natural circulation.
	RO	**48** **Verify RCP Thermal Barrier CCW Outlet, MOV-3-626 - OPEN** Adjust charging flow and Charging Flow to Regen Heat Exchanger, HCV-3-121, to maintain thermal barrier DP greater than 0 inches of water.
		Evaluator Note: If MOV-3-626 has closed on hi flow from pump start; ARP may have been used to reopen, if not, it will be opened here.

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Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	RO	**49** **Verify Containment Cooling** a. Check normal containment coolers – RUNNING a. Go to Step 50. b. Establish normal containment cooling 1) Verify component cooling water to normal containment coolers - AVAILABLE 2) Verify Component Cooling Water To Normal Containment Cooler valve - OPEN • MOV-3-1417 • MOV-3-1418 b. Consult with Shift Manager to determine if one of the following methods should be used to cool containment: * Emergency containment coolers. **OR** * Containment purge.
	RO	**50** **Maintain Reactor Coolant System Circulation** a. Check RCPs - ALL STOPPED a. Go to Step 51. b. Obtain permission from Plant Manager to start RCPs b. Perform the following: 1) Verify natural circulation. 2) Go to Step 51. c. Start RCPs as desired using 3-OP-041.1, REACTOR COOLANT PUMP
		Evaluator Note: all RCPs running
	RO	**51** **Check If Letdown Or Excess Letdown Should Be Placed In Service** Go to Step 53. a. Charging pumps - AT LEAST ONE RUNNING b. Letdown **OR** excess letdown - IN SERVICE PRIOR TO COMPONENT COOLING WATER MALFUNCTION c. Letdown **AND** excess letdown - SECURED
		Evaluator Note: normal letdown still in service, RNO to step 53 applies.

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Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	BOP	**53** **Locally Verify Component Cooling Water Flow From Seal Water Heat Exchanger, FI-3-618** Perform the following: a. Place Excess Letdown From Heat Exchanger To VCT Or RCDT, CV-3-389, in RCDT - Divert position. b. Close Excess Letdown And RCP Seal Return To VCT, MOV-3-381.
		Evaluator Note: calls NSO for local reading
	BOP	**54** **Locally Verify Component Cooling Water Flow From Spent Fuel Pool Heat Exchanger, FI-3-622** Perform the following: a. Monitor spent fuel pool temperatures. b. Add makeup as necessary to maintain spent fuel pool level greater than 7 inches below normal level of 57 feet.
		Evaluator Note: calls NSO for local reading
	US	**55** **Direct Shift Manager To Evaluate Plant Conditions** a. Check for applicability to conditions listed in 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR b. Verify applicable Technical Specification Limiting Conditions for Operation - SATISFIED b. Perform applicable Technical Specification corrective actions.
		Evaluator Note: calls Shift Manager refers to tech. specs to determine T.S. 3.7.2 action b applies until 3B CCW pump breaker is racked out. T.S. reference below.

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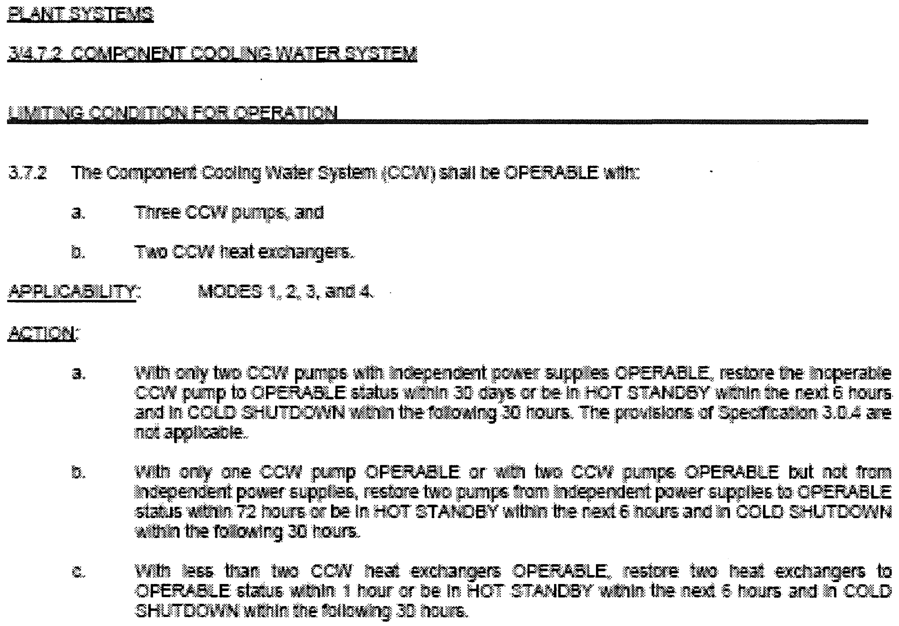
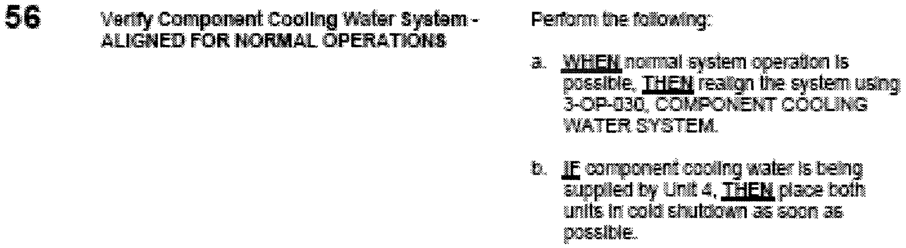
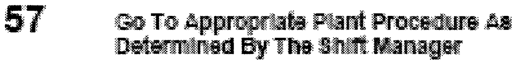
Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
	US →	 PLANT SYSTEMS 3/4.7.2 COMPONENT COOLING WATER SYSTEM LIMITING CONDITION FOR OPERATION 3.7.2 The Component Cooling Water System (CCW) shall be OPERABLE with: a. Three CCW pumps, and b. Two CCW heat exchangers. APPLICABILITY: MODES 1, 2, 3, and 4. ACTION: a. With only two CCW pumps with independent power supplies OPERABLE, restore the inoperable CCW pump to OPERABLE status within 30 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable. b. With only one CCW pump OPERABLE or with two CCW pumps OPERABLE but not from independent power supplies, restore two pumps from independent power supplies to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. c. With less than two CCW heat exchangers OPERABLE, restore two heat exchangers to OPERABLE status within 1 hour or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
		Evaluator Note: 3C CCW pump will not auto start for safeguards until 3B CCW pump breaker is racked out.
	RO	 **56** Verify Component Cooling Water System - ALIGNED FOR NORMAL OPERATIONS Perform the following: a. WHEN normal system operation is possible, THEN realign the system using 3-OP-030, COMPONENT COOLING WATER SYSTEM. b. IF component cooling water is being supplied by Unit 4, THEN place both units in cold shutdown as soon as possible.
	US	 **57** Go To Appropriate Plant Procedure As Determined By The Shift Manager
		Evaluator Note; US exits 3-ONOP-030, no other procedures in effect.

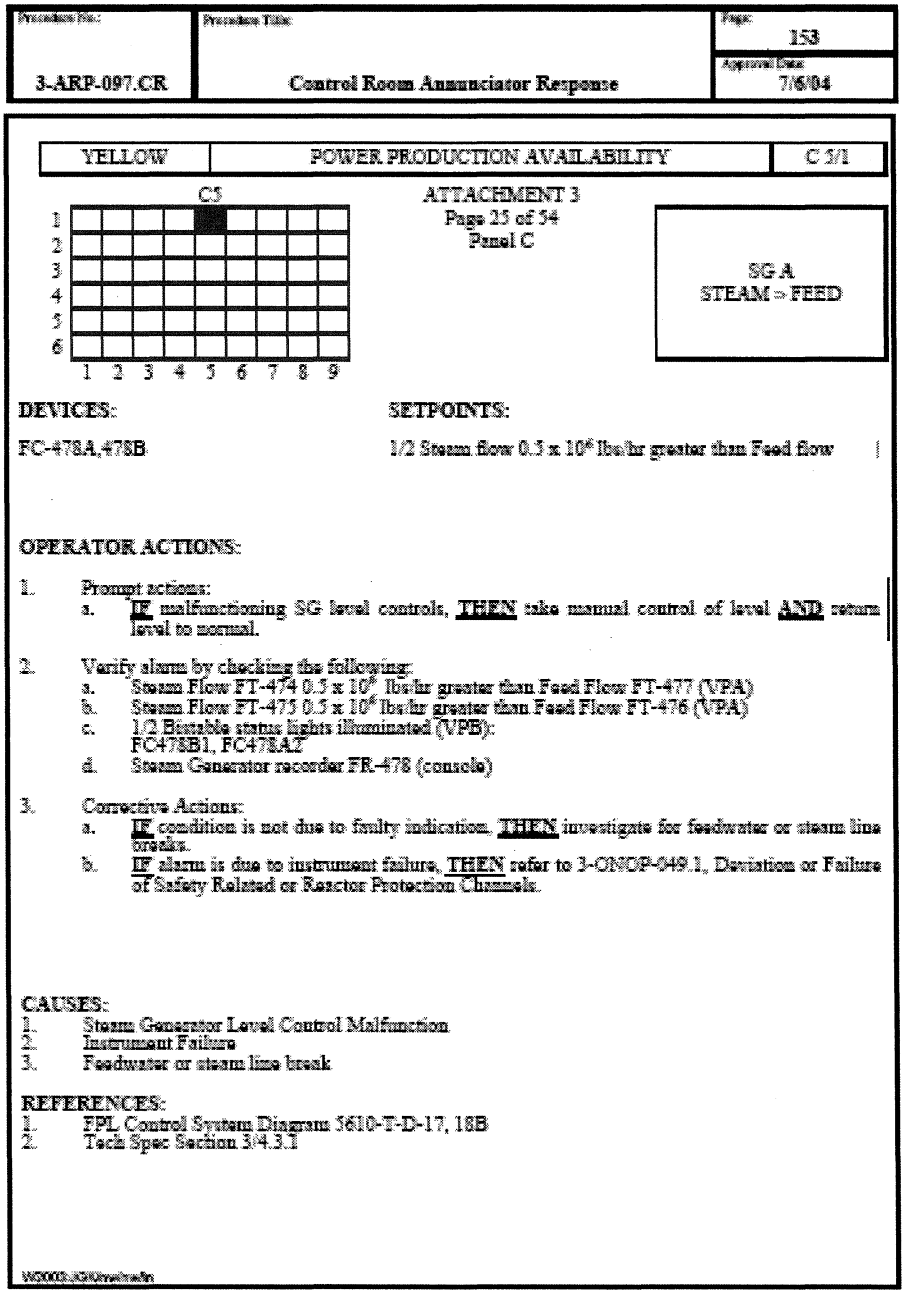
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 1 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, EVENT 2 – FT-3-474 FAIL HIGH
	BOP	Determines and reports FT-3-474 failed high by observation of: • Annunciator alarms C 5/1 and C 7/1 • FI-3-474 pegged high • Automatic FRV response • Rising 3A S/G water level
	BOP	Obtains US concurrence and places 3A FRV in manual to control level per guidance of ARP.
	RO	Reviews ARPs
		Evaluator Note: ARP C 5/1 provides guidance for manual FRV operation
	US	Directs stabilization of 3A S/G level, then enters 3-ONOP-049.1

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 2 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

Time	Position	Applicant's Actions or Behavior
	RO	

Procedure No.:	Procedure Title:	Page:
3-ARP-097.CR	Control Room Annunciator Response	153 Approval Date: 7/6/04

YELLOW	POWER PRODUCTION AVAILABILITY	C 5/1

C5

ATTACHMENT 3
Page 25 of 54
Panel C

SG A
STEAM > FEED

DEVICES: FC-478A,478B

SETPOINTS: 1/2 Steam flow 0.5 x 10^6 lbs/hr greater than Feed flow

OPERATOR ACTIONS:

1. Prompt actions:
   a. **IF** malfunctioning SG level controls, **THEN** take manual control of level **AND** return level to normal.

2. Verify alarm by checking the following:
   a. Steam Flow FT-474 0.5 x 10^6 lbs/hr greater than Feed Flow FT-477 (VPA)
   b. Steam Flow FT-475 0.5 x 10^6 lbs/hr greater than Feed Flow FT-476 (VPA)
   c. 1/2 Bistable status lights illuminated (VPB):
   FC478B1, FC478A2
   d. Steam Generator recorder FR-478 (console)

3. Corrective Actions:
   a. **IF** condition is not due to faulty indication, **THEN** investigate for feedwater or steam line breaks.
   b. **IF** alarm is due to instrument failure, **THEN** refer to 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.

CAUSES:
1. Steam Generator Level Control Malfunction
2. Instrument Failure
3. Feedwater or steam line break

REFERENCES:
1. FPL Control System Diagram 5610-T-D-17, 18B
2. Tech Spec Section 3/4.3.1

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 3 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

Time	Position	Applicant's Actions or Behavior
	BOP	5.0 <u>SUBSEQUENT ACTIONS</u> 5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.
		Evaluator Note: determines FT-3-474 failed high
	BOP	5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.
	BOP	5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
		Evaluator Note: after the BOP has stabilized 3A S/G level, Steam flow channel 475 is selected. The crew may also select feed flow channel 476 to align both controlling channels to the yellow channel. The transfer switches on the console are used to accomplish the transfer.
	BOP	5.4 <u>IF</u> a control function was placed in manual control due to the failure, <u>THEN</u> verify the control function is returned to automatic.
		Evaluator Note: when level is restored to program automatic control will be restored.
	US	5.5 Refer to Technical Specifications 3/4.3, Instrumentation, <u>AND</u> verify the minimum channels operable.
		Evaluator Note: T.S. table 3.3-1 function 12 action 6 , and table 3.3-2 functions 1.f action 15 and function 4.d apply. Tables show below.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 4 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

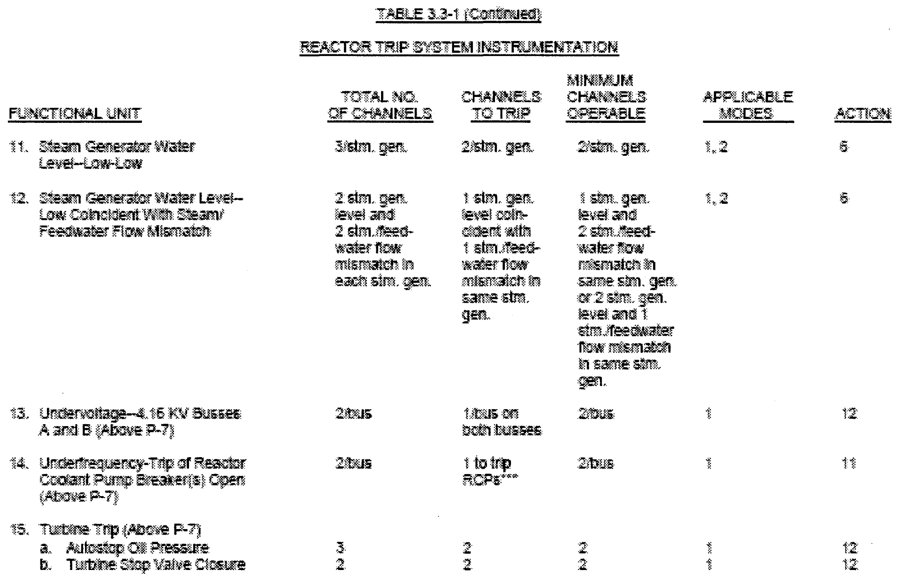
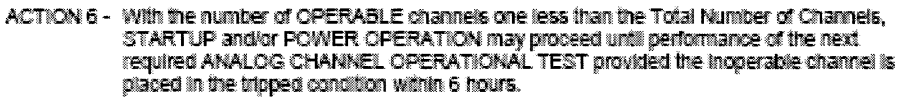
Time	Position	Applicant's Actions or Behavior
	US →	

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Steam Generator Water Level--Low-Low	3/stm. gen.	2/stm. gen.	2/stm. gen.	1, 2	6
12. Steam Generator Water Level--Low Coincident With Steam/Feedwater Flow Mismatch	2 stm. gen. level and 2 stm./feed-water flow mismatch in each stm. gen.	1 stm. gen. level coin-cident with 1 stm./feed-water flow mismatch in same stm. gen.	1 stm. gen. level and 2 stm./feed-water flow mismatch in same stm. gen. or 2 stm. gen. level and 1 stm./feedwater flow mismatch in same stm. gen.	1, 2	6
13. Undervoltage--4.16 KV Busses A and B (Above P-7)	2/bus	1/bus on both busses	2/bus	1	12
14. Underfrequency-Trip of Reactor Coolant Pump Breaker(s) Open (Above P-7)	2/bus	1 to trip RCPs***	2/bus	1	11
15. Turbine Trip (Above P-7)					
a. Autostop Oil Pressure	3	2	2	1	12
b. Turbine Stop Valve Closure	2	2	2	1	12

Time	Position	Applicant's Actions or Behavior
	→	

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.

		Evaluator Note: determines 6 hours to trip bistables

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 5 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

Time	Position	Applicant's Actions or Behavior

US

→

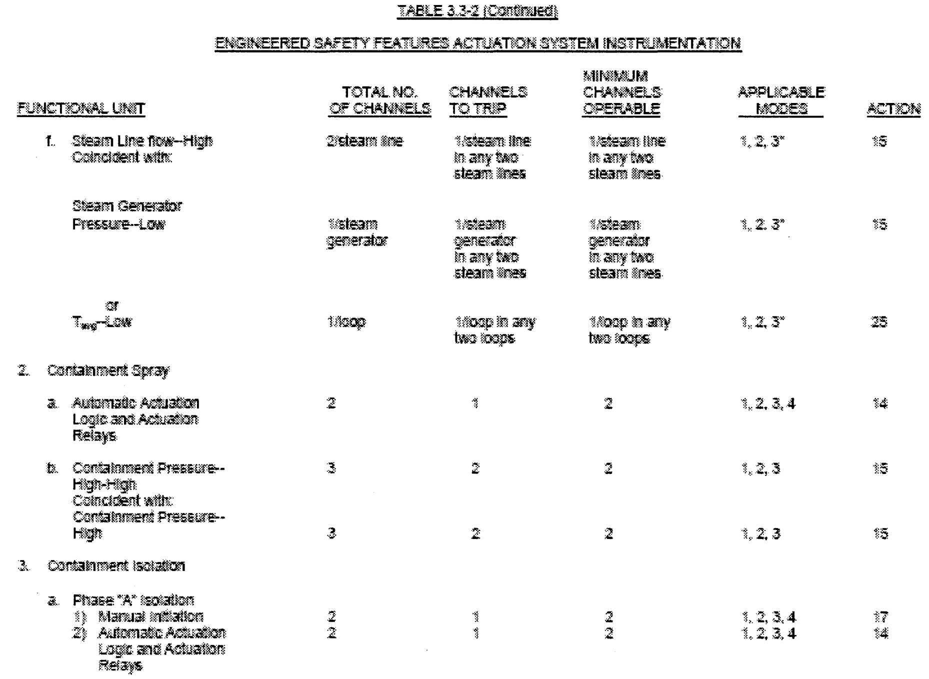
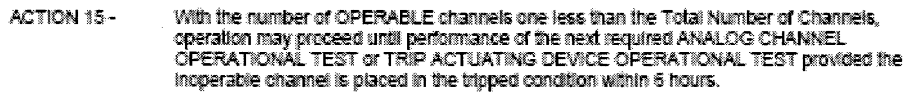


TABLE 3.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
f. Steam Line flow--High Coincident with:	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3*	15
Steam Generator Pressure--Low	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3*	15
or T_{avg}--Low	1/loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3*	25
2. Containment Spray					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
b. Containment Pressure--High-High Coincident with:	3	2	2	1, 2, 3	15
Containment Pressure--High	3	2	2	1, 2, 3	15
3. Containment Isolation					
a. Phase "A" Isolation					
1) Manual Initiation	2	1	2	1, 2, 3, 4	17
2) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14

→



ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST or TRIP ACTUATING DEVICE OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.

Evaluator Note: determines 6 hours to trip bistables

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 6 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

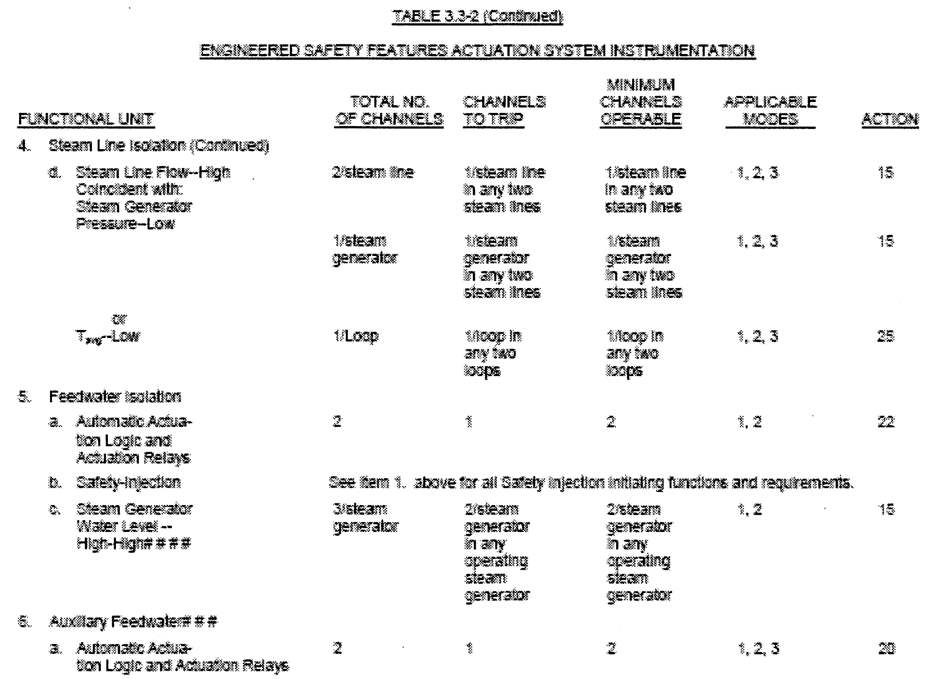
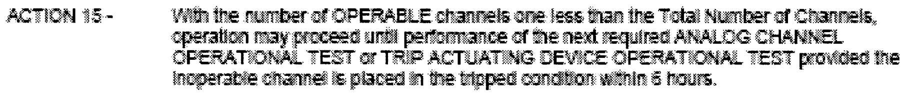
<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>US
→</td><td>


TABLE 3.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

<table>
<tr><th>FUNCTIONAL UNIT</th><th>TOTAL NO. OF CHANNELS</th><th>CHANNELS TO TRIP</th><th>MINIMUM CHANNELS OPERABLE</th><th>APPLICABLE MODES</th><th>ACTION</th></tr>
<tr><td>4. Steam Line Isolation (Continued)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>d. Steam Line Flow--High Coincident with: Steam Generator Pressure--Low</td><td>2/steam line</td><td>1/steam line in any two steam lines</td><td>1/steam line in any two steam lines</td><td>1, 2, 3</td><td>15</td></tr>
<tr><td></td><td>1/steam generator</td><td>1/steam generator in any two steam lines</td><td>1/steam generator in any two steam lines</td><td>1, 2, 3</td><td>15</td></tr>
<tr><td>or
T_{avg}--Low</td><td>1/Loop</td><td>1/loop in any two loops</td><td>1/loop in any two loops</td><td>1, 2, 3</td><td>25</td></tr>
<tr><td>5. Feedwater Isolation</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. Automatic Actuation Logic and Actuation Relays</td><td>2</td><td>1</td><td>2</td><td>1, 2</td><td>22</td></tr>
<tr><td>b. Safety-Injection</td><td colspan="5">See item 1. above for all Safety Injection initiating functions and requirements.</td></tr>
<tr><td>c. Steam Generator Water Level -- High-High# # #</td><td>3/steam generator</td><td>2/steam generator in any operating steam generator</td><td>2/steam generator in any operating steam generator</td><td>1, 2</td><td>15</td></tr>
<tr><td>6. Auxiliary Feedwater# # #</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. Automatic Actuation Logic and Actuation Relays</td><td>2</td><td>1</td><td>2</td><td>1, 2, 3</td><td>20</td></tr>
</table>
</td></tr>
<tr><td></td><td>→</td><td>


ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST or TRIP ACTUATING DEVICE OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.
</td></tr>
<tr><td></td><td></td><td>*Evaluator Note: determines 6 hours to trip bistables*</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

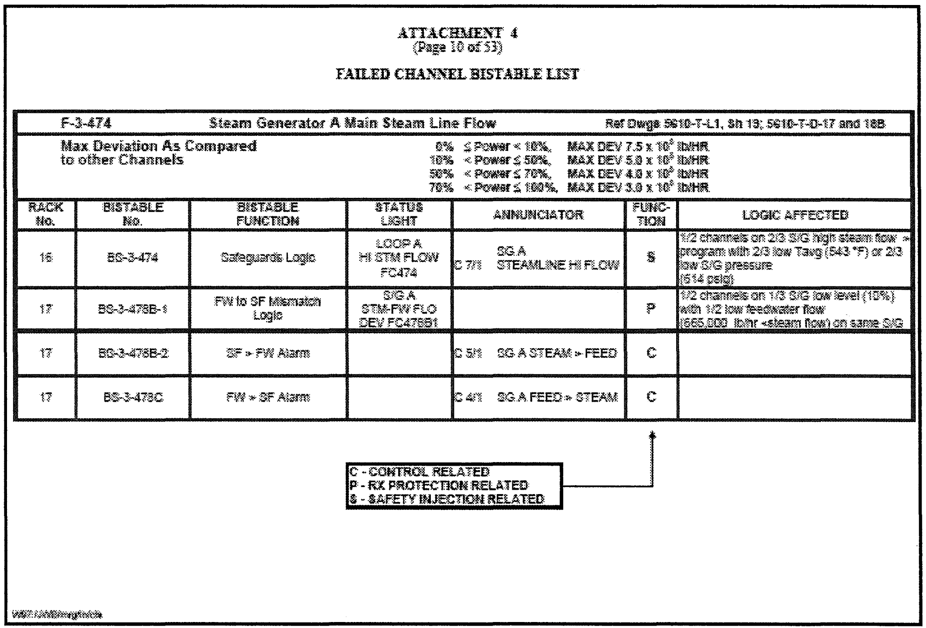
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 7 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

Time	Position	Applicant's Actions or Behavior
	US	5.5.1 Take appropriate actions as specified in Technical Specifications.
		Evaluator Note: US will conduct a brief to discuss tripping bistables. Next event will be triggered prior to tripping bistables.
		CAUTION The failed channel bistable(s) is required to be placed in the tripped mode within 6 hours of the failure determination, except if other channel bistable(s) are in the tripped or test position and would result in an undesired Engineered Safety Features actuation or Reactor Trip actuation. The overall effect of a failure of this type is a reduction of instrumentation redundancy and, therefore, a possible reduction in plant protection.
	US	5.11 **IF** any other channel has failed, **THEN** perform the following to trip bistables for the failed channel. 5.11.1 **IF** plant conditions are such that all required bistables associated with the failed channel may be tripped without an undesired RPS or ESF actuation, **THEN** perform the following: 1. Place all bistable switches for the affected loop in test position using Attachment 4. 2. Verify bistables tripped by observing corresponding status light (VPB) lit.
		Evaluator Note: Attachment 4 provided as reference

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 8 of 8

Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

Time	Position	Applicant's Actions or Behavior
	US	

ATTACHMENT 4
(Page 10 of 53)

FAILED CHANNEL BISTABLE LIST

F-3-474 Steam Generator A Main Steam Line Flow Ref Dwgs 5610-T-L1, Sh 13; 5610-T-D-17 and 18B

Max Deviation As Compared to other Channels

0% ≤ Power < 10%, MAX DEV 7.5 x 10^5 lb/HR
10% < Power ≤ 50%, MAX DEV 5.0 x 10^5 lb/HR
50% < Power ≤ 70%, MAX DEV 4.0 x 10^5 lb/HR
70% < Power ≤ 100%, MAX DEV 3.0 x 10^5 lb/HR

RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNC-TION	LOGIC AFFECTED
16	BS-3-474	Safeguards Logic	LOOP A HI STM FLOW FC474	C 7/1 SG A STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/G high steam flow > program with 2/3 low Tavg (543 °F) or 2/3 low S/G pressure (614 psig)
17	BS-3-478B-1	FW to SF Mismatch Logic	S/G A STM-FW FLO DEV FC478B1		P	1/2 channels on 1/3 S/G low level (10%) with 1/2 low feedwater flow (665,000 lb/hr <steam flow) on same S/G
17	BS-3-478B-2	SF > FW Alarm		C 5/1 SG A STEAM > FEED	C	
17	BS-3-478C	FW > SF Alarm		C 4/1 SG A FEED > STEAM	C	

C - CONTROL RELATED
P - RX PROTECTION RELATED
S - SAFETY INJECTION RELATED

		Evaluator Note: During brief, trigger next event

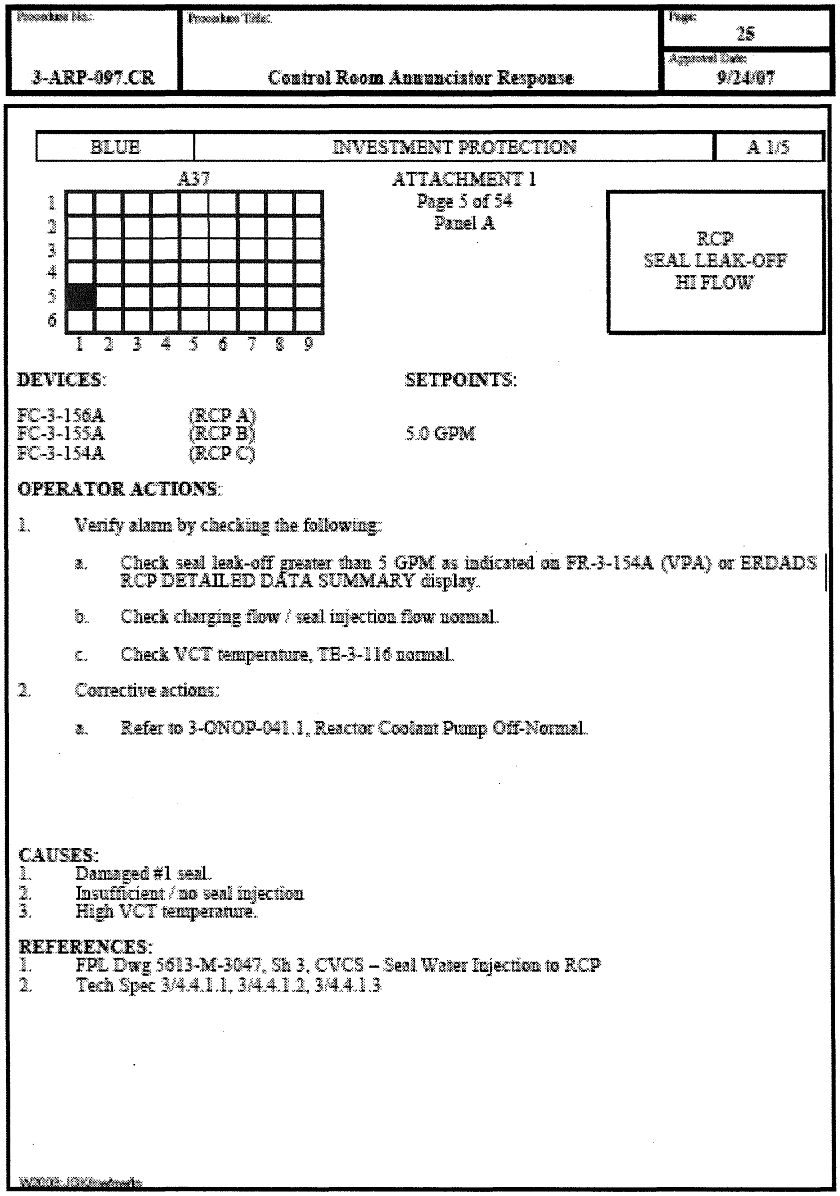
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 1 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, EVENT 3 – 3A RCP #1 SEAL FAILURE
	RO	Reports failure of 3A RCP #1 seal as determined by: • Annunciator alarm A 1/5 RCP seal leak-off Hi flow • FR-3-154A flow indicating 5.8 gpm for 3A RCP
	BOP	Refers to ARP A 1/5
		Evaluator Note: ARP shown next page

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 2 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	BOP	 Procedure No.: 3-ARP-097.CR Procedure Title: Control Room Annunciator Response Page: 25 Approval Date: 9/24/07 BLUE — INVESTMENT PROTECTION — A 1/5 A37 ATTACHMENT 1 Page 5 of 54 Panel A RCP SEAL LEAK-OFF HI FLOW **DEVICES:** FC-3-156A (RCP A) FC-3-155A (RCP B) FC-3-154A (RCP C) **SETPOINTS:** 5.0 GPM **OPERATOR ACTIONS:** 1. Verify alarm by checking the following: a. Check seal leak-off greater than 5 GPM as indicated on FR-3-154A (VPA) or ERDADS RCP DETAILED DATA SUMMARY display. b. Check charging flow / seal injection flow normal. c. Check VCT temperature, TE-3-116 normal. 2. Corrective actions: a. Refer to 3-ONOP-041.1, Reactor Coolant Pump Off-Normal. **CAUSES:** 1. Damaged #1 seal. 2. Insufficient / no seal injection 3. High VCT temperature. **REFERENCES:** 1. FPL Dwg 5613-M-3047, Sh 3, CVCS – Seal Water Injection to RCP 2. Tech Spec 3/4.4.1.1, 3/4.4.1.2, 3/4.4.1.3
	US	Directs response per 3-ONOP-041.1 Reactor Coolant Pump Off-Normal

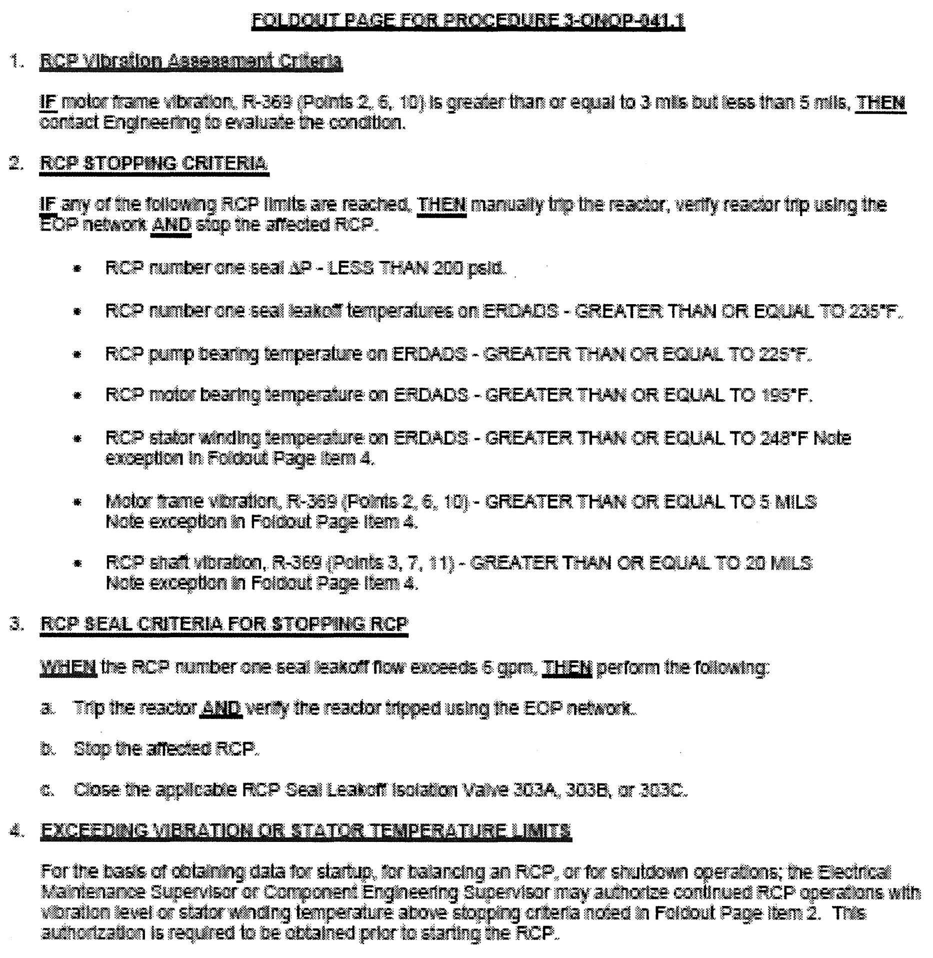
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 3 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	US	**CAUTION** *Containment entries shall NOT be performed when there are indications of an RCP seal package failure until the reactor is shutdown and RCS pressure/temperature is reduced to minimize leakage.* **NOTES** • *Foldout Page is required to be monitored throughout this procedure.* • *Off-normal RCP Conditions that require shutdown of a RCP shall be verified by cross-checking all RCP parameters.* • *If either 3B or 3C RCPs are stopped by the performance of this procedure, then the associated RCS loop pressurizer spray valve should be closed to prevent back-flow through the valve.*
	US	Reviews foldout page

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 4 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	US	 **FOLDOUT PAGE FOR PROCEDURE 3-ONOP-041.1** 1. **RCP Vibration Assessment Criteria** **IF** motor frame vibration, R-369 (Points 2, 6, 10) is greater than or equal to 3 mils but less than 5 mils, **THEN** contact Engineering to evaluate the condition. 2. **RCP STOPPING CRITERIA** **IF** any of the following RCP limits are reached, **THEN** manually trip the reactor, verify reactor trip using the EOP network **AND** stop the affected RCP. • RCP number one seal ΔP - LESS THAN 200 psid. • RCP number one seal leakoff temperatures on ERDADS - GREATER THAN OR EQUAL TO 235°F. • RCP pump bearing temperature on ERDADS - GREATER THAN OR EQUAL TO 225°F. • RCP motor bearing temperature on ERDADS - GREATER THAN OR EQUAL TO 195°F. • RCP stator winding temperature on ERDADS - GREATER THAN OR EQUAL TO 248°F Note exception in Foldout Page item 4. • Motor frame vibration, R-369 (Points 2, 6, 10) - GREATER THAN OR EQUAL TO 5 MILS Note exception in Foldout Page item 4. • RCP shaft vibration, R-369 (Points 3, 7, 11) - GREATER THAN OR EQUAL TO 20 MILS Note exception in Foldout Page item 4. 3. **RCP SEAL CRITERIA FOR STOPPING RCP** **WHEN** the RCP number one seal leakoff flow exceeds 6 gpm, **THEN** perform the following: a. Trip the reactor **AND** verify the reactor tripped using the EOP network. b. Stop the affected RCP. c. Close the applicable RCP Seal Leakoff Isolation Valve 303A, 303B, or 303C. 4. **EXCEEDING VIBRATION OR STATOR TEMPERATURE LIMITS** For the basis of obtaining data for startup, for balancing an RCP, or for shutdown operations; the Electrical Maintenance Supervisor or Component Engineering Supervisor may authorize continued RCP operations with vibration level or stator winding temperature above stopping criteria noted in Foldout Page item 2. This authorization is required to be obtained prior to starting the RCP.
	US	Determine foldout page does not apply for conditions

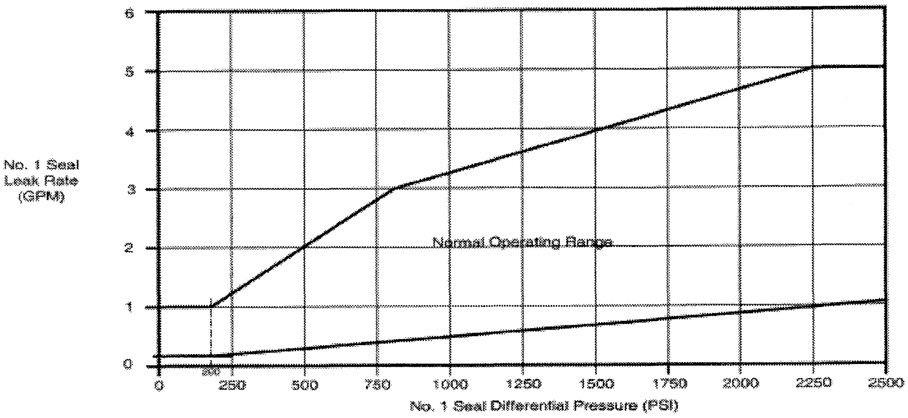
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 5 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	**1** **Check For Proper Seal Injection Flow** Go to Step 14 • RCP 3A Thermal Barrier ΔP, PI-3-131A - GREATER THAN ZERO INCHES • RCP 3B Thermal Barrier ΔP, PI-3-128A - GREATER THAN ZERO INCHES • RCP 3C Thermal Barrier ΔP, PI-3-125A - GREATER THAN ZERO INCHES • Local Seal Injection Flow Indication - GREATER THAN <u>OR</u> EQUAL TO 6 GPM ON ALL RCPs • ERDADS Seal Injection Flow Indication - GREATER THAN <u>OR</u> EQUAL TO 6 GPM ON ALL RCPs
		Evaluator Note: BOP calls NSO for local seal injection flows
	RO	**2** **Check Number One Seal Leakoff Flow Within Limits Of Enclosure 1** Observe NOTE prior to Step 16 <u>AND</u> go to Step 16.
	RO	Determines seal leakoff flow not within limits of enclosure 1
	US	Observes note and transitions to step 16
		Evaluator Note: enclosure 1 next page

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 6 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	ENCLOSURE 1 (Page 1 of 1) NUMBER ONE SEAL LEAKOFF 
		Evaluator Note: flow greater than 5.0 gpm not within enclosure at any pressure.
		NOTE *An RCP STANDPIPE HI LEVEL alarm is indication of 0.5 gpm flow past the number two seal.*
	RO	**16** **Check If Any RCP Number One Seal Leak-off Flow(s), FR-3-154A - GREATER THAN UPPER LIMIT OF ENCLOSURE 1** Go to Step 21
	RO	**17** **Check RCP Seal Bypass Valve CV-3-307 - CLOSED** Perform the following: a. Manually close CV-3-307 b. Check for corresponding decrease in thermal barrier ΔP c. Perform cross check of all RCP parameters to determine cause of high leakoff flow d. Request diagnostic assistance from the System Engineer <u>AND</u> Operations Supervision

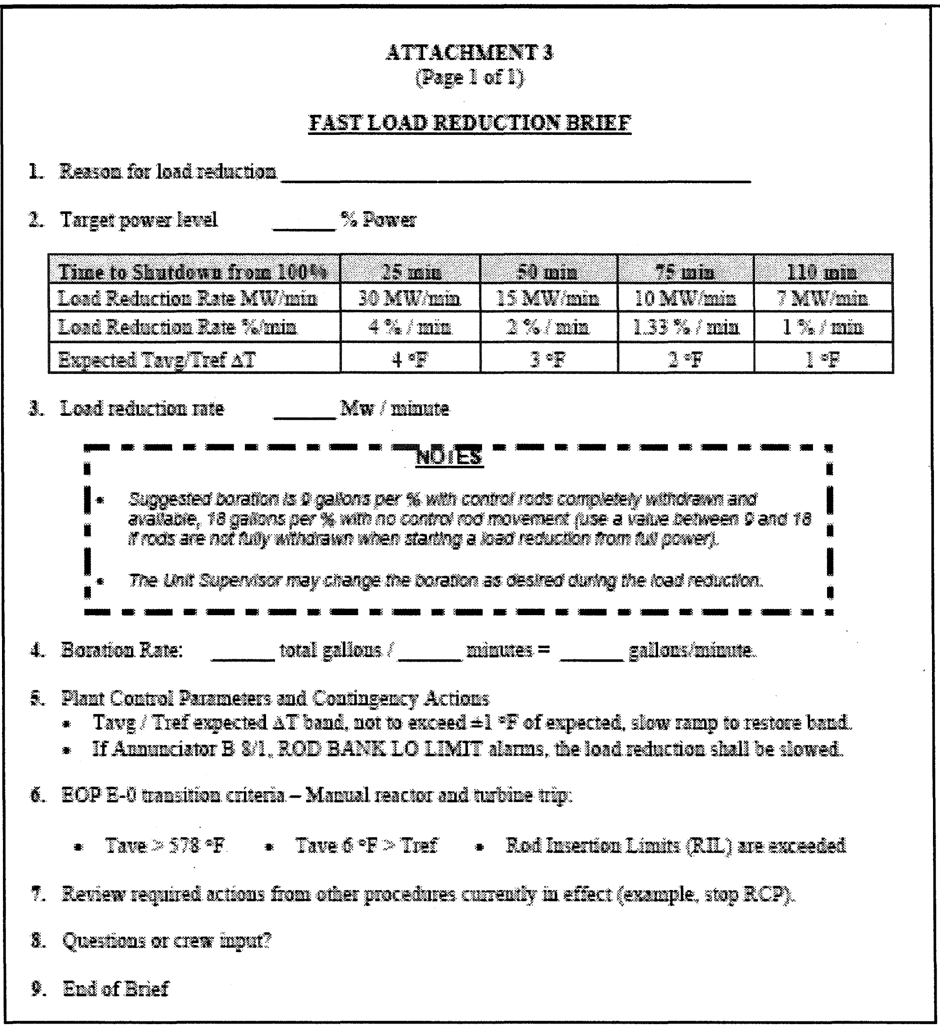
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 7 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	**18** **Check All RCP Number One Seal Leak-Off Flows On FR-3-154A – LESS THAN 6 GPM** Perform the following: a. Manually trip the reactor AND perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. b. WHEN the reactor verified tripped, THEN stop the affected RCP(s) c. Close affected RCP Seal Leakoff valve(s) after the pump has stopped: * CV-3-303A for RCP A * CV-3-303B for RCP B * CV-3-303C for RCP C d. Monitor RCDT level for indication of number two seal failure. e. DO NOT restart the affected RCP until the cause of the seal malfunction has been determined AND corrected. f. Return to Step 3.
	RO	**19** **Check All RCP Number One Seal Leak-Off Flows On FR-3-154A.** a. RCP number one seal leak-off flow - LESS THAN OR EQUAL TO 5.5 GPM a. Perform the following: 1) Commence unit shutdown using 3-ONOP-100, FAST LOAD REDUCTION. 2) WHEN turbine tripped, THEN trip the reactor. 3) WHEN the reactor is tripped, THEN stop affected RCP(s). 4) Go to Step 19c. b. Begin preparations to shutdown AND stop affected RCP using 3-GOP-103, POWER OPERATION TO HOT STANDBY c. Contact Plant Management for further guidance
		Evaluator Note: Determines 3A RCP seal leak-off flow greater than 5.5 gpm and 3-ONOP100, fast load reduction is required. 3A RCP is required to be tripped after the reactor is tripped.
	US	Transitions to 3-ONOP-100, Fast Load Reduction

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3 &4 Page 8 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>US</td><td>1 **Brief Control Room Personnel Using Attachment 3**</td></tr>
<tr><td></td><td>US</td><td>


ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction ____________________
2. Target power level ______ % Power

<table>
<tr><th>Time to Shutdown from 100%</th><th>25 min</th><th>50 min</th><th>75 min</th><th>110 min</th></tr>
<tr><td>Load Reduction Rate MW/min</td><td>30 MW/min</td><td>15 MW/min</td><td>10 MW/min</td><td>7 MW/min</td></tr>
<tr><td>Load Reduction Rate %/min</td><td>4 % / min</td><td>2 % / min</td><td>1.33 % / min</td><td>1 % / min</td></tr>
<tr><td>Expected Tavg/Tref ΔT</td><td>4 °F</td><td>3 °F</td><td>2 °F</td><td>1 °F</td></tr>
</table>

3. Load reduction rate ______ Mw / minute

NOTES
• *Suggested boration is 9 gallons per % with control rods completely withdrawn and available, 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).*
• *The Unit Supervisor may change the boration as desired during the load reduction.*

4. Boration Rate: ______ total gallons / ______ minutes = ______ gallons/minute.
5. Plant Control Parameters and Contingency Actions
• Tavg / Tref expected ΔT band, not to exceed ±1 °F of expected, slow ramp to restore band.
• If Annunciator B 8/1, ROD BANK LO LIMIT alarms, the load reduction shall be slowed.
6. EOP E-0 transition criteria – Manual reactor and turbine trip:
• Tave > 578 °F • Tave 6 °F > Tref • Rod Insertion Limits (RIL) are exceeded
7. Review required actions from other procedures currently in effect (example, stop RCP).
8. Questions or crew input?
9. End of Brief
</td></tr>
<tr><td></td><td>US</td><td>Will determine load reduction and boration rate. Then conduct brief.
9 gallons/% should be used to determine 900 gal required</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3 &4 Page 9 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	2 **Begin Boration** a. Set the Boric Acid Totalizer to value determined using Attachment 3 b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0 c. Place the Reactor Makeup Selector Switch to BORATE d. Place the RCS Makeup Control Switch to START IF boration is not required, THEN go to Step 3.
	RO	Determines FCV-3-113B failed to open and stops the boration
	US	Directs response per 3-ONOP-046.4, Malfunction of boron concentration control system
	RO	1 **Check Boric Acid OR Primary Water Makeup Flow Rates - ABNORMAL** Observe note prior to Step 28 and go to Step 28.
	RO	2 **Verify RCS Makeup Control Switch Is In MID Position With Makeup System Stopped**
		NOTES • *Steps 4 through 26 will need to be repeated as necessary to maintain an adequate suction source for the charging pumps and proper boron concentration until repairs are completed.* • *One percent VCT level indication is approximately 14.1 gallons.*
	RO	3 **Check The Reactor Makeup Selector Switch In BORATE OR AUTO** Go to Step 16.
	RO	4 **Check If Additional Boric Acid Should Be Added** Go to Step 16.
		Evaluator Note: Makeup selector should still be in borate position with additional boration required.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 10 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	**5** **Check Boric Acid Flow Rate – WAS EQUAL TO <u>OR</u> LESS THAN EXPECTED BEFORE THE MAKEUP SYSTEM WAS STOPPED** <u>IF</u> boric acid flow was greater than expected due to control valve oscillation <u>OR</u> a failure of FCV-3-113A in the open position, <u>THEN</u> perform the following: a. Calculate the time required <u>OR</u> corresponding change in VCT level indication to add the amount of boric acid needed using a flow path through MOV-3-350. b. Start one Boric Acid Transfer Pump. c. Monitor FI-3-110 <u>OR</u> LI-3-115 to observe the corresponding level change for the boric acid addition in the following steps. d. Open Emergency Boration Valve, MOV-3-350. e. <u>WHEN</u> the amount of boric acid needed has been added, <u>THEN</u> stop the Boric Acid Transfer Pump <u>AND</u> close MOV-3-350. f. Go to Step 15.
	RO	**6** **Calculate The Amount Of Boric Acid Needed Per The Plant Curve Book Or Known Plant Parameters**
	RO	**7** **Adjust The Potentiometer On The Flow Controller FC-3-113A To Obtain The Desired Flow Rate**
	RO	**8** **Set Totalizer For The Total Amount Of Boric Acid Needed**
	RO	**9** **Place The Reactor Makeup Selector Switch To BORATE**
	RO	**10** **Turn The RCS Makeup Control Switch to START**

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Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	**11** **Check One Of The Unit 3 Boric Acid Transfer Pumps - RUNNING** Perform the following: a. Start a Unit 3 Boric Acid Transfer Pump. b. Place the control switch for the other Unit 3 Boric Acid Transfer Pump to STOP. c. **IF** no Unit 3 Boric Acid Transfer Pump will start, **THEN** place BOTH Unit 3 Boric Acid Transfer Pump control switches to STOP **AND** align the 4A Boric Acid Transfer Pump as follows: 1) Close BA Pump 4A to BA Fltr Stop valve, 376. 2) Verify BA Fltr Recirc to BA Tank B Isol valve, 4-340 - CLOSED. 3) Open 4A - 3B BA Xfer Pump Disch X-Conn valve, 377. 4) Start the 4A Boric Acid Transfer Pump. d. **WHEN** the amount of boric acid needed has been added, **THEN** stop the Boric Acid Transfer Pump previously started.

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Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior		
	RO	**12**	**Check Boric Acid Flow Path And Flow Instrumentation** • FCV-3-113A, Boric Acid to Blender - OPEN • FT-3-113 - OPERABLE	Perform the following: a. <u>IF</u> FCV-3-113A is <u>NOT</u> open, <u>THEN</u> perform the following: 1) Place FCV-3-113A control switch to OPEN <u>OR</u> place FC-3-113A Flow Controller in MANUAL to establish desired flow rate. 2) <u>WHEN</u> the amount of boric acid needed has been added, <u>THEN</u> close FCV-113A. b. <u>IF</u> manual control of FCV-3-113A is <u>NOT</u> possible, <u>OR</u> FT-3-113 failure is suspected, <u>THEN</u> perform the following: 1) Calculate the time required <u>OR</u> the corresponding change in VCT level indication to add the amount of boric acid needed using a flow path through MOV-3-350 with one Boric Acid Transfer Pump running. 2) Monitor FI-3-110 <u>OR</u> LI-3-115 to observe the corresponding level change for the boric acid addition in the following steps. 3) Open Emergency Boration Valve, MOV-3-350. 4) <u>WHEN</u> the amount of boric acid needed has been added, <u>THEN</u> stop the Boric Acid Transfer Pump <u>AND</u> close MOV-3-350. 5) Turn the RCS Makeup Control Switch to STOP <u>AND</u> go to step 15.

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Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	**13** **Check Boric Acid To Chg Pump Suction, FCV-3-113B - OPEN** IF FCV-3-113B is not open, THEN perform the following: a. Place FCV-3-113B control switch to OPEN. b. WHEN the amount of boric acid needed has been added, THEN close FCV-3-113B. c. IF FCV-3-113B will NOT open, THEN place FCV-3-114B control switch to OPEN. d. WHEN the amount of boric acid needed has been added, THEN close FCV-3-114B. e. IF FCV-3-114B will NOT open, THEN perform the following: 1) Calculate the corresponding change in VCT level to add the amount of boric acid needed using a flow path through Manual Emergency Boration valve, 3-356. 2) Monitor LI-3-115 to observe the corresponding change in VCT level for the boric acid addition in the following steps. 3) Locally open Manual Emergency Boration valve, 3-356. 4) WHEN the amount of boric acid needed has been added, THEN close Manual Emergency Boration valve, 3-356. 5) Turn the RCS Makeup Control Switch to STOP AND go to Step 15.
		NOTE *Normal Differential Pressure across the Boric Acid Filters should be less than 10 PSID when boric acid flow has been established.*
	RO	**14** **Check Flow Rate On FR-3-113 – AS EXPECTED**
	RO	**15** **Check That The Amount Of Boric Acid Needed Was Added** Go to Step 4.

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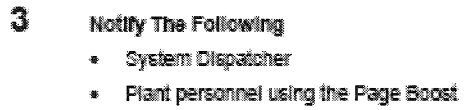
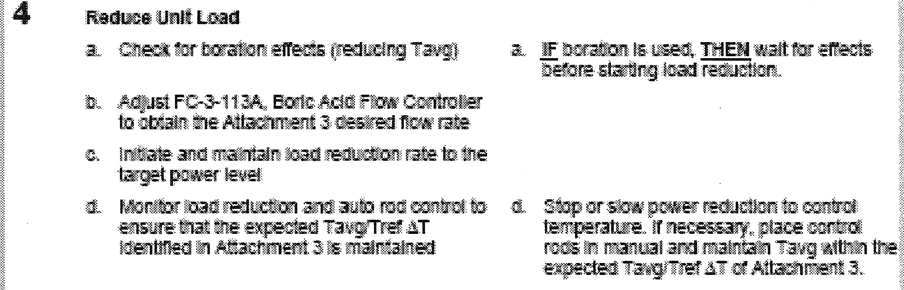
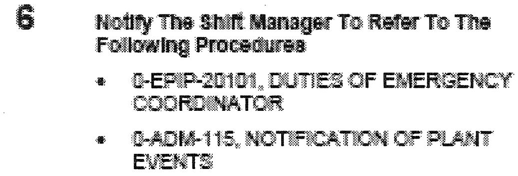
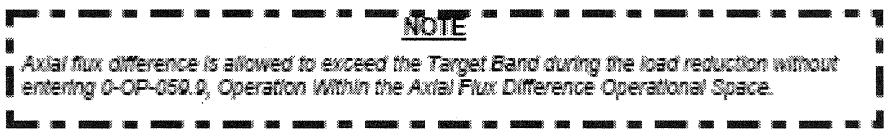
Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	RO	**16** **Check If Additional Primary Water Should Be Added** — Go to Step 41.
	BOP BOP RO	**41** **Report All Equipment Failures Or Malfunctions To The Responsible Supervisor** **42** **Notify The Nuclear Plant Supervisor To Evaluate Plant Conditions** a. Refer to 0-ONOP-046.3, LOSS OF BORATION FLOWPATHS b. Review Technical Specifications **43** **Check Repairs To Equipment Complete** — Perform the following: a. Maintain VCT level by performing one of the following: • IF due to VCT level transmitter failure, THEN perform manual makeup as necessary using 0-OP-046, CVCS - BORON CONCENTRATION CONTROL. OR • IF due to primary water or boric acid flow related problems, THEN repeat Steps 4 Through 26 as necessary to maintain VCT level and proper boron concentration. b. WHEN repairs are complete, THEN continue with Step 44.
		Evaluator Note: US should transition back to 3-ONOP-100 and continue unit shut down

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 15 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	US	Continues with 3-ONOP-100 shutdown
	BOP	 **3 Notify The Following** • System Dispatcher • Plant personnel using the Page Boost
	RO / BOP	 **4 Reduce Unit Load** a. Check for boration effects (reducing Tavg) — a. IF boration is used, THEN wait for effects before starting load reduction. b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate c. Initiate and maintain load reduction rate to the target power level d. Monitor load reduction and auto rod control to ensure that the expected Tavg/Tref ΔT identified in Attachment 3 is maintained — d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.
	RO	 **5 Monitor Annunciator B 8/1, ROD BANK LO LIMIT – RESET** — Perform the following: a. Slow load reduction until alarm is reset. b. Re-evaluate boration amount and rate and make adjustments as necessary.
	US	 **6 Notify The Shift Manager To Refer To The Following Procedures** • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS
		 NOTE *Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space.*

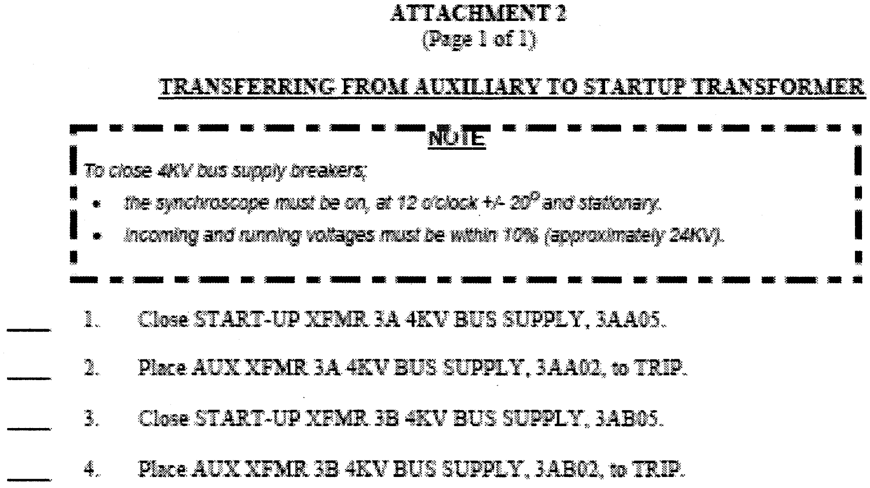
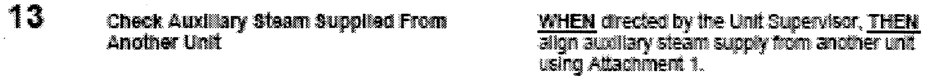
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 16 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior	
	RO	**7** **Check Plant Response** a. Check pressurizer level following program b. Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3	a. IF directed by the Unit Supervisor, THEN increase charging flow as follows: 1) Throttle open TCV-144, NRHX Temp Control Valve, bypass valve 3-834 to raise flow to approximately 600 gpm. 2) Start an additional charging pump. 3) Place an additional letdown orifice in service. b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.
	RO	**8** **Energize Pressurizer Backup Heaters**	
	BOP	**9** **Verify Turbine Load Less Than 570 MWE** Open the SGFP recirculation valves for the first feedwater pump to be stopped	WHEN turbine load is less than 570 MWe, THEN open the SGFP recirculation valves for the first feedwater pump to be stopped.
	BOP	**10** **Monitor Turbine Load Within 10% Of Target Power Level** Stop the boration as follows: a. Place the Reactor Makeup Selector Switch to AUTO b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired c. Place the RCS Makeup Control Switch to START	Go to Step 11.
	BOP	**11** Check Target Load **– LESS THAN 450 Mwe**	IF Target Load is GREATER THAN 450 Mwe, THEN perform the following: a. Maintain reactor power at or below the target value using: • Boration/dilution • Control Rod adjustments • Turbine load adjustments b. Maintain Tavg within ± 1 °F of Tref. c. Maintain Pressurizer level on program. d. Maintain Pressurizer pressure on program. e. Maintain SG Levels on program. f. Refer to other ONOPs in effect. g. Go to procedure and step in effect.

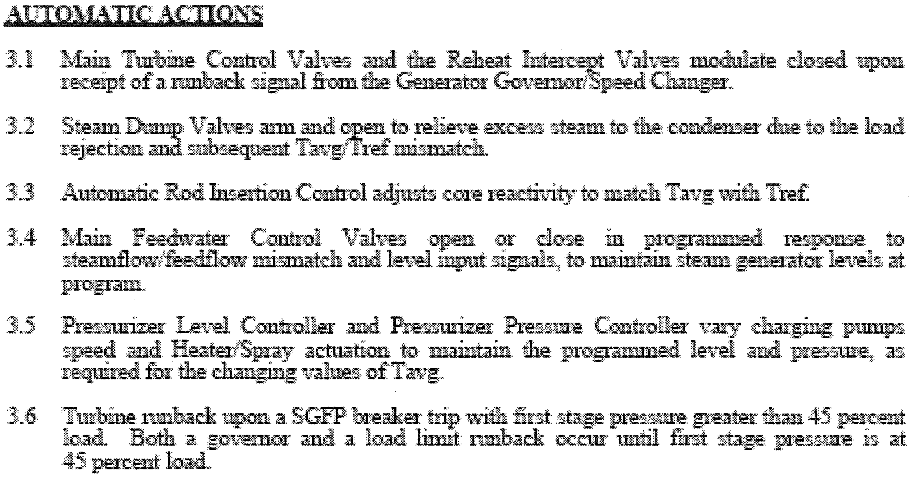
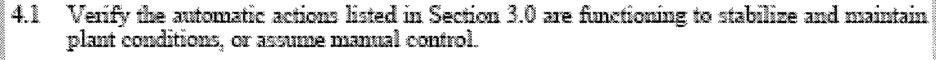
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3&4 Page 17 of 17

Event Description: 3A RCP #1 seal degrades. The crew responds per 3-ONOP-041.1 and 3-ONOP-100 Reactor Coolant Pump Off-normal. FCV-3-113B fails to open during boration. The crew responds per 3-ONOP-046.4

Time	Position	Applicant's Actions or Behavior
	BOP	 **12** **Check Station Service Loads Supplied From The Startup Transformer** **WHEN** directed by the Unit Supervisor, **THEN** transfer station service from the Auxiliary Transformers to the Startup Transformer using Attachment 2.
		Evaluator Note: transfers loads per attachment 2
	BOP	 **ATTACHMENT 2** (Page 1 of 1) **TRANSFERRING FROM AUXILIARY TO STARTUP TRANSFORMER** **NOTE** *To close 4KV bus supply breakers;* • *the synchroscope must be on, at 12 o'clock +/- 20° and stationary.* • *Incoming and running voltages must be within 10% (approximately 24KV).* ___ 1. Close START-UP XFMR 3A 4KV BUS SUPPLY, 3AA05. ___ 2. Place AUX XFMR 3A 4KV BUS SUPPLY, 3AA02, to TRIP. ___ 3. Close START-UP XFMR 3B 4KV BUS SUPPLY, 3AB05. ___ 4. Place AUX XFMR 3B 4KV BUS SUPPLY, 3AB02, to TRIP.
	BOP	 **13** **Check Auxiliary Steam Supplied From Another Unit** **WHEN** directed by the Unit Supervisor, **THEN** align auxiliary steam supply from another unit using Attachment 1.
		Evaluator Note: Directs FS/NSO to align aux steam using att. 1
		Evaluator Note: After reactor power <75% trigger event 5.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 5 Page 1 of 2

Event Description: When power is <75%, the 3B condensate pump trips due to bearing failure. 3C condensate pump fails to auto start. The 3B SGFP may trip automatically running the turbine back.

Time	Position	Applicant's Actions or Behavior
When power is <75%, Trigger lesson step, EVENT 5 – 3B CONDENSATE PP TRIP		
	BOP	Determines / Reports 3B condensate pump trip as determined by: • Alarm D 9/4 motor bearing high temp • Alarm G 8/4 condensate pump low flow • Increasing amps 3B condensate pump • Then zero amps 3B condensate pump • 3B condensate pump breaker indication
		Evaluator Note: The 3B SGFP will most likely trip due to the short amount of time to start the 3C condensate pump. Automatic turbine runback is blocked.
	US	Directs response per 3-ONOP089, Turbine Runback
	RO / BOP	 AUTOMATIC ACTIONS 3.1 Main Turbine Control Valves and the Reheat Intercept Valves modulate closed upon receipt of a runback signal from the Generator Governor/Speed Changer. 3.2 Steam Dump Valves arm and open to relieve excess steam to the condenser due to the load rejection and subsequent Tavg/Tref mismatch. 3.3 Automatic Rod Insertion Control adjusts core reactivity to match Tavg with Tref. 3.4 Main Feedwater Control Valves open or close in programmed response to steamflow/feedflow mismatch and level input signals, to maintain steam generator levels at program. 3.5 Pressurizer Level Controller and Pressurizer Pressure Controller vary charging pumps speed and Heater/Spray actuation to maintain the programmed level and pressure, as required for the changing values of Tavg. 3.6 Turbine runback upon a SGFP breaker trip with first stage pressure greater than 45 percent load. Both a governor and a load limit runback occur until first stage pressure is at 45 percent load.
	RO / BOP	 4.1 Verify the automatic actions listed in Section 3.0 are functioning to stabilize and maintain plant conditions, or assume manual control.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 5 Page 2 of 2

Event Description: When power is <75%, the 3B condensate pump trips due to bearing failure. 3C condensate pump fails to auto start. The 3B SGFP may trip automatically running the turbine back.

Time	Position	Applicant's Actions or Behavior
	US	**SUBSEQUENT OPERATOR ACTIONS** 5.1 Determine the cause of the runback initiation **AND** refer to the appropriate ONOP for specific recovery instructions. 5.2 Verify the following conditions:
	RO / BOP	5.2.1 Steam generator levels and pressures stabilized. 5.2.2 Steam dumps closed. 5.2.3 Tavg matches Tref. 5.2.4 Pressurizer levels and pressures stabilized.
	BOP	5.3 Notify the Load Dispatcher **AND** the Plant General Manager in accordance with 0-ADM-115, Notification of Plant Events. 5.4 **IF** possible, **THEN** mark Control Room charts with the date, time, and cause of the incident. 5.5 Complete operator logs. 5.6 Notify the Shift Manager to review the requirements of PI-AA-100-1002, Failure Investigation Process (FIP), to determine if a FIP Team should be activated.
	BOP	5.7 **IF** reactor power has changed by greater than or equal to 15 percent, **THEN** notify the Chemistry Department that RCS sampling is required per Technical Specifications Table 4.4-4, Item 6.b.
		Evaluator Note :RO should stop boration if in progress.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 1 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
Trigger lesson step, EVENT 4 – STEAM BREAK DOWNSTREAM MSIV		
	RO / BOP	Operators determine a reactor trip should have occurred by observation of: • Steam noise • Steam flows on all S/Gs pegged high • Reactor power increase • First out annunciators C 4/5 Reactor trip by turbine trip • First out annunciator E 2/6 HI HI SG LVL TURB TRIP
	US	Directs the reactor tripped
	RO	Attempts to trip the reactor from the console, but is unsuccessful
_____	**RO** **Critical Task**	**Trips the reactor from vertical panel B**
		Critical Task: (TC-PRA) Failure to manually trip the reactor within one minute if automatic trip signal fails to trip the reactor.
	US	Directs 3-EOP-E-0 immediate operator actions to be performed.
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*

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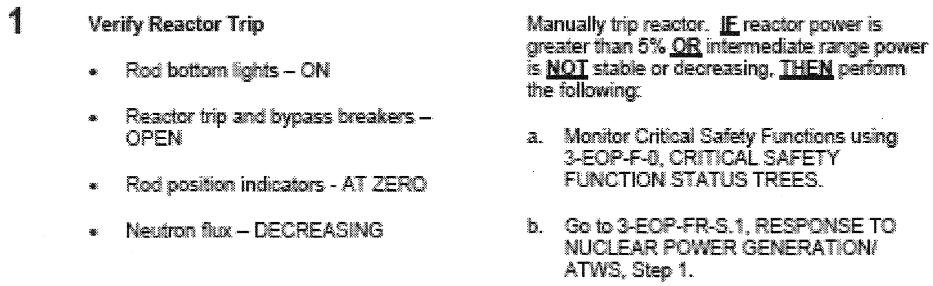
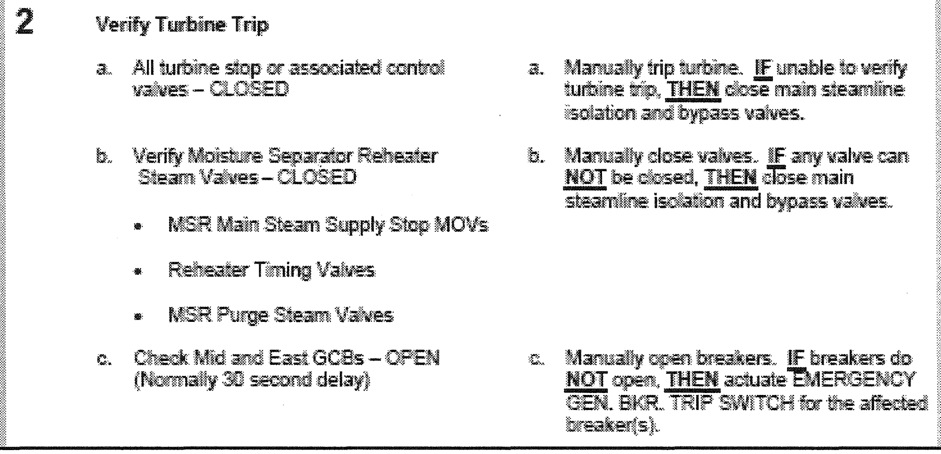
Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	 **1** **Verify Reactor Trip** • Rod bottom lights – ON • Reactor trip and bypass breakers – OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING Manually trip reactor. **IF** reactor power is greater than 5% **OR** intermediate range power is **NOT** stable or decreasing, **THEN** perform the following: a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.
	BOP	 **2** **Verify Turbine Trip** a. All turbine stop or associated control valves – CLOSED b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves c. Check Mid and East GCBs – OPEN (Normally 30 second delay) a. Manually trip turbine. **IF** unable to verify turbine trip, **THEN** close main steamline isolation and bypass valves. b. Manually close valves. **IF** any valve can **NOT** be closed, **THEN** close main steamline isolation and bypass valves. c. Manually open breakers. **IF** breakers do **NOT** open, **THEN** actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).
		Evaluator Note: BOP closes MSR main steam supply stop MOVs
	BOP **Critical Task**	**Closes 3B MSIV**
		Critical Task: Failure to isolate faulted S/G following automatic steam line isolation
		Evaluator Note: 3B MSIV fails to close on automatic isolation signal. If not closed as an early action, it will be closed in attachment 3.

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Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	BOP	**3** **Verify Power To Emergency 4 KV Buses** a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED a. Perform the following: 1) Attempt to emergency start any Unit 3 available diesel generator. 2) **IF** neither 3A nor 3B 4 KV bus is energized, **THEN** go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1. b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED b. Attempt to emergency start the de-energized Unit 3 bus diesel generator. c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS c. Perform the following: 1) **IF** lockout of 3D 4 KV bus **NOT** present, **THEN** perform the following: a) Verify 3C CCW pump - BREAKER OPEN. b) Verify 3C ICW pump – BREAKER OPEN. c) Operate bus supply breakers to restore power.
	RO	**4** **Check If SI Is Actuated** * SI Annunciators - ANY ON **OR** * Safeguards equipment – AUTO STARTED
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	US	Reviews foldout page

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Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	US	**FOLDOUT FOR PROCEDURE E-0** 1. ADVERSE CONTAINMENT CONDITIONS IF either of the conditions listed below occur, THEN use adverse containment setpoints: Containment atmosphere temperature ≥ 180°F OR Containment radiation levels ≥ 1.3x10^5 R/hr WHEN containment parameters drop below the above values, THEN normal setpoints can again be used IF the TSC determines that containment integrated dose rate has not exceeded 10^6 Rads. 2. RCP TRIP CRITERIA a. IF both conditions listed below occur, THEN trip all RCPs: 1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED. 2) RCS subcooling - LESS THAN 25°F[65°F] b. IF phase B actuated, THEN trip all RCPs. 3. FAULTED S/G ISOLATION CRITERIA IF any S/G pressure decreasing in an uncontrolled manner OR any S/G completely depressurized, THEN the following may be performed: a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6%[32%]. b. Isolate AFW flow to faulted S/G(s). c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range. 4. RUPTURED S/G ISOLATION CRITERIA IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, AND narrow range level in affected S/G(s) is greater than 6%[32%], THEN feed flow may be stopped to affected S/G(s). 5. AFW SYSTEM OPERATION CRITERIA a. IF two AFW pumps are operating on a single train, THEN one of the pumps shall be shut down within one hour of the initial start signal b. IF two AFW trains are operating and one of the AFW pumps has been operating at low flow of 80 gpm or less for one hour, THEN that AFW pump shall be shut down 6. CST MAKEUP WATER CRITERIA IF CST level decreases to less than 10%, THEN add makeup to CST using 3-OP-018.1, CONDENSATE STORAGE TANK.
	RO	Secures 3A RCP due to #1 seal failure and remaining pumps due to loss of subcooling.
	US	**5** **Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure**
		Evaluator Note: US directs BOP to perform attachment 3. Attachment 3 steps on page 61.

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Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**6** **Check AFW Pumps - AT LEAST TWO RUNNING** Perform the following: a. Manually open valves to establish two AFW pumps running. b. **IF** an AFW pump is tripped, **THEN** dispatch an operator to locally reset the AFW turbine trips. c. **IF** both units require AFW **AND** only one AFW pump is available, **THEN** perform the following: 1) Verify all RCPs - TRIPPED 2) Establish 270 gpm AFW flow to each unit. 3) Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.
	RO	**7** **Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT** Manually align valves to establish proper AFW alignment.
	RO	**8** **Verify Proper AFW Flow** a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%] a. Perform the following: 1) Verify AFW flow greater than 345 gpm. 2) **IF** AFW flow less than 345 gpm, **THEN** manually start pumps **AND** align valves to establish greater than 345 gpm flow. 3) **IF** total feed flow from all sources greater than 345 gpm can **NOT** be established, **THEN** perform the following: a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1. b. Maintain feed flow to S/G narrow range levels between 15%[32%] and 50%.

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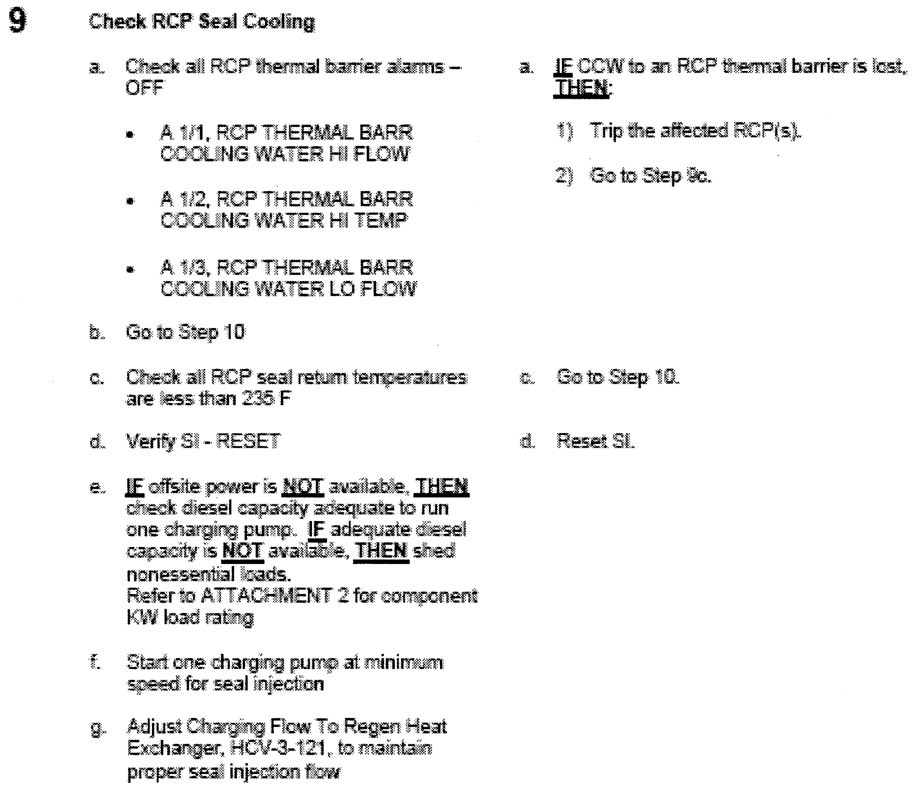
Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	 **9** **Check RCP Seal Cooling** a. Check all RCP thermal barrier alarms – OFF - A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW - A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP - A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW a. **IF** CCW to an RCP thermal barrier is lost, **THEN**: 1) Trip the affected RCP(s). 2) Go to Step 9c. b. Go to Step 10 c. Check all RCP seal return temperatures are less than 235 F c. Go to Step 10. d. Verify SI - RESET d. Reset SI. e. **IF** offsite power is **NOT** available, **THEN** check diesel capacity adequate to run one charging pump. **IF** adequate diesel capacity is **NOT** available, **THEN** shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating f. Start one charging pump at minimum speed for seal injection g. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow

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Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior	
	RO	**10** **Maintain RCS Cold Leg Temperature** * STABLE AT **OR** TRENDING TO 547°F IF ANY RCP RUNNING **OR** * LESS THAN 547°F **AND** STABLE IF NO RCP RUNNING	Perform the following: a. **IF** temperature is decreasing, **THEN** perform the following: 1) Stop dumping steam. 2) Limit total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. 3) **IF** cooldown is due to excessive steam flow, **THEN** close main steamline isolation and bypass valves. b. **IF** temperature greater than 547°F **AND** increasing, **THEN** perform the following: * Dump steam to condenser. **OR** * Dump steam using S/G steam dump to atmosphere valves.
	RO	**11** **Check PRZ PORVs, Spray Valves And Excess Letdown Isolated**	
		a. PORVs – CLOSED	a. **IF** PRZ pressure less than 2335 psig, **THEN** manually close PORVs. **IF** any PRZ PORV can **NOT** be closed, **THEN** manually close its block valve. **IF** block valve can **NOT** be closed, **THEN** perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
		b. Normal PRZ spray valves – CLOSED	b. **IF** PRZ pressure less than 2260 psig, **THEN** manually close valves. **IF** valve(s) can **NOT** be closed, **THEN** stop RCP(s) as necessary to stop spray flow.
		c. Auxiliary Spray Valve, CV-3-311 – CLOSED	c. Manually close auxiliary spray valve. **IF** auxiliary spray valve can **NOT** be closed, **THEN** close Charging Flow to Regen Heat Exchanger, HCV-3-121.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 8 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
		d. Excess letdown isolation valves – CLOSED d. Manually close valve(s). • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller
	RO	**12** **Check If RCPs Should Be Stopped** a. Check RCPs - ANY RUNNING a. Go to Step 13. b. Check RCS subcooling – LESS THAN 25°F[65°F] b. Go to Step 13. c. High-Head SI Pump – AT LEAST ONE RUNNING **AND** FLOWPATH VERIFIED c. Go to Step 13. d. Stop all RCPs
		EVALUATOR NOTE: all RCPs secured earlier
	RO	**13** **Check If S/Gs Are Faulted** a. Check pressures in all SGs – a. Go to Step 14. • ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER **OR** • ANY SG COMPLETELY DEPRESSURIZED b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 9 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**14** **Check If S/G Tubes Are Ruptured** a. Check levels in all S/Gs and secondary radiation levels: • ANY SG LEVEL INCREASING IN AN UNCONTROLLED MANNER OR • Condenser air ejector radiation, R-15 – HIGHER THAN NORMAL OR • SG blowdown radiation, R-19 – HIGHER THAN NORMAL OR • ERDADS SG or secondary radiation readings – HIGHER THAN NORMAL OR • Local steamline radiation – HIGHER THAN NORMAL b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1 a. Go to Step 15.
		EVALUATOR NOTE: Directs HP to take local steamline radiation surveys
	RO	**15** **Check If RCS Is Intact** a. Containment radiation - NORMAL b. Containment pressure - NORMAL c. Containment sump level - NORMAL • LI-3-6308A • LI-3-6308B Perform the following: 1. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2. Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 10 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**16** **Check If SI Should Be Terminated** a. RCS subcooling based on core exit TCs - GREATER THAN 30°F — a. Go to Step 17. b. Secondary heat sink — b. Go to Step 17. * Total feed flow to S/Gs - GREATER THAN 345 GPM OR * Narrow range level in at least one S/G - GREATER THAN 6% c. RCS pressure — c. Go to Step 17. • Pressure - GREATER THAN 1600 PSIG AND • Pressure - STABLE OR INCREASING d. PRZ Level - GREATER THAN 12% — d. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 17. e. Go To 3-EOP-ES-1.1, SI TERMINATION, Step 1
		EVALUATOR NOTE: Pressurizer level may not be greater then 12% on the first pass through the procedure. If greater then 12 % transition is made here to 3-EOP-ES-1.1
	RO	**17** **Monitor Critical Safety Functions Using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES**
	RO	**18** **Check S/G Levels** a. Narrow range level - GREATER THAN 6% — a. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6% in at least one S/G. b. Control feed flow to maintain narrow range level between 15% and 50% c. Narrow range level - LESS THAN 50% — c. Stop feed flow to any S/G with narrow range level greater than 50%. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 11 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**19 Check Secondary Radiation** a. Direct Nuclear Chemistry to take periodic activity samples of all S/Gs b. Direct Radiation Protection to take radiation readings on main steamlines c. Secondary radiation - NORMAL NEAR ROUTINE OPERATION VALUE c. Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
	RO	**20 Check Auxiliary Building Radiation- NORMAL** Evaluate cause of abnormal conditions. <u>IF</u> the cause is a loss of RCS inventory outside containment, <u>THEN</u> go to 3-EOP-ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1
	RO	**21 Check PRT Conditions - NORMAL** Evaluate cause of abnormal conditions.
		CAUTION *If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment using Attachment 3.*
	RO	**22 Verify SI - RESET** Reset SI
	RO	**23 Verify Containment Isolation Phase A and Phase B – RESET** Reset Phase A and Phase B
	RO	**24 Verify Instrument Air To Containment** a. Verify Instrument Air Containment Isolation, CV-3-2803 - OPEN b. Verify instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG b. Restore instrument air pressure using 0-ONOP-013, LOSS OF INSTRUMENT AIR, while continuing with this procedure.
		CAUTION *If RCS pressure decreases in an uncontrolled manner to less than 250 psig[650 psig], manual action will be required to restart the RHR pumps after they have been secured.*

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 12 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**25** **Monitor RCS Pressure To Check If RHR Pumps Should Be Stopped** a. Check RCS pressure 1) Pressure - GREATER THAN 250 PSIG[650 PSIG] — 1) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. 2) Pressure - STABLE OR INCREASING — 2) Go to Step 26. b. Stop RHR pumps **AND** place in Standby c. Check RCS pressure – GREATER THAN 250 PSIG[650 PSIG] — c. **IF** RCS pressure decreases to less than 250 PSIG[650 PSIG], **THEN** manually start both RHR pumps
		EVALUATOR NOTE: Stops RHR pumps
	RO RO	**26** **Check Power Supply To Charging Pumps - ALIGNED TO OFFSITE POWER** — Perform the following: a. Check diesel capacity adequate to run at least one charging pump. b. **IF** diesel capacity is **NOT** adequate, **THEN** shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating. **27** **Check Charging Flow Established** a. Charging pumps - AT LEAST ONE RUNNING — a. Perform Attachment 4 to establish charging. b. Adjust speed controllers as necessary to establish desired charging flow c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow
		Evaluator Note: attachment 4 used to establish charging.

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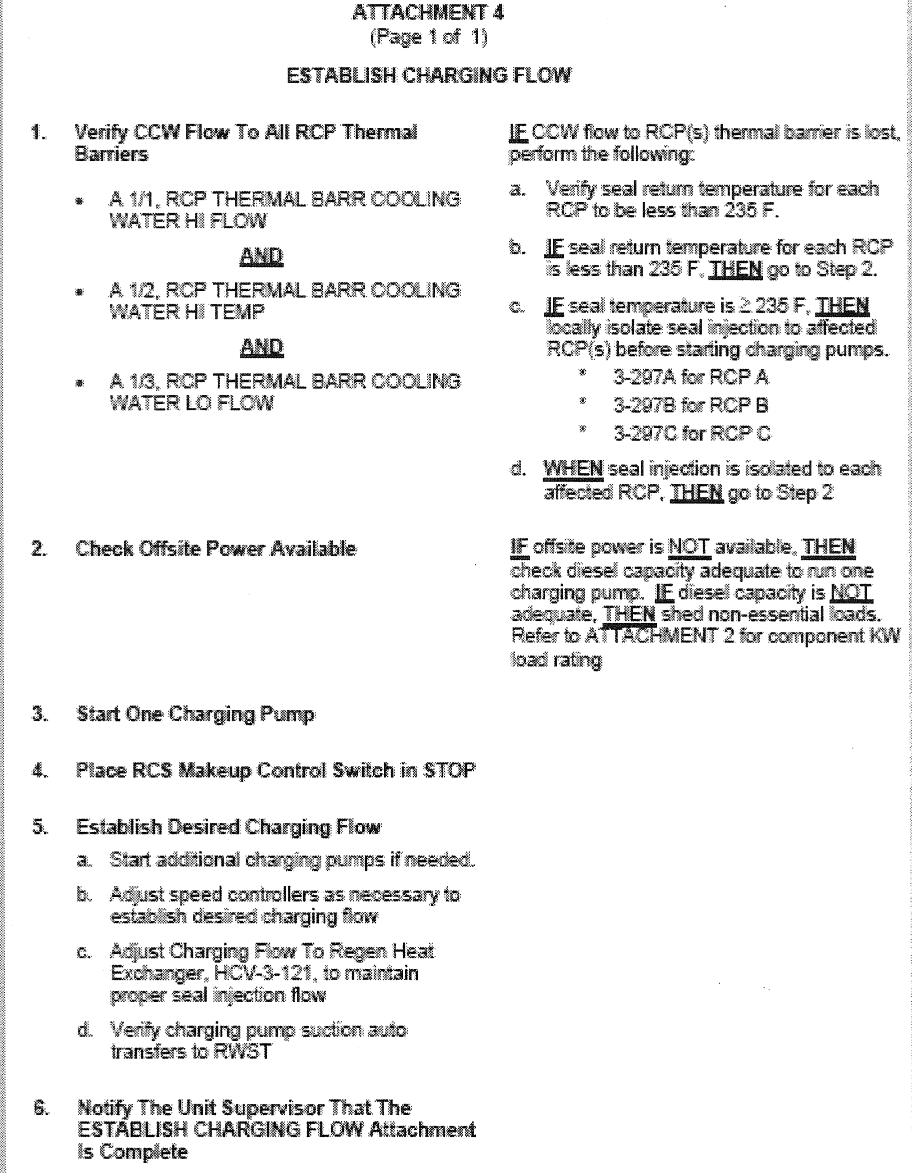
Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	

ATTACHMENT 4
(Page 1 of 1)

ESTABLISH CHARGING FLOW

1. **Verify CCW Flow To All RCP Thermal Barriers**
   - A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW

     AND
   - A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP

     AND
   - A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW

   IF CCW flow to RCP(s) thermal barrier is lost, perform the following:

   a. Verify seal return temperature for each RCP to be less than 235 F.

   b. IF seal return temperature for each RCP is less than 235 F, THEN go to Step 2.

   c. IF seal temperature is ≥ 235 F, THEN locally isolate seal injection to affected RCP(s) before starting charging pumps.
      - 3-297A for RCP A
      - 3-297B for RCP B
      - 3-297C for RCP C

   d. WHEN seal injection is isolated to each affected RCP, THEN go to Step 2

2. **Check Offsite Power Available**

   IF offsite power is NOT available, THEN check diesel capacity adequate to run one charging pump. IF diesel capacity is NOT adequate, THEN shed non-essential loads. Refer to ATTACHMENT 2 for component KW load rating

3. **Start One Charging Pump**

4. **Place RCS Makeup Control Switch in STOP**

5. **Establish Desired Charging Flow**

   a. Start additional charging pumps if needed.

   b. Adjust speed controllers as necessary to establish desired charging flow

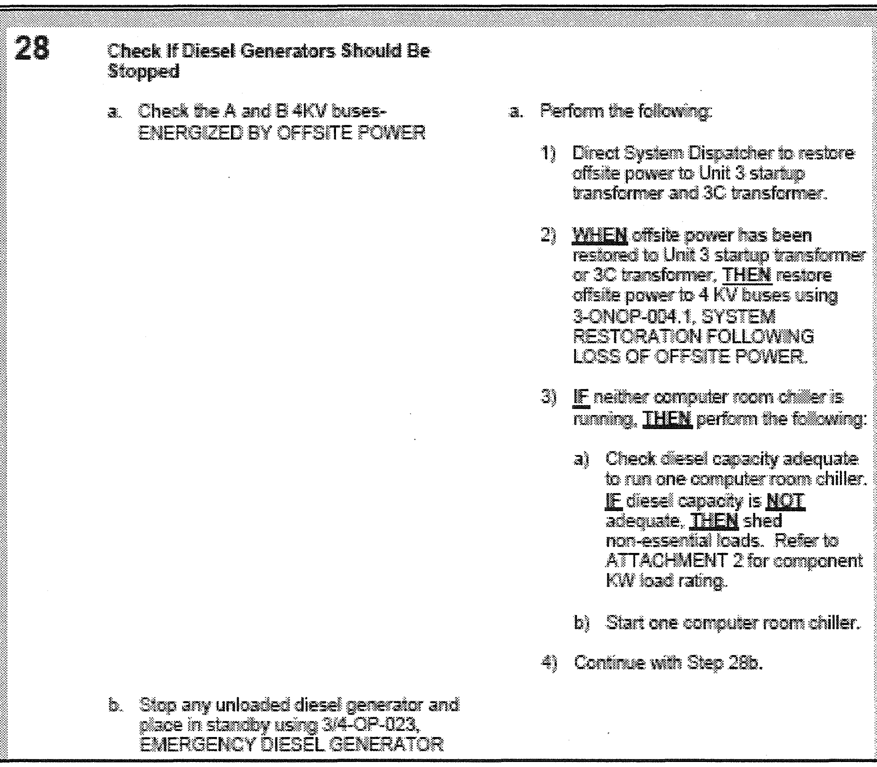
   c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow

   d. Verify charging pump suction auto transfers to RWST

6. **Notify The Unit Supervisor That The ESTABLISH CHARGING FLOW Attachment Is Complete**

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 14 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	 **28** **Check If Diesel Generators Should Be Stopped** a. Check the A and B 4KV buses-ENERGIZED BY OFFSITE POWER a. Perform the following: 1) Direct System Dispatcher to restore offsite power to Unit 3 startup transformer and 3C transformer. 2) <u>WHEN</u> offsite power has been restored to Unit 3 startup transformer or 3C transformer, <u>THEN</u> restore offsite power to 4 KV buses using 3-ONOP-004.1, SYSTEM RESTORATION FOLLOWING LOSS OF OFFSITE POWER. 3) <u>IF</u> neither computer room chiller is running, <u>THEN</u> perform the following: a) Check diesel capacity adequate to run one computer room chiller. <u>IF</u> diesel capacity is <u>NOT</u> adequate, <u>THEN</u> shed non-essential loads. Refer to ATTACHMENT 2 for component KW load rating. b) Start one computer room chiller. 4) Continue with Step 28b. b. Stop any unloaded diesel generator and place in standby using 3/4-OP-023, EMERGENCY DIESEL GENERATOR
		EVALUATOR NOTE: Directs NSO to prepare to secure EDGs using 3-OP-023
	RO	 **29** **Perform Attachment 5 to Align Plant Equipment**
	US	 **30** **Return To Step 10**
		EVALUATOR NOTE: Loops back to step 10 to meet SI termination criteria. Attachment 5 listed next for reference.

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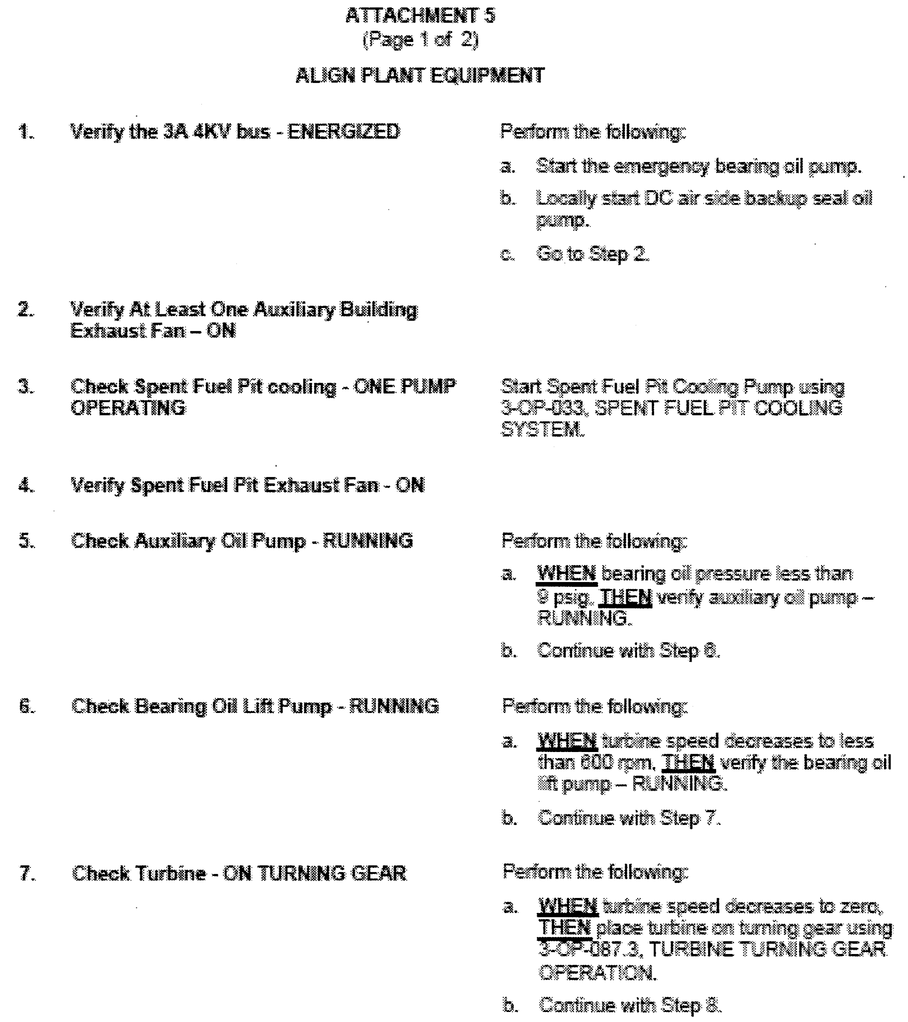
Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	

ATTACHMENT 5
(Page 1 of 2)
ALIGN PLANT EQUIPMENT

1. **Verify the 3A 4KV bus - ENERGIZED**	Perform the following: a. Start the emergency bearing oil pump. b. Locally start DC air side backup seal oil pump. c. Go to Step 2.
2. **Verify At Least One Auxiliary Building Exhaust Fan – ON**	
3. **Check Spent Fuel Pit cooling - ONE PUMP OPERATING**	Start Spent Fuel Pit Cooling Pump using 3-OP-033, SPENT FUEL PIT COOLING SYSTEM.
4. **Verify Spent Fuel Pit Exhaust Fan - ON**	
5. **Check Auxiliary Oil Pump - RUNNING**	Perform the following: a. **WHEN** bearing oil pressure less than 9 psig, **THEN** verify auxiliary oil pump – RUNNING. b. Continue with Step 6.
6. **Check Bearing Oil Lift Pump - RUNNING**	Perform the following: a. **WHEN** turbine speed decreases to less than 600 rpm, **THEN** verify the bearing oil lift pump – RUNNING. b. Continue with Step 7.
7. **Check Turbine - ON TURNING GEAR**	Perform the following: a. **WHEN** turbine speed decreases to zero, **THEN** place turbine on turning gear using 3-OP-087.3, TURBINE TURNING GEAR OPERATION. b. Continue with Step 8.

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Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
		ATTACHMENT 5 (Page 2 of 2) **ALIGN PLANT EQUIPMENT** 8. Verify Exciter Field Breaker - OPEN 9. Place Voltage Regulator To OFF 10. Place Generator Core Monitor In MANUAL START ONLY Mode Of Operation 11. Verify Lube Oil Reservoir Vapor Extractor – ON 12. Align Auxiliary Steam Supply From Any Available Unit 13. Stop All Heater Drain Pumps 14. Stop All But One Condensate Pump 15. Direct Operator To Locally Shut Down Moisture Separator Reheaters Using 3-OP-072.1, MOISTURE SEPARATOR REHEATERS 16. Perform 3-OSP-089, MAIN TURBINE VALVES OPERABILITY TEST 17. Notify The Unit Supervisor That The ALIGN PLANT EQUIPMENT Attachment Is Complete

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 17 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**10** **Maintain RCS Cold Leg Temperature** * STABLE AT **OR** TRENDING TO 547°F IF ANY RCP RUNNING **OR** * LESS THAN 547°F **AND** STABLE IF NO RCP RUNNING Perform the following: a. **IF** temperature is decreasing, **THEN** perform the following: 1) Stop dumping steam. 2) Limit total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. 3) **IF** cooldown is due to excessive steam flow, **THEN** close main steamline isolation and bypass valves. b. **IF** temperature greater than 547°F **AND** increasing, **THEN** perform the following: * Dump steam to condenser. **OR** * Dump steam using S/G steam dump to atmosphere valves.
	RO	**11** **Check PRZ PORVs, Spray Valves And Excess Letdown Isolated** a. PORVs – CLOSED a. **IF** PRZ pressure less than 2335 psig, **THEN** manually close PORVs. **IF** any PRZ PORV can **NOT** be closed, **THEN** manually close its block valve. **IF** block valve can **NOT** be closed, **THEN** perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. b. Normal PRZ spray valves – CLOSED b. **IF** PRZ pressure less than 2260 psig, **THEN** manually close valves. **IF** valve(s) can **NOT** be closed, **THEN** stop RCP(s) as necessary to stop spray flow. c. Auxiliary Spray Valve, CV-3-311 – CLOSED c. Manually close auxiliary spray valve. **IF** auxiliary spray valve can **NOT** be closed, **THEN** close Charging Flow to Regen Heat Exchanger, HCV-3-121.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 18 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
		d. Excess letdown isolation valves – CLOSED • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller d. Manually close valve(s).
	RO	**12** **Check If RCPs Should Be Stopped** a. Check RCPs - ANY RUNNING — a. Go to Step 13. b. Check RCS subcooling – LESS THAN 25°F[65°F] — b. Go to Step 13. c. High-Head SI Pump – AT LEAST ONE RUNNING **AND** FLOWPATH VERIFIED — c. Go to Step 13. d. Stop all RCPs
		EVALUATOR NOTE: RCPs secured
	RO	**13** **Check If S/Gs Are Faulted** a. Check pressures in all SGs – • ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER **OR** • ANY SG COMPLETELY DEPRESSURIZED a. Go to Step 14. b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 19 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**14** **Check If S/G Tubes Are Ruptured** a. Check levels in all S/Gs and secondary radiation levels: • ANY SG LEVEL INCREASING IN AN UNCONTROLLED MANNER **OR** • Condenser air ejector radiation, R-15 – HIGHER THAN NORMAL **OR** • SG blowdown radiation, R-19 – HIGHER THAN NORMAL **OR** • ERDADS SG or secondary radiation readings – HIGHER THAN NORMAL **OR** • Local steamline radiation – HIGHER THAN NORMAL b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1 a. Go to Step 15.
		EVALUATOR NOTE: Directs HP to take local steamline radiation surveys
	RO	**15** **Check If RCS Is Intact** a. Containment radiation - NORMAL b. Containment pressure - NORMAL c. Containment sump level - NORMAL • LI-3-6308A • LI-3-6308B Perform the following: 1. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2. Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 20 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
	RO	**16** **Check If SI Should Be Terminated** a. RCS subcooling based on core exit TCs - GREATER THAN 30°F — a. Go to Step 17. b. Secondary heat sink — b. Go to Step 17. * Total feed flow to S/Gs - GREATER THAN 345 GPM OR * Narrow range level in at least one S/G - GREATER THAN 6% c. RCS pressure — c. Go to Step 17. • Pressure - GREATER THAN 1600 PSIG AND • Pressure - STABLE OR INCREASING d. PRZ Level - GREATER THAN 12% — d. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 17. e. Go To 3-EOP-ES-1.1, SI TERMINATION, Step 1
	US	Conducts crew brief and transition is made to 3-EOP-ES-1.1 SI Termination

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 21 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td></td><td><u>NOTE</u>
<i>Foldout page is required to be monitored throughout this procedure.</i></td></tr>
<tr><td></td><td>US</td><td>
<u>FOLDOUT FOR PROCEDURE ES-1.1</u>
1. <u>ADVERSE CONTAINMENT CONDITIONS</u>
<u>IF</u> either of the conditions listed below occurs, <u>THEN</u> use adverse containment setpoints:
Containment atmosphere temperature ≥ 180°F
<u>OR</u>
Containment radiation levels ≥ 1.3x10⁵ R/hr
<u>WHEN</u> containment parameters drop below the above values, <u>THEN</u> normal setpoints can again be used <u>IF</u> containment integrated dose rate has not exceeded 10⁶ Rads.
2. <u>SI RE-INITIATION CRITERIA</u>
<u>IF</u> either condition listed below occurs following SI termination, <u>THEN</u> manually start SI pumps as necessary to restore RCS subcooling and PRZ level, <u>AND</u> go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1:
* RCS subcooling based on core exit TCs - LESS THAN 30°F[See below Table]
<table>
<tr><th colspan="2">SI TERMINATION ADVERSE SUBCOOLING VALUE</th></tr>
<tr><th><u>RCS PRESSURE (PSIG)</u></th><th><u>ADVERSE SUBCOOLING VALUE</u></th></tr>
<tr><td>< 2485 AND ≥ 2000</td><td>≥ 55 °F</td></tr>
<tr><td>< 2000 AND ≥ 1000</td><td>≥ 85 °F</td></tr>
<tr><td>< 1000</td><td>≥ 210°F</td></tr>
</table>
OR
* PRZ level – CAN NOT BE MAINTAINED GREATER THAN 17%[50%]
3. <u>CST MAKEUP WATER CRITERIA</u>
<u>IF</u> CST level decreases to less than 10%, <u>THEN</u> add makeup to CST using 3-OP-018.1, CONDENSATE STORAGE TANK.
4. <u>LOSS OF OFFSITE POWER OR SI ON OTHER UNIT</u>
<u>IF</u> SI has been reset <u>AND</u> either offsite power is lost <u>OR</u> SI actuates on the other unit, <u>THEN</u> restore safeguards equipment to required configuration. Refer to ATTACHMENT 3 for essential loads.
</td></tr>
<tr><td></td><td></td><td><i>Evaluator Note: US reviews foldout page</i></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 22 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior	
	RO	**1** **Verify SI - RESET**	
	BOP	**2** **Reset Containment Isolation Phase A And Phase B**	
	BOP	**3** **Verify Instrument Air To Containment** a. Verify Instrument Air Containment Isolation, CV-3-2803 - OPEN b. Verify Instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG	b. Restore instrument air pressure using 0-ONOP-013, LOSS OFINSTRUMENT AIR, while continuing with this procedure.
	RO	**4** **Check If Charging Flow Has Been Established** a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP(s) thermal barrier is lost, THEN locally isolate seal injection to affected RCP(s) before starting charging pumps. * 3-297A for RCP A * 3-297B for RCP B * 3-297C for RCP C 2) IF offsite power is NOT available, THEN check diesel capacity adequate to run charging pumps. IF adequate diesel capacity is NOT available, THEN shed non-essential loads. Refer to ATTACHMENT 3 for component KW load rating. 3) Start at least one charging pump. 4) IF charging flow can NOT be established, THEN maintain one SI pump for RCS inventory control using 3-ONOP-047.1, LOSS OF CHARGING FLOW IN MODES 1 THROUGH 4, through subsequent steps of this procedure.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 23 of 23

Event Description: A steam line break occurs requiring a manual reactor trip from VPB. 3B main steam isolation valve requires manual operation. 3-EOP-E-0 is entered with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW and 3A SI pumps fail to auto start.

Time	Position	Applicant's Actions or Behavior
		b. Establish desired charging flow 1) Start additional charging pumps as necessary to establish desired charging flow 2) Adjust charging pump speed controllers to establish desired charging flow 3) Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow
	RO	**5** **Stop The Following Pumps AND Place In Standby** • RHR pumps • High-head SI pumps
	RO	**6** **Verify SI Flow NOT Required** a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [Refer to Foldout Page Item 2 Adverse Value] a. Manually start SI pumps to restore subcooling AND go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. b. PRZ level - GREATER THAN 17%[50%] b. Control charging flow to maintain PRZ level. IF PRZ level can NOT be maintained, THEN manually start SI pumps to restore PRZ level and go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
Take shift from Crew following verification		

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 1 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 1 Check The Load Centers Associated With The Energized 4 KV Buses – ENERGIZED • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC	Close the Load Center supply breakers.
	BOP **Critical Step**	**Step** **2. Check If Main Steamlines Should Be Isolated**	
		a. Check main steamline isolation and bypass valves - ANY OPEN	**a. Go to Step 3.**
		b. Check if either main steam isolation signal has actuated **• High steam flow with either low S/G pressure 614 psig OR low Tavg 543 F** **OR** **• Hi-Hi containment pressure 20 PSIG**	**b. Go to Step 3.**
		c. Verify main steam isolation and bypass valves - CLOSED	**c. Push manual Steamline Isolation push buttons on VPB OR manually close valves.**
		Evaluator Note: 3B S/G MSIV should be closed here	

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 2 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 3. Verify Feedwater Isolation a. Place main feedwater pump switches in STOP b. Feedwater control valves – CLOSED — b. Manually close valves. c. Feedwater bypass valves – CLOSED — c. Manually close valves. d. Close feedwater isolation MOVs — d. Locally close valves. e. Verify standby feedwater pumps – OFF — e. IF standby feedwater is aligned to Unit 3, THEN stop standby feedwater pump(s).
	BOP	Step 4. Verify Proper ICW System Operation a. Verify ICW pumps - AT LEAST TWO RUNNING — a. Start ICW pump(s) to establish at least two running. b. Verify ICW to TPCW Heat Exchanger – ISOLATED — b. Manually close valve(s). IF valve(s) can NOT be closed, THEN locally close the following valves: • POV-3-4882 – CLOSED — • 3-50-319 for POV-3-4882 • POV-3-4883 – CLOSED — • 3-50-339 for POV-3-4883 c. Check ICW headers - TIED TOGETHER — c. IF both ICW headers are intact, THEN direct operator to tie headers together.
		Evaluator Note: BOP starts 3A ICW PP, 3B fails to start if attempted

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 3 of 11
Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 5. Verify Proper CCW System Operation	
		a. CCW Heat Exchangers – THREE IN SERVICE	a. Perform the following: 1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP. 2) Verify Emergency Containment Coolers - ONLY TWO RUNNING 3) Go to Step 5c.
		b. CCW pumps - ONLY TWO RUNNING	b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.
		c. CCW headers - TIED TOGETHER	c. IF both CCW headers are intact, THEN direct a field operator to tie the headers together.
		d. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN	d. IF containment isolation phase B NOT actuated AND CCW radiation levels are normal, AND RCP number one seal leak-off temperature is less than 235°F, THEN manually open MOV-3-626. IF MOV-3-626 can NOT be manually opened, THEN direct operator to open MOV-3-626 locally.
	BOP	Step 6. Verify Containment Cooling	
		a. Check emergency containment coolers - ONLY TWO RUNNING	a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING.
		b. Verify emergency containment filter fans - AT LEAST TWO RUNNING	b. Manually start emergency containment filter fans.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 4 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 7. Verify SI Pump Operation a. At least two high head pumps running — a. Manually start high-head pump(s). b. Both RHR pumps running — b. Manually start RHR pump(s).
	BOP	Step 8. Verify SI Flow a. RCS pressure - LESS THAN 1600 PSIG[2000 PSIG] — a. Go to Step 9. b. High-head SI pump flow indicator – CHECK FOR FLOW — b. Manually start pumps AND align valves to establish an injection flowpath. c. RCS pressure - LESS THAN 250 PSIG[650 PSIG] — c. Go to Step 9. d. RHR pump flow indicator - CHECK FOR FLOW — d. Manually start pumps AND align valves to establish an injection flowpath.
	BOP	Step 9. Realign SI System a. Verify Unit 3 high-head SI pumps - TWO RUNNING — a. Perform the following: 1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps. 2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure. 3) Go to Step 10.
		Evaluator Note: 3A SI PP fails to start, BOP stops one of the unit 4 SI pumps.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 5 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT Perform the following: a. Manually actuate Containment Isolation Phase A. b. IF any Containment Isolation Phase A valve is NOT closed, THEN manually close valve. IF valve(s) can NOT be manually closed, THEN manually or locally isolate affected containment penetration.
	BOP	Step 11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	Step 12. Verify SI – RESET Reset SI
	BOP	Step 13. Verify Containment Phase A – RESET Reset Phase A
		Evaluator Note: BOP is required to go back to the containment isolation racks and rest the six phase A lockout relays, (three lockout relays on each rack

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 att.3 Page 6 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 14. Reestablish RCP Cooling a. Check RCPs – AT LEAST ONE RUNNING — a. Go to step 15. b. Open CCW to normal containment cooler valves — b. Stop all RCPs • MOV-3-1417 • MOV-3-1418 c. Reset and start normal containment coolers — c. Stop all RCPs
	BOP	Step 15. Monitor Containment Pressure To Verify Containment Spray NOT Required a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG — a. Perform the following: • PR-3-6306A AND • PR-3-6306B 1) IF containment spray NOT initiated, THEN manually initiate containment spray. 2) Verify Containment Isolation Phase B-ACTUATED. 3) Verify Containment Isolation Phase B valve white lights on VPB – ALL BRIGHT.
		4) IF any Containment Isolation Phase B valve did NOT close, THEN manually or locally isolate affected containment penetration. 5) Stop all RCPs.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 7 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 16. Verify Containment and Control Room Ventilation Isolation a. Unit 3 containment purge exhaust and supply fans – OFF — a. Manually stop fans. b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT — b. Manually align equipment for Control Room emergency recirculation.
		NOTE *Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.*
	BOP	Step 17. Place Hydrogen Monitors In Service Using 3-OP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM
		Evaluator Note: BOP will call NSO to align PAHM. 3-OP-094 steps listed below.

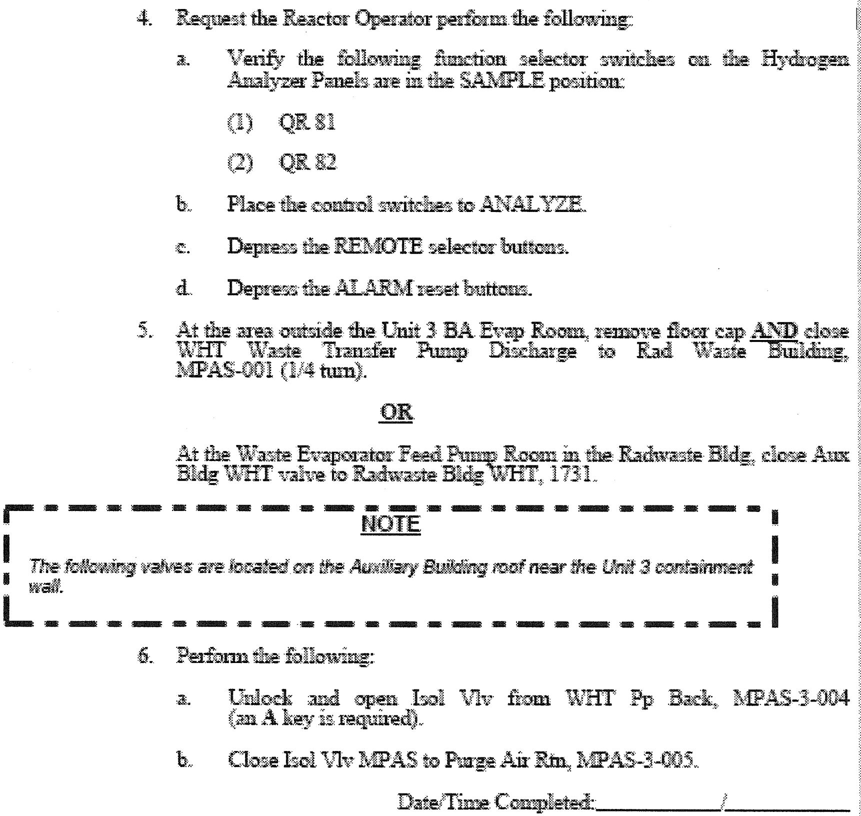
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 8 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
		7.1 Post Accident H_2 Monitor Startup **NOTE** *Hydrogen Monitors should be in service within 30 minutes of a valid SI signal.* 7.1.1 Initial Conditions 1. All applicable prerequisites listed in Section 3.0 are satisfied. 7.1.2 Procedure Steps **NOTES** - *Valves PASS-3-008, 3-001A, 3-001B, 3-002A and 3-002B are located in the floor outside the Unit 3 Sample Room.* - *Full travel for valves is provided in parenthesis and should not be exceeded or damage to reach rod assemblies may occur.* 1. Remove the floor caps **AND** open the following valves using the reach rods located in the Auxiliary Building: a. Post Accident Sampling System Return Line Isolation Valve, PASS-3-008 (2 1/4 turns) b. H_2 Analyzer 3A Outlet Isol, PAHM-3-001A (6 turns) c. H_2 Analyzer 3B Outlet Isol, PAHM-3-001B (6 turns) d. PACV Vent and Sample System to PAHM Header Isolation Valve (RR), PAHM-3-002A (6 turns) e. PACV Vent and Sample System to PAHM Header Isolation Valve (RR), PAHM-3-002B (5 turns) 2. Unlock **AND** open PACVS Isol Vlv Penet 53, HV-3-3, in front of the Unit 3 Containment Spray Pump Room. (An A key is required for this lock.) 3. Unlock **AND** open PACVS Isol Vlv Penet 16, HV-3-1, located in the north Aux Bldg hallway. (An A key is required for this lock.)

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 9 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
		 4. Request the Reactor Operator perform the following: a. Verify the following function selector switches on the Hydrogen Analyzer Panels are in the SAMPLE position: (1) QR 81 (2) QR 82 b. Place the control switches to ANALYZE. c. Depress the REMOTE selector buttons. d. Depress the ALARM reset buttons. 5. At the area outside the Unit 3 BA Evap Room, remove floor cap <u>AND</u> close WHT Waste Transfer Pump Discharge to Rad Waste Building, MPAS-001 (1/4 turn). <u>OR</u> At the Waste Evaporator Feed Pump Room in the Radwaste Bldg, close Aux Bldg WHT valve to Radwaste Bldg WHT, 1731. <u>NOTE</u> *The following valves are located on the Auxiliary Building roof near the Unit 3 containment wall.* 6. Perform the following: a. Unlock and open Isol Vlv from WHT Pp Back, MPAS-3-004 (an A key is required). b. Close Isol Vlv MPAS to Purge Air Rm, MPAS-3-005. Date/Time Completed:__________/__________
	BOP	Step 18. Verify All Four EDGs – RUNNING EMERGENCY START any available EDG NOT running.

Op-Test No.: 2009-301	Scenario No.: 3	Event No.: 6 att.3	Page 10 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 19. Verify Power To Emergency 4 KV Buses and Load Centers a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED a. Perform the following: 1) Inform the Unit Supervisor that Attachment 3 is complete with the exception of the de-energized bus or buses. 2) IF the Unit Supervisor decides not to energize the de-energized bus or buses, THEN go to Step 20. 3) IF the Unit Supervisor decides to energize 3A, 3B, or 3D bus, THEN perform the following: a) IF 3A 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS. b) IF 3B 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS. c) IF 3D 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 att.3 Page 11 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Note Any Actions That Had To Be Taken
		Evaluator Note: BOP informs US of completion and manual start of 3A ICW pump *Evaluator Note: BOP should receive a turnover from the RO and continue in the EOP network.*

NRC XXIV_NRC_SEN_3

OPERATIONS SHIFT TURNOVER REPORT

ONCOMING CREW ASSIGNMENTS

Shift Mgr:			**Inside SNPO:**	
Field Supv.:			**Outside SNPO:**	
Admin RCO:			**ANPO:**	
Unit 3			**Unit 4**	
Unit Supv.:			**Unit Supv.:**	
RCO:			**RCO:**	
NPO:			**NPO:**	

Plant Status

Unit 3			**Unit 4**	
Mode:	1		**Mode:**	1
Power:	100%		**Power:**	100%
MWe:	760		**MWe:**	760
Gross Leakrate:	.02 gpm		**Gross Leakrate:**	.02 gpm
RCS Boron Conc:	1300 ppm		**RCS Boron Conc:**	400 ppm

Operational Concerns:

3C charging pump out of service due to packing leakage. Due back in 14 hours. Thunderstorms reported in the area.

U3 Anticipated LCO Actions:

U4 Anticipated LCO Actions:

Results of Offgoing Focus Area:

Maintain 100%

Unit 3 Status

Reactor Operator

Mode:	1
Power:	100%
MWe:	760
Tavg:	574.2ºF
RCS Pressure:	2250 psig
RCS Boron Conc:	1300 ppm

RCS Leakrate	
Gross:	.02 gpm
Unidentified	.01 gpm
Charging Pps:	.01 gpm

Accumulator Ref Levels	
A	6615 gal
B	6641 gal
C	6627 gal

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

Unit 3 Status

Changes to Risk Significant Equipment:

B train protected both units
Online risk is green

Upcoming Reactivity Management Activities:

Upcoming Major POD Activities:

Upcoming ECOs to Hang and /or Release:

Evolutions or Compensatory Actions in Progress:

General Information, Remarks, and Operator Work Around Status:

Aux. steam supply aligned from unit 3.
Condenser inleakage 0 scfm.

TP-2009-301 Scenario #4 Event Description

Facility: Turkey Point   Scenario No.: 4 New   Op Test No.: 2009-301

Examiners: __________   Candidates: __________ US

__________   __________ RO

__________   __________ BOP

Initial Conditions: Mode 1, 100% MOL. 3C charging pump out of service due to packing leakage.

Turnover: Equipment OOS: 3C charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. Thunder storms are in the area.

Maintain 100%

Online risk – green

B train protected both units

Event No.		Event Type*	Event Description
~~1~~	~~TFFVV01O=T~~	~~(R)BOP~~ ~~(R)SRO~~	~~CV-3-2011, low pressure heater bypass valve fails open causing reactor power to exceed 100%. Turbine load is reduced to maintain reactor power <100%~~
~~2~~	~~TVS1MABD= - 1~~	~~(I)BOP~~ ~~(TS,I)SRO~~	~~PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.~~
3	TVHPBOTL = 0.0006	(R)RO (N)BOP (TS,R)SRO	A 30 gpm pressurizer surge line leak occurs. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.
4	TFH244AH=T	(C)RO (TS,C)SRO	PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig.
5	TVHPBOTL = 0.006	(M)ALL	The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

TP-2009-301 Scenario #4 Event Description

Facility: Turkey Point Scenario No.: 4a New Op Test No.: 2009-301

Examiners: __________ Candidates: __________ US

__________ __________ RO

__________ __________ BOP

Initial Conditions: Mode 1, 100% MOL. 3C charging pump out of service due to packing leakage.

Turnover: Equipment OOS: 3C charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. Thunder storms are in the area.

Maintain 100%

Online risk – green

B train protected both units

Event No.		Event Type*	Event Description
1	TFS1M8WL=T	(I) BOP (TS,I) SRO	PT-3-485 fails low requiring manual control of S/G B FRV.
2	TVHPBOTL = 0.0006	(R)RO (N)BOP (TS,R)SRO	A 30 gpm pressurizer surge line leak occurs. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.
3	TFH244AH=T	(C)RO (TS,C)SRO	PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig.
4	TVHPBOTL = 0.006	(M)ALL	The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Turkey Point 2009-301 Scenario #4

Event 1 – CV-3-2011, low pressure heater bypass valve fails open causing reactor power to exceed 100%. Turbine load is reduced to maintain reactor power <100%

Event 2 - PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

Event 3 – A 30 gpm pressurizer surge line leak occurs. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

Event 4 – PC-3-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig.

Event 5 – The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Scenario XXIV NRC 4

Simulator Operating Instructions

Setup

Reset to IC-1 (100% MOL)

Open & execute lesson file SRO_XXIV_NRC_4.lsn

Place simulator in run

Start 3B charging pump and secure 3C charging pump

Trigger lesson step: SETUP – 3C CHARGING PUMP OOS (actuates TAB1POSN = RACKOUT, TABM270 = 0.0, TABM291A = 0.0, TABM290 = 0.0, TABM275C = 0.0)

Trigger lesson step: SETUP – SI FAIL TO ACTUATE (actuates TFL3SIA1=T, TFL3SIA2=T)

Place simulator in freeze.

Place clearance info tag on 3C Charging Pump start switch

Provide shift turnover checklists

Select 3A QSPDS to page 211 (SAT) and 3B QSPDS to page 212 (RVL). Set ERDADS on VPA and at the RCO desk to the Utilities screen

Fill in blender & shutdown boron addition placards at console blender station. Data for each IC may be found in the ECC & Shutdown Guidelines Book in the simulator I/F.

Event 1 – CV-3-2011 FAIL OPEN

Initiated immediately after shift turnover.

CV-3-2011, low pressure heater bypass valve fails open causing reactor power to exceed 100%. Turbine load is reduced to maintain reactor power <100%

Trigger lesson step **Event 1 – CV-3-2011 FAIL OPEN** (actuates TFFVV01O=T)

Respond as Turbine Operator when called to investigate the failure of CV-3-2011. Report back no obvious cause for the failure.

Respond as WCC or Operations Manager when call to report failure of CV-3-2011. Acknowledge report as given.

Event 2 – PT-3-446 FAIL OPEN

PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

Trigger lesson step **Event 2 – PT-3- 446 FAIL OPEN** (actuates TVS1MABD=-1)

Respond as WCC / I&C supervisor or Operations Manager when call to report failure of PT-3-446. Acknowledge report as given.

If lead evaluator desires, call control room as I&C and request to postpone tripping bistables until they arrive.

If directs as FS to bypass PT-3-446 on AMSAC panel then after 2 minutes, trigger lesson step **EVENT 2 – 446 BYPASSED**

Event 3 – 30 GPM PZR SURGE LINE LEAK

A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

3-ONOP-041.3 Excessive Reactor Coolant System Leakage

Step 13 – Respond as SM, acknowledge direction to refer to EPIP-20101

Step 14 – Respond as Health Physics, acknowledge direction to conduct local radiation surveys and post radiation areas as required.

If called respond as AOM, acknowledge unit 3 shutdown per 3-ONOP-100 in progress.

3-ONOP-100 Fast Load Reduction

Step 3 - Respond as system dispatcher; acknowledge TP unit 3 coming off line due to RCS leakage.

Step 7 – If call, respond as SM and acknowledge request to refer to 0-EPIP-20101 and 0-ADM-115

If called respond as NSO, acknowledge direction to align aux steam using attachment 1 of 3-ONOP-100. No action required.

Event 4 – PC-3-444J FAIL HIGH

PC-3-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig.*manual operation. The RCS leak increases requiring safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.*

When directed - Trigger lesson step **EVENT 4 – PC-3-444J FAIL HIGH** (actuates TFH244AH=T)

Respond as I&C when notified of PC-3-444J failure.

Event 5 – 300 GPM PZR SURGE LINE SBLOCA

The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

When directed - Trigger lesson step **EVENT 5 – 300 GPM PZR SURGE LINE SBLOCA** (actuates TVHPBOTL=0.006)

The Crew responds per 3-EOP-E-0

3-EOP-E-0

Step 14.a - Respond as Health Physics; acknowledge previous direction to take radiation readings on main steamlines. After 10 minutes from last request, report radiation readings at background.

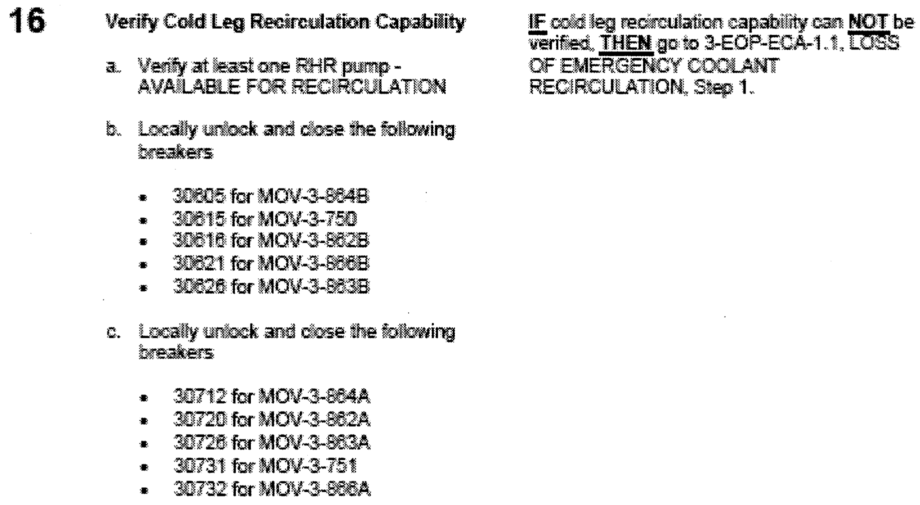
3-EOP-E-1

Step 4 - Respond as Nuclear chemistry to check DAM1 and take periodic activity samples of all S/G.

Step 4 – Respond as Health Physics to take radiation readings on main steam lines

Step 15.b – Acknowledge request as SNPO to establish communication to secure 3A and 3B EDGs. No action required

Step 16 – Acknowledge request to unlock and close the following breakers:



16 **Verify Cold Leg Recirculation Capability**

a. Verify at least one RHR pump - AVAILABLE FOR RECIRCULATION

b. Locally unlock and close the following breakers

- 30605 for MOV-3-864B
- 30615 for MOV-3-750
- 30616 for MOV-3-862B
- 30621 for MOV-3-866B
- 30626 for MOV-3-863B

c. Locally unlock and close the following breakers

- 30712 for MOV-3-864A
- 30720 for MOV-3-862A
- 30728 for MOV-3-863A
- 30731 for MOV-3-751
- 30732 for MOV-3-866A

IF cold leg recirculation capability can **NOT** be verified, **THEN** go to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

If desired **Trigge**r lesson step **EVENT 5 – CLOSE BREAKERS**

Step – 17 Acknowledge request to close radiation shield doors for containment spray pump and charging pump rooms

3-EOP-E-0 Attachment 3

Step 17 – Respond as NSO, Acknowledge direction to place Hydrogen monitors in service on unit 3 using 3-OP-094, containment post accident monitoring system. **Trigger** lesson step – **EVENT 5– ALIGN PAHM FOR SERVICE**

1. After 5 minutes report Section 7.1.2 steps 1-3 are complete, request operator perform step 4
2. Acknowledge completion of step 4 and to continue
3. After 2 minutes report section 7.1.2 complete, PAHM in service

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 1 Page 1 of 2

Event Description: CV-3-2011, low pressure heater bypass valve fails open causing reactor power to exceed 100%. Turbine load is reduced to maintain reactor power <100%

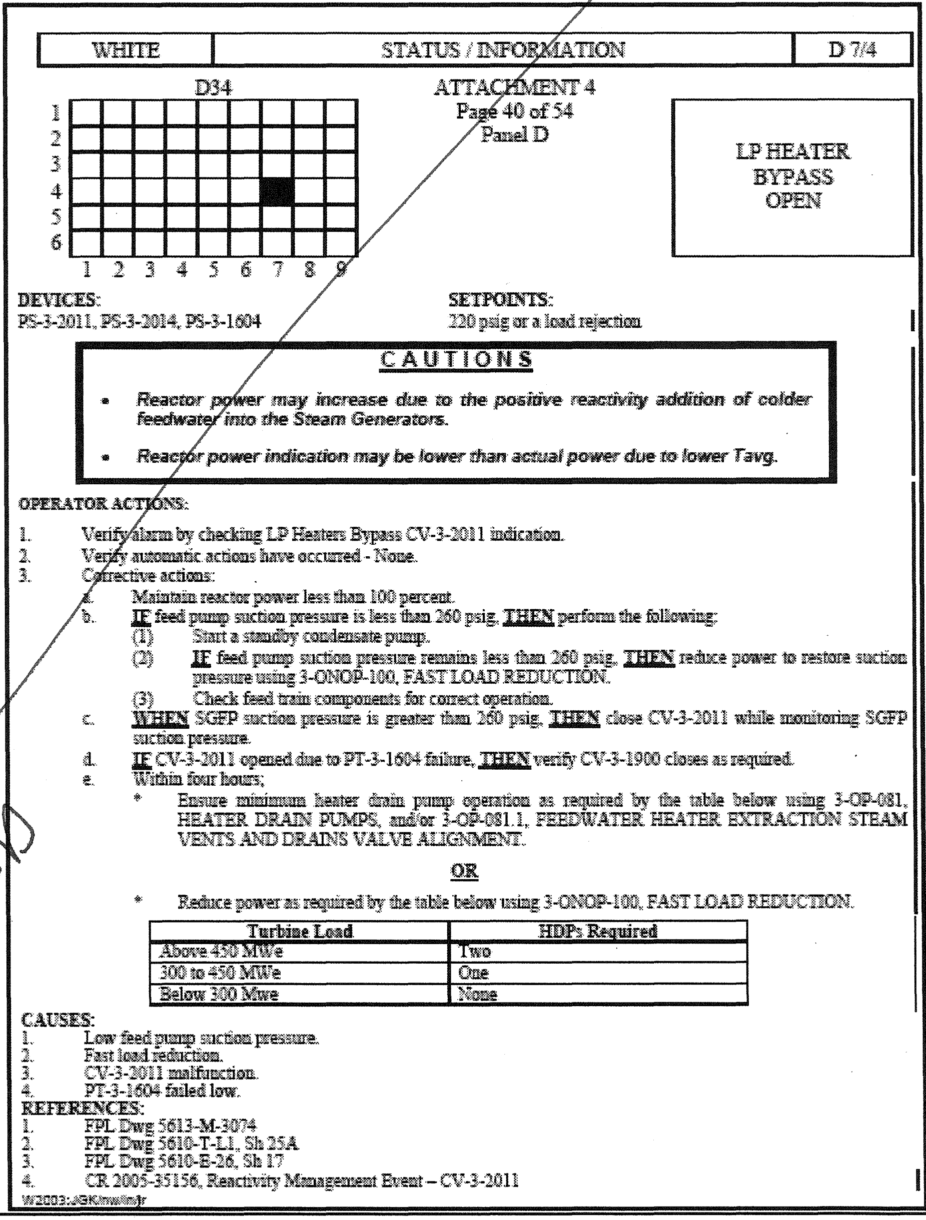
Time	Position	Applicant's Actions or Behavior
		Trigger, EVENT 1 – CV-23-2011 FAIL OPEN
	BOP	Recognizes / Reports CV-3-2011 failed open as indicated by: • Alarm D 7/4 – LP heater bypass open • Increase in reactor power >100% • Increase in MWe • CV-3-2011 position indication on console
	RO / BOP	Refers to ARP D 7/4 *(next page)*
	BOP	Verifies alarm by checking CV-3-2011 position
	BOP	Maintains reactor power less than 100% by adjusting turbine load limiter in the lower direction
	BOP	Checks feed pump suction press <260 psig *Evaluator Note: pressure >260 psig*
	BOP	Attempts to manually close CV-3-2011 from the console
		Evaluator Note: valve will remain open for the remainder of scenario. ADM-241 provides guidance to reduce turbine load to reduce reactor power if transient causing event is on the secondary plant.
	BOP	Checks for failure of PT-3-1604
	BOP	Verifies two heater drain pumps running
	US	Directs Turbine Operator to investigate the failure of CV-3-2011
	US	Notifies the WCC and Operations Manager of failure.

NOT USED

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 1 Page 2 of 2

Event Description: CV-3-2011, low pressure heater bypass valve fails open causing reactor power to exceed 100%. Turbine load is reduced to maintain reactor power <100%

Time	Position	Applicant's Actions or Behavior
	RO / BOP	



WHITE	STATUS / INFORMATION	D 7/4

D34

ATTACHMENT 4
Page 40 of 54
Panel D

LP HEATER
BYPASS
OPEN

DEVICES:
PS-3-2011, PS-3-2014, PS-3-1604

SETPOINTS:
220 psig or a load rejection

CAUTIONS

- *Reactor power may increase due to the positive reactivity addition of colder feedwater into the Steam Generators.*
- *Reactor power indication may be lower than actual power due to lower Tavg.*

OPERATOR ACTIONS:

1. Verify alarm by checking LP Heaters Bypass CV-3-2011 indication.
2. Verify automatic actions have occurred - None.
3. Corrective actions:
   a. Maintain reactor power less than 100 percent.
   b. **IF** feed pump suction pressure is less than 260 psig, **THEN** perform the following:
      (1) Start a standby condensate pump.
      (2) **IF** feed pump suction pressure remains less than 260 psig, **THEN** reduce power to restore suction pressure using 3-ONOP-100, FAST LOAD REDUCTION.
      (3) Check feed train components for correct operation.
   c. **WHEN** SGFP suction pressure is greater than 260 psig, **THEN** close CV-3-2011 while monitoring SGFP suction pressure.
   d. **IF** CV-3-2011 opened due to PT-3-1604 failure, **THEN** verify CV-3-1900 closes as required.
   e. Within four hours;
      * Ensure minimum heater drain pump operation as required by the table below using 3-OP-081, HEATER DRAIN PUMPS, and/or 3-OP-081.1, FEEDWATER HEATER EXTRACTION STEAM VENTS AND DRAINS VALVE ALIGNMENT.

OR

      * Reduce power as required by the table below using 3-ONOP-100, FAST LOAD REDUCTION.

Turbine Load	HDPs Required
Above 450 MWe	Two
300 to 450 MWe	One
Below 300 Mwe	None

CAUSES:
1. Low feed pump suction pressure.
2. Fast load reduction.
3. CV-3-2011 malfunction.
4. PT-3-1604 failed low.

REFERENCES:
1. FPL Dwg 5613-M-3074
2. FPL Dwg 5610-T-L1, Sh 25A
3. FPL Dwg 5610-E-26, Sh 17
4. CR 2005-35156, Reactivity Management Event – CV-3-2011

W2003:JGK/mw/ln/jr

NOT USED

		Evaluator note: Following plant stabilization and notifications, continue to event 2 - 30 GPM PZR SURGE LINE LEAK

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 1 of 6

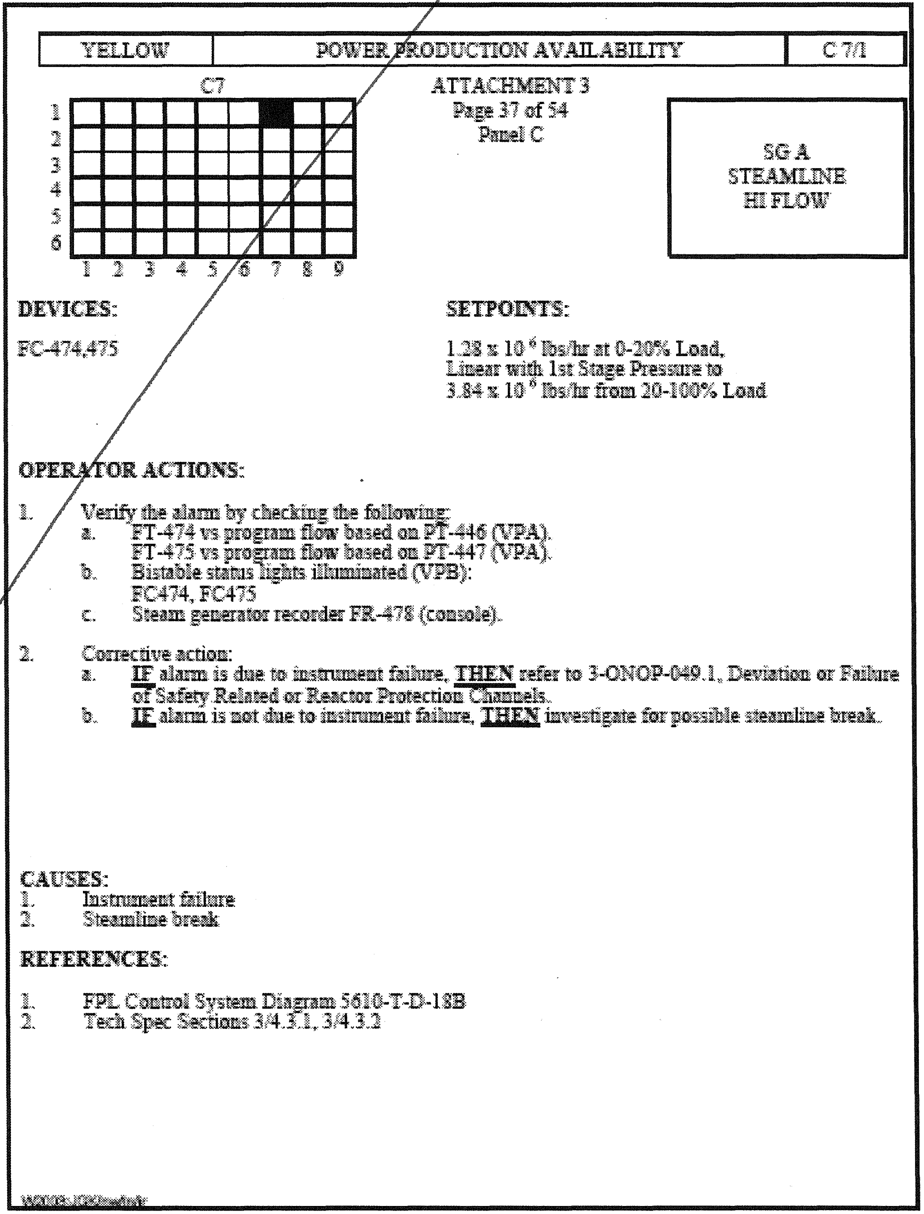
Event Description: PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

Time	Position	Applicant's Actions or Behavior
	RO	Identifies / Reports the failure of FT-3-446 as identified by: • Alarms D 7/6, C 7/1, 7/2, 7/3, and C 8/3 • B/S status lights 474, 484, 494, and 446A2 • PI-3-446 indication on VPA
	BOP	References ARPs and is directed to 3-ONOP-049.1 to remove channel from service.
		Evaluator Note: ARP C 7/1 included for reference next page

NOT USED

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 2 of 6

Event Description: PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>BOP</td><td>
YELLOW POWER PRODUCTION AVAILABILITY C 7/1
ATTACHMENT 3
Page 37 of 54
Panel C
SG A
STEAMLINE
HI FLOW
DEVICES:
FC-474,475
SETPOINTS:
1.28 x 10 ^{6} lbs/hr at 0-20% Load,
Linear with 1st Stage Pressure to
3.84 x 10 ^{6} lbs/hr from 20-100% Load
OPERATOR ACTIONS:
1. Verify the alarm by checking the following:
a. FT-474 vs program flow based on PT-446 (VPA).
FT-475 vs program flow based on PT-447 (VPA).
b. Bistable status lights illuminated (VPB):
FC474, FC475
c. Steam generator recorder FR-478 (console).
2. Corrective action:
a. IF alarm is due to instrument failure, THEN refer to 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.
b. IF alarm is not due to instrument failure, THEN investigate for possible steamline break.
CAUSES:
1. Instrument failure
2. Steamline break
REFERENCES:
1. FPL Control System Diagram 5610-T-D-18B
2. Tech Spec Sections 3/4.3.1, 3/4.3.2</td></tr>
<tr><td></td><td>US</td><td>Directs response per 3-ONOP-049.1</td></tr>
</table>

	RO	5.1 Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 3 of 6

Event Description: PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

Time	Position	Applicant's Actions or Behavior
	RO	5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.
	RO	5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
		Evaluator Note: PT-3-447 already selected as controlling channel
	US	5.5 Refer to Technical Specifications 3/4.3, Instrumentation, **AND** verify the minimum channels operable.
	→	

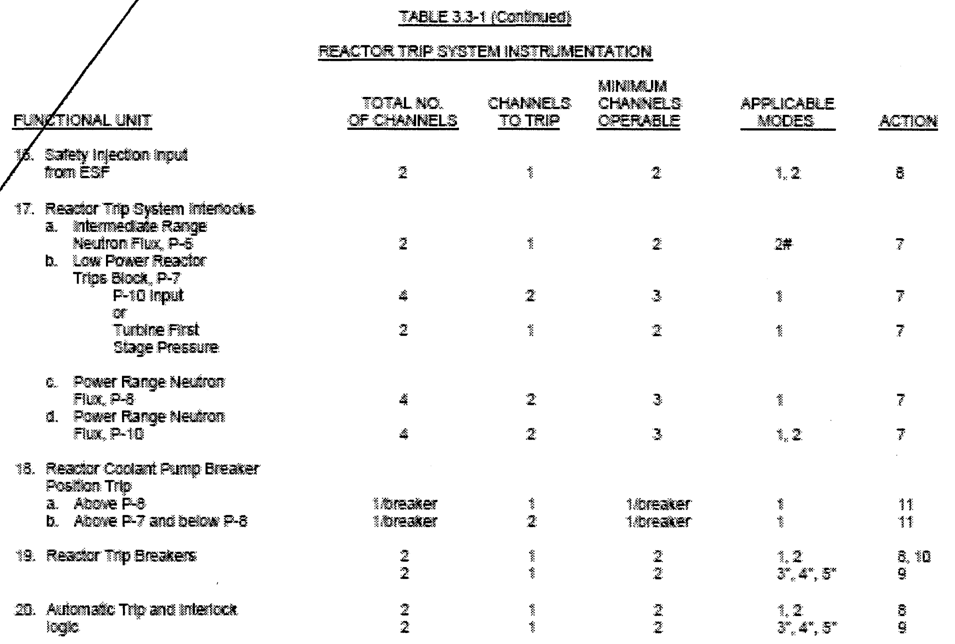


TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
16. Safety Injection Input from ESF	2	1	2	1, 2	8
17. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2	1	2	2#	7
b. Low Power Reactor Trips Block, P-7					
P-10 Input	4	2	3	1	7
or					
Turbine First Stage Pressure	2	1	2	1	7
c. Power Range Neutron Flux, P-8	4	2	3	1	7
d. Power Range Neutron Flux, P-10	4	2	3	1, 2	7
18. Reactor Coolant Pump Breaker Position Trip					
a. Above P-8	1/breaker	1	1/breaker	1	11
b. Above P-7 and below P-8	1/breaker	2	1/breaker	1	11
19. Reactor Trip Breakers	2 2	1 1	2 2	1, 2 3*, 4*, 5*	8, 10 9
20. Automatic Trip and Interlock logic	2 2	1 1	2 2	1, 2 3*, 4*, 5*	8 9

ACTION 7 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 4 of 6

Event Description: PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

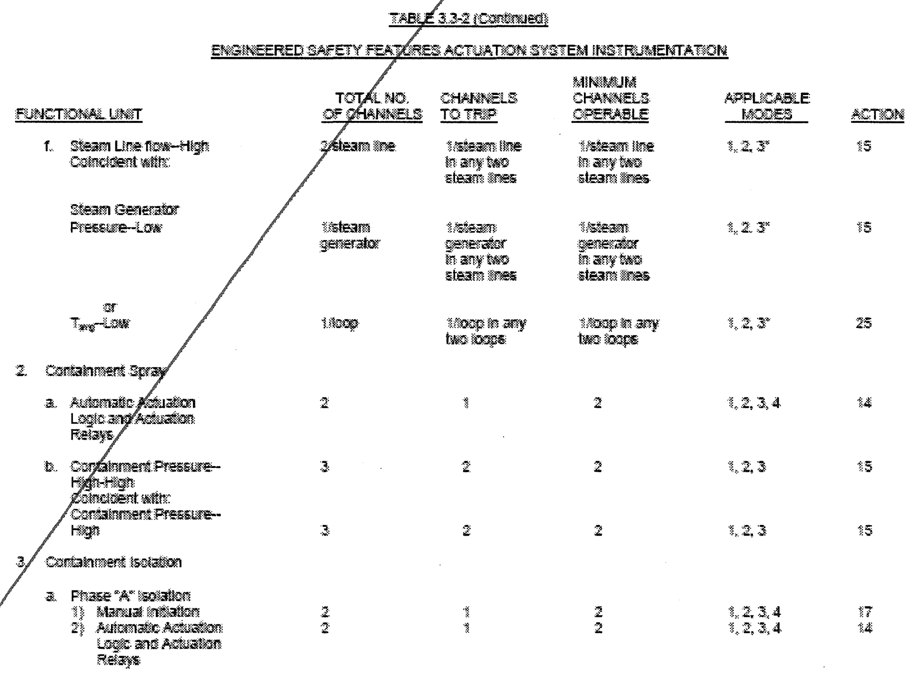
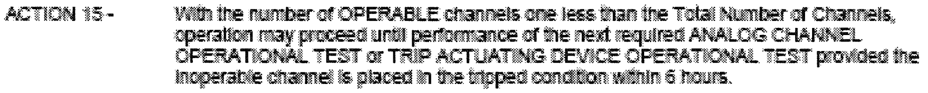
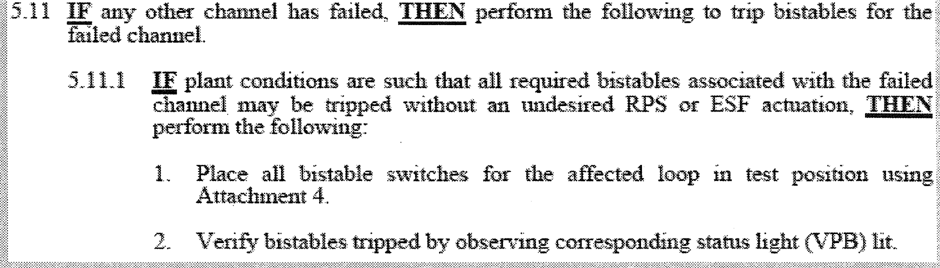
<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>→</td><td>


TABLE 3.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

<table>
<tr><th>FUNCTIONAL UNIT</th><th>TOTAL NO. OF CHANNELS</th><th>CHANNELS TO TRIP</th><th>MINIMUM CHANNELS OPERABLE</th><th>APPLICABLE MODES</th><th>ACTION</th></tr>
<tr><td>f. Steam Line flow--High Coincident with:</td><td>2/steam line</td><td>1/steam line in any two steam lines</td><td>1/steam line in any two steam lines</td><td>1, 2, 3*</td><td>15</td></tr>
<tr><td>Steam Generator Pressure--Low</td><td>1/steam generator</td><td>1/steam generator in any two steam lines</td><td>1/steam generator in any two steam lines</td><td>1, 2. 3*</td><td>15</td></tr>
<tr><td>or
T_{avg}--Low</td><td>1/loop</td><td>1/loop in any two loops</td><td>1/loop in any two loops</td><td>1, 2, 3*</td><td>25</td></tr>
<tr><td>2. Containment Spray</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. Automatic Actuation Logic and Actuation Relays</td><td>2</td><td>1</td><td>2</td><td>1, 2, 3, 4</td><td>14</td></tr>
<tr><td>b. Containment Pressure--High-High Coincident with:</td><td>3</td><td>2</td><td>2</td><td>1, 2, 3</td><td>15</td></tr>
<tr><td>Containment Pressure--High</td><td>3</td><td>2</td><td>2</td><td>1, 2, 3</td><td>15</td></tr>
<tr><td>3. Containment Isolation</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. Phase "A" Isolation</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1) Manual Initiation</td><td>2</td><td>1</td><td>2</td><td>1, 2, 3, 4</td><td>17</td></tr>
<tr><td>2) Automatic Actuation Logic and Actuation Relays</td><td>2</td><td>1</td><td>2</td><td>1, 2, 3, 4</td><td>14</td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td>


ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST or TRIP ACTUATING DEVICE OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.
</td></tr>
<tr><td></td><td>BOP</td><td>


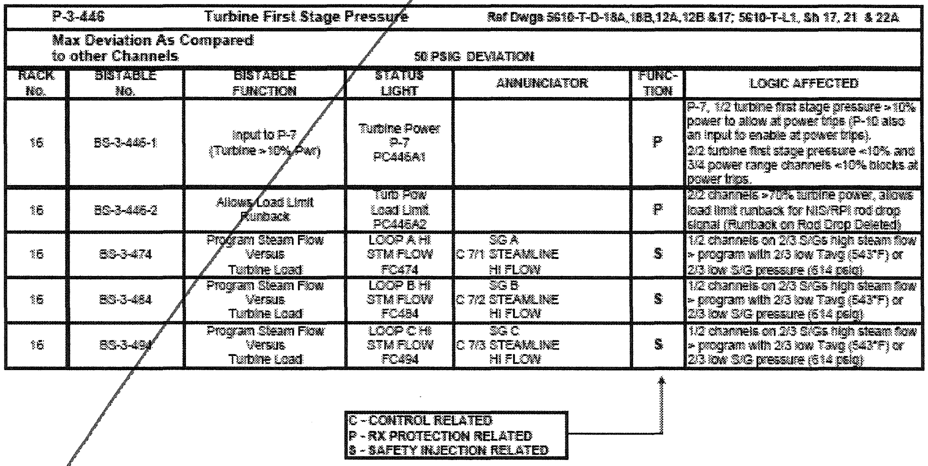
5.11 <u>**IF**</u> any other channel has failed, <u>**THEN**</u> perform the following to trip bistables for the failed channel.

5.11.1 <u>**IF**</u> plant conditions are such that all required bistables associated with the failed channel may be tripped without an undesired RPS or ESF actuation, <u>**THEN**</u> perform the following:

1. Place all bistable switches for the affected loop in test position using Attachment 4.
2. Verify bistables tripped by observing corresponding status light (VPB) lit.
</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 5 of 6

Event Description: PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

Time	Position	Applicant's Actions or Behavior
		

P-3-446		Turbine First Stage Pressure		Ref Dwgs 5610-T-D-18A,18B,12A,12B &17; 5610-T-L1, Sh 17, 21 & 22A		
Max Deviation As Compared to other Channels				50 PSIG DEVIATION		
RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNC-TION	LOGIC AFFECTED
16	BS-3-446-1	Input to P-7 (Turbine > 10% Pwr)	Turbine Power P-7 PC446A1		P	P-7, 1/2 turbine first stage pressure > 10% power to allow at power trips (P-10 also an input to enable at power trips). 2/2 turbine first stage pressure < 10% and 3/4 power range channels < 10% blocks at power trips.
16	BS-3-446-2	Allows Load Limit Runback	Turb Pow Load Limit PC446A2		P	2/2 channels > 70% turbine power, allows load limit runback for NIS/RPI rod drop signal (Runback on Rod Drop Deleted)
16	BS-3-474	Program Steam Flow Versus Turbine Load	LOOP A HI STM FLOW FC474	C 7/1 SG A STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)
16	BS-3-484	Program Steam Flow Versus Turbine Load	LOOP B HI STM FLOW FC484	C 7/2 SG B STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)
16	BS-3-494	Program Steam Flow Versus Turbine Load	LOOP C HI STM FLOW FC494	C 7/3 SG C STEAMLINE HI FLOW	S	1/2 channels on 2/3 S/Gs high steam flow > program with 2/3 low Tavg (543°F) or 2/3 low S/G pressure (614 psig)

C - CONTROL RELATED
P - RX PROTECTION RELATED
S - SAFETY INJECTION RELATED

Time	Position	Applicant's Actions or Behavior
		Evaluator Note: If desired to trip bistables allow crew to continue, otherwise inform crew I&C requests to postpone tripping bistables until they come up.
	US	Conducts brief and trips bistables identified above in rack 16.
	US →	5.12 **IF** any of the following channels are failed, **THEN** place the Bypass Switch(es) for the failed channel to Bypass position at the AMSAC panel using Attachment 5: 5.12.1 Any Steam Generator Level Channel I (LI-3-474, LI-3-484, or LI-3-494) **OR** 5.12.2 Any Steam Generator Level Channel II (LI-3-475, LI-3-485, or LI-3-495) **OR** 5.12.3 PT-3-446 **OR** 5.12.4 PT-3-447
	BOP	FS called to bypass PT-3-446 on AMSAC panel

		NOTE *The following step is to allow automatic operation of the Steam Dump to Condenser System in the Steam Pressure Mode following a failure of PT-3-446, First Stage Pressure Channel. It will also preclude tripping open all four valves on a minor load rejection resulting in an undesirable plant transient.*

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 6 of 6

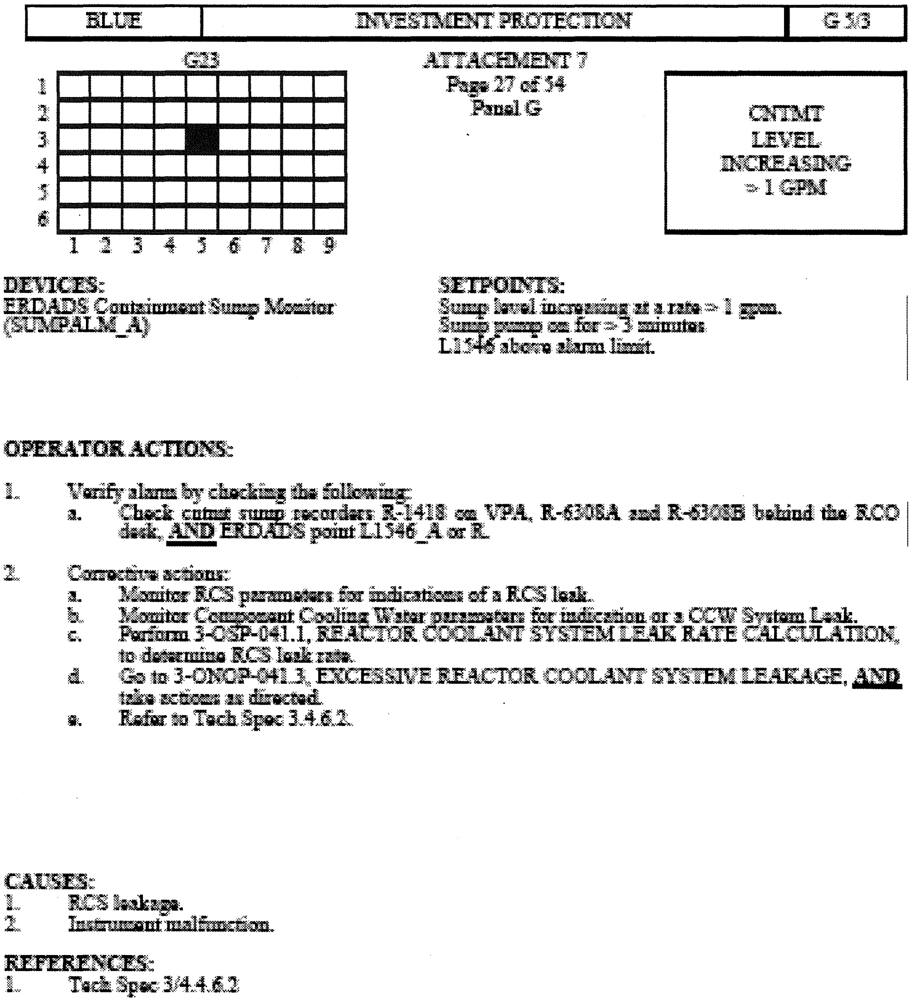
Event Description: PT-3-446 fails low. The channel is removed from service per 3-ONOP-049.1.

Time	Position	Applicant's Actions or Behavior
	BOP →	**ATTACHMENT 5** (Page 1 of 1) **AMSAC CONTROL PANEL** 1. Place the Normal/Bypass switch(es) to BYPASS for the applicable failed channel(s) at the local AMSAC Control Panel. a. Processor A (1) Level 1 (**A** S/G Level, Channel 474) (2) Level 2 (**B** S/G Level, Channel 484) (3) Level 3 (**C** S/G Level, Channel 494) (4) Power 1 (First Stage Turbine Pressure, Channel 446) (5) Power 2 (First Stage Turbine Pressure, Channel 447) b. Processor B (1) Level 1 (**A** S/G Level, Channel 475) (2) Level 2 (**B** S/G Level, Channel 485) (3) Level 3 (**C** S/G Level, Channel 495) (4) Power 1 (First Stage Turbine Pressure, Channel 446) (5) Power 2 (First Stage Turbine Pressure, Channel 447) 2. At the AMSAC Panel, depress and release the SYSTEM RESET pushbutton.
	BOP	5.14 **IF** First Stage Pressure Channel, PT-3-446, has failed, **THEN** place the Steam Dump to Condenser Mode Selector Switch to MANUAL.
	BOP	5.16 Initiate a Plant Work Order **AND** notify the I&C Supervisor.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 1 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

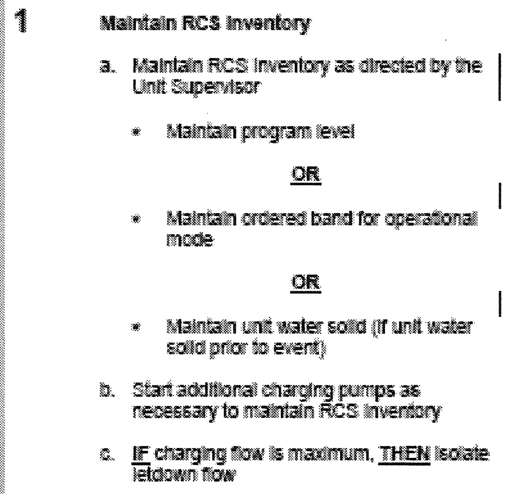
Time	Position	Applicant's Actions or Behavior
Trigger, EVENT 2 – 30 GPM PZR SURGE LINE LEAK		
		Evaluator Note: G 5/3 CV sump alarm will alert the crew to a possible RCS leak
	RO	Reports alarm G 5/3, containment level increase > 1 gpm.

	BOP	 BLUE | INVESTMENT PROTECTION | G 5/3 G23 ATTACHMENT 7 Page 27 of 54 Panel G CNTMT LEVEL INCREASING > 1 GPM **DEVICES:** ERDADS Containment Sump Monitor (SUMPALM_A) **SETPOINTS:** Sump level increasing at a rate > 1 gpm. Sump pump on for > 3 minutes L1546 above alarm limit. **OPERATOR ACTIONS:** 1. Verify alarm by checking the following: a. Check cntmt sump recorders R-1418 on VPA, R-6308A and R-6308B behind the RCO desk, AND ERDADS point L1546_A or R. 2. Corrective actions: a. Monitor RCS parameters for indications of a RCS leak. b. Monitor Component Cooling Water parameters for indication or a CCW System Leak. c. Perform 3-OSP-041.1, REACTOR COOLANT SYSTEM LEAK RATE CALCULATION, to determine RCS leak rate. d. Go to 3-ONOP-041.3, EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE, AND take actions as directed. e. Refer to Tech Spec 3.4.6.2. **CAUSES:** 1. RCS leakage. 2. Instrument malfunction. **REFERENCES:** 1. Tech Spec 3/4.4.6.2
	US	Directs response per 3-ONOP-041.3 RCS system leakage

Op-Test No.: 2009-301	Scenario No.: 5	Event No.: 2 Page 2 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

Time	Position	Applicant's Actions or Behavior

	RO	**1** **Maintain RCS Inventory** a. Maintain RCS Inventory as directed by the Unit Supervisor • Maintain program level **OR** • Maintain ordered band for operational mode **OR** • Maintain unit water solid (If unit water solid prior to event) b. Start additional charging pumps as necessary to maintain RCS Inventory c. IF charging flow is maximum, THEN isolate letdown flow
		Evaluator Note: A charging pump will be started for inventory
	RO	**2** **Check RCS Inventory Decreasing** Go to Step 10.
		Evaluator Note: Inventory currently being maintained
	RO	**10** **Monitor RCS Leakage** a. Perform The Following 1) Determine RCS leak rate using the appropriate leak rate procedure • 3-OSP-041.1, REACTOR COOLANT SYSTEM LEAKRATE CALCULATION **OR** • 3-OSP-041.2, REACTOR COOLANT SYSTEM VISUAL LEAK INSPECTION AND LEAK EVALUATION 2) Attempt to identify the source of the leak 3) Check if the leak is isolable — 3) Go to Step 11. 4) Isolate the leak as follows • IF leakage is from the RHR System, THEN perform ATTACHMENT 1 **OR** • Plant Clearance

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 3 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

<table>
<tr><th>Time</th><th>Position</th><th colspan="2">Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>BOP</td><td colspan="2">

11 **Check For Additional Indications Of RCS Leakage**

<table>
<tr><td>a. Verify R-11 - STABLE <u>OR</u> DECREASING</td><td>a. Perform the following:
1) Close Containment Instrument Air Bleed Valves, CV-3-2819 And CV-3-2826.
2) Close Containment Sump Pump Discharge Valves, CV-3-2821 And CV-3-2822.
3) Perform 3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE, while continuing with this procedure.</td></tr>
<tr><td>b. Verify R-12 - STABLE <u>OR</u> DECREASING</td><td>b. Perform the following:
1) Close Containment Instrument Air Bleed Valves, CV-3-2819 and CV-3-2826.
2) Close Containment Sump Pump Discharge Valves, CV-3-2821 and CV-3-2822.
3) Perform 3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE, while continuing with this procedure.</td></tr>
<tr><td>c. Verify R-14 - STABLE <u>OR</u> DECREASING</td><td>c. Perform 3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE, while continuing with this procedure.</td></tr>
<tr><td>d. Verify SG tubes - INTACT
• R-15 - STABLE <u>OR</u> DECREASING
• R-19 - STABLE <u>OR</u> DECREASING
• SECONDARY SAMPLE RESULTS</td><td>d. Perform 3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE, while continuing with this procedure.</td></tr>
<tr><td>e. Verify RCS to Component Cooling Water boundary - INTACT
• R-17A STABLE <u>OR</u> DECREASING
• R-17B STABLE <u>OR</u> DECREASING</td><td>e. Perform 3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE, while continuing with this procedure.</td></tr>
</table>

</td></tr>
<tr><td></td><td></td><td colspan="2"></td></tr>
</table>

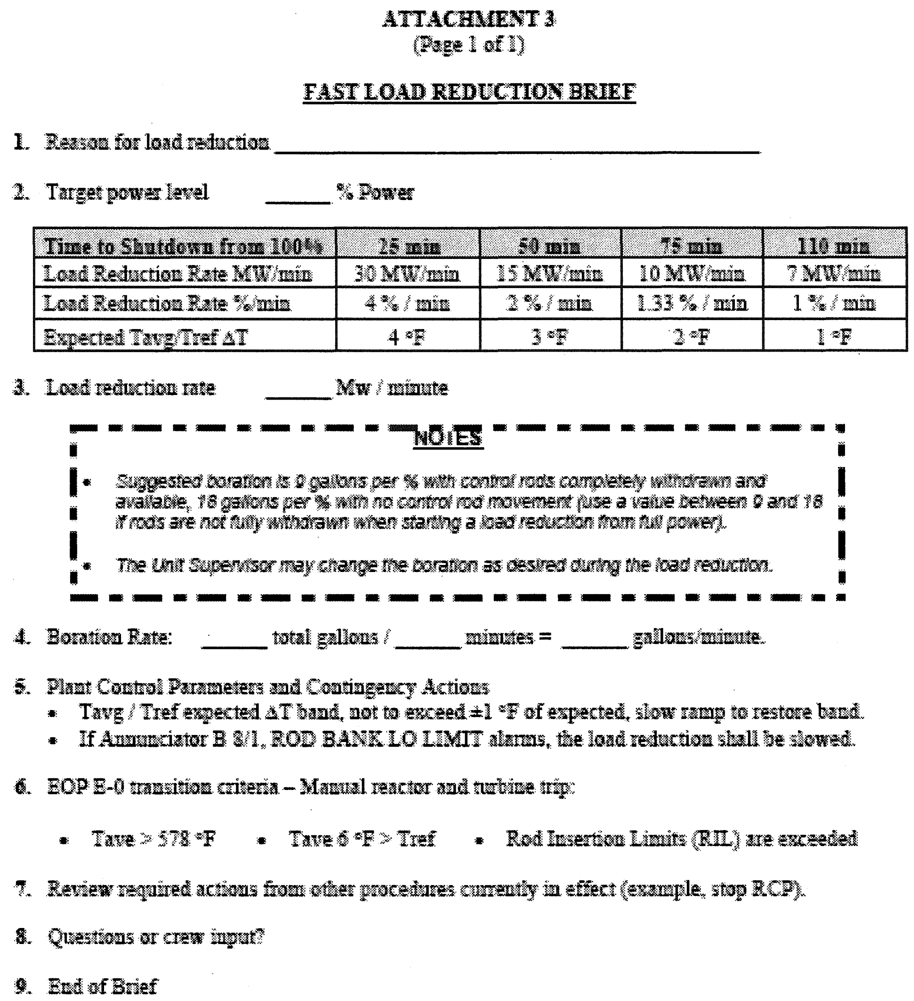
Op-Test No.: <u>2009-301</u> Scenario No.: <u>5</u> Event No.: <u>2</u> Page <u>4</u> of <u>9</u>

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

Time	Position	Applicant's Actions or Behavior
	US	**12** **Determine If RCS Leakage Within Limits Of Technical Specifications** a. Check Technical Specifications b. Verify RCS leakage - LESS THAN LIMIT b. Perform the following: 1) Perform actions required by Technical Specifications. 2) <u>IF</u> unit shutdown is required, <u>THEN</u> perform 3-GOP-103, POWER OPERATION TO HOT STANDBY, or 3-ONOP-100, FAST LOAD REDUCTION, while continuing with this procedure. 3) <u>WHEN</u> the unit is in MODE 3, <u>THEN</u> initiate cooldown to cold shutdown using 3-GOP-305, Hot Standby To Cold Shutdown.
		Evaluator Note: determines leakage greater than 1 gpm, action b.
	US	3.4.6.2 Reactor Coolant System operational leakage shall be limited to: a. No PRESSURE BOUNDARY LEAKAGE, b. 1 GPM UNIDENTIFIED LEAKAGE, c. 150 gallons per day primary-to-secondary leakage through any one steam generator (SG), d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and e. Leakage as specified in Table 3.4-1 up to a maximum of 5 GPM at a Reactor Coolant System pressure of 2235 ± 20 psig from any Reactor Coolant System Pressure Isolation Valve specified in Table 3.4-1.* <u>APPLICABILITY</u>: MODES 1, 2, 3 and 4. <u>ACTION</u>: a. With any PRESSURE BOUNDARY LEAKAGE, or with primary-to-secondary leakage not within limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours. b. With any Reactor Coolant System operational leakage greater than any one of the above limits, excluding primary-to-secondary leakage, PRESSURE BOUNDARY LEAKAGE, and leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. c. With any Reactor Coolant System Pressure Isolation Valve leakage greater than allowed by 3.4.6.2.e above operation may continue provided: 1. Within 4 hours verify that at least two valves in each high pressure line having a non-functional valve are in, and remain in that mode corresponding to the isolated condition, i.e., manual valves shall be locked in the closed position; motor operated valves shall be placed in the closed position and power supplies deenergized. Follow applicable ACTION statement for the affected system, and

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 5 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>US</td><td>1 Brief Control Room Personnel Using Attachment 3</td></tr>
<tr><td></td><td>US</td><td>


ATTACHMENT 3
(Page 1 of 1)

<u>FAST LOAD REDUCTION BRIEF</u>

1. Reason for load reduction ______________________________
2. Target power level _____ % Power

<table>
<tr><th>Time to Shutdown from 100%</th><th>25 min</th><th>50 min</th><th>75 min</th><th>110 min</th></tr>
<tr><td>Load Reduction Rate MW/min</td><td>30 MW/min</td><td>15 MW/min</td><td>10 MW/min</td><td>7 MW/min</td></tr>
<tr><td>Load Reduction Rate %/min</td><td>4 % / min</td><td>2 % / min</td><td>1.33 % / min</td><td>1 % / min</td></tr>
<tr><td>Expected Tavg/Tref ΔT</td><td>4 °F</td><td>3 °F</td><td>2 °F</td><td>1 °F</td></tr>
</table>
3. Load reduction rate _____ Mw / minute

<u>NOTES</u>
• <i>Suggested boration is 9 gallons per % with control rods completely withdrawn and available, 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).</i>
• <i>The Unit Supervisor may change the boration as desired during the load reduction.</i>

4. Boration Rate: _____ total gallons / _____ minutes = _____ gallons/minute.
5. Plant Control Parameters and Contingency Actions
• Tavg / Tref expected ΔT band, not to exceed ±1 °F of expected, slow ramp to restore band.
• If Annunciator B 8/1, ROD BANK LO LIMIT alarms, the load reduction shall be slowed.
6. EOP E-0 transition criteria – Manual reactor and turbine trip:
• Tave > 578 °F • Tave 6 °F > Tref • Rod Insertion Limits (RIL) are exceeded
7. Review required actions from other procedures currently in effect (example, stop RCP).
8. Questions or crew input?
9. End of Brief
</td></tr>
<tr><td></td><td></td><td><i>Evaluator Note: 900 gal BA required, rate picked will determine flow rate. Foldout page next if covered.</i></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 6 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

Time	Position	Applicant's Actions or Behavior
	US	**FOLDOUT PAGE** 1. **3-EOP-E-0 Transition Criteria** **IF** any of the following limits are reached, **THEN** trip the Reactor and Turbine **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION: a. RCS Tavg - GREATER THAN 578 °F b. RCS Tavg - GREATER THAN Tref by 6 °F c. Rod Insertion Limits are exceeded as indicated by: • Rod Position Bank D Insertion Limit Recorder (VPA) • Stepcounters on console • Plant Curve Book Section 7, Figure 3 2. **Notify Chemistry Department** **WHEN** reactor power has changed by greater than or equal to 15 percent, **THEN** notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4. 3. **Restore Blender to AUTO** **WHEN** boration is complete, **THEN** restore the Blender to AUTO as follows. a. Place the Reactor Makeup Selector Switch to AUTO b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired c. Place the RCS Makeup Control Switch to START
	RO	**2** **Begin Boration** — **IF** boration is not required, **THEN** go to Step 3. a. Set the Boric Acid Totalizer to value determined using Attachment 3 b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0 c. Place the Reactor Makeup Selector Switch to BORATE d. Place the RCS Makeup Control Switch to START
	BOP	**3** **Notify The Following** • System Dispatcher • Plant personnel using the Page Boost

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 7 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

Time	Position	Applicant's Actions or Behavior
	BOP	**4** **Reduce Unit Load** a. Check for boration effects (reducing Tavg) a. IF boration is used, THEN wait for effects before starting load reduction. b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate c. Initiate and maintain load reduction rate to the target power level d. Monitor load reduction and auto rod control to ensure that the expected Tavg/Tref ΔT identified in Attachment 3 is maintained d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.
	RO	**5** **Monitor Annunciator B 8/1, ROD BANK LO LIMIT – RESET** Perform the following: a. Slow load reduction until alarm is reset. b. Re-evaluate boration amount and rate and make adjustments as necessary.
	US	**6** **Notify The Shift Manager To Refer To The Following Procedures** • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS
		NOTE *Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space.*
	RO	**7** **Check Plant Response** a. Check pressurizer level following program a. IF directed by the Unit Supervisor, THEN increase charging flow as follows: 1) Throttle open TCV-144, NRHX Temp Control Valve, bypass valve 3-834 to raise flow to approximately 600 gpm. 2) Start an additional charging pump. 3) Place an additional letdown orifice in service. b. Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3 b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 8 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

Time	Position	Applicant's Actions or Behavior
	RO	**8** **Energize Pressurizer Backup Heaters**
	BOP	**9** **Verify Turbine Load Less Than 570 MWE** Open the SGFP recirculation valves for the first feedwater pump to be stopped WHEN turbine load is less than 570 MWe, THEN open the SGFP recirculation valves for the first feedwater pump to be stopped.
		NOTE *Boration should be stopped above the target power level to prevent excessive boration*
	BOP	**10** **Monitor Turbine Load Within 10% Of Target Power Level** Stop the boration as follows: a. Place the Reactor Makeup Selector Switch to AUTO b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired c. Place the RCS Makeup Control Switch to START Go to Step 11.
	BOP	**11** **Check Target Load** **– LESS THAN 450 Mwe** IF Target Load is GREATER THAN 450 Mwe, THEN perform the following: a. Maintain reactor power at or below the target value using: • Boration/dilution • Control Rod adjustments • Turbine load adjustments b. Maintain Tavg within ± 1 °F of Tref. c. Maintain Pressurizer level on program. d. Maintain Pressurizer pressure on program. e. Maintain SG Levels on program. f. Refer to other ONOPs in effect. g. Go to procedure and step in effect.
	BOP	**12** **Check Station Service Loads Supplied From The Startup Transformer** WHEN directed by the Unit Supervisor, THEN transfer station service from the Auxiliary Transformers to the Startup Transformer using Attachment 2.
		Evaluator Note: Attachment 2 may be used to swap station loads. *Attachment 2 next.*

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 9 of 9

Event Description: A 30 gpm pressurizer surge line leak occurs after excess letdown is placed in service. 3-ONOP-041.3 is entered to address the leak. Leakage verified greater than tech. specs and 3-ONOP-100 is used to shutdown the unit.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	**ATTACHMENT 2** (Page 1 of 1) **TRANSFERRING FROM AUXILIARY TO STARTUP TRANSFORMER** **NOTE** *To close 4KV bus supply breakers;* • *the synchroscope must be on, at 12 o'clock +/- 20° and stationary.* • *incoming and running voltages must be within 10% (approximately 24KV).* 1. Close START-UP XFMR 3A 4KV BUS SUPPLY, 3AA05. 2. Place AUX XFMR 3A 4KV BUS SUPPLY, 3AA02, to TRIP. 3. Close START-UP XFMR 3B 4KV BUS SUPPLY, 3AB05. 4. Place AUX XFMR 3B 4KV BUS SUPPLY, 3AB02, to TRIP.
	BOP	**13** **Check Auxiliary Steam Supplied From Another Unit** WHEN directed by the Unit Supervisor, THEN align auxiliary steam supply from another unit using Attachment 1.
		Evaluator Note: Aux. steam supplied from unit 3 from turnover brief.
		Evaluator Note: When reactor power is less than 75% power trigger Event 4, PT-3-444J fails high.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 Page 1 of 7

Event Description: PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig..

Time	Position	Applicant's Actions or Behavior
Trigger lesson step, EVENT 4 – PC-3-444J FAIL HIGH		
	RO	Determines / Reports the failure of PC-3-444j as determined by: • Opening of PCV-3-455C, Pressurizer PORV • Alarm A 9/5, Pzr press controller hi output • BU Pressurizer heaters on • PCV-3- 455A open, Pressurizer spray valve • PCV-3- 455B open, Pressurizer spray valve
	US	Directs actions per 3-ONOP-41.5, RCS Pressure Malfunction
		NOTE *Foldout page is required to be monitored throughout this procedure.*
		CAUTION *The Master Controller should be operated carefully (Normal controller output for 2235 psig is 42.5 percent demand; 92 percent demand will open PCV-3-455C). If the following conditions are met, an excessive increase in controller output could cause Power Operated Relief Valve PCV-3-455C to open:* *1. PCV-3-455C hand switch in AUTO.* *2. Pressurizer pressure is greater than or equal to 2000 psig, or OMS switch in LO Press Ops.*

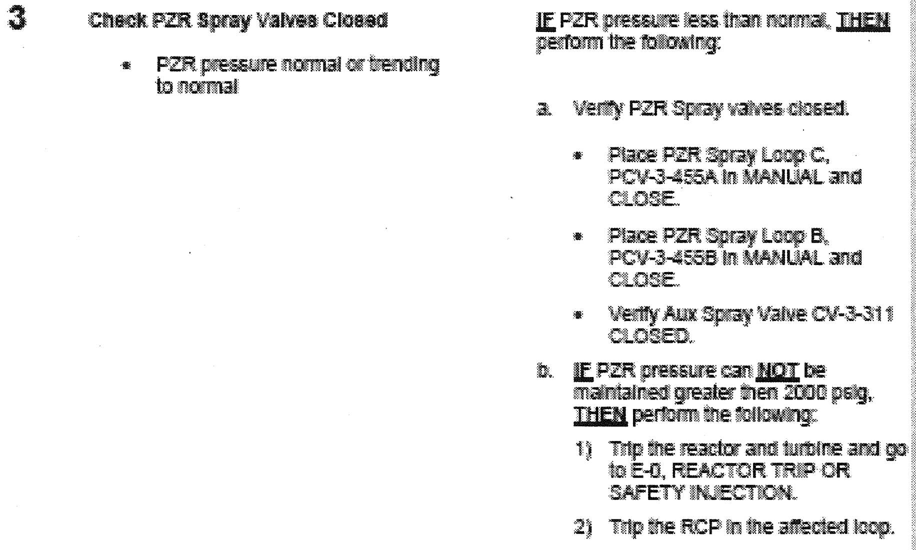
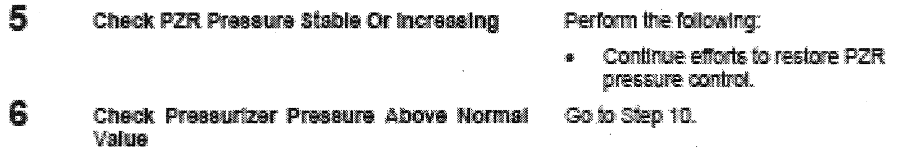
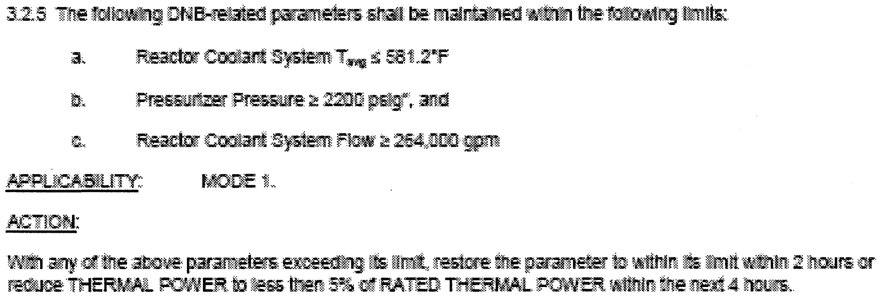
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 Page 2 of 7

Event Description: PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig..

Time	Position	Applicant's Actions or Behavior
		1 **Check PZR Pressure Control Instrument Loop Not Failed** a. Check PT-3-444 - NOT FAILED by comparison with adjacent pressure channels and known plant parameters a. Perform the following: 1) Verify PCV-3-455C OR MOV-3-536 CLOSED. 2) Take manual control of PC-3-444J, PZR PRESS CONTROL. 3) IF manual control of PC-3-444J is NOT effective, THEN perform the following: * Take manual control of PZR spray valves. * Take manual control of PZR heaters. b. Check PT-3-445 - NOT FAILED by comparison with adjacent pressure channels and known plant parameters b. Perform the following: 1) Verify PCV-3-456 OR MOV-3-535 CLOSED.
	RO	2 **Check PORVs Closed** • PCV-3-455C - CLOSED • PCV-3-456 - CLOSED Perform the following: • IF PZR pressure is less than 2335, THEN manually close PORVs. IF any PZR PORV can NOT be closed, THEN manually close its block valve.
		CAUTION *A fire in containment or the 3B 4KV Switchgear Room may cause spurious actuation of and give false valve position indication for Auxiliary Spray Valve, CV-3-311.*
		Evaluator Note: PORV 455C opens on failure.

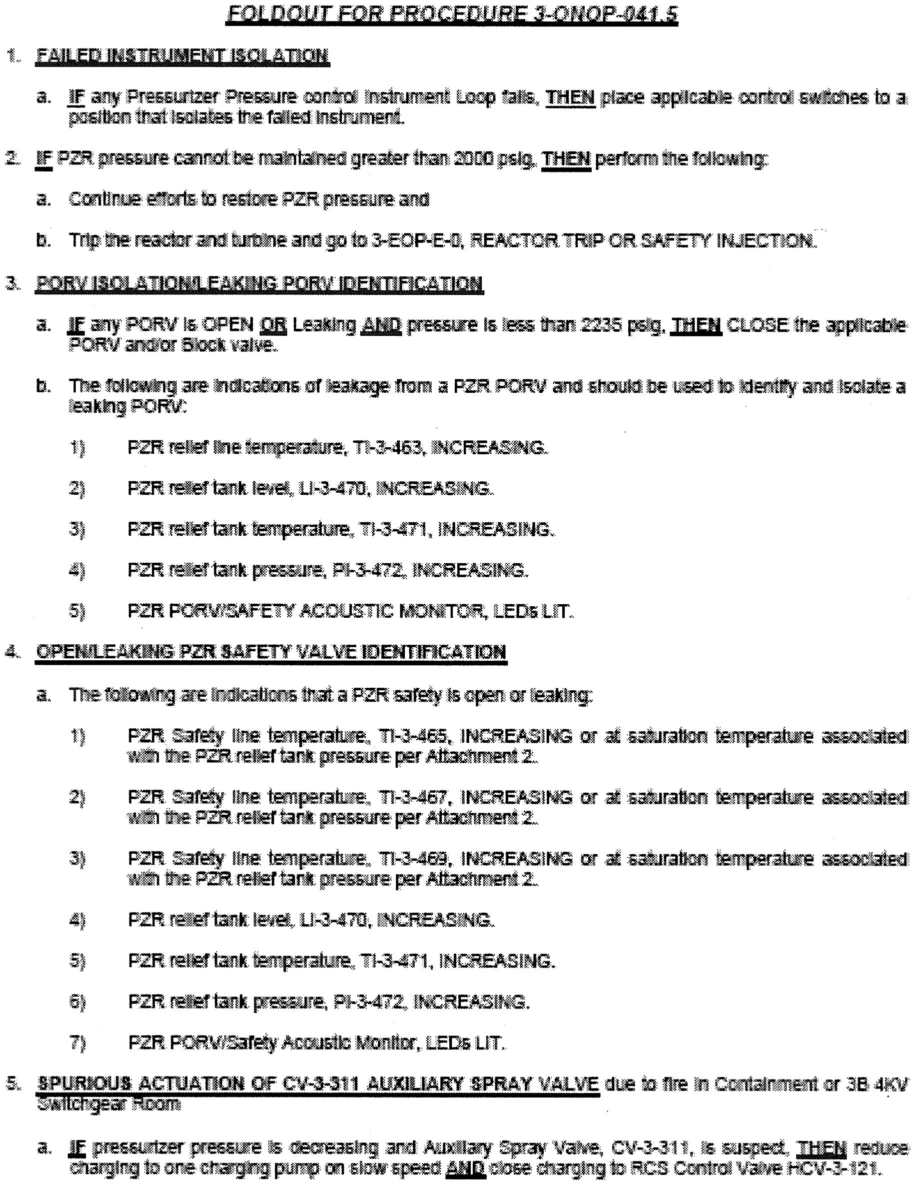
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 Page 3 of 7

Event Description: PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig..

Time	Position	Applicant's Actions or Behavior
	RO	**3 Check PZR Spray Valves Closed** • PZR pressure normal or trending to normal IF PZR pressure less than normal, THEN perform the following: a. Verify PZR Spray valves closed. • Place PZR Spray Loop C, PCV-3-455A in MANUAL and CLOSE. • Place PZR Spray Loop B, PCV-3-455B in MANUAL and CLOSE. • Verify Aux Spray Valve CV-3-311 CLOSED. b. IF PZR pressure can NOT be maintained greater then 2000 psig, THEN perform the following: 1) Trip the reactor and turbine and go to E-0, REACTOR TRIP OR SAFETY INJECTION. 2) Trip the RCP in the affected loop.
	RO	**5 Check PZR Pressure Stable Or Increasing** Perform the following: • Continue efforts to restore PZR pressure control. **6 Check Pressurizer Pressure Above Normal Value** Go to Step 10.
		Evaluator Note: DNB TS will be entered as RCS pressure drops below 2200 psig.
		3.2.5 The following DNB-related parameters shall be maintained within the following limits: a. Reactor Coolant System $T_{avg} \le 581.2$°F b. Pressurizer Pressure ≥ 2200 psig*, and c. Reactor Coolant System Flow ≥ 264,000 gpm APPLICABILITY: MODE 1. ACTION: With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less then 5% of RATED THERMAL POWER within the next 4 hours.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 Page 4 of 7

Event Description: PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig..

Time	Position	Applicant's Actions or Behavior
		 **FOLDOUT FOR PROCEDURE 3-ONOP-041.5** 1. **FAILED INSTRUMENT ISOLATION** a. **IF** any Pressurizer Pressure control Instrument Loop fails, **THEN** place applicable control switches to a position that isolates the failed instrument. 2. **IF** PZR pressure cannot be maintained greater than 2000 psig, **THEN** perform the following: a. Continue efforts to restore PZR pressure and b. Trip the reactor and turbine and go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION. 3. **PORV ISOLATION/LEAKING PORV IDENTIFICATION** a. **IF** any PORV is OPEN **OR** Leaking **AND** pressure is less than 2235 psig, **THEN** CLOSE the applicable PORV and/or Block valve. b. The following are indications of leakage from a PZR PORV and should be used to identify and isolate a leaking PORV: 1) PZR relief line temperature, TI-3-463, INCREASING. 2) PZR relief tank level, LI-3-470, INCREASING. 3) PZR relief tank temperature, TI-3-471, INCREASING. 4) PZR relief tank pressure, PI-3-472, INCREASING. 5) PZR PORV/SAFETY ACOUSTIC MONITOR, LEDs LIT. 4. **OPEN/LEAKING PZR SAFETY VALVE IDENTIFICATION** a. The following are indications that a PZR safety is open or leaking: 1) PZR Safety line temperature, TI-3-465, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2. 2) PZR Safety line temperature, TI-3-467, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2. 3) PZR Safety line temperature, TI-3-469, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2. 4) PZR relief tank level, LI-3-470, INCREASING. 5) PZR relief tank temperature, TI-3-471, INCREASING. 6) PZR relief tank pressure, PI-3-472, INCREASING. 7) PZR PORV/Safety Acoustic Monitor, LEDs LIT. 5. **SPURIOUS ACTUATION OF CV-3-311 AUXILIARY SPRAY VALVE** due to fire in Containment or 3B 4KV Switchgear Room a. **IF** pressurizer pressure is decreasing and Auxiliary Spray Valve, CV-3-311, is suspect, **THEN** reduce charging to one charging pump on slow speed **AND** close charging to RCS Control Valve HCV-3-121.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 Page 5 of 7

Event Description: PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig..

Time	Position	Applicant's Actions or Behavior
		NOTES • *If Pressurizer Pressure Malfunction is a result of a failure of the 3-450CX or 3-460CX relays (as indicated by a loss of Letdown flow with a loss of Pressurizer Heaters with no concurrent failure of Level Transmitters 3-459A, 3-460, 3-461), use 3-ONOP-003.6, Attachment 4 for 3-460CX failure, OR 3-ONOP-003.9, Attachment 4 for 3-459CX failure as guidance for establishing Letdown flow and Pressurizer Heaters.* • *If the buttons on relays 3-459CX or 3-460CX are used to restore Letdown flow and Pressurizer Heaters, comply with Tech Spec Action Statement 3.4.3 Action b.* • *If the manual control of Heaters from the Electrical penetration room is used, comply with Tech Spec Action Statement 3.4.3 Action a.*
	RO	**10** **Check Pressurizer Pressure Low Or Decreasing** Go to Step 20.
	RO	**11** **Maintain PZR Pressure Greater Than 2000 PSIG** • Check PZR pressure greater than 2000 psig • Maintain PZR pressure greater than 2000 psig a. Restore pressure to greater than 2000 psig. b. IF pressure can NOT be maintained greater than 2000 psig, THEN perform the following: • Continue efforts to restore pressure and • Trip the Reactor and turbine and go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1.
	RO	**12** **Check PZR Heaters Operable** a. Check PZR Heaters ON b. Check PZR Htrs capable of maintaining pressure Perform the following: a. Perform the following: * Verify PZR Control Group Heater Distribution Panel B-11 Breakers, West Electrical Penetration Room, CLOSED. * Verify PZR Backup Group A Heater Distribution Panel B-12 Breakers, West Electrical Penetration Room, CLOSED. * Verify PZR Backup Group B Heater Distribution Panel B-13 Breakers, West Electrical Penetration Room, CLOSED. b. Dispatch an operator to perform Attachment 1, Pressurizer Heater Output Worksheet, to determine heater output. c. Notify the Electrical Department.

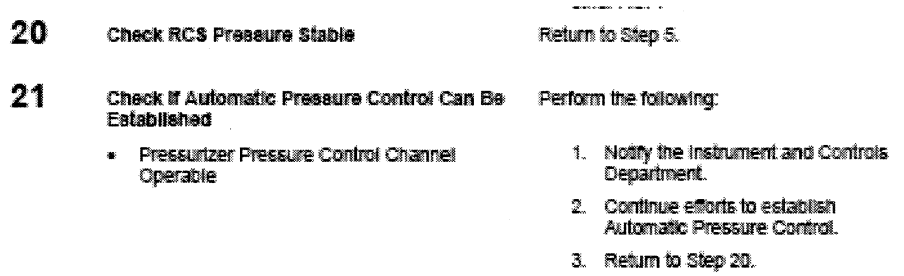
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 Page 6 of 7

Event Description: PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig..

Time	Position	Applicant's Actions or Behavior
	RO	**13** **Check If A PORV Is Leaking** — Go to Step 15. * PZR relief line temperature, TI-3-463 - INCREASING or at the saturation temperature associated with the PZR relief tank pressure according to Attachment 2 * PZR relief tank level, LI-3-470 - INCREASING * PZR relief tank temperature, TI-3-471 - INCREASING <u>OR</u> above ambient temperature for containment conditions * PZR relief tank pressure PI-3-472 - INCREASING * PZR PORV/Safety Acoustic Monitor - LEDs LIT
	RO	**15** **Determine If A Leaking PZR Safety Is Causing Pressure To Decrease** a. Check if a PZR Safety is leaking — a. Go to Step 16. * PZR safety line temperature, TI-3-465 - INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2 * PZR safety line temperature, TI-3-467 - INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2 * PZR safety line temperature, TI-3-469 - INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2 * PZR relief tank level, LI-3-470 - INCREASING * PZR relief tank temperature, TI-3-471 - INCREASING * PZR relief tank pressure, PI-3-472 - INCREASING * PZR PORV/Safety Acoustic Monitor - LEDs LIT b. Refer to Technical Specifications for a leaking PZR SAFETY
		16 **Determine If RCS Leakage Is Causing Pressure To Decrease** • Monitor RCS Leakage using 3-OSP-041.1, RCS LEAK RATE CALCULATION **17** **Check Pressurizer Pressure Decreasing** — Go to Step 20.

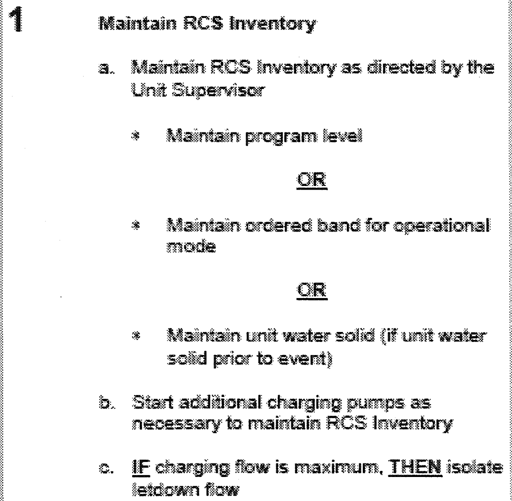
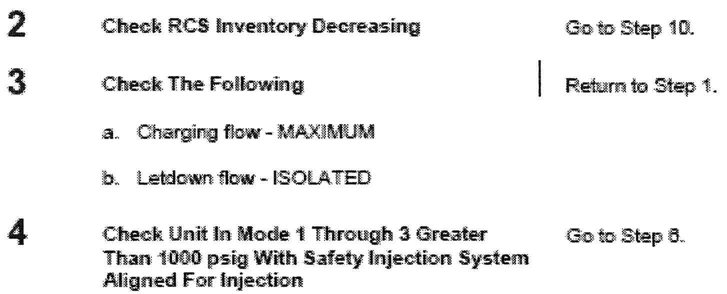
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 Page 7 of 7

Event Description: PC-444J fails high. The crew responds per 3-ONOP-41.5. RCS pressure drops below 2000 psig..

Time	Position	Applicant's Actions or Behavior
	RO	 **20** Check RCS Pressure Stable — Return to Step 5. **21** Check If Automatic Pressure Control Can Be Established — Perform the following: • Pressurizer Pressure Control Channel Operable 1. Notify the Instrument and Controls Department. 2. Continue efforts to establish Automatic Pressure Control. 3. Return to Step 20.
		Evaluators Note: When pressure is stable and actions completed continue to SBLOCA.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 1 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, EVENT 5 – 300 GPM PZR SURGE LINE SBLOCA
	US	Directs actions per 3-ONOP-041.3, Excessive RCS leakage
	RO	 1 **Maintain RCS Inventory** a. Maintain RCS Inventory as directed by the Unit Supervisor * Maintain program level <u>OR</u> * Maintain ordered band for operational mode <u>OR</u> * Maintain unit water solid (if unit water solid prior to event) b. Start additional charging pumps as necessary to maintain RCS Inventory c. <u>IF</u> charging flow is maximum, <u>THEN</u> isolate letdown flow
		Evaluator Note: RO will maximize charging and isolate letdown.
	RO	 2 **Check RCS Inventory Decreasing** — Go to Step 10. 3 **Check The Following** — Return to Step 1. a. Charging flow - MAXIMUM b. Letdown flow - ISOLATED 4 **Check Unit In Mode 1 Through 3 Greater Than 1000 psig With Safety Injection System Aligned For Injection** — Go to Step 6.
	RO	 5 **Manually Trip The Reactor <u>AND</u> Go To 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION**
	US	Directs response per 3-EOP-E-0 starting at step 1.
		 <u>NOTE</u> *Steps 1 through 4 are IMMEDIATE ACTION steps.*

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 2 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**1** **Verify Reactor Trip** • Rod bottom lights – ON • Reactor trip and bypass breakers – OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING Manually trip reactor. **IF** reactor power is greater than 5% **OR** intermediate range power is **NOT** stable or decreasing, **THEN** perform the following: a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.
		Evaluator Note: Containment temperature will reach adverse containment setpoint during this event.
	BOP	**2** **Verify Turbine Trip** a. All turbine stop or associated control valves – CLOSED a. Manually trip turbine. **IF** unable to verify turbine trip, **THEN** close main steamline isolation and bypass valves. b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves b. Manually close valves. **IF** any valve can **NOT** be closed, **THEN** close main steamline isolation and bypass valves. c. Check Mid and East GCBs – OPEN (Normally 30 second delay) c. Manually open breakers. **IF** breakers do **NOT** open, **THEN** actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).
		Evaluator Note: BOP closes MSR main steam supply stop MOVs

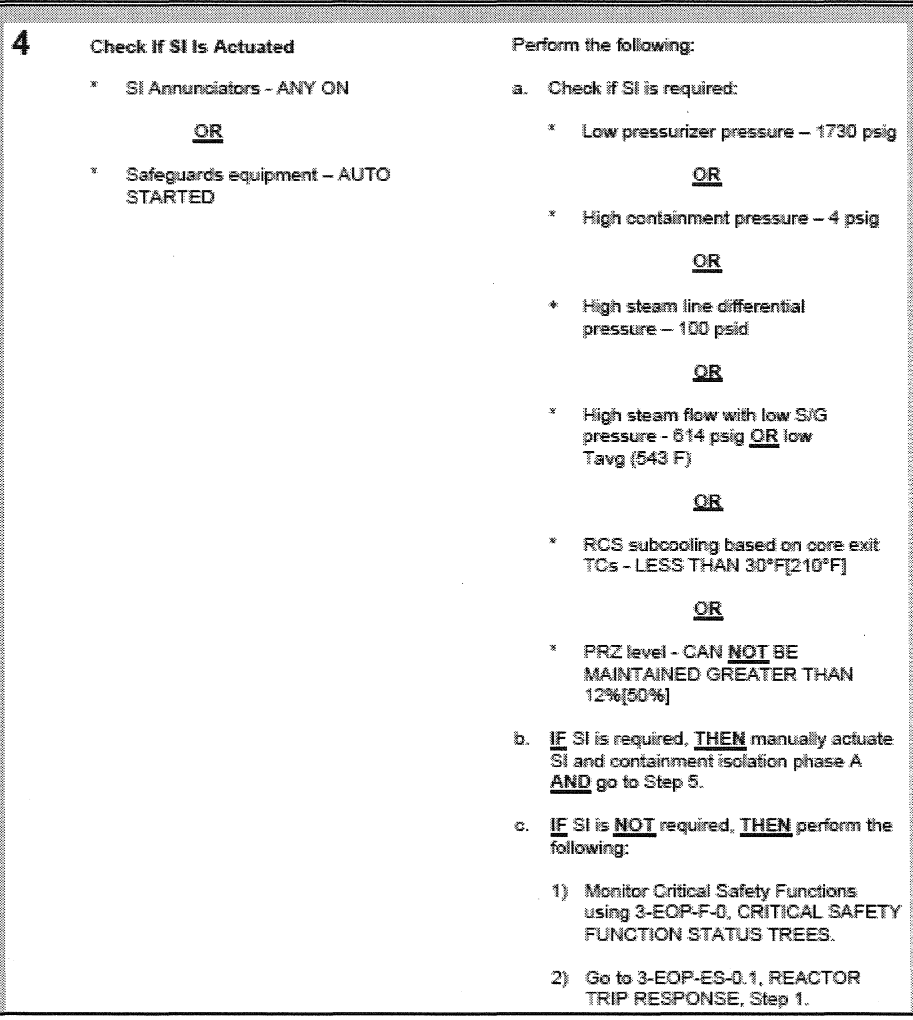
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 3 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	BOP	**3** **Verify Power To Emergency 4 KV Buses** a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED a. Perform the following: 1) Attempt to emergency start any Unit 3 available diesel generator. 2) **IF** neither 3A nor 3B 4 KV bus is energized, **THEN** go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1. b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED b. Attempt to emergency start the de-energized Unit 3 bus diesel generator. c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS c. Perform the following: 1) **IF** lockout of 3D 4 KV bus **NOT** present, **THEN** perform the following: a) Verify 3C CCW pump - BREAKER OPEN. b) Verify 3C ICW pump – BREAKER OPEN. c) Operate bus supply breakers to restore power.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 4 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO **Critical Task**	**4** **Check If SI Is Actuated** * SI Annunciators - ANY ON <u>OR</u> * Safeguards equipment – AUTO STARTED Perform the following: a. Check if SI is required: * Low pressurizer pressure – 1730 psig <u>OR</u> * High containment pressure – 4 psig <u>OR</u> * High steam line differential pressure – 100 psid <u>OR</u> * High steam flow with low S/G pressure - 614 psig <u>OR</u> low Tavg (543 F) <u>OR</u> * RCS subcooling based on core exit TCs - LESS THAN 30°F[210°F] <u>OR</u> * PRZ level - CAN <u>NOT</u> BE MAINTAINED GREATER THAN 12%[50%] b. <u>IF</u> SI is required, <u>THEN</u> manually actuate SI and containment isolation phase A <u>AND</u> go to Step 5. c. <u>IF</u> SI is <u>NOT</u> required, <u>THEN</u> perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-ES-0.1, REACTOR TRIP RESPONSE, Step 1.
		Evaluator Note: Critical task: (TC-WOG/PRA) Failure to manually safety inject and actuate Phase A within 1 minute if an SI actuation setpoint is exceeded following a LOCA and automatic SI actuation fails to occur.

		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 5 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	US	**FOLDOUT FOR PROCEDURE E-0** 1. **ADVERSE CONTAINMENT CONDITIONS** **IF** either of the conditions listed below occur, **THEN** use adverse containment setpoints: Containment atmosphere temperature ≥ 180°F **OR** Containment radiation levels ≥ $1.3x10^5$ R/hr **WHEN** containment parameters drop below the above values, **THEN** normal setpoints can again be used **IF** the TSC determines that containment integrated dose rate has not exceeded 10^6 Rads. 2. **RCP TRIP CRITERIA** a. **IF** both conditions listed below occur, **THEN** trip all RCPs: 1) High-head SI pumps - AT LEAST ONE RUNNING **AND** SI FLOWPATH VERIFIED. 2) RCS subcooling - LESS THAN 25°F[85°F] b. **IF** phase B actuated, **THEN** trip all RCPs. 3. **FAULTED S/G ISOLATION CRITERIA** **IF** any S/G pressure decreasing in an uncontrolled manner **OR** any S/G completely depressurized, **THEN** the following may be performed: a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6%[32%]. b. Isolate AFW flow to faulted S/G(s). c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range. 4. **RUPTURED S/G ISOLATION CRITERIA** **IF** any S/G level increases in an uncontrolled manner **OR** any S/G has abnormal radiation, **AND** narrow range level in affected S/G(s) is greater than 6%[32%], **THEN** feed flow may be stopped to affected S/G(s). 5. **AFW SYSTEM OPERATION CRITERIA** a. **IF** two AFW pumps are operating on a single train, **THEN** one of the pumps shall be shut down within one hour of the initial start signal b. **IF** two AFW trains are operating and one of the AFW pumps has been operating at low flow of 60 gpm or less for one hour, **THEN** that AFW pump shall be shut down 6. **CST MAKEUP WATER CRITERIA** **IF** CST level decreases to less than 10%, **THEN** add makeup to CST using 3-OP-018.1, CONDENSATE STORAGE TANK.
	BOP	**5** **Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure**
		Evaluator Note: BOP will perform attachment 3 while the US and RO continue in 3-EOP-E-0. Attachment 3 actions included at the end of lesson guide.

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**6** **Check AFW Pumps - AT LEAST TWO RUNNING** Perform the following: a. Manually open valves to establish two AFW pumps running. b. <u>IF</u> an AFW pump is tripped, <u>THEN</u> dispatch an operator to locally reset the AFW turbine trips. c. <u>IF</u> both units require AFW <u>AND</u> only one AFW pump is available, <u>THEN</u> perform the following: 1) Verify all RCPs - TRIPPED 2) Establish 270 gpm AFW flow to each unit. 3) Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.
	RO	**7** **Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT** Manually align valves to establish proper AFW alignment.

	RO	**8** **Verify Proper AFW Flow** a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%] a. Perform the following: 1) Verify AFW flow greater than 345 gpm. 2) IF AFW flow less than 345 gpm, **THEN** manually start pumps **AND** align valves to establish greater than 345 gpm flow. 3) IF total feed flow from all sources greater than 345 gpm can **NOT** be established, **THEN** perform the following: a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1. b. Maintain feed flow to S/G narrow range levels between 15%[32%] and 50%.
		Evaluator Note: narrow range levels <32%(adverse conditions). Verifies AFW flow >345 gpm.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 7 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior

	RO	**9**	**Check RCP Seal Cooling**	
			a. Check all RCP thermal barrier alarms – OFF • A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW • A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP • A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW	a. **IF** CCW to an RCP thermal barrier is lost, **THEN**: 1) Trip the affected RCP(s). 2) Go to Step 9c.
			b. Go to Step 10	
			c. Check all RCP seal return temperatures are less than 235 F	c. Go to Step 10.
			d. Verify SI - RESET	d. Reset SI.
			e. **IF** offsite power is **NOT** available, **THEN** check diesel capacity adequate to run one charging pump. **IF** adequate diesel capacity is **NOT** available, **THEN** shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating	
			f. Start one charging pump at minimum speed for seal injection	
			g. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow	
			Evaluator Note: Step 9.b transitions to step 10	
	RO	**10**	**Maintain RCS Cold Leg Temperature**	Perform the following:
			* STABLE AT **OR** TRENDING TO 547°F IF ANY RCP RUNNING **OR** * LESS THAN 547°F **AND** STABLE IF NO RCP RUNNING	a. **IF** temperature is decreasing, **THEN** perform the following: 1) Stop dumping steam. 2) Limit total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. 3) **IF** cooldown is due to excessive steam flow, **THEN** close main steamline isolation and bypass valves.
				b. **IF** temperature greater than 547°F **AND** increasing, **THEN** perform the following: * Dump steam to condenser. **OR** * Dump steam using S/G steam dump to atmosphere valves.

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**11** **Check PRZ PORVs, Spray Valves And Excess Letdown Isolated** a. PORVs – CLOSED a. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. IF any PRZ PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. b. Normal PRZ spray valves – CLOSED b. IF PRZ pressure less than 2260 psig, THEN manually close valves. IF valve(s) can NOT be closed, THEN stop RCP(s) as necessary to stop spray flow. c. Auxiliary Spray Valve, CV-3-311 – CLOSED c. Manually close auxiliary spray valve. IF auxiliary spray valve can NOT be closed, THEN close Charging Flow to Regen Heat Exchanger, HCV-3-121. d. Excess letdown isolation valves – CLOSED • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller d. Manually close valve(s).
	RO	**12** **Check If RCPs Should Be Stopped** a. Check RCPs - ANY RUNNING a. Go to Step 13. b. Check RCS subcooling – LESS THAN 25°F[65°F] b. Go to Step 13. c. High-Head SI Pump – AT LEAST ONE RUNNING AND FLOWPATH VERIFIED c. Go to Step 13. d. Stop all RCPs

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**13** **Check If S/Gs Are Faulted** a. Check pressures in all SGs – (a. Go to Step 14.) * ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR * ANY SG COMPLETELY DEPRESSURIZED b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1
	RO	**14** **Check If S/G Tubes Are Ruptured** a. Check levels in all S/Gs and secondary radiation levels: (a. Go to Step 15.) * ANY SG LEVEL INCREASING IN AN UNCONTROLLED MANNER OR * Condenser air ejector radiation, R-15 – HIGHER THAN NORMAL OR * SG blowdown radiation, R-19 – HIGHER THAN NORMAL OR * ERDADS SG or secondary radiation readings – HIGHER THAN NORMAL OR * Local steamline radiation – HIGHER THAN NORMAL b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1
		Evaluator Note: No faulted or ruptured S/Gs

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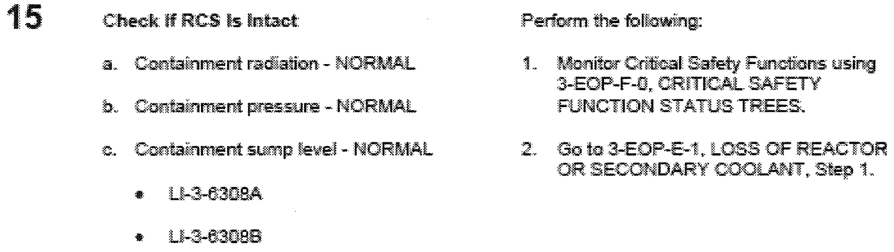
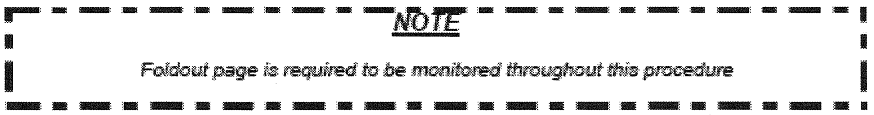
Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	 **15** Check If RCS Is Intact a. Containment radiation - NORMAL b. Containment pressure - NORMAL c. Containment sump level - NORMAL • LI-3-6308A • LI-3-6308B Perform the following: 1. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2. Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
		Evaluator Note: Based on containment conditions, the crew will monitor critical safety functions and transition to 3-EOP-E-1, Loss of Reactor or Secondary Coolant, step 1.
	RO Critical Task	**Secures RCPs due to a loss of subcooling**
		Critical Task: (TC-WOG) Failure to trip RCPs within 5 minutes of reaching EOP RCP trip criteria on subcooling following a small-break LOCA (WOG E-0/E-1 discussion)
	US	Directs response per 3-EOP-E-1
		 NOTE *Foldout page is required to be monitored throughout this procedure*
		Evaluator Note: See fold out next page
	US	Reviews foldout page with crew

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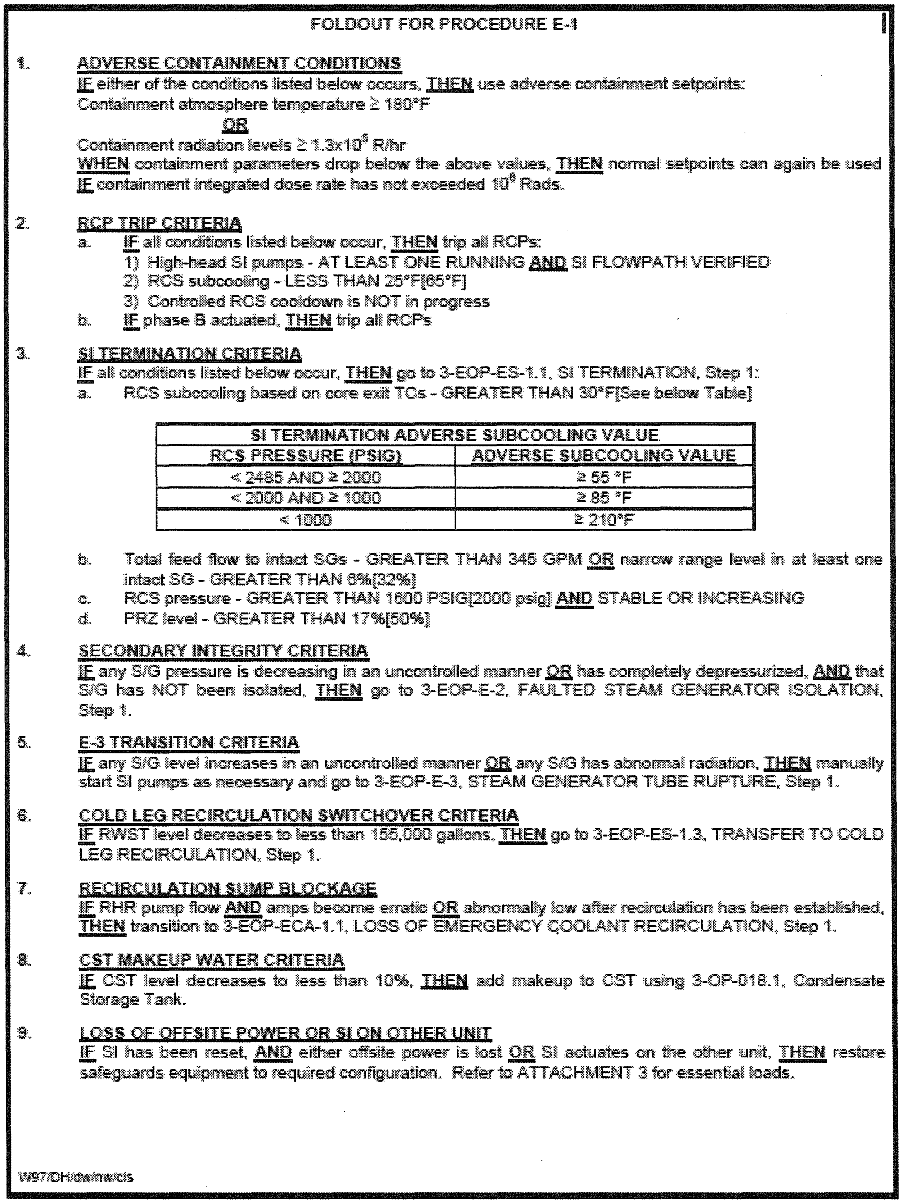
Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	US	

FOLDOUT FOR PROCEDURE E-1

1. ADVERSE CONTAINMENT CONDITIONS
   IF either of the conditions listed below occurs, THEN use adverse containment setpoints:
   Containment atmosphere temperature ≥ 180°F
   OR
   Containment radiation levels ≥ 1.3x10^5 R/hr
   WHEN containment parameters drop below the above values, THEN normal setpoints can again be used IF containment integrated dose rate has not exceeded 10^6 Rads.

2. RCP TRIP CRITERIA
   a. IF all conditions listed below occur, THEN trip all RCPs:
      1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED
      2) RCS subcooling - LESS THAN 25°F[65°F]
      3) Controlled RCS cooldown is NOT in progress
   b. IF phase B actuated, THEN trip all RCPs

3. SI TERMINATION CRITERIA
   IF all conditions listed below occur, THEN go to 3-EOP-ES-1.1, SI TERMINATION, Step 1:
   a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[See below Table]

SI TERMINATION ADVERSE SUBCOOLING VALUE	
RCS PRESSURE (PSIG)	ADVERSE SUBCOOLING VALUE
< 2485 AND ≥ 2000	≥ 55 °F
< 2000 AND ≥ 1000	≥ 85 °F
< 1000	≥ 210°F

   b. Total feed flow to intact SGs - GREATER THAN 345 GPM OR narrow range level in at least one intact SG - GREATER THAN 6%[32%]
   c. RCS pressure - GREATER THAN 1600 PSIG[2000 psig] AND STABLE OR INCREASING
   d. PRZ level - GREATER THAN 17%[50%]

4. SECONDARY INTEGRITY CRITERIA
   IF any S/G pressure is decreasing in an uncontrolled manner OR has completely depressurized, AND that S/G has NOT been isolated, THEN go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

5. E-3 TRANSITION CRITERIA
   IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, THEN manually start SI pumps as necessary and go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA
   IF RWST level decreases to less than 155,000 gallons, THEN go to 3-EOP-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

7. RECIRCULATION SUMP BLOCKAGE
   IF RHR pump flow AND amps become erratic OR abnormally low after recirculation has been established, THEN transition to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

8. CST MAKEUP WATER CRITERIA
   IF CST level decreases to less than 10%, THEN add makeup to CST using 3-OP-018.1, Condensate Storage Tank.

9. LOSS OF OFFSITE POWER OR SI ON OTHER UNIT
   IF SI has been reset, AND either offsite power is lost OR SI actuates on the other unit, THEN restore safeguards equipment to required configuration. Refer to ATTACHMENT 3 for essential loads.

W97/DH/dw/nw/cls

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**1 Monitor Conditions To Determine If RCPs Should Be Stopped** a. RCPs - ANY RUNNING a. Go to Step 2. b. High-head SI pumps - AT LEAST ONE RUNNING b. Go to Step 2. c. RCS Subcooling - LESS THAN 25°F[65°F] c. Go to Step 2. d. Controlled plant cooldown – **NOT** IN PROGRESS d. Go to Step 2. e. Stop all RCPs
		Evaluator Note: All RCPs secured
	BOP	**2 Check If S/Gs Are NOT Faulted** a. Check pressures in all S/Gs – • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED a. **IF** any S/G is faulted **AND** that S/G has **NOT** previously been isolated, **THEN** go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
	BOP	**3 Maintain Intact S/G Levels** a. Narrow range level - GREATER THAN 6%[32%] a. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. b. Control feed flow to maintain narrow range level between 15%[32%] and 50% c. Narrow range level - LESS THAN 50% c. Stop feed flow to any S/G with narrow range level greater than 50%. **IF** narrow range level in any S/G continues to increase in an uncontrolled manner, **THEN** go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
	BOP	**4 Monitor Secondary Radiation** a. Direct Nuclear Chemistry to take periodic activity samples of all S/Gs b. Direct Nuclear Chemistry to check DAM1 monitor reading c. Direct Health Physics to take radiation readings on main steamlines d. Secondary radiation - NORMAL NEAR ROUTINE OPERATION VALUE d. Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 13 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior	
		CAUTION *If any PRZ PORV opens because of high PRZ pressure, it is required to be verified closed or isolated after pressure decreases to less than the PORV setpoint.*	
	RO	**5 Check PRZ PORVs AND Block Valves** a. Power to block valves - AVAILABLE b. PORVs - CLOSED c. Block valves - AT LEAST ONE OPEN	a. Restore power to block valves b. **IF** PRZ pressure less than 2335 psig, **THEN** manually close PORVs. **IF** any valve can **NOT** be closed, **THEN** manually close its block valve. c. Open one block valve unless it was closed to isolate an open PORV.
	RO	**6 Verify SI - RESET**	
	BOP	**7 Reset Containment Isolation Phase A AND Phase B**	
	BOP	**8 Verify Instrument Air To Containment** a. Verify Instrument Air Containment Isolation, CV-3-2803 - OPEN b. Verify instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG	b. Restore instrument air pressure using 0-ONOP-013, LOSS OF INSTRUMENT AIR, while continuing with this procedure.
	BOP	**9 Check Power Supply To All Charging Pumps - ALIGNED TO OFFSITE POWER**	Check diesel capacity adequate to run three charging pumps. **IF** adequate diesel capacity is **NOT** available, **THEN** shed nonessential loads. Refer to ATTACHMENT 3 for component KW load rating.
	RO	**10 Check Charging Flow Established** a. Charging pumps - AT LEAST ONE RUNNING b. Adjust speed controllers as necessary to establish desired charging flow to establish SI Termination conditions c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow	a. Perform Attachment 4 to establish charging.

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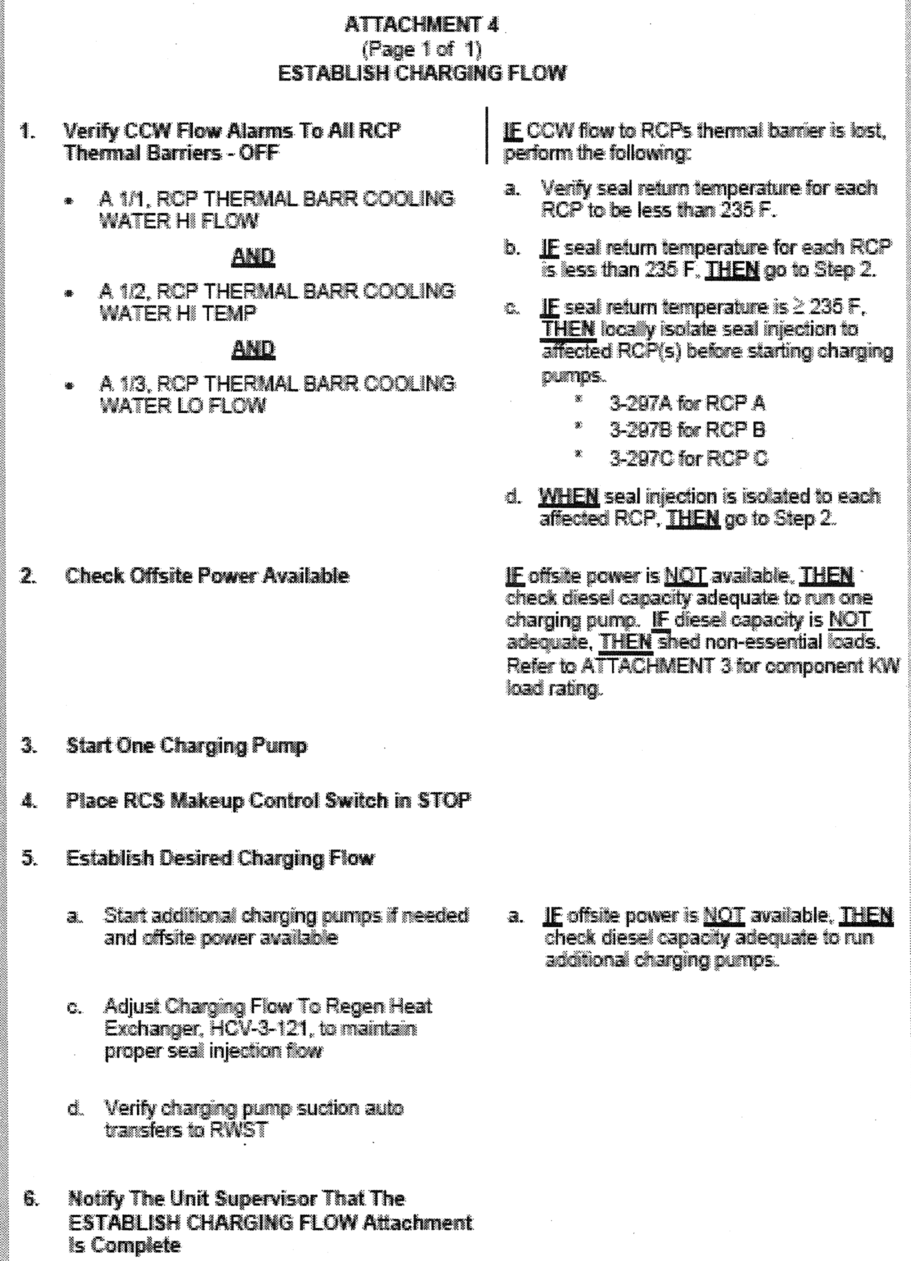
Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
		Evaluator Note: attachment 4 will be used to start charging pumps

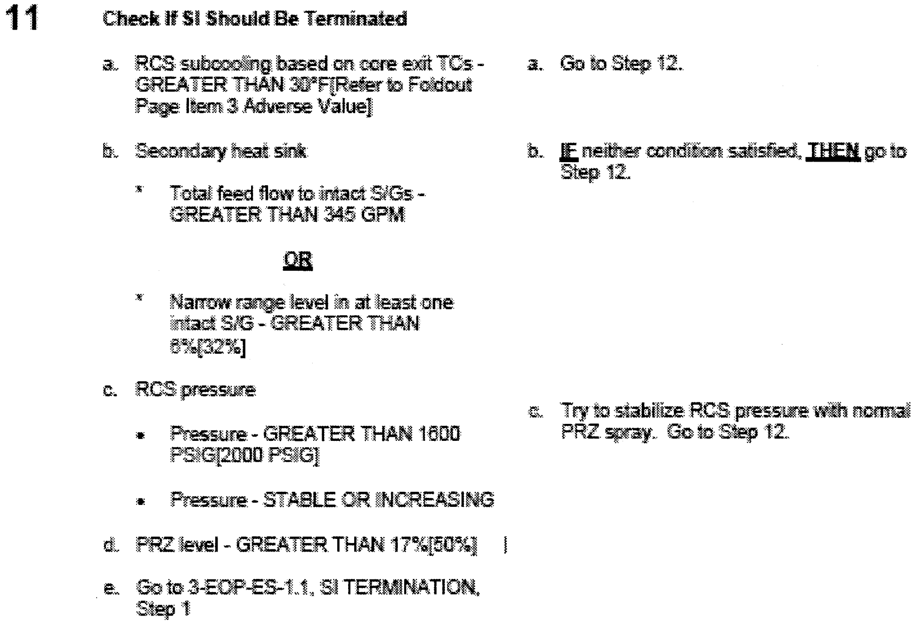


ATTACHMENT 4
(Page 1 of 1)
ESTABLISH CHARGING FLOW

1. **Verify CCW Flow Alarms To All RCP Thermal Barriers - OFF** • A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW **AND** • A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP **AND** • A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW	**IF** CCW flow to RCPs thermal barrier is lost, perform the following: a. Verify seal return temperature for each RCP to be less than 235 F. b. **IF** seal return temperature for each RCP is less than 235 F, **THEN** go to Step 2. c. **IF** seal return temperature is ≥ 235 F, **THEN** locally isolate seal injection to affected RCP(s) before starting charging pumps. * 3-297A for RCP A * 3-297B for RCP B * 3-297C for RCP C d. **WHEN** seal injection is isolated to each affected RCP, **THEN** go to Step 2.
2. **Check Offsite Power Available**	**IF** offsite power is **NOT** available, **THEN** check diesel capacity adequate to run one charging pump. **IF** diesel capacity is **NOT** adequate, **THEN** shed non-essential loads. Refer to ATTACHMENT 3 for component KW load rating.
3. **Start One Charging Pump**	
4. **Place RCS Makeup Control Switch in STOP**	
5. **Establish Desired Charging Flow**	
a. Start additional charging pumps if needed and offsite power available	a. **IF** offsite power is **NOT** available, **THEN** check diesel capacity adequate to run additional charging pumps.
c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow	
d. Verify charging pump suction auto transfers to RWST	
6. **Notify The Unit Supervisor That The ESTABLISH CHARGING FLOW Attachment Is Complete**	

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 Page 15 of 20

Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	11 **Check If SI Should Be Terminated** a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[Refer to Foldout Page Item 3 Adverse Value] a. Go to Step 12. b. Secondary heat sink * Total feed flow to intact S/Gs - GREATER THAN 345 GPM **OR** * Narrow range level in at least one intact S/G - GREATER THAN 6%[32%] b. **IF** neither condition satisfied, **THEN** go to Step 12. c. RCS pressure • Pressure - GREATER THAN 1600 PSIG[2000 PSIG] • Pressure - STABLE OR INCREASING c. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 12. d. PRZ level - GREATER THAN 17%[50%] e. Go to 3-EOP-ES-1.1, SI TERMINATION, Step 1
		Evaluator Note: foldout back on page 9 of this section, transitions to step 12.

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**12** **Check If Containment Spray Should Be Stopped** a. Containment spray pumps – ANY RUNNING b. Check the following • Emergency Containment Filter Spray Valves - CLOSED • 3A ECF Spray SV-3-2905, 2906 • 3B ECF Spray SV-3-2907, 2908 • 3C ECF Spray SV-3-2909, 2910 • Containment temperature - LESS THAN 122°F • Containment pressure - LESS THAN 14 PSIG c. Reset containment spray signal d. Stop both containment spray pumps **AND** place in standby e. Close Containment Spray Isolation valves • MOV-3-880A • MOV-3-880B RNO: a. Observe CAUTION prior to Step 13 **AND** go to Step 13. b. **WHEN** containment pressure less than 14 psig, **AND** containment temperature less than 122°F, **THEN** do Steps 12c through 12e. Observe CAUTION prior to Step 13 **AND** continue with Step 13.
		CAUTION ***High-Head SI flow and RCS Subcooling are required to be monitored. If either High-Head SI flow increases or RCS Subcooling decreases in an uncontrolled manner, the RHR pumps must be manually restarted to supply water to the RCS.***
	RO	**13** **Check If RHR Pumps Should Be Stopped** a. Check RCS pressure - GREATER THAN 250 PSIG [650 PSIG] b. Check RHR flow – LESS THAN 1000 gpm c. Verify SI - RESET d. Stop RHR pumps **AND** place in standby RNO: a. **IF** RHR Flow greater than 1000 gpm, **THEN** go to Step 15. b. Go to Step 14.
		Evaluator Note: Directs RHR pumps stopped

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	**14** **Check RCS And S/G Pressures** • Check pressure in all S/Gs - STABLE **OR** INCREASING • Check RCS pressure - STABLE **OR** DECREASING Observe NOTE prior to Step 1 **AND** return to Step 1.
	BOP	**15** **Check If Diesel Generators Should Be Stopped** a. Check the A and B 4KV buses - ENERGIZED BY OFFSITE POWER a. Perform the following: 1) Direct System Dispatcher to restore offsite power to Unit 3 startup transformer **AND** 3C transformer. 2) **WHEN** offsite power has been restored to Unit 3 startup transformer **OR** 3C transformer, **THEN** restore offsite power to 4KV buses using 3-ONOP-004.1, SYSTEM RESTORATION FOLLOWING LOSS OF OFFSITE POWER. 3) **IF** neither computer room chiller is running, **THEN** perform the following: a) Check diesel capacity adequate to run one train of chilled water for computer room. **IF** adequate diesel capacity is **NOT** available, **THEN** shed non-essential loads. Refer to ATTACHMENT 3 for component KW load rating. b) Start one train of chilled water. 4) Continue with Step 15b. b. Stop any unloaded diesel generator and place in standby using 3/4-OP-023, EMERGENCY DIESEL GENERATOR
		Evaluator Note: Directs U4 RO to start chilled water
		Evaluator Note: 3-OP-023 directs the BOP to establish communication with an operator locally at the EDG prior to securing. Scenario ends prior to communication being established.

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**16** **Verify Cold Leg Recirculation Capability** a. Verify at least one RHR pump - AVAILABLE FOR RECIRCULATION b. Locally unlock and close the following breakers • 30605 for MOV-3-864B • 30615 for MOV-3-750 • 30616 for MOV-3-862B • 30621 for MOV-3-866B • 30626 for MOV-3-863B c. Locally unlock and close the following breakers • 30712 for MOV-3-864A • 30720 for MOV-3-862A • 30726 for MOV-3-863A • 30731 for MOV-3-751 • 30732 for MOV-3-866A <u>IF</u> cold leg recirculation capability can <u>NOT</u> be verified, <u>THEN</u> go to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
		Evaluator Note: Directs breakers to be unlocked and closed
	BOP	**17** **Locally Verify Radiation Shield Doors - CLOSED** • Containment spray pump room • Charging pump room
		Evaluator Note: Directs doors closed

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	US	**18** **Initiate Evaluation Of Plant Status** a. Check auxiliary building radiation - NORMAL 1) Check plant vent process radiation monitor, R-14 2) Check auxiliary building area radiation monitors 3) Check spent fuel pit SPING-4 monitor 4) Direct H.P. to survey the following for abnormal radiation • Pipe & valve room • Electrical penetration rooms a. Perform the following: a) Place control room ventilation system in emergency recirculation mode. b) Try to identify **AND** isolate leakage. c) **IF** abnormal auxiliary building radiation is due to a significant loss of reactor coolant outside containment, **THEN** go to 3-EOP-ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1. b. Verify containment hydrogen monitors - IN SERVICE b. Perform the following: 1) Verify PASS system has been aligned using 3-OP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM. 2) Direct Chemistry to obtain grab samples locally. c. Direct Chemistry to align PASS for sampling of the RCS d. Verify emergency core cooling components - OPERATING PROPERLY • High head safety injection pumps • RHR pumps • Auxiliary feedwater system • Containment spray system • Emergency diesel generators fuel supply and starting air supply • ICW system • CCW system • Emergency containment coolers • Emergency containment filters d. Manually align components to ensure availability of emergency core cooling components.

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Event Description: The surge line leak increases requiring reactor trip and safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	RO	**19** **Check If RCS Cooldown And Depressurization Is Required** a. RCS pressure - GREATER THAN 250 PSIG[650 PSIG] b. Go to 3-EOP-ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1 a. Perform the following: 1) IF RHR pump flow greater than 1000 gpm, THEN go to Step 20. 2) IF RHR pump flow less than or equal to 1000 gpm, THEN go to 3–EOP–ES–1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1.
	US	Transitions to 3-EOP-ES-1.2, Post LOCA Cooldown and Depressurization, step 1.

Inform the crew you have the shift, remain in place.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 1 Check The Load Centers Associated With The Energized 4 KV Buses – ENERGIZED — Close the Load Center supply breakers. • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC
	BOP	Step 2. Check If Main Steamlines Should Be Isolated a. Check main steamline isolation and bypass valves - ANY OPEN — a. Go to Step 3. b. Check if either main steam isolation signal has actuated — b. Go to Step 3. • High steam flow with either low S/G pressure 614 psig OR low Tavg 543 F OR • Hi-Hi containment pressure 20 PSIG c. Verify main steam isolation and bypass valves - CLOSED — c. Push manual Steamline Isolation push buttons on VPB OR manually close valves.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 att.3 Page 2 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior	
	BOP	Step	
		3. Verify Feedwater Isolation	
		a. Place main feedwater pump switches in STOP	
		b. Feedwater control valves – CLOSED	b. Manually close valves.
		c. Feedwater bypass valves – CLOSED	c. Manually close valves.
		d. Close feedwater isolation MOVs	d. Locally close valves.
		e. Verify standby feedwater pumps – OFF	e. IF standby feedwater is aligned to Unit 3, THEN stop standby feedwater pump(s).
	BOP	Step	
		4. Verify Proper ICW System Operation	
		a. Verify ICW pumps - AT LEAST TWO RUNNING	a. Start ICW pump(s) to establish at least two running.
		b. Verify ICW to TPCW Heat Exchanger – ISOLATED	b. Manually close valve(s). IF valve(s) can NOT be closed, THEN locally close the following valves:
		• POV-3-4882 – CLOSED	• 3-50-319 for POV-3-4882
		• POV-3-4883 – CLOSED	• 3-50-339 for POV-3-4883

		c. Check ICW headers - TIED TOGETHER	c. IF both ICW headers are intact, THEN direct operator to tie headers together.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 5. Verify Proper CCW System Operation	
		a. CCW Heat Exchangers – THREE IN SERVICE	a. Perform the following: 1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP. 2) Verify Emergency Containment Coolers - ONLY TWO RUNNING 3) Go to Step 5c.
		b. CCW pumps - ONLY TWO RUNNING	b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.
		c. CCW headers - TIED TOGETHER	c. IF both CCW headers are intact, THEN direct a field operator to tie the headers together.
		d. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN	d. IF containment isolation phase B NOT actuated AND CCW radiation levels are normal, AND RCP number one seal leak-off temperature is less than 235°F, THEN manually open MOV-3-626. IF MOV-3-626 can NOT be manually opened, THEN direct operator to open MOV-3-626 locally.

	BOP	Step 6. Verify Containment Cooling a. Check emergency containment coolers - ONLY TWO RUNNING a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING. b. Verify emergency containment filter fans - AT LEAST TWO RUNNING b. Manually start emergency containment filter fans.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 att.3 Page 4 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 7. Verify SI Pump Operation a. At least two high head pumps running a. Manually start high-head pump(s). b. Both RHR pumps running b. Manually start RHR pump(s).
	BOP	Step 8. Verify SI Flow a. RCS pressure - LESS THAN 1600 PSIG[2000 PSIG] a. Go to Step 9. b. High-head SI pump flow indicator – CHECK FOR FLOW b. Manually start pumps AND align valves to establish an injection flowpath. c. RCS pressure - LESS THAN 250 PSIG[650 PSIG] c. Go to Step 9. d. RHR pump flow indicator - CHECK FOR FLOW d. Manually start pumps AND align valves to establish an injection flowpath.
	BOP	Step 9. Realign SI System a. Verify Unit 3 high-head SI pumps - TWO RUNNING a. Perform the following: 1) Operate Unit 3 and Unit 4 high-

		head SI pumps to establish injection to Unit 3 from two high-head SI pumps. 2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure. 3) Go to Step 10.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT Perform the following: a. Manually actuate Containment Isolation Phase A. b. IF any Containment Isolation Phase A valve is NOT closed, THEN manually close valve. IF valve(s) can NOT be manually closed, THEN manually or locally isolate affected containment penetration.
	BOP	Step 11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	Step 12. Verify SI – RESET Reset SI
	BOP	Step

		13. Verify Containment Phase A – RESET Reset Phase A
		Evaluator Note: BOP is required to go back to the containment isolation racks and rest the six phase A lockout relays, (three lockout relays on each rack)

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 14. Reestablish RCP Cooling a. Check RCPs – AT LEAST ONE RUNNING — a. Go to step 15. b. Open CCW to normal containment cooler valves — b. Stop all RCPs • MOV-3-1417 • MOV-3-1418 c. Reset and start normal containment coolers — c. Stop all RCPs.
	BOP	Step 15. Monitor Containment Pressure To Verify Containment Spray NOT Required a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG — a. Perform the following: • PR-3-6306A AND — 1) IF containment spray NOT initiated, THEN manually initiate

		• PR-3-6306B	containment spray. 2) Verify Containment Isolation Phase B-ACTUATED. 3) Verify Containment Isolation Phase B valve white lights on VPB – ALL BRIGHT.
			4) IF any Containment Isolation Phase B valve did NOT close, THEN manually or locally isolate affected containment penetration. 5) Stop all RCPs.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 16. Verify Containment and Control Room Ventilation Isolation a. Unit 3 containment purge exhaust and supply fans – OFF — a. Manually stop fans. b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT — b. Manually align equipment for Control Room emergency recirculation.
		NOTE *Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.*
	BOP	Step 17. Place Hydrogen Monitors In Service Using 3-OP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM

		Evaluator Note: BOP will call NSO to align PAHM. 3-OP-094 steps listed below.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior

7.1 Post Accident H_2 Monitor Startup

NOTE

Hydrogen Monitors should be in service within 30 minutes of a valid SI signal.

7.1.1 Initial Conditions

1. All applicable prerequisites listed in Section 3.0 are satisfied.

7.1.2 Procedure Steps

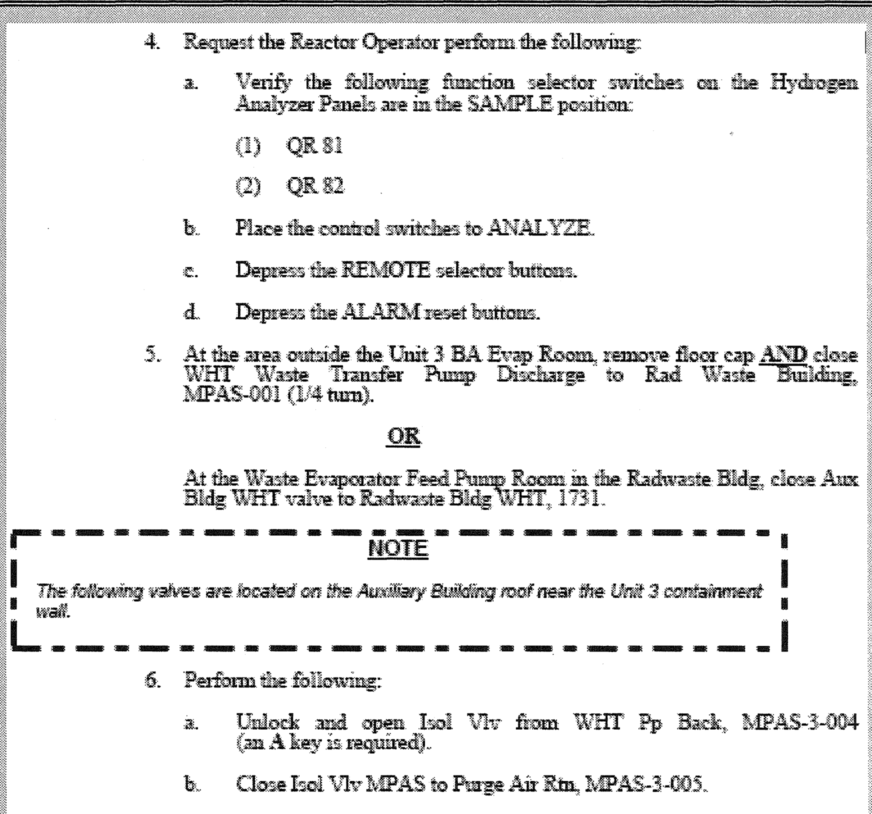
NOTES

- *Valves PASS-3-008, 3-001A, 3-001B, 3-002A and 3-002B are located in the floor outside the Unit 3 Sample Room.*
- *Full travel for valves is provided in parenthesis and should not be exceeded or damage to reach rod assemblies may occur.*

1. Remove the floor caps **AND** open the following valves using the reach rods located in the Auxiliary Building:
    a. Post Accident Sampling System Return Line Isolation Valve, PASS-3-008 (2 1/4 turns)
    b. H_2 Analyzer 3A Outlet Isol, PAHM-3-001A (6 turns)
    c. H_2 Analyzer 3B Outlet Isol, PAHM-3-001B (6 turns)
    d. PACV Vent and Sample System to PAHM Header Isolation Valve (RR), PAHM-3-002A (6 turns)
    e. PACV Vent and Sample System to PAHM Header Isolation Valve (RR), PAHM-3-002B (5 turns)
2. Unlock **AND** open PACVS Isol Vlv Penet 53, HV-3-3, in front of the Unit 3 Containment Spray Pump Room. (An A key is required for this lock.)
3. Unlock **AND** open PACVS Isol Vlv Penet 16, HV-3-1, located in the north Aux Bldg hallway. (An A key is required for this lock.)

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 5 att.3 Page 9 of 11

Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
		 4. Request the Reactor Operator perform the following: a. Verify the following function selector switches on the Hydrogen Analyzer Panels are in the SAMPLE position: (1) QR 81 (2) QR 82 b. Place the control switches to ANALYZE. c. Depress the REMOTE selector buttons. d. Depress the ALARM reset buttons. 5. At the area outside the Unit 3 BA Evap Room, remove floor cap <u>AND</u> close WHT Waste Transfer Pump Discharge to Rad Waste Building, MPAS-001 (1/4 turn). <u>OR</u> At the Waste Evaporator Feed Pump Room in the Radwaste Bldg, close Aux Bldg WHT valve to Radwaste Bldg WHT, 1731. <u>NOTE</u> *The following valves are located on the Auxiliary Building roof near the Unit 3 containment wall.* 6. Perform the following: a. Unlock and open Isol Vlv from WHT Pp Back, MPAS-3-004 (an A key is required). b. Close Isol Vlv MPAS to Purge Air Rtn, MPAS-3-005. Date/Time Completed:__________/__________
	BOP	Step 18. Verify All Four EDGs – RUNNING EMERGENCY START any available EDG NOT running.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 19. Verify Power To Emergency 4 KV Buses and Load Centers a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED a. Perform the following: 1) Inform the Unit Supervisor that Attachment 3 is complete with the exception of the de-energized bus or buses. 2) IF the Unit Supervisor decides not to energize the de-energized bus or buses, THEN go to Step 20. 3) IF the Unit Supervisor decides to energize 3A, 3B, or 3D bus, THEN perform the following: a) IF 3A 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS. b) IF 3B 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS. c) IF 3D 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.

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Event Description: 3-EOP-E-0 Attachment 3 actions

Time	Position	Applicant's Actions or Behavior
	BOP	Step 20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Note Any Actions That Had To Be Taken
		Evaluator Note: BOP informs US of completion of attachment 3. *Evaluator Note: BOP should receive a turnover from the RO and continue in the EOP network.*