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, 60% 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. Thunderstorms reported in the area

Maintain 60%

Online risk – green

B train protected both units

Event No.		Event Type	Event Description
1	TAHUVBSC = 15 TAHUVBMC = 2.20000	(TS)SRO	3C RCP vibration alarm at 3.2 mils frame and 16 mils shaft. The crew responds to alarm F1/1 and is directed to 3-ONOP-041.1 and Tech. Spec. 3.4.1. In accordance with the fold out page, vibration levels warrant Engineering evaluation only.
2	TFFVP1A = T TFL10101 = T TFU1LRRD = T	(R,C)SRO (R)RO (C)BOP	3A SGFP shaft shears requiring the BOP to place the control switch to off per 0-ADM-211. This should initiate an automatic runback to 45%. The crew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.
3	TFLID41 = T TFLID31 = T	(C)RO (C)RO (TS,C,C)SRO	Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3-ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switch on the console and Vertical Panel Bravo (VPB) fails revealing an ATWS condition.
4	TFL3SIA1 = T TFHN12C = T TFHN23C = T TFHN34C = T TFSW75BC = T	(M) ALL (C)RO,SRO (C)RO,SRO (C)BOP,SRO	The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.
5		(M)ALL	The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

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

Turkey Point 2009-301 Scenario #1

Event 1 – C RCP vibrations increase to 3.2 mils frame and 16 mils shaft. The crew responds per 3-ONOP-041.1 Reactor Coolant Pump Off Normal.

Event 2 - 3A SGFP shaft shears requiring the BOP to place the control switch to off per 0-ADM-211. This should initiate an automatic runback to 45%. The crew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.

Event 3 – Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3-ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Event 4 – The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Event 5 - The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Scenario XXIV NRC 1

Simulator Operating Instructions

Setup

IC-24 (60% 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 steps:

a. SETUP – 3C Charging pump OOS, ATWS , Rod Control failure, Train A SI failure, CV-6275B failure, Automatic Turbine runback failure(actuates TAB1POSM = RACKOUT, TFL2XBSE =T, TFL2XASE = T, TFL3SIA1 = T, TCE6DQ7C = T, TCE6DQ8C = T, TFL3V1 = F, TFL10101 = 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 - C RCP vibration alarm

Initiated immediately after shift turnover.

The crew will respond to annunciator alarm F 1/1, RCP motor/shaft hi vib. The annunciator response procedure will direct the crew to check remote and control room indications and perform 3-ONOP-041.1 for readings above the alarm setpoint. The US begins performing 3-ONOP-041.1 at step 1.

When directed - Trigger lesson step **EVENT 1 – 3C RCP VIBRATION** (actuates TAHUVBSC = 15.0, TAHUVBMC = 2.2)

ARP F1/1 step 2a. - Respond as NSO if directed to check vibration indications in the cable spreading room.

Local indication on Bentley-Nevada reading – 3.2 mils frame, 16 mils shaft.

The Crew responds per 3-ONOP-041.1

Fold out page item 1 – Respond as Engineering and acknowledge request to monitor 3C RCP.

Step 1 – Respond as NSO when directed to check RCP seal injection flow greater than or equal to 6 gpm on all RCPs. Report readings from RCP seal flow display.
Select reactor coolant system from main menu, select reactor coolant pumps, select seal flow display, report readings rounded to nearest unit.

Step 12a – Respond as SM and acknowledge entry into 3-ONOP-041.1 for 3C RCP vibrations.

If called respond as WCC, or AOM. Acknowledge high vibrations on 3C RCP.

Event 2 – 3A SGFP SHAFT SHEAR W/ FAILURES

3A SGFP shaft shears requiring the BOP to place the control switch to off per 0-ADM-211. This should initiate an automatic runback to 45%. The crew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.

When directed - Trigger lesson step **EVENT 2 – 3A SGFP SHAFT SHEAR W/ FAILURES** (actuates TFFVP1A = T, TFL10101 = T, TFU1LRRD = T)

If a unit trip is required during response to loss of 3A SGFP, the crew will determine an ATWS condition exists, continue at EVENT 4

The Crew responds per 3-ONOP-089 turbine runback

Step 5.3 – Respond as Load Dispatcher and Plant General Manager; acknowledge entry into 3-ONOP-089 for the shaft shear on 3A SGFP and manual runback.

Step 5.6 – Respond as SM if called; acknowledge to review the requirements of PI-AA-100-1002.

Step 5.7 – Respond as Chemistry; acknowledge RCS sampling is required per Technical Specifications table 4.4-4, item 6.b.

If called respond as WCC, or AOM. Acknowledge shaft shear on 3A SGFP and manual runback.

The Crew responds per 3-ONOP-028 rod control system malfunction

Step 5.2.3.1 – Respond as Reactor Engineer Supervisor; acknowledge failure of Rod Control to operate in automatic

Step 5.2.3.2 – Respond as I&C Supervisor; acknowledge request to verify RPI indication and to investigate CRDM system for possible failure

If called respond as WCC, or AOM. Acknowledge failure of Rod Control to operate in automatic

Event 3 – Sequential Dropped Rods

Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3-ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Following the report to the I&C Supervisor in step 5.2.3.2 above and when directed - Trigger lesson step **EVENT 3 – DROPPED CONTROL ROD H8** (actuates TFLID41 = T)

The Crew responds per 3-ONOP-028.3 Dropped RCC

Step 10 – Respond as Reactor Engineering; Acknowledge dropped RCC H8.

If called respond as WCC, or AOM. Acknowledge dropped RCC H8.

Following the report to the reactor Engineer, following step 11 and when directed - Trigger lesson step **EVENT 3 – DROPPED CONTROL ROD H4** (actuates TFLID31 = T)

Event 4 – ATWS W/ 3C RCP SEAL FAILURE

The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB

Entered from Event 3 on drop of second control rod or, Event 2 on manual trip attempt.

The Crew responds per 3-EOP-E-0 and 3-EOP-FR-S.1 Response to Nuclear Power Generation / ATWS

3-EOP-FR-S.1

Step 7.a - May be performed as an early action. Respond as the NSO and acknowledge direction to open the reactor trip breakers and the rod drive mg set breakers. After a two minute delay, **TRIGGER** lesson step – **EVENT 4 - TRIP REACTOR.**

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 4 – 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

Step 14.a – Respond as Health Physics; acknowledge direction to check local stream line radiation higher than normal.

Event 5 – SBLOCA Response

The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

3-EOP-E-1 response

Step 4.a – Respond as Chemistry to take periodic activity samples of all SGs

Step 4.b – Respond as Chemistry to check DAM1 monitor reading

Step 4.c – Respond as Health Physics to take radiation readings on main steam lines

Step 16.b&c – Respond as NSO, Acknowledge direction to unlock and close the following breakers:

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

After 3-5 minutes **Trigger** lesson step – **EVENT-5-E-1 BREAKER ALIGNMENT.** Report completed after 8-10 minutes.

Step 17 – Respond as SNPO, Acknowledge direction to verify radiation shield doors closed for the containment spray pump room and charging pump room

Step 18.a.4 – Respond as H.P. to survey the Pipe & valve room and Electrical penetration rooms for abnormal radiation

Step 18.c – Respond as Chemistry to align PASS for sampling the RCS

3-OP-023

Respond as Unit 4 RO, Acknowledge direction to secure U4 EDGs.

Step 6.1.2.1 – Respond as NSO to go to 3A Diesel Generator Engine Control Panel 3C13A and establish communications with the control room

Step 6.2.2.1 - Respond as NSO to go to 3B Diesel Generator Engine Control Panel 3C13B and establish communications with the control room

3-EOP-ES-1.2

Step 3.d.1 – Respond as SNPO, acknowledge direction to Proceed to Unit 3 West Electrical Penetration Room and reset group A Backup PRZ Heater lockout relay

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Event Description: 3C RCP vibration alarm at 3.2 mils frame and 16 mils shaft. The crew responds to alarm F1/1 and is directed to 3-ONOP-041.1 and Tech. Spec. 3.4.1. In accordance with the fold out page, vibration levels warrant Engineering evaluation only.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step **EVENT 1 – 3C RCP VIBRATION**
	BOP	Recognizes/reports unexpected alarm F1/1 RCP HI VIB to the unit supervisor (US).
	BOP	Perform actions of 3-ARP-097.CR for annunciator F1/1: 1. Verifies alarm by checking RCP vibration recorder R-3-369. ***Note: Finds 3C RCP at 3.2 mils frame and 16 mils shaft.*** 2a. Dispatches operator to check vibration indications in the cable spreading room. *Note: Local DANGER indication lights will not be lit. Setpoints at 20 mils shaft and 5 mils on motor.* b. Reports to US 3C RCP shaft vibration greater than setpoint at 16 mils and requires 3-ONOP-041.1 response.
	US	Directs response per 3-ONOP-041.1
		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.*

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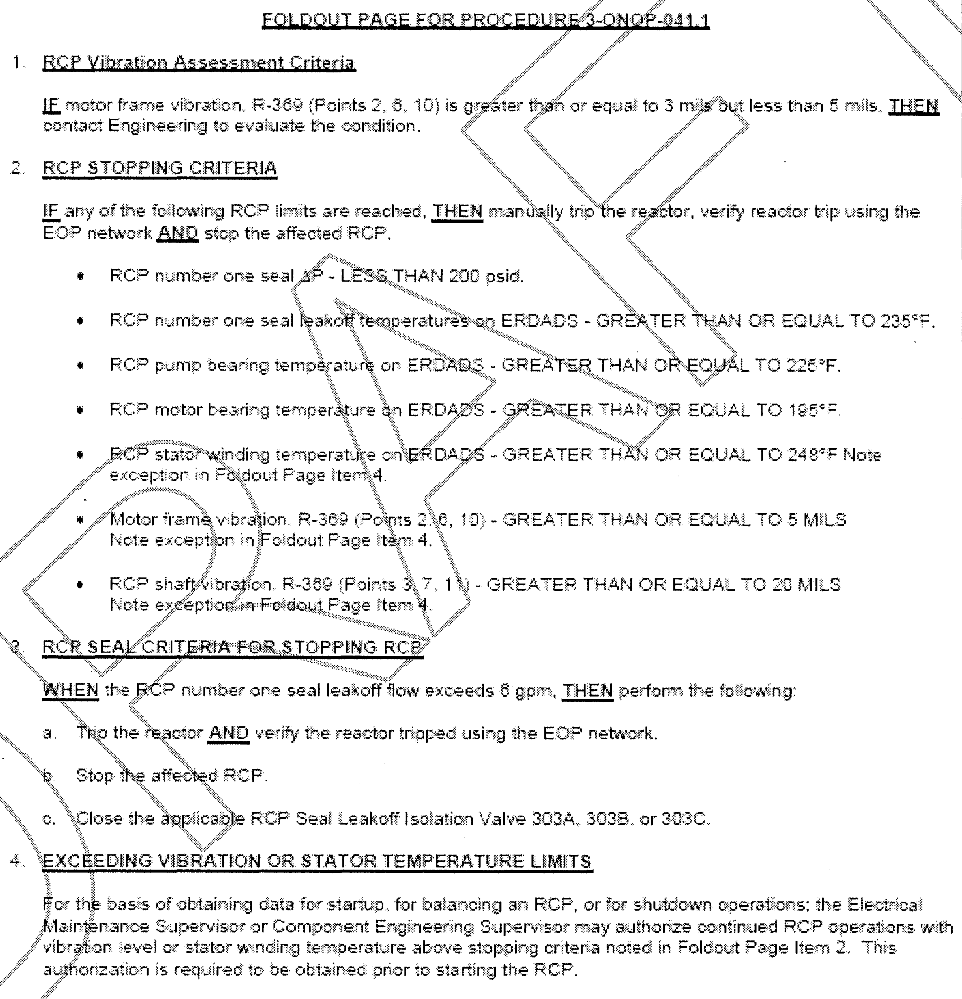
Event Description: 3C RCP vibration alarm at 3.2 mils frame and 16 mils shaf. The crew responds to alarm F1/1 and is directed to 3-ONOP-041.1 and Tech. Spec. 3.4.1. In accordance with the fold out page, vibration levels warrant Engineering evaluation only.

Time	Position	Applicant's Actions or Behavior
		

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.

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Event Description: 3C RCP vibration alarm at 3.2 mils frame and 16 mils shaft. The crew responds to alarm F1/1 and is directedto 3-ONOP-041.1 and Tech. Spec. 3.4.1. In accordance with the fold out page, vibration levels warrant Engineering evaluation only.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	Foldout - Reviews fold out page. ***Note: Item 1, RCP vibration assessment criteria met. Requires contacting Engineering to evaluate the condition.Items 2-4 do not apply.***
	RO	Foldout - Contacts Engineering to evaluate 3C RCP.
		1 Checks for proper seal injection flow. • PI-3-131A – greater than zero inches • PI-3-128A – greater than zero inches
	BOP	• PI-3-125A – greater than zero inches
		• Local seal injection flow ≥ 6gpm on all RCPs
	RO	• ERDADS seal injection flow ≥ 6gpm on all RCPs
		2. Check number one seal leakoff flow within limits of enclosure 1. ***Note: Should be between .9 gpm and 4.8 gpm per enclosure 1.***
	RO	3. Check thermal barriers intact A1/1 RCP THERMAL BARR COOLING WATER HI FLOW alarm – off A1/2 RCP THERMAL BARR COOLING WATER HI TEMP alarm – off A1/3 RCP THERMAL BARR COOLING WATER LO FLOW alarm – off

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Event Description: 3C RCP vibration alarm at 3.2 mils frame and 16 mils shaft. The crew responds to alarm F1/1 and is directed to 3-ONOP-041.1 and Tech. Spec. 3.4.1. In accordance with the fold out page, vibration levels warrant Engineering evaluation only.

Time	Position	Applicant's Actions or Behavior
	BOP	4. Check for proper cooling to RCP pump bearing
		• RCP bearing temperatures on ERDADS – less than 210ºF
		• Number one seal leakoff on ERDADS – less than 215ºF
	RO	5. Check VCT temperature on TI-3-116 – less than 130ºF
		6. Check RCP standpipe HI level alarms – off
		• G2/1 for RCP A
		• G2/2 for RCP B
		• G2/3 for RCP C
		7. Check RCP standpipe lo level alarms – off
		• G3/1 for RCP A
		• G3/2 for RCP B
		• G3/3 for RCP C
		8. Check RCP oil reservoir HI/LO level alarms – off
		• B2/4 for RCP A
		• B2/5 for RCP B
		• B2/6 for RCP C
		9. Check for proper RCP motor cooling
		a. Verify the following alarms are off:
		• H9/1 RCP A MOTOR BEARING HI TEMP
		• H9/2 RCP B MOTOR BEARING HI TEMP
		• H9/3 RCP C MOTOR BEARING HI TEMP
		• H9/4 RCP MOTOR BEARING COOLING WATER HI TEMP
		• H9/5 RCP MOTOR BEARING COOLING WATER LO FLOW
		• H9/6 RCP A/B/C PUMP/MOTOR HI TEMP
	BOP	b. Verify RCP motor bearing and stator temperatures on ERDADS– Stable or decreasing

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Event Description: 3C RCP vibration alarm at 3.2 mils frame and 16 mils shaft. The crew responds to alarm F1/1 and is directed to 3-ONOP-041.1 and Tech. Spec. 3.4.1. In accordance with the fold out page, vibration levels warrant Engineering evaluation only.

Time	Position	Applicant's Actions or Behavior
	RO	10. Check RCP seal bypass valve, CV-3-307 – open. ***Note: RNO sends you to step 12.***
	US	12. Directs SM to evaluate plant condition a. Check 0-ADM-115 Notification of plant events. b. Review Technical Specification 3.4.1 for compliance. ***Note: T.S 3.4.1 is meet with the 3C RCP running while the reactor trip breakers are closed***
	BOP	Informs work control and assistant operations manager

A crew brief may be held during or at the close of the ONOP

Following Technical Specifications review, **Trigger** lesson step **EVENT 2 – 3A SGFP SHAFT SHEAR W/ FAILURES**

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Event Description: 3A SGFP shaft shears requiring the BOP to place the control switch to off per 0 ADM-211. This should initiate an automatic runback to 45%. The crew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.

Time	Position	Applicant's Actions or Behavior
		Note: If a reactor trip is required an ATWS condition will exist, continue at EVENT 4
	BOP	Recognizes/reports to US the shaft shear of 3A SGFP based upon the following indications: • 3A SGFP amp reduction from 870amps to 300amps • 3A SGFP run indication red light still illuminated • SGFP A LO FLOW ALARM D5/2 • SG A, B and C STEAM >FEED alarms C5/1, 5/2, 5/3 • SG A, B and C LEVEL DEVIATION alarms C6/1, 6/2, 6/3 • Lowering SG levels on all SG level indications: vertical panel A(VPA) and the console
	US	Acknowledges the failure of 3A SGFP and directs the BOP to place the control switch for 3A SGFP in the off position per 0-ADM-211 guidelines while performing the immediate operator actions (IOA) of 3-ONOP-089 Turbine Runback.
	RO / BOP	Step 4.1 (IOA) Verify the automatic actions are functioning to stabilize and maintain plant conditions or assume manual control: • Main turbine control and Reheat intercept valves modulate closed (VPA) • Steam dumps arm and open on Tavg/Tref mismatch (console) • Automatic rod control adjusts core reactivity to match Tavg/Tref (console) • Main Feedwater control valves respond to maintain programmed level (console) • Pressurizer level and pressure controllers function to maintain pressurizer level and pressure (console)

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Event Description: 3A SGFP shaft shears requiring the BOP to place the control switch to off per 0 ADM-211. This should initiate an automatic runback to 45%. The crew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 4.1 (IOA) BOP recognizes/reports to US failure of the automatic runback as evident by : • Main turbine control and Reheat intercept valves stable (VPA) • Main Feedwater control valves maintaining 60% programmed level (console) • Steam dumps closed (console)
	BOP	Step 4.1 (IOA) BOP uses load limiter to runback the unit to 45% ***Note: Approximately 300 MWe.*** ***Note: If the unit is runback to the point of all governor valves closed, a turbine and reactor trip signal will occur continue at EVENT 4.***
	RO	Step 4.1 (IOA) RO recognizes/reports to US failure of automatic rod control as evident by : • NO automatic rod control with rod motion demanded(console) • Pressurizer level and pressure controllers controlling to maintain 60% pressurizer level and pressure (console) • Charging pump flow decrease in response to increasing pressurizer level
	RO	Step 4.1 (IOA) RO places rod control in manual and inserts control rods in a controlled manner to match Tavg/Tref. ***Note: 0-ADM-211 allows +/- 4°F during transient.*** ***Note: If the crew is too slow in responding, the US may direct a manual reactor trip based on SG levels, continue at EVENT 4.*** ***Note: Control bank D should end up around 110 steps***

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

Event Description: 3A SGFP shaft shears requiring the BOP to place the control switch to off per 0 ADM-211. This should initiate an automatic runback to 45%. The cew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	Step 5.2 Verify the following conditions: • Steam Generator levels and pressures stabilized • Steam dumps closed • Tavg matches Tref • Pressurizer levels and pressures stabilized
	BOP	Step 5.3 Notify load dispatcher and the Plant General Manager in accordance with 0-ADM-115, notification of plant events
	RO / BOP	Step 5.4 If possible, then mark Control Room charts with the date, time, and cause of the incident
	US	Step 5.5 Complete operator logs
	US	Step 5.6 Notify Shift Manager to review the requirements of PI-AA-100-1002, failure investigation process(FIP), to determine if a FIP team should be activated
	US	Step 5.7 If reactor power has changed by greater than or equal to 15 percent, then notify Chemistry department that RCS sampling is required per Technical Specifications table 4.4-4, item 6.b

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 4 of 5

Event Description: 3A SGFP shaft shears requiring the BOP to place the control switch to off per 0 ADM-211. This should initiate an automatic runback to 45%. Thecrew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.

Time	Position	Applicant's Actions or Behavior
	US	Directs response for the failure of Automatic Rod Control per 3-ONOP-028 Reactor 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, REATOR 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	Step 4.2.1 - (IOA) Place Rod Control Selector switch to the MAN position
		CAUTION For URGENT FAILURE condition rod motion is blocked. The cause must be corrected before moving rods. Resetting the URGENT FAILURE prior to correcting problem could result in ratcheting the mechanisms when the RESET pushbutton is depressed.
	RO	Step 5.2.1 - <u>DO NOT</u> increase reactor power without permission from the Reactor Engineering Supervisor and the Shift Manager

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Event Description: 3A SGFP shaft shears requiring theBOP to place the control switch to off per 0 ADM-211. This should initiate an automatic runback to 45%. The crew responds per 3-ONOP-089. A failure of the runback circuit requires the BOP to manually run the unit back to 45%. A failure of automatic rod control will prevent control rods from inserting when demanded. The RO will take manual control and match Tave/Tref. The US will use of 3-ONOP-028 to address the rod control failure. Should a unit trip occur, event three will be skipped.

Time	Position	Applicant's Actions or Behavior
	RO	Step 5.2.2 - Manually position the RCC control bank to restore steady state conditions 1. <u>IF</u> the RC control bank will still not move, <u>THEN</u> maintain steady state conditions with Tavg equal to Tref by: a. Boration / Dilution <u>OR</u> b. Changing turbine load
	US	Step 5.2.3 - Notify the following: 1. Reactor Engineering Supervisor or designee 2. I&C Supervisor to verify RPI indication and to investigate CRDM System for possible failure

Trigger lesson step **EVENT 3 – DROPPED CONTROL ROD H8**

A crew brief may be held during or at the close of the ONOP.

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

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes/reports to US the Dropped Control Rod H8 based upon the following indications: • IRPI for H8 indicating 0.0 • H8 rod bottom light lit • NIS/RPI ROD DROP ROD STOP alarm B 7/1 • S/D RODS OFF TOP/ROD DEV alarm B 9/3 • N41, N42, N43, N44 DROPPED ROD ROD STOP light illuminated
	US	Directs response per 3-ONOP-028.3
		NOTES • *Foldout page is required to be monitored throughout this procedure.* • *A redundant control rod position indicating system has been installed per TSA 08-002. The system provides equivalent RPI system indication for Control Bank B rods B10, K14, P6, K2, B6, F14, and P 10. If the operability of RPI indication for control rod B10, K14, P6, K2, B6, F14, or P10 is in question, the redundant indicating system may be used in lieu of the RPI indication in question.* • *All references in this procedure to the RPI indication for Control Bank B, other than for rod F-2, can be interpreted as either the console RPI indication or the redundant indication system installed by TSA 08-002, assuming the indication being referenced is operable.* • *The control rod bottom light is a function of the RPI circuit and not RPI indication. Because of this, the rod bottom light will function if using either the Control Bank B RPI indication or the redundant indication system installed by TSA 08-002.* • *Misaligned rods are addressed by 3-ONOP-028.1, RCC Misalignment.*

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

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3-ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Time	Position	Applicant's Actions or Behavior

FOLDOUT FOR PROCEDURE ONOP-028.3

Following is a list of applicable Technical Specification LCOs and procedure steps that verify compliance. These need to be reviewed by the Shift Manager to ensure compliance.

1. T.S. 3.1.1.1 - SHUTDOWN MARGIN
   - Covered in Steps 11 and 13
   - 1 hour to verify AND repeat every 12 hours.
2. T.S. 3.1.3.1 - GROUP ROD HEIGHT
   - Covered in Steps 1, 7, 8, 9, and 15, Attachment 1 Steps 3 and 13
   - 1 hour - to restore OR declare inoperable AND be less than 75% power,
     72 hours - to perform Flux Map, and
     5 days – to perform re-analysis of accidents.
   - If 2 Control Rods, 7 hours - to be in Hot Standby
   - If 2 or more Shutdown Rods are not fully withdrawn, apply Tech Spec 3.0.3.
   - If Rod Deviation Monitor is inoperable, compare RPIs to Step Counters every 4 hours.
3. T.S. 3.1.3.5 - SHUTDOWN ROD INSERTION LIMIT
   - Covered in Steps 7 and 9
   - 1 hour - to restore OR declare inoperable.
   - If 2 or more Shutdown Rods are not fully withdrawn, apply Tech Spec 3.0.3.
   - If Rod Deviation Monitor is inoperable, compare RPIs to Step Counters every 4 hours.
4. T.S. 3.1.3.6 - CONTROL ROD INSERTION LIMIT
   - Covered in Steps 8 and 9.
   - 2 hours - to restore OR to reduce power to within guidelines of COLR.
   - If Rod Deviation Monitor is inoperable, compare RPIs to Step Counters every 4 hours.
5. T.S. 3.2.1 - AXIAL FLUX DIFFERENCE
   - Covered in Steps 5 and 8.
   - 30 minutes to get power less than 50% AND the next 4 hours to set the NIS trip setpoint to 55%.
6. T.S. 3.2.4 - QUADRANT POWER TILT RATIO
   - Covered in Step 6.
   - 1 hour to perform AND required every hour thereafter while QPTR exceeds 2%.
   - If QPTR is greater than 9%, reduce power 3% for every 1% QPTR exceeds 1 within 30 minutes.
   - If QPTR is greater then 2%, reduce power 3% for every 1% QPTR exceeds 1 within 2 hours.
   - Reduce the NIS trip setpoints the same amount within the next 4 hours.

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

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Time	Position	Applicant's Actions or Behavior
	RO	Step 1 **Check Number Of RCCs DROPPED - More Than One** a. Check the following — a. Go to Step 2. * More than one rod bottom light - ON **OR** * More than one rod position indicator – AT ZERO b. Manually trip the Reactor and Turbine c. Go to 3-EOP-E-0, Reactor Trip or Safety Injection
	RO	Step 2 – Check reactor in Mode 1
	RO	Step 3 – Place rod motion control selector switch to MANUAL
		CAUTIONS • *Do NOT dilute the RCS while performing this procedure until the SHUTDOWN MARGIN calculation has been performed using 0-OP-028.2, SHUTDOWN MARGIN CALCULATION.* • *Do NOT increase reactor power while performing this procedure.* • *Do NOT use control rods for power or temperature adjustments until the cause of the dropped rod is identified and determined not to affect any other rods.*

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 4 of 8

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respondper 3-ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Time	Position	Applicant's Actions or Behavior
	RO	Step 4 - **Verify Automatic Controls Are Functioning To Stabilize The Unit AND No Transient Is In Progress** a. Tavg/Tref within 3°F b. PZR level/pressure trending to program c. S/G level trending to program a. Reduce turbine load to control temperature. b. Manually control systems to stabilize the unit. c. Manually control systems to stabilize the unit. ***Note: Turbine will be used to control RCS temperature***
	RO	Step 5 – **Check AFD Within RAOC** • G 5/1, AXIAL FLUX T.S. LIMIT EXCEEDED - OFF • At least 3 channels of AFD indicating within the RAOC limit as defined in the Plant Curve Book, Section 5, Figure 1 Within 30 minutes, reduce reactor power to less than 50% using 3-ONOP-100, FAST LOAD REDUCTION, while continuing with this procedure. ***Note: <50% there are no AFD restrictions, see next page for curve***
	BOP	Step 6 – **Initiate Hourly QPTR Determination Using 3-OSP-059.10, DETERMINATION OF QUADRANT POWER TILT RATIO Until Either QPTR Results Are Satisfactory OR Reactor Power Is Less Than 50%** ***Note: Reactor power is less than 50%***
	US	Step 7 - Declare the dropped RCC Inoperable
	BOP	Notifies Work Control of the failure of H8

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 5 of 8

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3-ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

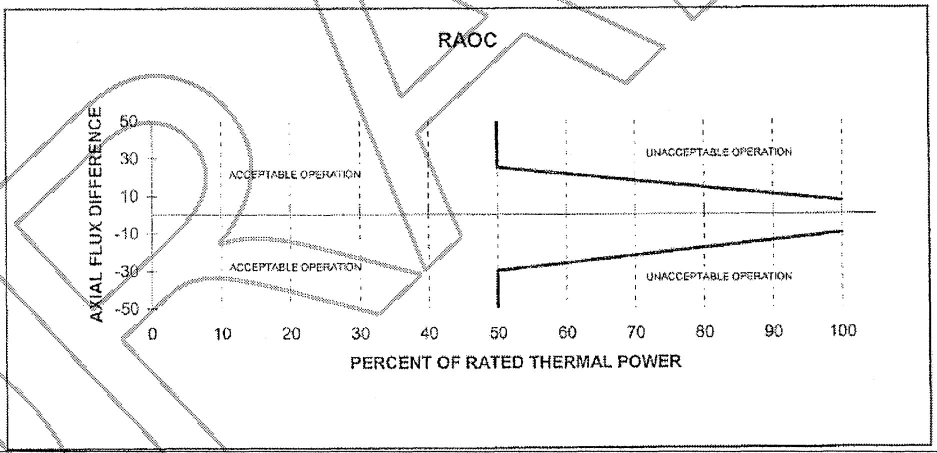
Time	Position	Applicant's Actions or Behavior

UNIT 3, CYCLE 23
ALLOWABLE FLUX DIFFERENCE

Section 5, Figure 1
21 Sep 2007
JCB

RAOC LIMITS DEFINED IN COLR		
POWER	POSITIVE LIMITS	NEGATIVE LIMITS
100	7	-10
50	25	-30

CALCULATED SLOPE AND INTERCEPT VALUES BASED ON RAOC LIMITS	
RAOC POSITIVE LIMIT	
SLOPE	-2.778
INTERCEPT	119.444
RAOC NEGATIVE LIMIT	
SLOPE	2.500
INTERCEPT	125.000



CALCULATED AFD LIMIT BASED ON POWER LIMIT
(POWER - INTERCEPT) / SLOPE

CALCULATED RAOC LIMITS		
POWER	POSITIVE LIMITS	NEGATIVE LIMITS
50	25	-30
55	23.2	-28
60	21.4	-26
65	19.6	-24
70	17.8	-22
75	16	-20
80	14.2	-18
85	12.4	-16
90	10.6	-14
95	8.8	-12
100	7	-10

REFERENCE:PC/M 07-019 Rev. 0

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 6 of 8

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3-ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Time	Position	Applicant's Actions or Behavior
	RO	Step 8 – **Reduce Reactor Power To Less Than 50% Within 1 Hour** a. Within one hour, reduce reactor power to less than 50% using 3-ONOP-100, FAST LOAD REDUCTION, while continuing with this procedure
	RO	Step 9 – **Check The Following:** - Rod Position and Insertion Monitors - Operable - Annunciator B 8/1, ROD BANK A/B/C/D LO LIMIT - Not Locked In - Annunciator B 9/3, SHUTDOWN ROD OFF TOP/DEVIATION - Not Locked In Compare RPIs to group step counters every 4 hours to comply with Technical Specification Surveillances 4.1.3.1.1 and 4.1.3.6.
	BOP	Step 10 – Notify Reactor Engineering of Dropped RCC
		NOTE *SHUTDOWN MARGIN shall be verified within 1 hour of a DROPPED RCC and every 12 hours thereafter.*

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 7 of 8

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 11 – **Verify Shutdown Margin Adequate** a. Check RCS boron concentration * Greater than or equal to pre-event value OR * Greater than the Minimum Shutdown Boron Versus RCS Temperature as a Function of Burnup Requirements in the Plant Curve Book, Section 3, Figure 5 b. Log SHUTDOWN MARGIN satisfied in the Unit Narrative Log a. Notify Reactor Engineering to evaluate SHUTDOWN MARGIN using 0-OP-028.2, SHUTDOWN MARGIN CALCULATION.
		Trigger lesson step **EVENT 3 – DROPPED CONTROL ROD H4** ***Note: Second dropped rod requires manual reactor trip revealing ATWS condition***
	RO	Recognizes/reports to US the Dropped Control Rod H4 based upon the following indications: • IRPI for H4 indicating 0.0 • H4 rod bottom light lit
	US	Returns to step 1

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

Event Description: Sequential drop of two control rods. Control Rod H8 will blow a stationary coil fuse dropping control rod H8. The crew will respond per 3ONOP-028.3. The second rod drop H4 requires the RO to manually trip the unit. The reactor trip switches on the console and VPB fail revealing an ATWS condition.

Time	Position	Applicant's Actions or Behavior
	RO	Check Number Of RCCs DROPPED - More Than One a. Check the following — a. Go to Step 2. * More than one rod bottom light - ON OR * More than one rod position indicator – AT ZERO b. Manually trip the Reactor and Turbine c. Go to 3-EOP-E-0, Reactor Trip or Safety Injection
	RO	Attempts to trip the reactor from the console and VPB ***Note: both switches fail to trip the unit***
	RO	Informs US of ATWS condition and performs IOAs of 3-EOP-E-0 and 3-EOP-FR-S.1

Note: See EVENT 4 for 3-EOP-E-0 and EOP-FR-S.1 actions

No brief should be conducted on the transition

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 1 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

	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 ***Note: verifies reactor is not tripped***
	RO	Step 1 RNO - 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. ***Note: Determines reactor power >5%, performs a and b substeps.***
	US	Directs response per 3-EOP-FR-S.1 ***Note: Crew may perform and early action for step 7.a NRO todirect a trip of the reactor locally*** ***Note: Adverse Containment conditions and SI may occur during 3-EOP-FR-S.1 response, crew should recognize both conditions as they occur***

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 2 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
	US	**CAUTION** *RCPs should not be tripped with reactor power GREATER THAN 5%.* NOTE *Steps 1 and 2 are IMMEDIATE ACTION steps.*
	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 Perform the following: **a. Manually trip reactor. b. IF reactor will NOT trip, THEN ensure control rod insertion in Auto or Manual.** ***Note: inserts control rods in manual*** ***Note: critical task - (TC-WOG/PRA) Failure to insert negative reactivity by driving rods in manual within one minute (or one minute after they stop moving in automatic) to drive the reactor subcritical. (FR-S.1, Task C)***
	BOP √	Step 2(IOA) – **Verify Turbine Trip** **a. All turbine stop valves - CLOSED** **a. Perform the following:** **1) Manually trip the turbine.** **2) IF turbine will NOT trip, THEN close main steamline isolation and bypass valves.** 3) Go to Step 3.
		Note: critical task - (TC-WOG/PRA) Failure to trip the Turbine prior to completing FR-S.1, step 2

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 3 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
		b. Verify Moisture Separator Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves b. Perform the following: 1) Manually close valves. 2) IF any MSR valve can NOT be closed, THEN close main steamline isolation and bypass valves. ***Note: Closing Reheater steam stop valves is bypassed on manual turbine trip***
Start Time _____	BOP √	Step-3 - Check AFW pumps – All Running ***Note: BOP opens MOV-1403, 1404, and 1405 to start AFW pumps*** **(TC-PRA) Failure to trip 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.**
	RO	Step 4 – Initiate Emergency Boration Of RCS a. Verify charging pumps – AT LEAST ONE RUNNING IN MANUAL b. Stop makeup system c. Manually start Boric Acid Pump 3A or 3B c. Align charging pump suction to the RWST as follows: 1) Hold closed LCV-3-115C control switch. 2) Direct an operator to open Breaker 30669 for LCV-3-115C. 3) WHEN 30669 is open, THEN release LCV-3-115C control switch. 4) Go to Step 4e. d. Open Emergency Boration Valve, MOV-3-350 d. Perform the following: 1) Open Boric Acid To Blender, FCV-3-113A.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 4 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior	
			2) Open Blender Flow To Charging Pump, FCV-3-113B. 3) Locally open Manual Emergency Boration Valve, 3-356. 4) WHEN Manual Emergency Boration Valve, 3-356, is open, THEN close Blender To Charging Pump, FCV-3-113B. 5) Continue with Step 4e.
		e. Open Charging Flow To Regen Heat Exchanger, HCV-3-121	
		f. Verify Loop A Charging Isolation, CV-3-310A – OPEN	Open Loop C Charging Isolation, CV-3-310B.
		g. Establish emergency boration flow • FI-3-110 – GREATER THAN 60 GPM • FI-3-122A – GREATER THAN 45	Start additional charging pumps AND align valves as necessary to establish emergency boration flow.
	RO	Step 5 – Check PRZ Pressure - LESS THAN 2335 PSIG	Perform the following: a. Verify PRZ PORVs and block valves open. b. IF PRZ PORVs and block valves are NOT open, THEN open PRZ PORVs and block valves until PRZ pressure less than 2135 psig.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 5 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 6 – Verify Containment Ventilation – ISOLATED a. Verify Unit 3 containment purge exhaust and supply fans – OFF	
		b. Verify Containment Purge Supply and Exhaust Isolation valves – CLOSED	b. IF any purge valve can NOT be closed, THEN pull fuse(s) for any open purge valve(s) from behind VPB:
		• POV-3-2600 • POV-3-2601 • POV-3-2602 • POV-3-2603	• XEP for POV-3-2600 • XLAG for POV-3-2601 • XEQ for POV-3-2602 • XLAH for POV-3-2603
		c. Verify Containment Instrument Air Bleed Isolation valves - CLOSED • CV-3-2819 • CV-3-2826	c. IF neither valve can be closed, THEN locally close Containment Air Bleed to Purge Air Return Line Isolation, MPAS-3-005.
		CAUTION *If an SI signal exists or occurs and the reactor is subcritical, proper safeguards equipment alignment is required to be verified using Attachment 3 of 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure.*	
		Note: CV-3-2819 and CV-3-2826 will be closed by the RO on VPB	

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 6 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 7 – ***Note: 7.a may have been performed as an early action***	
		Check If The Following Trips Have Occurred	
		a. Reactor trip	a. In 3B MCC room, locally trip reactor as follows: • Open 3A and 3B Reactor Trip Breakers. • Open 3A and 3B Reactor Trip Bypass Breakers. • Open A/B MG set generator output breakers. • Open A/B MG set motor input breakers.
		b. Turbine trip	b. Locally trip turbine at turbine front standard.
		c. Mid and East GCBs – OPEN (Normally 30 seconds delay)	c. Perform the following: 1) Manually open breakers. 2) IF breakers do NOT open THEN actuate Emergency Gen Bkr Trip Switch for the affected breaker(s). 3) IF breaker position indication is NOT available AND turbine speed is NOT decreasing, THEN direct Field Operator to perform the following: a) Obtain key 17 from the Shift Manager key locker. b) Locally trip Mid and East GCBs from the switchyard. • 8W33 • 8W68

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 7 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
		NOTE *When adverse containment conditions exist, Gamma-Metrics indication needs to be used.*
	RO	Step 8 – Monitor Reactor Subcritical a. Power range channels – LESS THAN 5% — a. Observe Caution prior to Step 9 and go to Step 9. b. Intermediate range channels – NEGATIVE STARTUP RATE — b. Observe Caution prior to Step 9 and go to Step 9. c. Observe Caution prior to Step 17 and go to Step 17
		Note: If early action taken to trip reactor, transition tostep 17 may be made here
		CAUTION *If CST level decreases to less than 10%, makeup water sources for CST will be necessary to maintain secondary heat sink.*

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 8 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 9 Monitor S/G Levels a. Narrow range level in at least one S/G – GREATER THAN 6%[32%] a. Perform the following: 1) Establish total feedwater flow greater than 750 gpm. 2) IF feed flow NOT greater than 750 gpm, THEN manually start pumps and align valves to establish greater than 750 gpm. 3) Maintain total feedwater flow greater than 750 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%
		Note: Bop should stop feeding SGs to keep in band, may require SI reset and securing one pump.
	RO	Step 10 Verify All Dilution Paths – ISOLATED a. Check FR-3-113 - NO PRIMARY WATER FLOW a. Perform the following: 1) Close Demin Water To Blender, FCV-3-114A.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 9 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior		
				2) Locally close the following valves: • Primary Water To Chemical Addition Tank 3-359A • Primary Water From Chemical Addition Tank 3-272 • Manual Dilution Valve, 3-353A
	RO	Step 11	Check For Reactivity Insertion From Uncontrolled RCS Cooldown	Perform the following:
				a. Stop any controlled cooldown.
			* RCS temperatures – DECREASING IN AN UNCONTROLLED MANNER OR * Any S/G pressure – DECREASING IN AN UNCONTROLLED MANNER	b. Go to Step 15.
	BOP	Step 12	Check Main Steamline Isolation AND Bypass Valves - CLOSED	Manually close valves.
	BOP	Step 13	Identify Faulted S/G(s)	
			a. Check pressures in all S/Gs	a. Go to Step 15.
			* ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR * ANY S/G COMPLETELY DEPRESSURIZED	

Note: RNO transitions to step 15

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 10 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
		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 15 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.
	RO	Step 16 Verify Reactor Subcritical a. Power range channels – LESS THAN 5% b. Intermediate range channels - NEGATIVE STARTUP RATE Perform the following: 1) Continue to borate. 2) IF boration NOT available, THEN allow RCS to heat up. 3) Perform actions of other Function Restoration Procedures in effect which do NOT cool down or otherwise add positive reactivity to the core. 4) Return to Step 4.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 11 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior	
		CAUTION *Boration should continue during subsequent actions until adequate shutdown margin is obtained.*	
	US	Step 17 -Return to procedure and step in effect	
		Note: Transition is made back to 3-EOP-E-0 step 2.	
	BOP	Step 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).

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 4 Page 12 of 30

Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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 to3-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: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
	RO	Step 4 Check If SI Is Actuated * SI Annunciators - ANY ON OR * Safeguards equipment – AUTO STARTED
		Note: Safety Injection should have actuated due to SBLOCA, 3C RCP seal failure
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
		Note: If subcooling is lost , RCPs should be secured
	BOP	Step 5 Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure
Note: BOP will perform 3-EOP-E-0 attachment 3 while the RO continues in procedure. Now that IOAs are complete, 3C RCP should be secured, CV-3-303C closed, and PCV-3-455A placed in manual and closed.		
Attachment 3 actions listed here, skip to page23 of event 4 to continue with procedure		
	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.

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior	
	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 • 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.
	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).

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior	
	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.
	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.

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior	
		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.
	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).

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
	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.
		Note: BOP determines RCS pressure >650psig. Step 8.c RNO directs to step 9.
	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
		Note: BOP should recognize A train SI failure if not already corrected and initiate train A SI allowing unit 4 pumps to be secured

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
		Note: Step 10 is a critical step: (WOG) Failure to close containment isolation valve(s) so that least one isolation valve in each critical phase A penetration (flow path exists for unisolated leakage from the RCS to containment then to atmosphere) prior to the end of the scenario.(E-0, task O).
	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.**
		Note: BOP should identify CV-3-6275B, SG B Blowdown isolation not closed and manually close valve on VPB
	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

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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 • MOV-3-1417 • MOV-3-1418	b. Stop all RCPs
		c. Reset and start normal containment coolers	c. Stop all RCPs
		Note: If subcooling was lost to RCPs all will be secured, if running cooling will be restored	
	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.

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
		4) IF any Containment Isolation Phase B valve did NOT close, THEN manually or locally isolate affected containment penetration. 5) Stop all RCPs.
	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
		Note: BOP will call NSO to align PAHM
	BOP	Step 18. Verify All Four EDGs – RUNNING — EMERGENCY START any available EDG NOT running.

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automaticallyactuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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
		Note: BOP informs US of completion , manual train A SI actuation, and CV-3-6275B closure ***Note: BOP should receive a turnover from the RO and continue in the EOP network.***

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Event Description The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
		Note: US and RO continue in 3-EOP-E-0 at step 6
	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.**
		Note: Pumps were started in 3-EOP-FR-S.1 STEP 3
	RO √	Step 7 **Verify AFW Valve Alignment- PROPER EMERGENCY ALIGNMENT** **Manually align valves to establish proper AFW alignment.**
		Note: Steps 6, 7, and 8 are critical steps: (WOG) Failure to establish minimum AFW flow before transitioning out of E-0. (E-0, task F).

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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	
		Note: Step 9.b transitions to step 10	

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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.
		Note: RCS continues to Cooldown due to SI flow

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiing manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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
		Note: RCPs may be secured based on subcooling

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

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 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	a. Go to Step 14.
		Note: 13.a RNO sends you to step 14	
	RO	Step 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	a. Go to Step 15.

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Event Description: The crew will respond to the ATWS per 3-EOP-E-0 and 3-EOP-FR-S.1. 3C RCP continues to degrade resulting in seal package failure (SBLOCA). Train A safety injection fails to automatically actuate requiring manual actuation. CV-6275B, SG B Blowdown isolation, fails to close on Phase A requiring manual operation from VPB.

Time	Position	Applicant's Actions or Behavior
		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
	RO	Step 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.
		Note: RNO transitions to 3-EOP-E-1 Loss of reactor or secondary coolant. A crew brief should be conducted at the transition

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Event Description: The crew responds to the small break LOCA per 3EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	All	***NOTE*** *Foldout page is required to be monitored throughout this procedure*

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 S/G - 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.

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 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	
	BOP	Step 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	Step 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	

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
		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	Step 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.
		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.*	

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 5 Check PRZ PORVs AND Block Valves	
		a. Power to block valves - AVAILABLE	a. Restore power to block valves
		b. PORVs - CLOSED	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. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.
	RO	Step 6 Verify SI - RESET	
	RO	Step 7 Reset Containment Isolation Phase A and Phase B	
	BOP	Step 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.

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	BOP	Step 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	Step 10 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 to establish SI Termination conditions c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow
		Note: RO performs attachment 4 next page ***Note: Containment penetration fire alarm will sound due to temperatures in containment. Crew will silence the alarm.***

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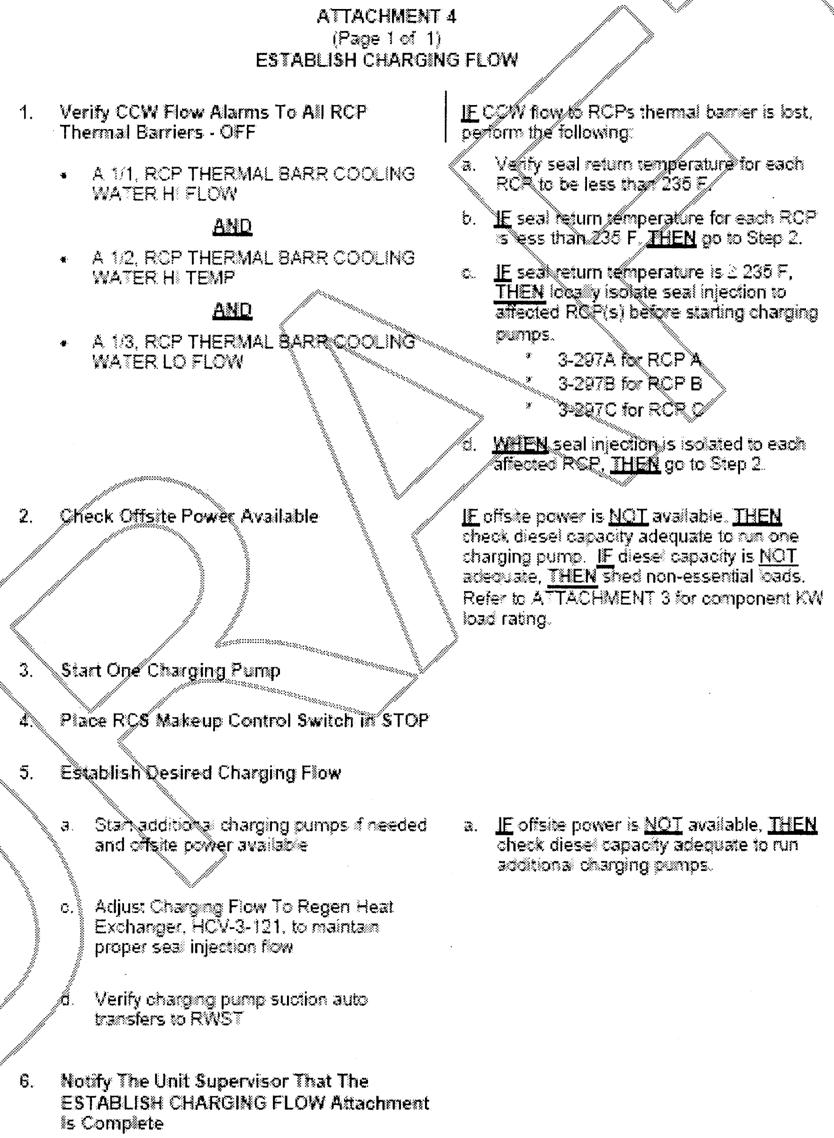
Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	RO	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
		Note: RO starts A and/or B charging pump

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	RO	Step 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 — b. IF neither condition satisfied, THEN go to Step 12. * 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%] c. RCS pressure • Pressure - GREATER THAN 1600 PSIG[2000 PSIG] — c. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 12. • Pressure - STABLE OR INCREASING d. PRZ level - GREATER THAN 17%[50%] e. Go to 3-EOP-ES-1.1, SI TERMINATION, Step 1
		Note: RCS pressure <2000 psig, directs to step 12

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	RO	Step 12 Check If Containment Spray Should Be Stopped a. Containment spray pumps – ANY RUNNING a. Observe CAUTION prior to Step 13 AND go to Step 13. b. Check the following • Emergency Containment Filter Spray Valves – CLOSED • 3A ECF Spray SV-3-2905, 2906 • 3B ECF Spray SV-3-2907, 2908 • 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 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. 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
		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.*

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 13 Check If RHR Pumps Should Be Stopped	
		a. Check RCS pressure - GREATER THAN 250 PSIG [650 PSIG]	a. IF RHR Flow greater than 1000 gpm, THEN go to Step 15.
		b. Check RHR flow – LESS THAN 1000 gpm	b. Go to Step 14.
		c. Verify SI - RESET	
		d. Stop RHR pumps AND place in standby	
		Note: RHR pumps are stopped	
	BOP	Step 14 Check RCS And S/G Pressures	Observe NOTE prior to Step 1 AND return to Step 1.
		• Check pressure in all S/Gs - STABLE OR INCREASING	
		• Check RCS pressure - STABLE OR DECREASING	
		Note: RCS pressure should be stable	
	BOP	Step 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.

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
		a) Check diesel capacity adequate to run one train of chilled water for computer room. IF adequate diesel capacity is NOT available, 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: 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
		Note: EDGs are secure per 3-OP-023 see next page

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Event Description: The crew responds to the small break LOCA per 3EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	BOP	3-OP-023 6.1.2 Procedure Steps 1. Direct an operator to go to 3A Diesel Generator Engine Control Panel 3C13A. a. Establish communication between the Control Room and the Unit 3 Diesel Generator Building.
		3. Place the A Diesel Generator Normal Stop/Normal Start switch in the NORMAL STOP position (spring return to normal). a. Verify the DG3A Engine Idling AMBER light is ON. b. As 3A Diesel Generator decelerates, verify the DG3A Ready to Start RED light energizes.
		6.2.2 Procedure Steps 1. Direct an operator to go to 3B Diesel Generator Engine Control Panel 3C13B. a. Establish communication between the Control Room and the Diesel Generator Building.
		3. Place the B Diesel Generator Normal Stop/Normal Start switch in the NORMAL STOP position (spring return to normal). a. Verify the DG3B Engine Idling AMBER light is ON. b. As 3B Diesel Generator decelerates, verify the DG3B Ready to Start RED light energizes.

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	RO	Step 16 Verify Cold Leg Recirculation Capability a. Verify at least one RHR pump - AVAILABLE FOR RECIRCULATION IF cold leg recirculation capability can NOT be verified, THEN go to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1. 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
	BOP	Step 17 Locally Verify Radiation Shield Doors - CLOSED • Containment spray pump room • Charging pump room
		Note: calls SNPO to verify doors closed

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
	BOP	Step 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. components.
		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	

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	RO	Step 19 Check If RCS Cooldown And Depressurization Is Required a. RCS pressure - GREATER THAN 250 PSIG[650 PSIG] 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 -EOP-ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1. b. Go to 3-EOP-ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1
	US	***Note: Transition is made to 3-EOP-ES-1.2.*** ***A crew brief should be conducted on the transition***
		CAUTIONS • *If RWST level decreases to less than 155,000 gallons, the SI System is required to be aligned for cold leg recirculation using 3-EOP-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.* • *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.* • *CCW System load requirements of 3-OP-030, COMPONENT COOLING WATER SYSTEM, SHALL NOT be exceeded.*

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Event Description: The crew responds to the small break LOCA per 3EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior
	US	**NOTE** *Foldout page is required to be monitored throughout this procedure.*
	US	**FOLDOUT FOR PROCEDURE ES-1.2** 1. **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[210°F] b. Total feed flow to intact SGs - GREATER THAN 345 GPM **OR** narrow range level in at least one intact S/G - GREATER THAN 6%[32%] c. RCS pressure - GREATER THAN 1600 PSIG[2000 psig] **AND** STABLE OR INCREASING d. PRZ level - GREATER THAN 17%[50%] 2. **SI RE-INITIATION CRITERIA** **IF** either condition listed below occurs, **THEN** manually start SI pumps as necessary to restore RCS subcooling and PRZ level: * RCS subcooling based on core exit TCs - LESS THAN 30°F[210°F] **OR** * PRZ level – CAN **NOT** BE MAINTAINED GREATER THAN 17%[50%] 3. **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. 4. **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 and go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1. 5. **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. 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. 7. **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 2 for essential loads. 8. **RED PATH SUMMARY** **IF** any condition listed below occurs, **THEN** go to 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES, Step 1: a. Subcriticality: Nuclear power - GREATER THAN 5% b. Core Cooling: Core exit TCs - GREATER THAN 1200°F c. Heat Sink: Narrow range level in all S/Gs - LESS THAN 6%[32%] **AND** total feedwater flow - LESS THAN 345 GPM d. Integrity: Cold leg temperature decrease - GREATER THAN 100°F IN LAST 60 MINUTES **AND** any RCS cold leg temperature - HAS BEEN LESS THAN 290°F e. Containment: Containment pressure - GREATER THAN 55 PSIG 9. **ADVERSE CONTAINMENT CONDITIONS** Adverse containment conditions are defined as either a containment atmosphere temperature greater than or equal to 180°F **OR** containment radiation levels greater than or equal to 1.3x10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used. **IF** containment temperature subsequently falls below 180°F, **THEN** normal setpoint values may be used. **IF** containment radiation level subsequently falls below 1.3x10^5 R/hr **AND** TSC staff has determined that the integrated dose to containment is less than 10^6 Rads, **THEN** normal setpoint values may be used.

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Event Description: The crew responds to the small break LOCA per 3EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 1 Check If RHR Pumps Should Be Stopped	
		a. Check RHR pumps - ANY RUNNING	a. Go to Step 2.
		b. Check RCS pressure - GREATER THAN 250 PSIG [650 PSIG]	b. IF RHR Flow greater than 1000 gpm, THEN go to Step 2
		c. Check RHR flow – LESS THAN 1000 gpm	c. Go to Step 2.
		d. Stop RHR pumps AND place in Standby	
	BOP	Step 2 Verify All 4KV Buses – ENERGIZED BY OFFSITE POWER	Perform the following:
		▪ A 4KV bus B 4KV bus	a. Direct System Dispatcher to restore offsite power to Unit 3 startup transformer AND 3C transformer.
		▪ D 4KV bus C 4KV bus	b. 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.
			c. Check diesel capacity adequate to run charging pumps. IF adequate diesel capacity is NOT available, THEN shed non-essential loads. Refer to ATTACHMENT 2 for component KW load rating.
			d. Continue with Step 3.

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Event Description: The crew responds to the small break LOCAper 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
	RO	Step 3 Verify PRZ Backup Group Heater Lockouts - RESET	
		a. Verify the A 4KV bus - ENERGIZED	a. WHEN the A 4KV bus is reenergized, THEN do Steps 3b through 3d. Continue with Step 3e.
		b. Verify SI - RESET	
		c. Place group A PRZ Backup Group Heater control switch in OFF	
		d. Direct operator to perform the following	
		1) Proceed to Unit 3 West Electrical Penetration Room	
		2) Reset group A Backup PRZ Heater Lockout Relay	
		e. Verify group B PZR backup group heaters - RESET	e. Perform the following: 1) Place group B PRZ Backup Group Heater control switch in OFF. 2) Direct operator to perform the following: a) Obtain key 29 from Shift Manager key locker. b) Proceed to 3D Load Center Room.
		• The B 4KV bus – ENERGIZED FROM STARTUP TRANSFORMER	
		• SI – RESET	
		f. Check the A and B 4KV bus - BOTH ENERGIZED BY OFFSITE POWER	f. c) Place PRZ Backup Heater 3B Key Switch to EMERGENCY. Check diesel capacity adequate to energize group A and B PRZ heaters (450 KW

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Event Description: The crew responds to the small break LOCA per 3-EOP-E-1 Loss of Reactor or Secondary Coolant and 3-EOP-ES-1.2 POST LOCA Cooldown and Depressurization.

Time	Position	Applicant's Actions or Behavior	
		Note: Following direction to the NSO to reset pressurizer heaters, inform the crew you now have the shift, remain in place and not to discuss the 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:	60		Power:	100
MWe:	420		MWe:	756
Gross Leakrate:	.02		Gross Leakrate:	.02
RCS Boron Conc:	794		RCS Boron Conc:	128

Operational Concerns:

Thunder storms reported in the area

U3 Anticipated LCO Actions:

U4 Anticipated LCO Actions:

Results of Offgoing Focus Area:

Unit 3 Status

Reactor Operator

Mode:	1
Power:	60 %
MWe:	420
Tavg:	561.5°F
RCS Pressure:	2251 psig
RCS Boron Conc:	794 ppm

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

Accumulator Ref Levels	
A	6615 gal
B	6637 gal
C	6625 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:

3C charging pumps out of service – packing leakage – scheduled return in 14 hours.

General Information, Remarks, and Operator Work Around Status:

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

Facility: Turkey Point Scenario No.: 2 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 (T.S,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
2	TFB1LTLV = T	(I)RO (TS,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 and Tech Spec 3.1.2.1 and 3.1.2.2.
3	TFKCSMB = T	(C) SRO / BOP	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.
4		(R)RO (N)BOP (TS,R)SRO	OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-ONOP-100 to reduce power to 30%.
5	TFF1MABH = T	(I)BOP (TS,I)SRO	After 5 to 10% power change, LT-3-488 S/G B controlling level channel fails high requiring manual control of FC-488 S/G B feed regulating valve (FRV) per the prompt actions of annunciator alarm C 6/2, SG B LEVEL DEVIATION. The crew refers to 3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels.

6	TFP8SWYD = T TFQ5GAFS = T TFQ5B20A = T TFG1B86S = T	(M)ALL (C)BOP (C)BOP (C)SRO (C)SRO	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 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. Transition is made to 3-EOP-ECA-0.2 following power restoration.

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

Turkey Point 2009-301 Scenario #2

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

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 and Tech Spec 3.1.2.1 and 3.1.2.2.

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.

Event 4 - OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-ONOP-100 to reduce power to 30%.

Event 5 – After 5 to 10% power change, LT-3-488 S/G B controlling level channel fails high requiring manual control of FC-488 S/G B feed regulating valve (FRV) per the prompt actions of annunciator alarm C 6/2, SG B LEVEL DEVIATION. The crew refers to 3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels.

Event 6 – 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 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. Transition is made to 3-EOP-ECA-0.2 following power restoration.

Scenario XXIV NRC 2

Simulator Operating Instructions

Setup

IC-2 (50% 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 (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

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 4 minutes inform 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

When directed - 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.

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

OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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 and are now OOS. You have validated their data and you want the crew to confirm the requirements of Tech. Specs and reduce reactor power to 30% using 3-ONOP-100 at a 2%/min rate as soon as possible.

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

3-ONOP-100

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 – LT-3-488 FAILS HIGH

LT-3-488 S/G B controlling level channel fails high requiring manual control of FC-488 S/G B feed regulating valve (FRV) per the prompt actions of annunciator alarm C 6/2, SG B LEVEL DEVIATION. The crew refers to 3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels.

When directed - Trigger lesson step **EVENT 5 – LT-3-488 FAIL HIGH** (actuates TFF1MMABH = T)

If a unit trip is required during response to LT-3-488 failure, the crew will transition to 3-EOP-E-0, continue at EVENT 6

The Crew responds per 3-ONOP-049.1, Deviation or Failure of Safety Related of Reactor Protection Channels.

Event 6 – 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 6 – LOSS OF ALL AC**(actuates TFP8SWYD = T, TFQ5GAFS = T, TFQ5B20A = T, TFG1B86S = 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 6 – 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.

b. following permission, **TRIGGER** lesson step **EVENT 6 – 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 6 – 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 6 – 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

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 6 – 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.: 2 Event No.: 1 Page 1 of 9

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

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.
		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.: 2 Event No.: 1 Page 2 of 9

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

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 <u>AND</u> level controls using Attachment 4. 3. <u>IF</u> a Reactor Trip has occurred, <u>THEN</u> 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 <u>4P06A</u> Vital Instrument AC Selector Switch in the Cable Spreading Room. 4. <u>IF</u> 4P06 is powered by the CS Inverter, <u>THEN</u> notify the Nuclear Plant Supervisor. ***CAUTION*** *DO NOT proceed with this procedure if 4P06 is powered by the CS Inverter.* 5. <u>IF</u> 4P06 is <u>NOT</u> powered from CS Inverter, <u>THEN</u> place SPARE inverter CS in service to supply 3P06 Vital Instrument AC Bus load as follows: a. At Vital Instrument Panel <u>3P06A</u> 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.: 2 Event No.: 1 Page 3 of 9

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

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.: 2 Event No.: 1 Page 4 of 9

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

Time	Position	Applicant's Actions or Behavior

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.: 2 Event No.: 1 Page 5 of 9

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

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.: 2 Event No.: 1 Page 6 of 9

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

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

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 1 Page 7 of 9

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

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.: 2 Event No.: 1 Page 8 of 9

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

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. <u>IF</u> power can <u>NOT</u> be restored to 3P06 within 1 hour, <u>THEN</u> perform the actions required by Technical Specifications as directed by the NPS. c. Return to Step 1.
		Note: Steps 1 thru 7 will be reviewed until power is restored.
		<u>CAUTION</u> ***Auto/Manual controllers should NOT be returned to AUTO until vital power has been completely restored.*** *<u>NOTE</u>* *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.*

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

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

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 d. Verify all annunciators indicate correctly for the current plant status c. <u>IF</u> AUTOMATIC control is <u>NOT</u> available <u>OR</u> desired, <u>THEN</u> maintain controls in MANUAL. 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**
		Note: Following restoration of all controllers to automatic, event 2 may be initiated.

Op-Test No.: 2009-301 Scenario No.: 2 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

Time	Position	Applicant's Actions or Behavior
		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
		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.: 2 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

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.
		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. ***Note: May direct SNPO to check LT-3-112 local indication***
	US	Refers to T.S 3.1.2.1.and 3.1.2.2
		Note: T.S. listed below for reference

Op-Test No.: 2009-301 Scenario No.: 2 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

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.: 2 Event No.: 2 Page 4 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

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.: 2 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

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.
		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 • LI-3-115 - ABNORMALLY HIGH • LI-3-112 - DECREASING DUE TO FULL DIVERT OF LCV-3-115A Go to Step 31.
		Note: transitions to step 31
	RO	Step 31 Check for LI-3-115 Failing Or Failed Low • LI-3-115 - ABNORMALLY LOW • LI-3-112 - INCREASING DUE TO AUTO MAKEUP OR STABLE DUE TO LCV-3-115A DIVERTING Go to Step 34.

Op-Test No.: 2009-301 Scenario No.: 2 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

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
		Note: Informs WCC and SM of failure ofLT-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.: 2 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 and Tech Spec 3.1.2.1 and 3.1.2.2.

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.: 2 Event No.: 3 Page 1 of 10

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
		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.
		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. ***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.: 2 Event No.: 3 Page 2 of 10

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 ICW Pump Start (System in Operation)

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.

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

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 Go to 3-ONOP-011, SCREEN WASH SYSTEM/INTAKE MALFUNCTION • Alarm I 3/3, Traveling Screen HI ΔP - OFF • Traveling Screen DP - LESS THAN 7.5 INCHES OF WATER

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 4 of 10

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.: 2 Event No.: 3 Page 5 of 10

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.
		Note: BOP starts 3A ICW PP and secures 3B ICW PP

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

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: a. Check alarm I 4/4, ICW HEADER A/B LO PRESS - OFF b. Check Intake Cooling Water Header Pressure - GREATER THAN 10 PSIG • PI-3-1619 • PI-3-1620 Perform the following: 1. Dispatch operator to investigate for intake cooling water system leakage. 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.: 2 Event No.: 3 Page 7 of 10

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.: 2 Event No.: 3 Page 8 of 10

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.: 2 Event No.: 3 Page 9 of 10

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.

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

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

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

Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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

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.: 2 Event No.: 4 Page 2 of 9

Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior

TABLE 3.7-2

STEAM LINE SAFETY VALVES PER LOOP

	VALVE NUMBER			LIFT SETTING (±3%)* **	ORIFICE SIZE SQUARE INCHES
	Loop A	Loop B	Loop C		
1.	RV1400	RV1405	RV1410	1085 psig	16
2.	RV1401	RV1406	RV1411	1100 psig	16
3.	RV1402	RV1407	RV1412	1115 psig	16
4.	RV1403	RV1408	RV1413	1130 psig	16

---

*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.

Time	Position	Applicant's Actions or Behavior
	US	Directs response per 3-ONOP-100
	US	Step 1 Brief Control Room Personnel Using Attachment 3
		Note: A 2%/min rate should be used as directed by the Operations Manager. 9 gallons per % shoud 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.

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

Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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

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Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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
		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.

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Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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.
		Note: After a 5 to 10 % reduction in load go event5
	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.

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Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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
		Note: Respond as SM to refer to proceduresif 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.

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Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-ONOP-100 to reduce power to 30%.

Time	Position	Applicant's Actions or Behavior
	RO	Step 8 Energize Pressurizer Backup Heaters
		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: 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.
		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.

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Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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
		Note: may secure 3A heater drain pump and 3B condensate pump

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Event Description: OOS main steam code safety valves, RV-1400 and RV-1401 require the crew to reduce power to below 33% to comply with T.S. 3.7.1.1. The crew will be given the OOS information, asked to validate the T.S. call and use 0-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.
		Note: Event 4 is terminated with the initiation of event5 following 5-10% load change.

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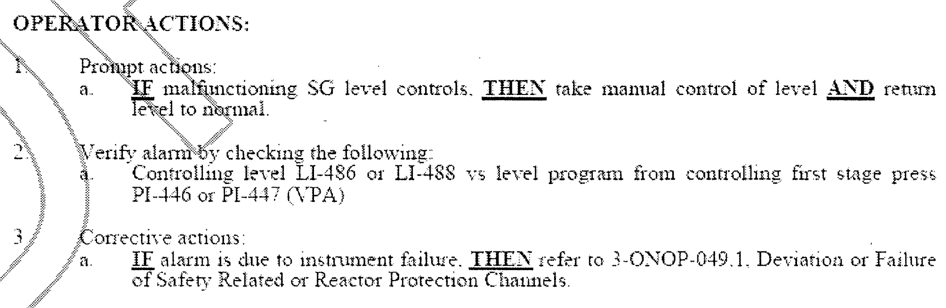
Event Description: LT-3-488 S/G B controlling level channel fails high requiring manual control of FC-488 S/G B feed regulating valve (FRV) per the prompt actions of annunciator alarm C 6/2, SG B LEVEL DEVIATION. The crew refers to 3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step **EVENT 5 – LT-3-488 FAIL HIGH**
	BOP	Recognizes and reports the failure of LT-3-488 to US
		Note: BOP determines failure based upon the following indications: ▪ ***LT-3-488 pegged high on VPA*** ▪ ***SG B level deviation alarm C 6/2*** ▪ ***FC-488, SG B FRV throttling closed*** ▪ ***Lowering level in SG B*** ***Note: If unit trip occurs during attempt to restore SG B level transition to EVENT 6.***
	BOP	With US concurrence, takes manual control of FC-488 to control SG B level on program.
		 **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. Controlling level LI-486 or LI-488 vs level program from controlling first stage press PI-446 or PI-447 (VPA) 3. Corrective actions: 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.
	US	Directs turbine load reduction stopped and response per 3-ONOP-049.1

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

Event Description: LT-3-488 S/G B controlling level channel fails high requiring manual control of FC-488 S/G B feed regulating valve (FRV) per the prompt actions of annunciator alarm C 6/2, SG B LEVEL DEVIATION. The crew refers to 3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels

Time	Position	Applicant's Actions or Behavior
		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 ir service.
	BOP	Step 5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
		Note: BOP transfers 3B SG LVL CONT XFER switch to chan III LT-486.
	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.

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

Event Description: LT-3-488 S/G B controlling level channel fails high requiring manual control of FC-488 S/G B feed regulating valve (FRV) per the prompt actions of annunciator alarm C 6/2, SG B LEVEL DEVIATION. The crew refers to 3-ONOP-049.1 Deviation or Failure of Safety Related or Reactor Protection Channels

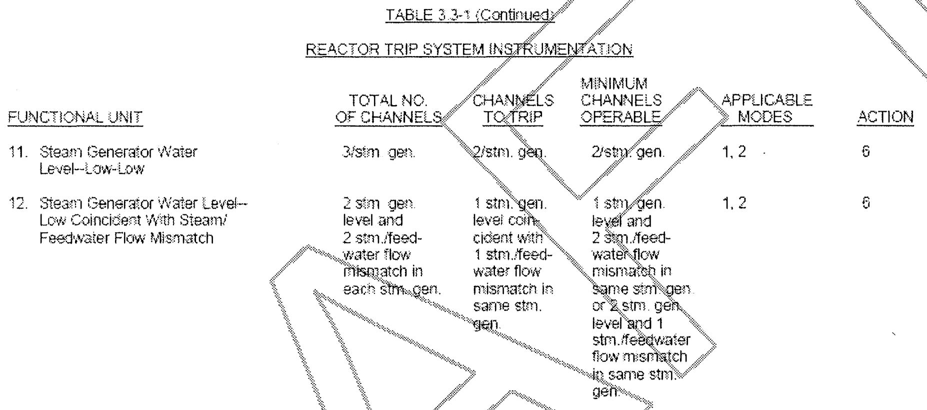
Time	Position	Applicant's Actions or Behavior
	US	

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 coincident 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

Time	Position	Applicant's Actions or Behavior
		Note: US determines min channels required are met
	BOP	Step 5.15 IF any Feedwater Control Valve is in Manual control due to this failure, THEN load (MWe) should be maintained as steady as possible until all Feedwater Control Valves are restored to Automatic control.
	US	Step 5.16 Initiate a Plant Work Order AND notify the I&C Supervisor.
		Note: When S/G B FRV returned to automaticand T.S. referenced, Event 6 can be triggered.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 1 of 40

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
_____ AFW Start time	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).

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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 (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.
		Note: Emergency start will be unsuccessfulA and B EDGs are locked out, 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.: 2 Event No.: 6 Page 3 of 40

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
		Note: MSIVs may be closed in step 2.b.

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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 3 Check If RCS Is Isolated a. PRZ PORVs – CLOSED b. Letdown isolation valves - CLOSED c. 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	a. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. b. Manually close valves. c. Manually close valves.
		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.

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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
		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.
______ AFW stop time		***Note: Critical task: (TC-PRA) Failure to trip 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. Also critical in other applied scenarios when one hour limit is exceeded***
		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.*

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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 • *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	
		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.	

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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	**ATTACHMENT 1** (Page 1 of 1) **3A 4KV BUS STRIPPING** 1. IF 3A 4KV Bus is de-energized AND 3D 4KV Bus is aligned to 3A 4KV Bus, THEN verify the Station Blackout Tie Permissive Blue light is ON AND 4AD07 OPEN. 2. IF 3A 4KV Bus is de-energized AND 3D 4KV Bus is NOT aligned to 3A 4KV Bus OR Station Blackout Tie Permissive Blue Light is OFF, THEN 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. IF Supply From 4KV Bus 3A, 3AD01, is open, THEN verify Feeder To 4KV Bus 3D, 3AA17, is open. 4. IF Supply From 4KV Bus 3A, 3AD01, 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 Pum 3C, 3AD04, can NOT be opened, THEN open Feeder To 4KV Bus 3D, 3AA17, AND Supply From 4KV-Bus 3A, 3AD01. 5. Notify Unit 3 Reactor Operator that 3A 4KV bus stripping is complete.
		Note: BOP will perform theverifications 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.

Time	Position	Applicant's Actions or Behavior
	BOP	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 • 3AB15, 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.
		Note: BOP will perform the verifications of steps 1 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.

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.
		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.
		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 * Emergency start OR * Rapid start OR * Normal start	a. Go to Step 9.
		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.
		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.
		Note: 3B EDG breaker will not close from the consoleand operator will be sent to the EDG to trylocally. Operator will report back breaker will not close locallyafter 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
		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 22 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
		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.
		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.
____ Start time	√	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.*
		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.

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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.
		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.*
		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
	BOP	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)
________ ________ Time bus restored	BOP √	Step 15 Verify 3A 4KV bus energized ***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
		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
		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
		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
		Note: CCW to unit 4 SI pumps is alignedto unit 4. ***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 √	**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**
		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.

<table>
<tr><th>Time</th><th>Position</th><th colspan="2">Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>RO</td><td colspan="2">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</td></tr>
<tr><td></td><td></td><td colspan="2">CAUTION
<i>If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heat sink.</i></td></tr>
<tr><td></td><td>RO</td><td>Step
16 Maintain Intact S/G Levels
a. Narrow range level – GREATER THAN 6%[32%]
b. Control AFW flow to maintain narrow range level between 15%[32%] and 50%
c. Narrow range level - LESS THAN 50%</td><td>a. Maintain maximum AFW flow until narrow range level greater than 6%[32%] in at least one S/G.
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.</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
	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
		Note: Attachment 3 listed next for reference.Only step 3 currently applies. No communication will be given back during scenario.

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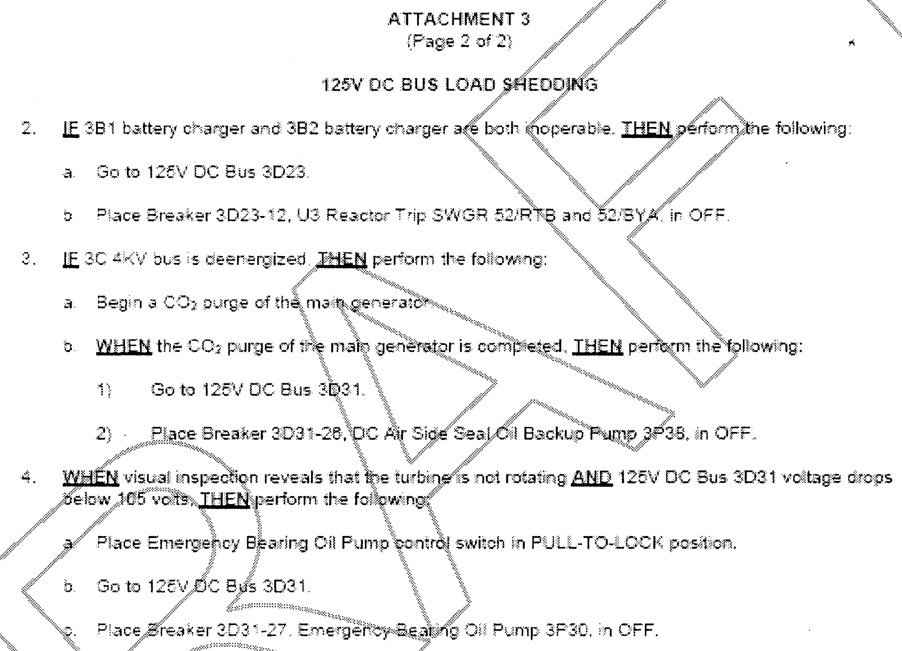
Event Description: A lightning strike causes a spurious generator lockout and turbine/reactor trip followed by a loss of the switchyard. 3A Emergency Diesel Generator (EDG) fails to start and can not be started, 3B EDG starts but its output breaker fails to close requiring the crew to use the blackout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

Time	Position	Applicant's Actions or Behavior
		ATTACHMENT 3 (Page 2 of 2) 125V DC BUS LOAD SHEDDING 2. <u>IF</u> 3B1 battery charger and 3B2 battery charger are both inoperable, <u>THEN</u> 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. <u>IF</u> 3C 4KV bus is deenergized, <u>THEN</u> perform the following: a. Begin a CO_2 purge of the main generator. b. <u>WHEN</u> the CO_2 purge of the main generator is completed, <u>THEN</u> perform the following: 1) Go to 125V DC Bus 3D31. 2) Place Breaker 3D31-28, DC Air Side Seal Oil Backup Pump 3P35, in OFF. 4. <u>WHEN</u> visual inspection reveals that the turbine is not rotating <u>AND</u> 125V DC Bus 3D31 voltage drops below 105 volts, <u>THEN</u> 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 S/Gs, 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 • Intermediate range channels - ZERO OR NEGATIVE STARTUP RATE • Source range channels - ZERO OR NEGATIVE STARTUP RATE Control S/G steam dump to atmosphere valves to stop S/G depressurization and allow RCS to heat up.
		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 b. Verify SI - RESET a. WHEN SI actuated, THEN do Steps 28b, 29, 30 and 31. Continue with Step 32.

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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.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 32 of 40

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.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 33 of 40

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

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 34 of 40

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.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 35 of 40

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.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 36 of 40

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
		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

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 37 of 40

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.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 38 of 40

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.
		Note: starts A and C ICW pumps
		CAUTION *CCW System load requirements of 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION, SHALL NOT be exceeded.*

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 39 of 40

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.
		Note: Starts A and C CCW pumps	

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 40 of 40

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 b. Stop both Unit 4 high-head SI pumps AND place in STANDBY	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.
		Note: Can not establish 2 HHSI pumps from unit3, directs attachment 1 to be completed	
		Take shift from crew to end scenario	

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:	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% 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%

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 #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% 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	TFH1TV59 = T	(I)SRO / RO	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.
2	TVFCLK1 = 0.020000	(C,N)BOP (R)RO (C,R)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.
3	TFS1MAML = T	(I)RO (TS,I)SRO	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.
4	TVSBVL15 = 0.2600 TVHHSGC = 3.0000	(M)ALL	3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.
	TFKC882A = T	(C)BOP (C)SRO	POV-4882, TPCW isolation fails to close
	TFF5AFAF = T TFF5AFBF = T	(C)BOP (C)SRO	Train A and B AFW fail to auto start

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

Turkey Point 2009-301 Scenario #3

Event 1 - 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 2 – 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 3 - 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.

Event 4 – 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

Scenario XXIV NRC 3

Simulator Operating Instructions

Setup

Restore IC-1 (Mode 1 MOL)

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 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-3-459 FAIL LOW

Initiated immediately after shift turnover.

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 1 – LT-3-459 FAIL LOW**
(Actuates TFH1TV59 = T)

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

Event 2 – 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 2 – 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 2 – 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.

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.

Event 3 – 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 3 – PT-3-447 FAIL LOW** (actuates TFS1MAML=T)

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

Event 4 – 3C S/G FAULT / RUPTURE

3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

When directed - Trigger lesson step **EVENT 4 – 3C S/G FAULT / RUPTURE** (actuates TVSBVL15 = 0.2600, TVHHSGC = 3.0000)

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-S.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.

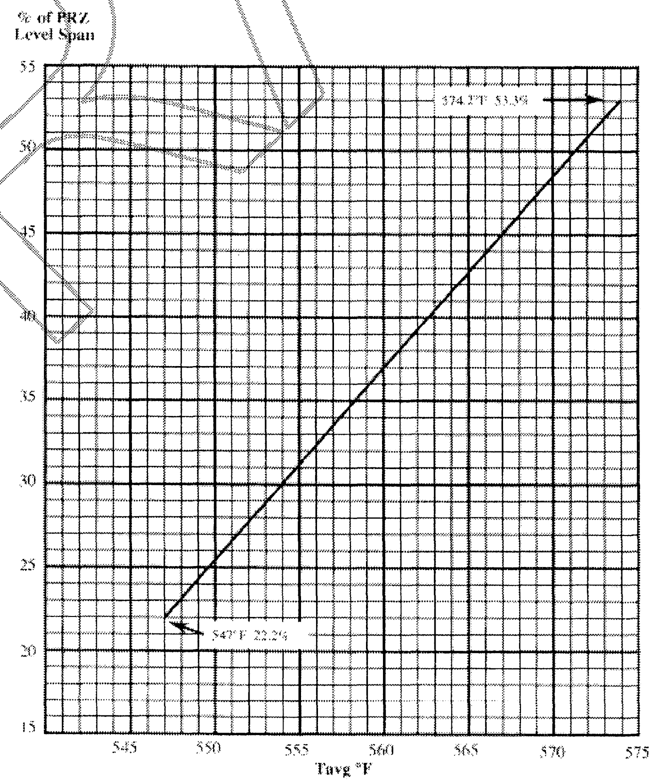
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 1 Page 1 of 6

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 1 – 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∆ 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.: 3 Event No.: 1 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
		Note: RO will select channel 2 or3 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.
		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.: 3 Event No.: 1 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.
		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.
		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.: 3 Event No.: 1 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.
		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.
		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.: 3 Event No.: 1 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	1	2	1, 2	1
	2	1	2	3*, 4*, 5*	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.

Note: functional unit # 9, action 13 6 hrs. to trip bistables

RO

Step

5.5.1 Take appropriate actions as specified in Technical Specifications.

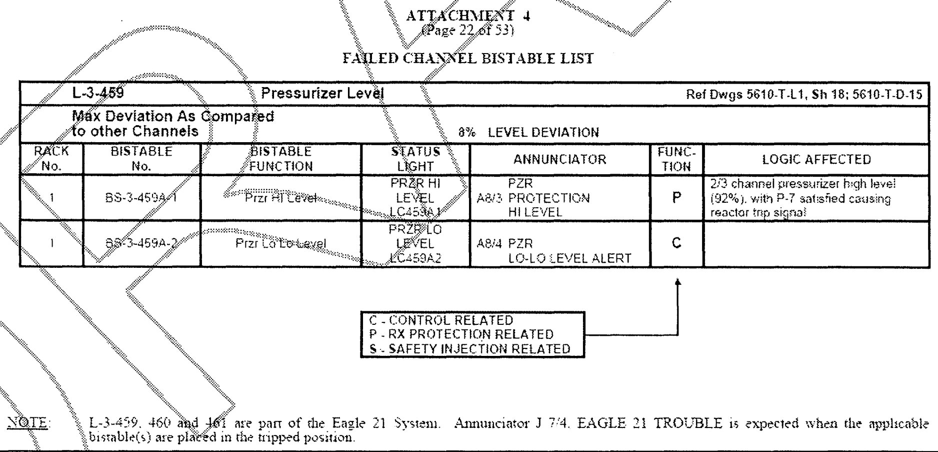
CAUTION

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.: 3 Event No.: 1 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.



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.

Note: Following identification of bistables, continue to next event.

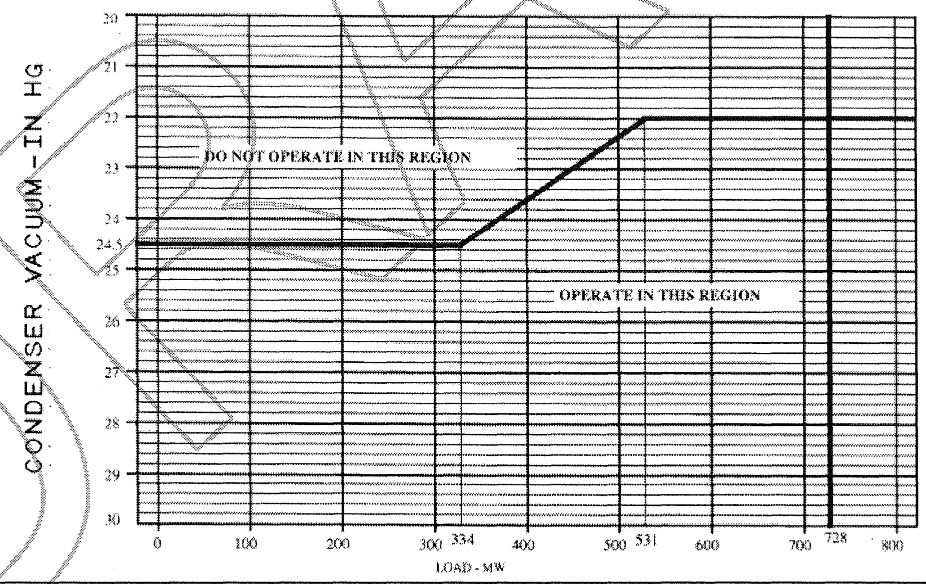
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 1 of 8

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 2 – 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 **IF** only one set of SJAEs is in service, **THEN** place the standby set in service using Attachment 1.
		Note: all SJAEs are in service.

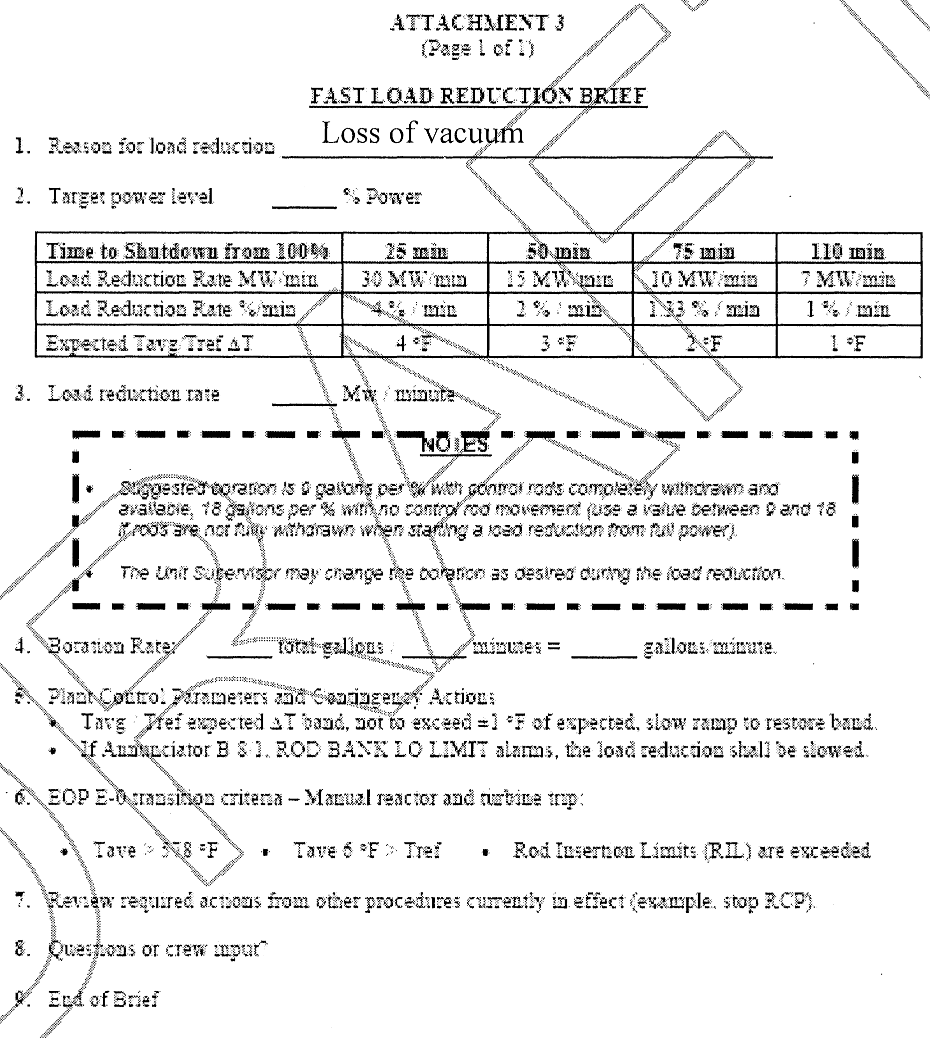
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 2 Page 2 of 8

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.
		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	Directs response per 3-ONOP-100
	US	Step 1 Brief Control Room Personnel Using Attachment 3
		Attachment 3 included next for reference.

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

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	

ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction Loss of vacuum
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.: 3 Event No.: 2 Page 4 of 8

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
		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.: 3 Event No.: 2 Page 5 of 8

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) 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	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.: 3 Event No.: 2 Page 6 of 8

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
		Note: Respond as SM to refer to procedures if directed
		<u>NOTE</u> *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.: 3 Event No.: 2 Page 7 of 8

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.: 3 Event No.: 2 Page 8 of 8

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
		Note: Following load reduction and stable vacuum trigger next event

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

Event Description: 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.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step **EVENT 3 PT– 3-447 FAIL LOW**
	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.
		<u>NOTES</u> • *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.

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

Event Description: 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.

Time	Position	Applicant's Actions or Behavior
		Note: RO selects PT-3-446 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.
	US	Step 5.5 Refer to Technical Specifications 3/4.3, Instrumentation, AND verify the minimum channels operable.

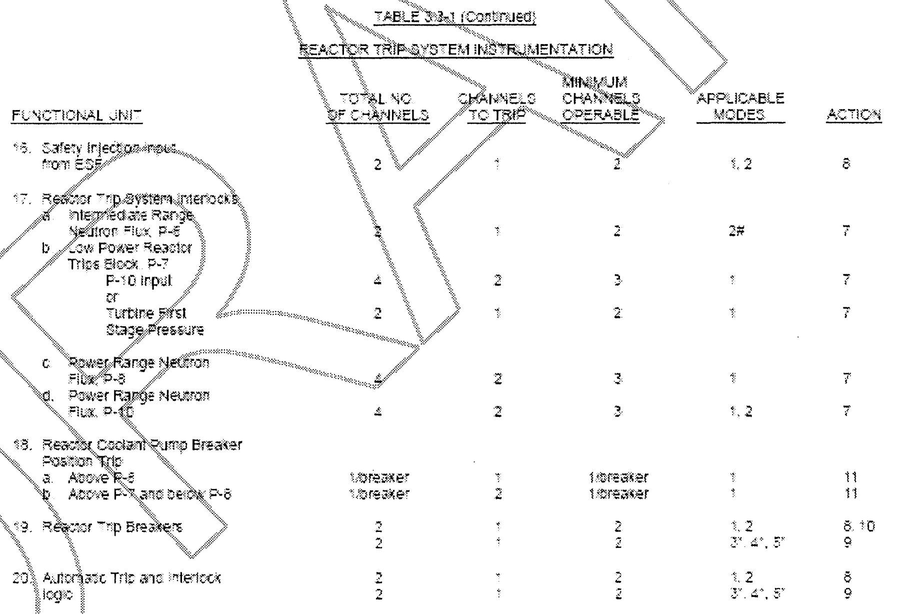


TABLE 3.3-1 (Continued)

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.

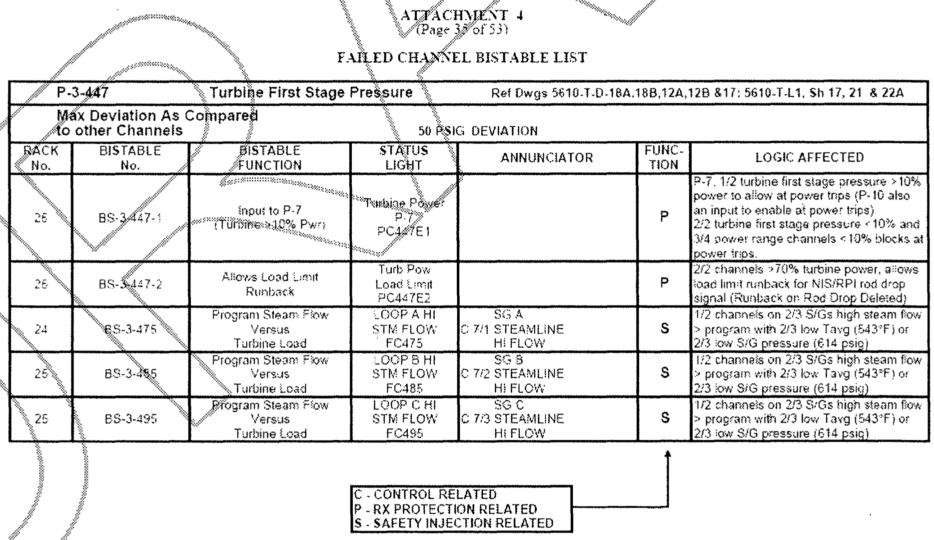
NOTE

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.: 3 Event No.: 3 Page 3 of 3

Event Description: 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.

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.
		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	FUNC-TION	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	SG A C 7/1 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	SG B C 7/2 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	SG C C 7/3 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

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

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, **EVENT 4 – 3C S/G FAULT / RUPTURE**
	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
Start time for RCP trip	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).
		Note: MSR main steam supply stop valves closed by BOP

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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 major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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 ≥ 1.3x10^5 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 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.

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

Time	Position	Applicant's Actions or Behavior
		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.***
______ Stop time	**RO** √	**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** √	**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.**
		Note: If 3C S/G not identified as ruptured initially feed flow may be established until identified as ruptured. Critical task: (WOG) Failure to establish minimum AFW flow before transitioning out of E-0. (E-0, task F).
	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
		Note: Attachment 3 listed at end of scenario.

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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.**
		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.**
		Note: Steps 6, 7, and 8 are critical steps: (WOG) Failure to establish minimum AFW flow before transitioning out of E0. (E-0, task F).

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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 major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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	
		Note: Step 9.b transitions to step 10	

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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.
		Note: RCS continues to Cooldown due to SI flow

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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 major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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
		Note: Red path on Integrity transitions to 3-EOP-FR-P.1, Response to Imminent Pressurized Thermal Shock Condition.
	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.*

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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.*

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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	***Note: Directs NSO to close AFSS-3-006 and open AFSS-007 to supply train 1 AFW from 3B S/G.***
	BOP	***Note: Places HIC-1458A and HIC-1458B in manual closed to isolate feed to 3C S/G .***

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

Time	Position	Applicant's Actions or Behavior
	RO	**4** Check PRZ PORV Block Valves a. Power to block valves - AVAILABLE b. Block valves - AT LEAST ONE OPEN a. Restore power to block valves. 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 b. Check RCS pressure - LESS THAN 460 PSIG c. Go to Step 5e. d. Check PRZ pressure - LESS THAN 2335 PSIG e. PRZ PORVs - CLOSED a. Go to Step 5d. 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. 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. 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[260°F] • RVLMS (QSPDS) plenum indication - GREATER THAN 0%
	US	***Note: transitions to step 27***

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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	***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 <u>NOT</u> cool down RCS until temperature has been stable for 1 hour 3) Do <u>NOT</u> increase RCS pressure during the 1 hour soak 4) Perform actions of other procedures in effect which do <u>NOT</u> cool down <u>OR</u> 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 <u>AND</u> 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 <u>AND</u> Step In Effect

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Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

Time	Position	Applicant's Actions or Behavior
	US	Transitions back and directs action of 3-EOP-E-2.
		C A U T I O N S • *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
		C A U T I O N *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 major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

Time	Position	Applicant's Actions or Behavior	
	BOP	**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-3-006 • 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	
		Note: Completes isolation of 3C S/G	

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 Page 18 of 22

Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 Page 19 of 22

Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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.
		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.*

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 Page 20 of 22

Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 Page 21 of 22

Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

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.
		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 AND Bypass Valves**
		CAUTION *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
		CAUTION *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.*

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 Page 22 of 22

Event Description: 3C S/G experiences a major fault and rupture in containment. AFW fails to auto actuate and POV-4882, TPCW isolation, fails to close. 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.

Time	Position	Applicant's Actions or Behavior	
	BOP	**8** Control Ruptured S/G(s) Level a. Narrow range level – GREATER THAN 6%[32%] b. Stop feed flow to ruptured S/G(s)	a. Perform the following: 1) Maintain feed flow to ruptured S/G until level is greater than 6%[32%]. 2) <u>WHEN</u> ruptured S/G level is greater than 6%[32%], <u>THEN</u> stop feed flow to ruptured S/G(s). 3) Continue with Step 9.
	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 <u>NOT</u> continue until each ruptured S/G(s) is isolated from at least one intact S/G(s) to be used for RCS cooldown. <u>IF</u> any ruptured S/G(s) can <u>NOT</u> be isolated from at least one intact S/G, <u>THEN</u> go to 3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT-SUBCOOLED RECOVERY DESIRED, Step 1.
		Note: Critical Task, (WOG) Failure to isolate feed and steam for a faulted SG prior to transitioning from E-2. (E-2, Task A)	
	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.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 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 — 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.: 3 Event No.: 4 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.
		Note: BOP closes POV-3-4882	

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 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.: 4 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.: 3 Event No.: 4 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
		Note: BOP is required to go back to the contáinment 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 • MOV-3-1417 • MOV-3-1418	b. Stop all RCPs
		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.: 3 Event No.: 4 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
		Note: BOP will call NSO to align PAHM. 3-OP-094 steps listed below.

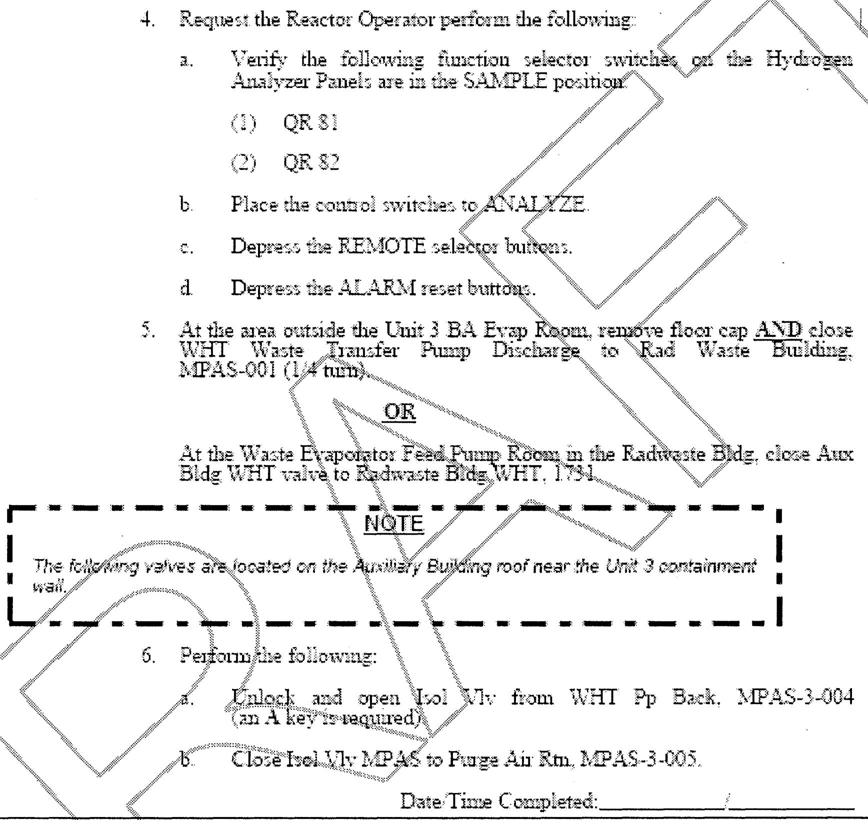
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 att.3 Page 8 of 11

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.: 4 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.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 4 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.: 4 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
		Note: BOP informs US of completion and manual closure of POV-3-4882 was required. ***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:	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%

Unit 3 Status

Reactor Operator

Mode:	1
Power:	100%
MWe:	760
Tavg:	574.2°F
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 #4 Event Description

Facility: Turkey Point   Scenario No.: 4 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	(C)SRO / RO	3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown.
3.a		(R)RO (N)BOP (R)SRO	3-ONOP-100 is used per 3-ONOP-041.1 to shutdown the unit.
4	TVSBVL10 = 0.2500	(C)BOP (C,C)SRO (C)RO	A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.
4.a	TFM2D3AS = T TFK2A19S = T TFK2B17T = T	(M)ALL (C)BOP (C)RO (C)SRO (C)SRO	3-EOP-E-0 is entered for the reactor trip response with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW pump fails to auto start, and 3A SI pump fails to auto start requiring operator action.

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

Turkey Point 2009-301 Scenario #4

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 to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown.

Event 3.a - 3-ONOP-100 is used per 3-ONOP-041.1 to shutdown the unit.

Event 4 – A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

Event 4.a - 3-EOP-E-0 is entered for the reactor trip response with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW pump fails to auto start, and 3A SI pump fails to auto start requiring operator action.

Scenario XXIV NRC 4

Simulator Operating Instructions

Setup

Restore IC-11 (Mode 1 BOL)

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.** 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)

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 to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown.

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 – STEAM BREAK DOWNSTREAM MSIV

A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak. 3-EOP-E-0 is entered for the reactor trip response with a transition to 3-EOP-ES-1.1 to terminate safety injection. 3B ICW pump breaker fails, 3A ICW pump fails to auto start, and 3A SI pump fails to auto start requiring operator action.

When directed - Trigger lesson step **EVENT 4 – 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.

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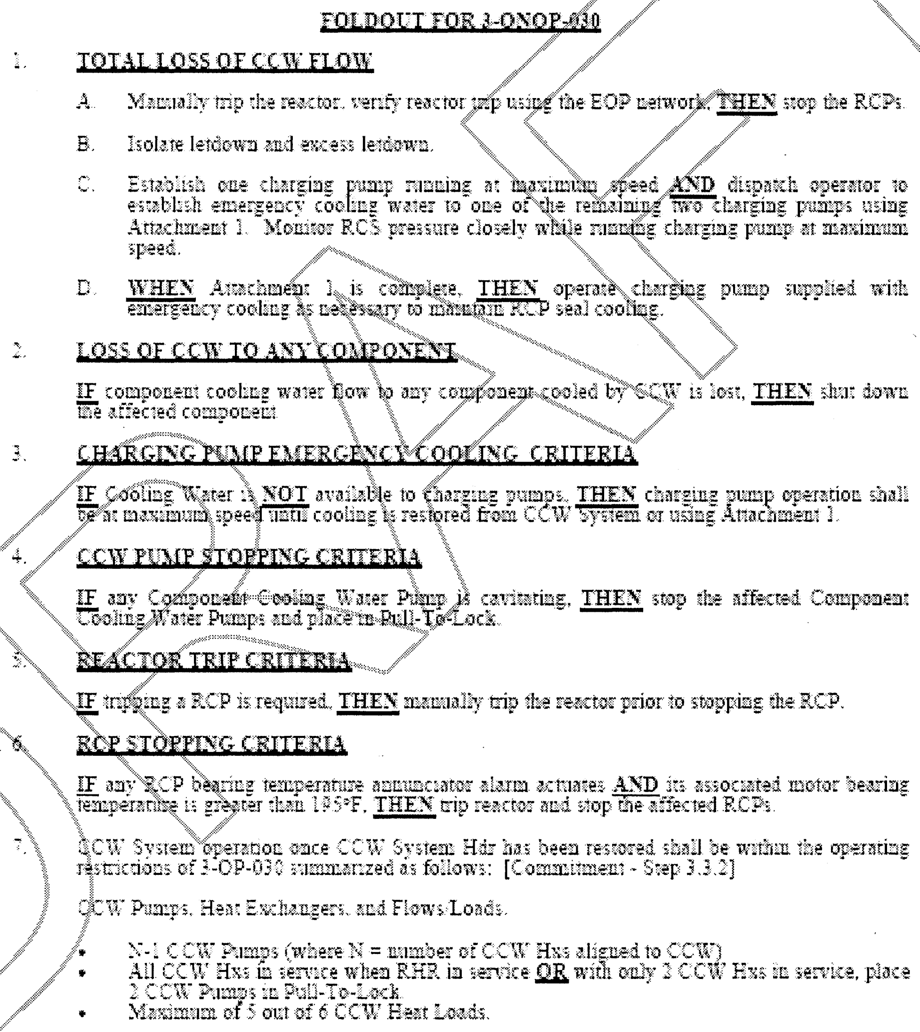
Event Description: 3B CCW pump trips due to breaker failure, 3-701G, PC-3-611 isolation, was inadvertently closed following 3-OSP-030.5, CCW pump auto start test, preventing an auto start of 3A or 3B CCW pumps. A CCW pump is started per 3-ONOP-030, Component Cooling Water Malfunction.

Time	Position	Applicant's Actions or Behavior
Trigger lesson step, **EVENT 1 – 3B CCW PUMP TRIP**		
______ 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	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.
		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.: 4 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** √	**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.
		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.

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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	**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% <u>AND</u> • STABLE OR INCREASING Perform the following: 1. Open Component Cooling Water Surge Tank Makeup, MOV-3-832 as necessary to add makeup. 2. <u>IF</u> Component Cooling Water Surge Tank Level can <u>NOT</u> be maintained, <u>THEN</u> 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 — a. Go to Step 34. b. Check if flow has been lost in any CCW header — b. <u>IF</u> flow in both CCW headers is normal, <u>THEN</u> go to Step 34. * FT-3-613A for header A * FT-3-613B for header B
		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.

Time	Position	Applicant's Actions or Behavior
	RO	**34** Verify Component Cooling Water From Unit 4 - NOT REQUIRED a. Unit 3 CCW headers filled and intact a. Return to Step 4. b. Verify CCW pumps - AT LEAST ONE RUNNING b. Start a Standby CCW pump. c. Verify flow in at least one intact CCW header * FI-3-613A for header A * FI-3-613B for header B c. Perform the following: 1) Try to establish flow in at least one intact CCW header. 2) IF flow in at least one intact CCW header can NOT be established, THEN observe NOTE prior to Step 36 and go to Step 36. 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 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) IF any component cooled by component cooling water must be operated AND stable component cooling water temperature can NOT be maintained, THEN observe NOTE prior to Step 36 and go to Step 36.
	US	**35** Observe CAUTION Prior To Step 43 And Go To Step 43
	US	CAUTION *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.*

Op-Test No.: 2009-301 Scenario No.: 4 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, <u>THEN</u> 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. <u>IF</u> component cooling water can <u>NOT</u> be established to any component, <u>THEN</u> 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.
		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

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 1 Page 7 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 / BOP	**45** Establish Charging Flow a. Locally verify component cooling water flow from charging pumps, FI-3-660 b. Check charging pumps - AT LEAST ONE RUNNING c. Maintain minimum charging flow for RCP seal injection	a. Verify emergency cooling water has been established to desired charging pump using Attachment 1. b. __IF__ any charging pumps were running prior to component cooling water malfunction, __THEN__ start one charging pump.
		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.
		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 — b. Consult with Shift Manager to determine if one of the following methods should be used to cool containment: 1) Verify component cooling water to normal containment coolers - AVAILABLE — • Emergency containment coolers. <u>OR</u> • Containment purge. 2) Verify Component Cooling Water To Normal Containment Cooler valve - OPEN • MOV-3-1417 • MOV-3-1418
	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
		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 <u>OR</u> excess letdown - IN SERVICE PRIOR TO COMPONENT COOLING WATER MALFUNCTION c. Letdown <u>AND</u> excess letdown - SECURED
		Note: normal letdown still in service, RNO to step 53 applies.

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

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 1 Page 10 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	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.
		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
		Note; US exits 3-ONOP-030, no other procedures in effect.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 1 of 8

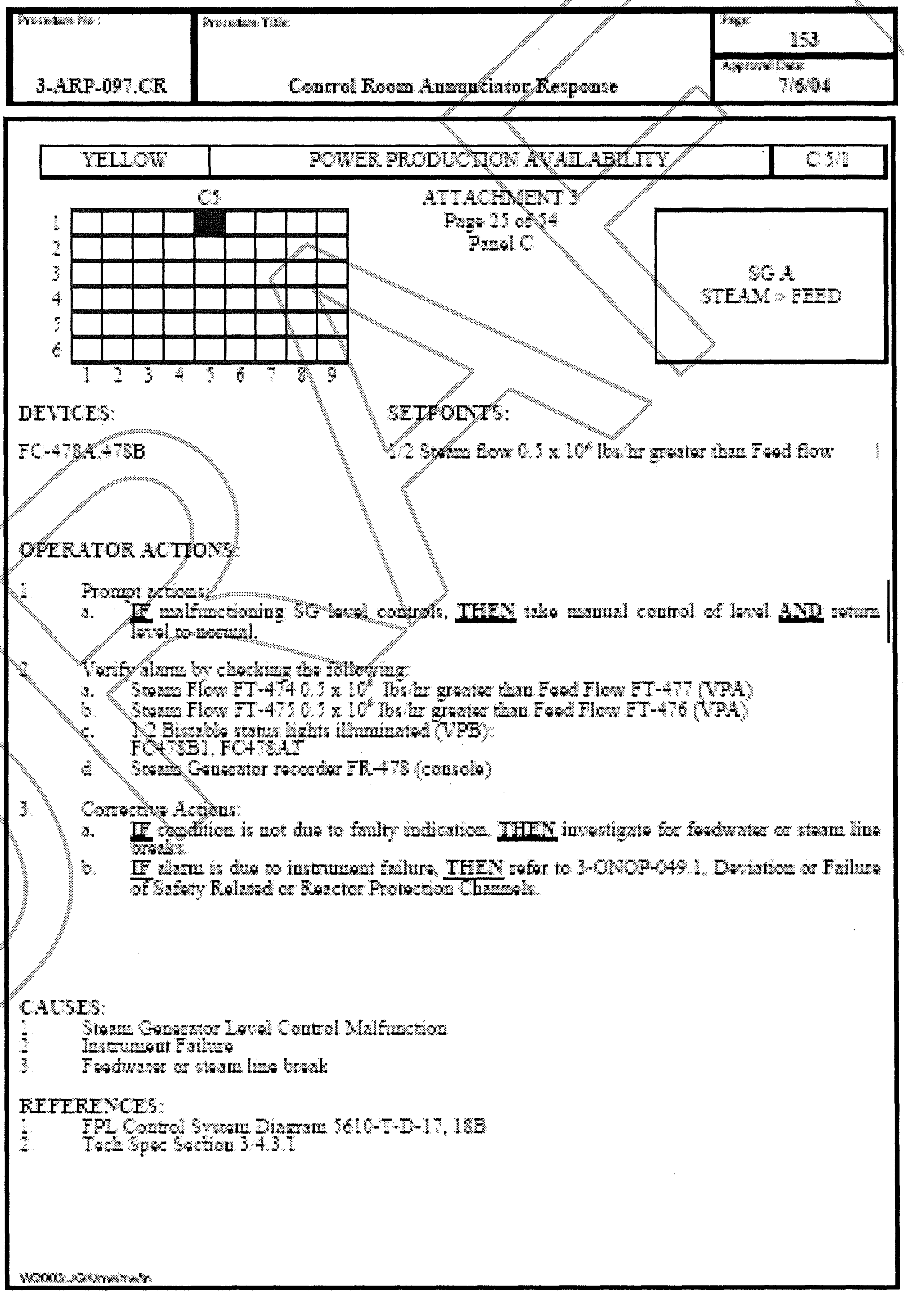
Event Description: FT-3-474 Fails high causing 3A steam generator level to increase. 3A S/G feed regulating valve FCV-3-478 is placed in manual to return 3A S/G level to program. 3-ONOP-049.1 is used to swap controlling channels and return 3A FRV to automatic control.

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
		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.: 4 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

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, FC478A1
   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.: 4 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.
		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.
		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.
		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.
		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.: 4 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.

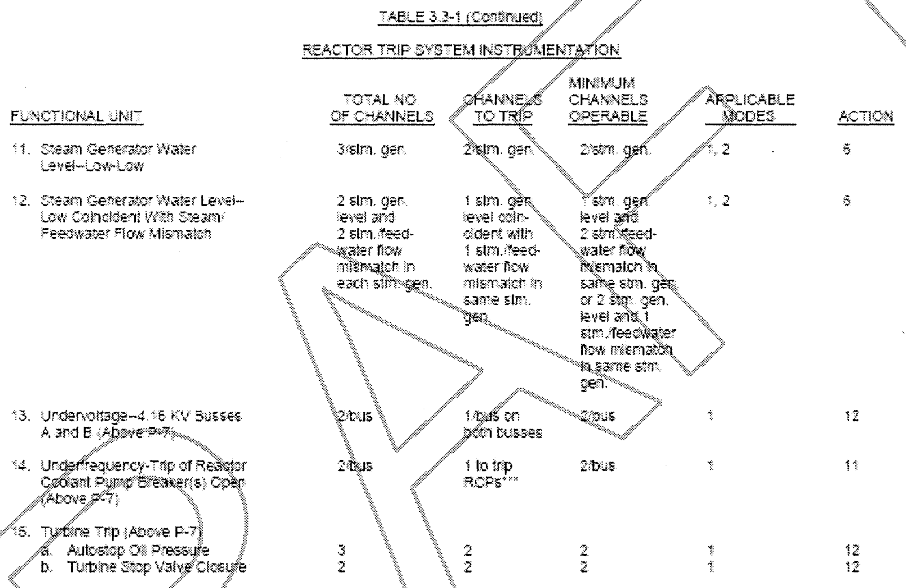
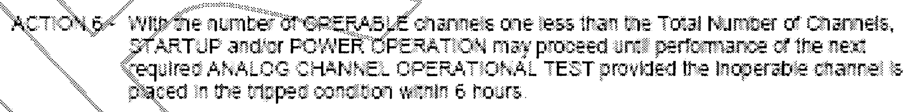
<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>US</td><td>


TABLE 3.3-1 (Continued)

REACTOR TRIP 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>11. Steam Generator Water Level--Low-Low</td><td>3/stm. gen.</td><td>2/stm. gen.</td><td>2/stm. gen.</td><td>1, 2</td><td>6</td></tr>
<tr><td>12. Steam Generator Water Level--Low Coincident With Steam/Feedwater Flow Mismatch</td><td>2 stm. gen. level and 2 stm./feedwater flow mismatch in each stm. gen.</td><td>1 stm. gen. level coincident with 1 stm./feedwater flow mismatch in same stm. gen.</td><td>1 stm. gen. level and 2 stm./feedwater flow mismatch in same stm. gen. or 2 stm. gen. level and 1 stm./feedwater flow mismatch in same stm. gen.</td><td>1, 2</td><td>6</td></tr>
<tr><td>13. Undervoltage--4.16 KV Busses A and B (Above P-7)</td><td>2/bus</td><td>1/bus on both busses</td><td>2/bus</td><td>1</td><td>12</td></tr>
<tr><td>14. Underfrequency-Trip of Reactor Coolant Pump Breaker(s) Open (Above P-7)</td><td>2/bus</td><td>1 to trip RCPs***</td><td>2/bus</td><td>1</td><td>11</td></tr>
<tr><td>15. Turbine Trip (Above P-7)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. Autostop Oil Pressure</td><td>3</td><td>2</td><td>2</td><td>1</td><td>12</td></tr>
<tr><td>b. Turbine Stop Valve Closure</td><td>2</td><td>2</td><td>2</td><td>1</td><td>12</td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td>


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.
</td></tr>
<tr><td></td><td></td><td><i>Note: determines 6 hours to trip bistables</i></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 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.

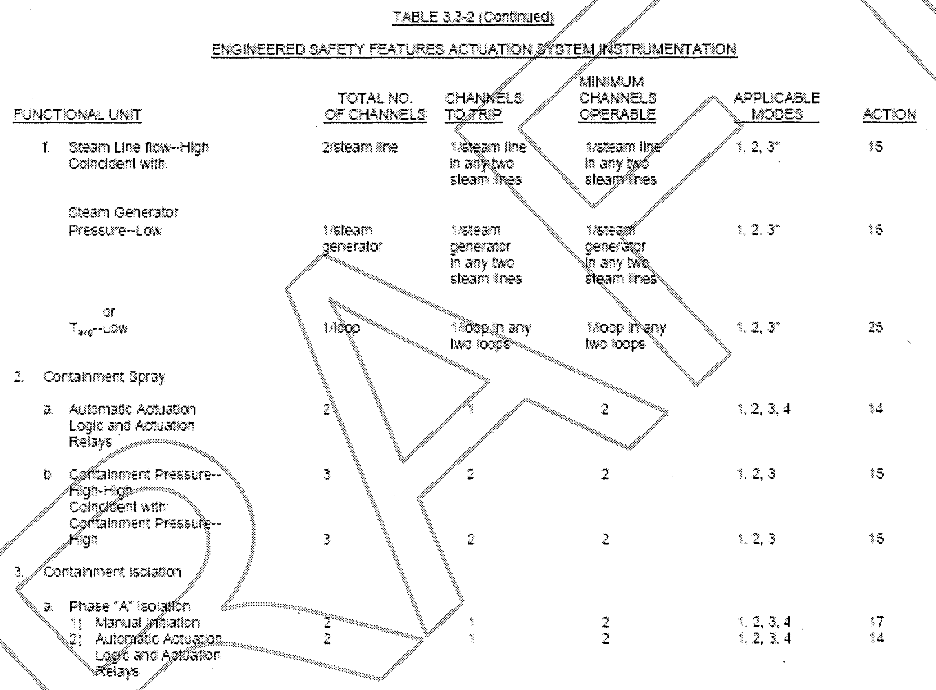
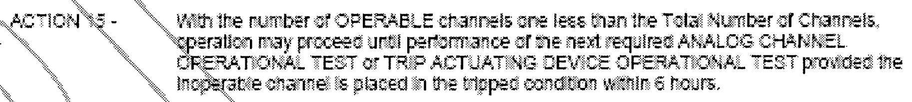
<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>US</td><td>


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>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>US</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><i>Note: determines 6 hours to trip bistables</i></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 4 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>US</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><i>Note: determines 6 hours to trip bistables</i></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

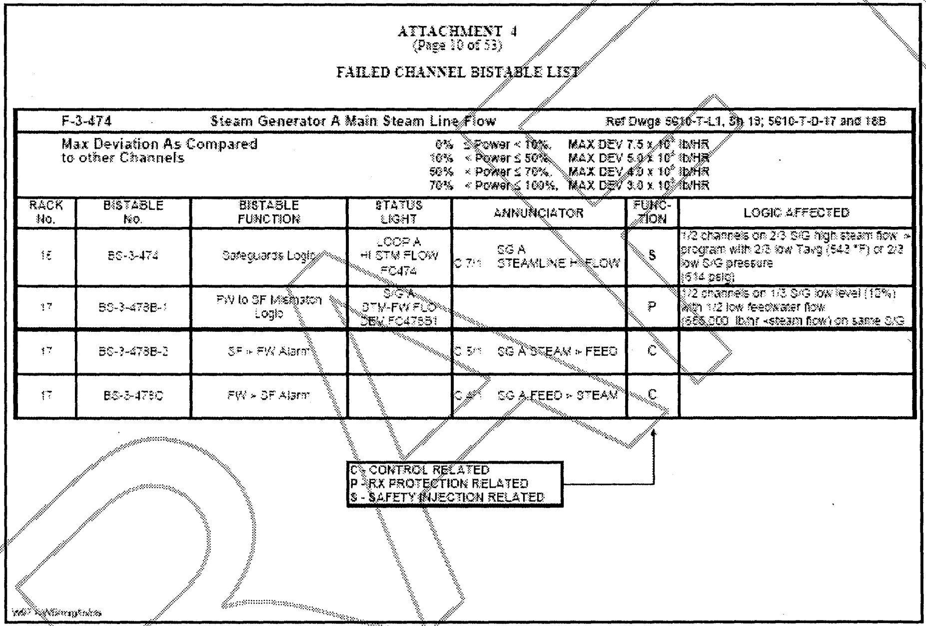
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 7 of 8

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.
		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.
		Note: Attachment 4 provided as reference

Op-Test No.: 2009-301 Scenario No.: 4 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	
		Note: following brief trigger next event

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
15	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 (655,000 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-3-479C	FW > SF Alarm		C 4/1 SG A FEED > STEAM	C	

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

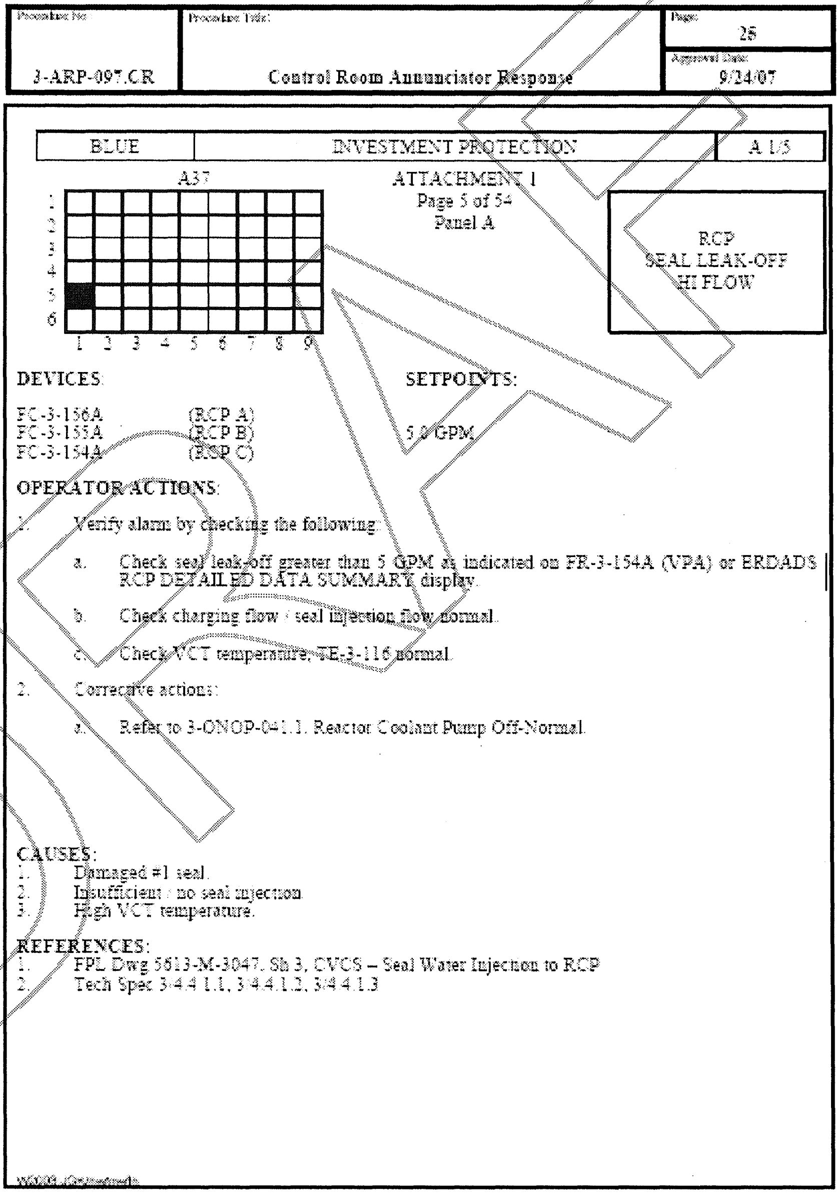
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 3 Page 1 of 7

Event Description: 3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown

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
		Note: ARP shown next page

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 3 Page 2 of 7

Event Description: 3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown

Time	Position	Applicant's Actions or Behavior
	BOP	

Procedure No:	Procedure Title:	Page: 25 Approval Date: 9/24/07
3-ARP-097.CR	Control Room Annunciator Response	

BLUE	INVESTMENT PROTECTION	A 1/5

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	(RSP 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.

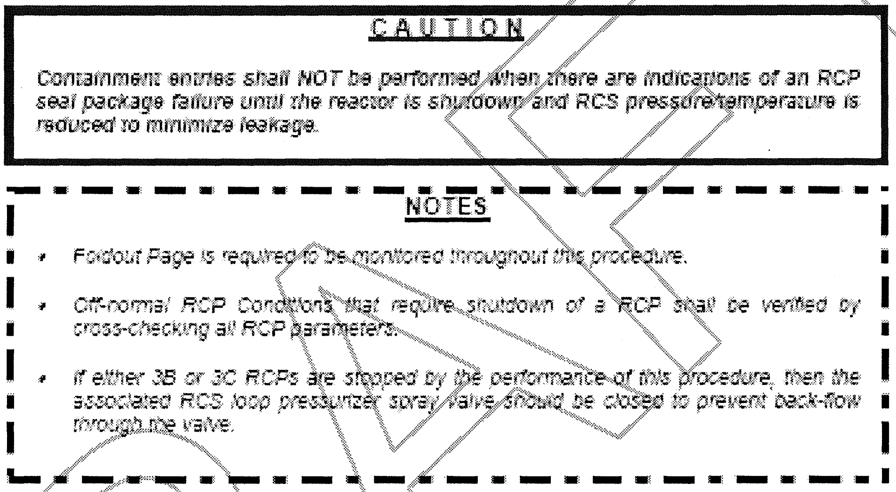
CAUSES:
1. Damaged #1 seal.
2. Insufficient / no seal injection.
3. High VCT temperature.

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

Time	Position	Applicant's Actions or Behavior
	US	Directs response per 3-ONOP-041.1 Reactor Coolant Pump Off-Normal

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

Event Description: 3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown

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.: 4 Event No.: 3 Page 4 of 7

Event Description: 3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown.

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

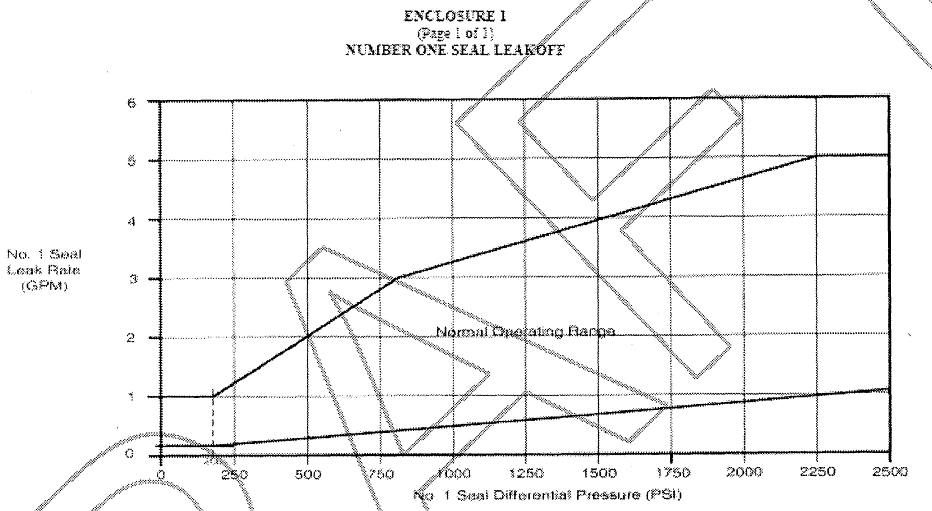
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 3 Page 5 of 7

Event Description: 3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown.

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 **OR** EQUAL TO 6 GPM ON ALL RCPs • ERDADS Seal Injection Flow Indication - GREATER THAN **OR** EQUAL TO 6 GPM ON ALL RCPs
		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 AND go to Step 16.
	RO	Determines seal leakoff flow not within limits of enclosure 1
	US	Observes note and transitions to step 16
		Note: enclosure 1 next page

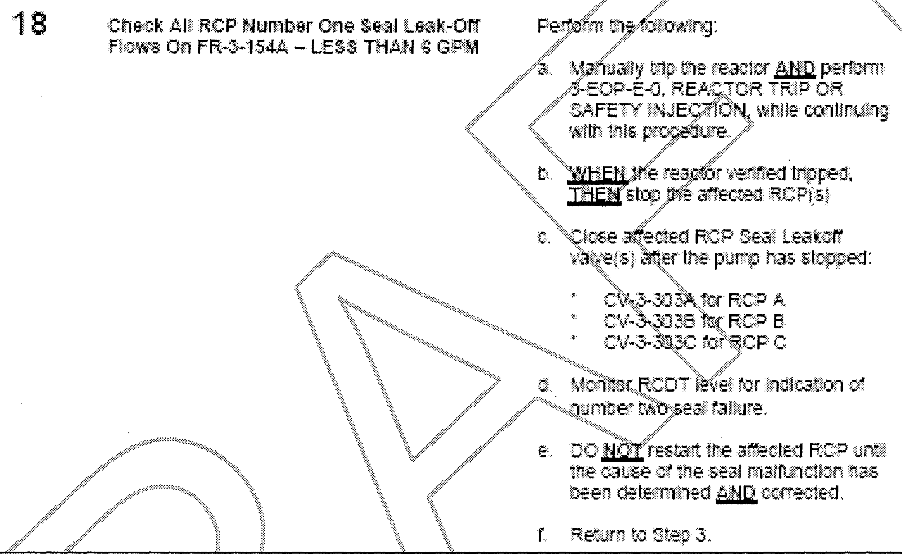
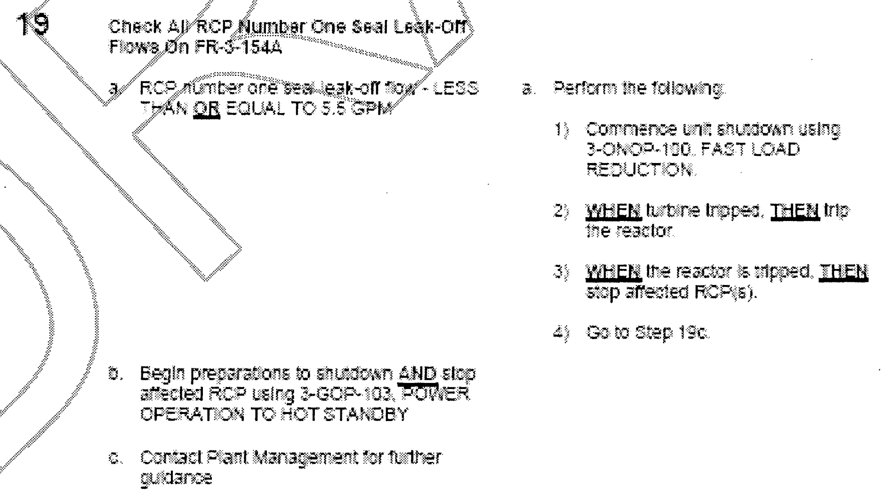
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 3 Page 6 of 7

Event Description: 3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown

Time	Position	Applicant's Actions or Behavior
	RO	 ENCLOSURE 1 (Page 1 of 1) NUMBER ONE SEAL LEAKOFF
		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 **AND** Operations Supervision

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

Event Description: 3A RCP #1 seal degrades. The crew responds to annunciator A 1/5, RCP seal leakoff hi flow and are directed to 3-ONOP-041.1, Reactor Coolant Pump Off-normal. 3a #1 seal continues to degrade requiring a unit shutdown

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 <u>AND</u> perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. b. <u>WHEN</u> the reactor verified tripped, <u>THEN</u> 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 <u>NOT</u> restart the affected RCP until the cause of the seal malfunction has been determined <u>AND</u> 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 <u>OR</u> EQUAL TO 5.5 GPM a. Perform the following: 1) Commence unit shutdown using 3-ONOP-100, FAST LOAD REDUCTION. 2) <u>WHEN</u> turbine tripped, <u>THEN</u> trip the reactor. 3) <u>WHEN</u> the reactor is tripped, <u>THEN</u> stop affected RCP(s). 4) Go to Step 19c. b. Begin preparations to shutdown <u>AND</u> stop affected RCP using 3-GOP-103, POWER OPERATION TO HOT STANDBY c. Contact Plant Management for further guidance
		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

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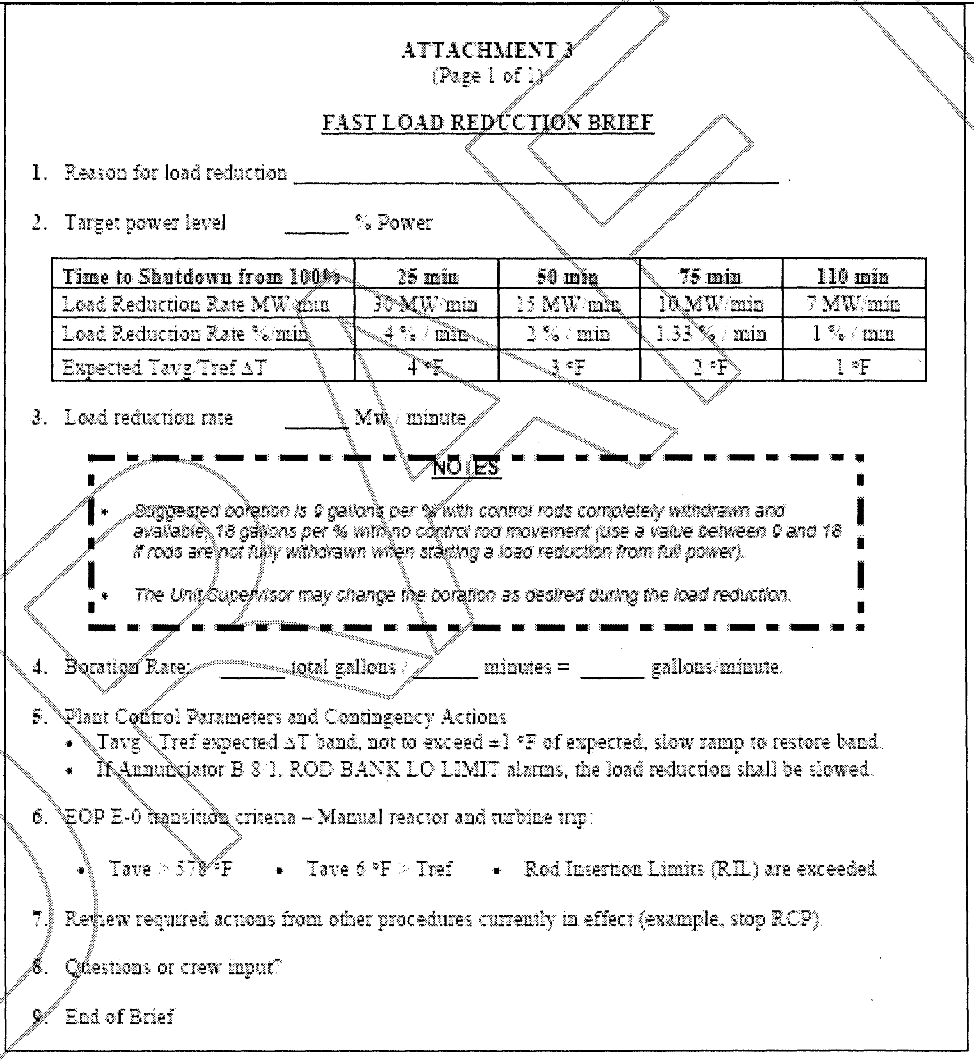
Event Description: 3-ONOP-100 is used per 3-ONOP-041.1 to shutdown the unit.

Time	Position	Applicant's Actions or Behavior
	US	**1** Brief Control Room Personnel Using Attachment 3
	US	

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

	US	Will determine load reduction and boration rate. Then conduct brief. 9 gallons/% should be used to determine 900 gal required

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Event Description: 3-ONOP-100 is used per 3-ONOP-041.1 to shutdown the unit.

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 <u>IF</u> boration is not required, <u>THEN</u> go to Step 3.
	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. <u>IF</u> boration is used, <u>THEN</u> 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
		<u>NOTE</u> *Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-OP-059.8, Operation Within the Axial Flux Difference Operational Space.*

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Event Description: 3-ONOP-100 is used per 3-ONOP-041.1 to shutdown the unit.

Time	Position	Applicant's Actions or Behavior
	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 500 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.
	RO	**8** **Energize Pressurizer Backup Heaters**
	BOP	**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
	BOP	**10** **Monitor Turbine Load Within 10% Of Target Power Level** Go to Step 11. 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
	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 adjusments 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.

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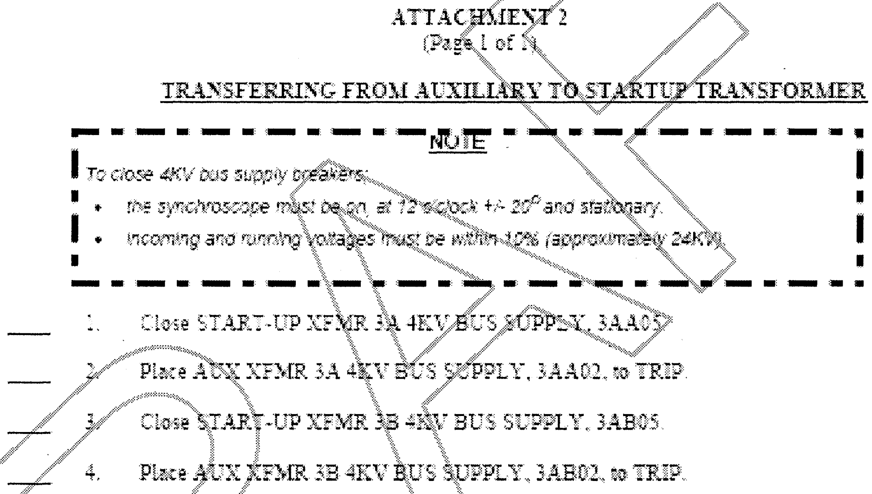
Event Description: 3-ONOP-100 is used per 3-ONOP-041.1 to shutdown the unit.

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.
		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.
		Note: Directs FS/NSO to align aux steam using att. 1
		Note: After a 5 to 10% power reduction, trigger event 4.

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

Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

Time	Position	Applicant's Actions or Behavior
		Trigger lesson step, **EVENT 4 – STEAM BREAK DOWNSTREAM MSIV**
______ Auto Trip Failure	RO / BOP	Operators determine a reactor trip should have occurred byobservation 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** √	**Trips the reactor from vertical panel B**
	US	Directs 3-EOP-E-0 immediate operator actions to be performed.
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4a Page 1 of 22

Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

Time	Position	Applicant's Actions or Behavior
____ Reactor Tripped	**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.
		Critical Task: (TC-PRA) Failure to manually trip the reactor within one minute if automatic trip signal fails to trip the reactor.
	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).
		Note: BOP closes MSR main steam supply stop MOVs
	BOP √	**Closes 3B MSIV**
		Critical Task: Failure to isolate faulted S/G following automatic steam line isolation
		Note: 3B MSIV fails to close on automatic isolation signal

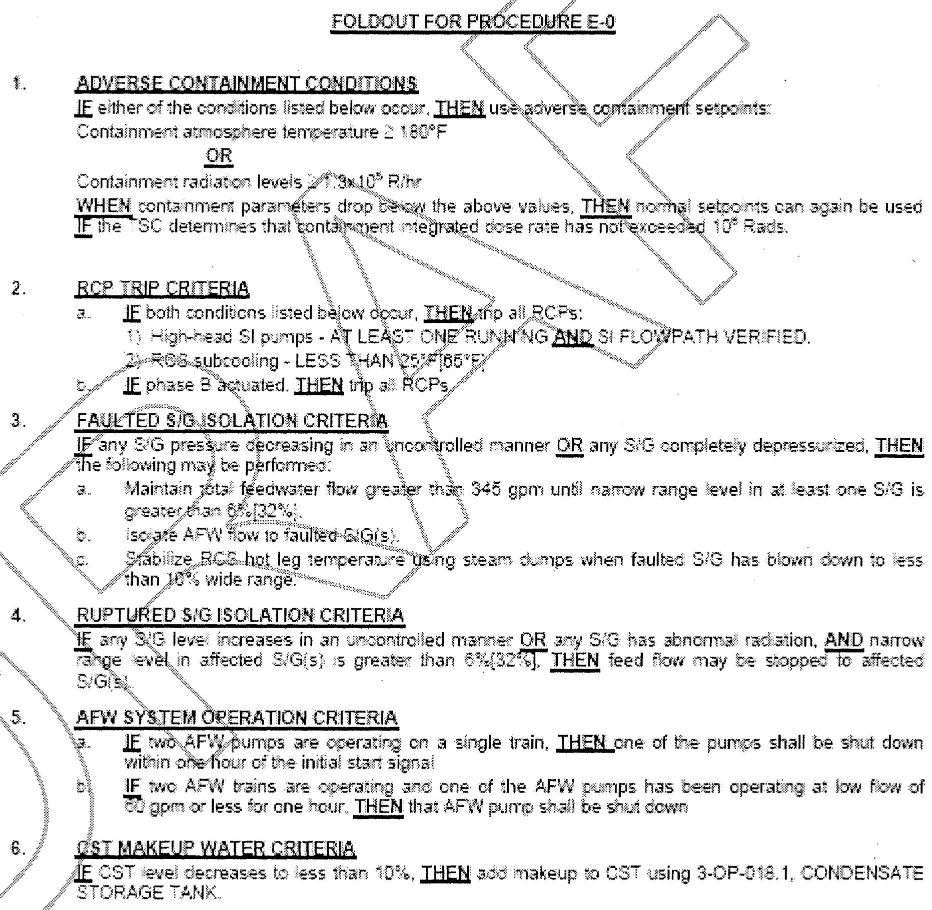
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4a Page 2 of 22

Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4a Page 3 of 22

Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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 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.
	RO	Secures 3A RCP due to #1 seal failure
	US	**5** Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure
		Note: US directs BOP to perform attachment 3. Attachment 3 steps on page 53.

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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%] b. Maintain feed flow to S/G narrow range levels between 15%[32%] and 50%.	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.

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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 on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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.

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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
		NOTE: SUBCOOLING >25°F
	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

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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.
		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.

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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 * Total feed flow to S/Gs - GREATER THAN 345 GPM <u>OR</u> * Narrow range level in at least one S/G - GREATER THAN 6% b. Go to Step 17. c. RCS pressure • Pressure - GREATER THAN 1600 PSIG <u>AND</u> • Pressure - STABLE <u>OR</u> INCREASING c. Go to Step 17. 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
		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%. <u>IF</u> narrow range level in any S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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.*

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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] 2) Pressure - STABLE OR INCREASING b. Stop RHR pumps **AND** place in Standby c. Check RCS pressure – GREATER THAN 250 PSIG[650 PSIG]	 1) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. 2) Go to Step 26. c. **IF** RCS pressure decreases to less than 250 PSIG[650 PSIG], **THEN** manually start both RHR pumps
		NOTE: Stops RHR pumps	
	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.
	RO	**27** Check Charging Flow Established a. Charging pumps - AT LEAST ONE RUNNING 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	a. Perform Attachment 4 to establish charging.
		Note: attachment 4 used to establish charging.	

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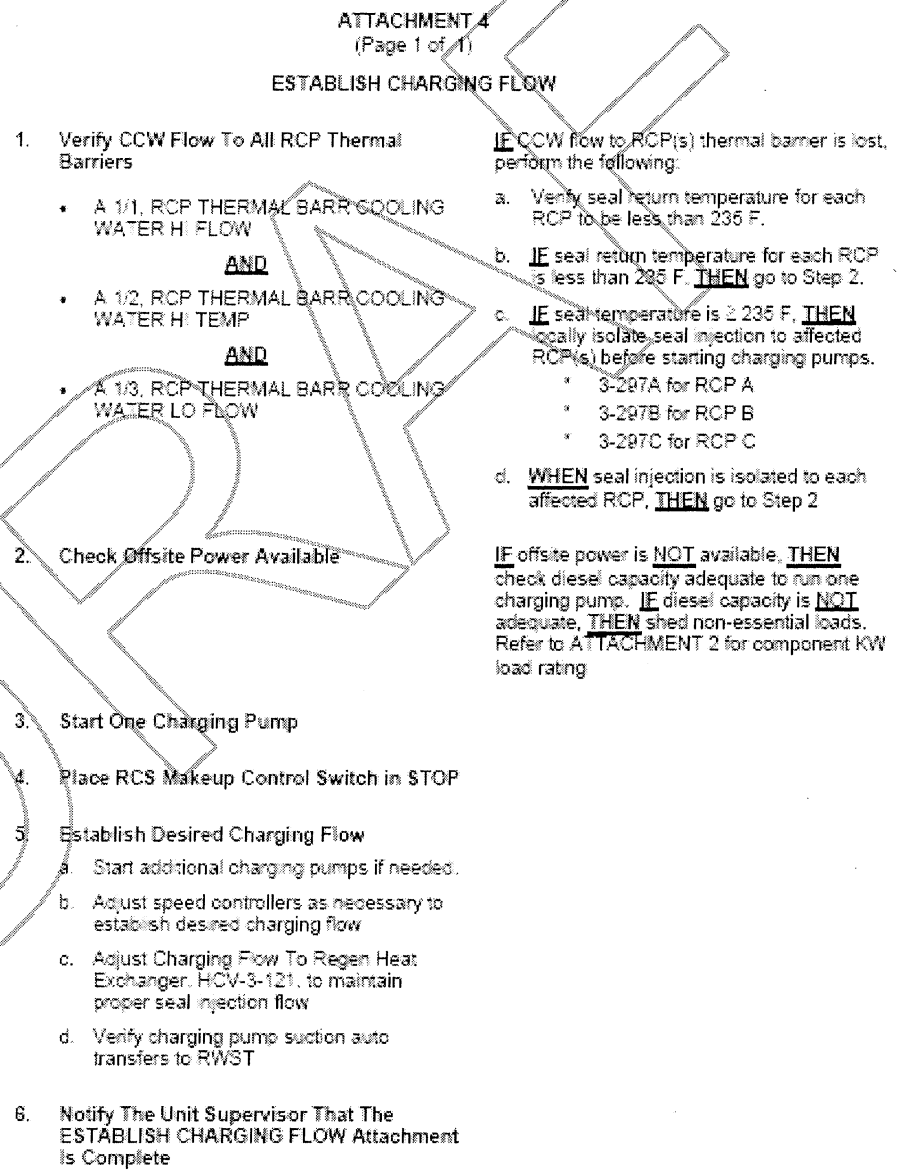
Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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	

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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
		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
		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 on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4a Page 15 of 22

Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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.

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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[85°F] — b. Go to Step 13. c. High-Head SI Pump – AT LEAST ONE RUNNING <u>AND</u> FLOWPATH VERIFIED — c. Go to Step 13. d. Stop all RCPs
		NOTE: SUBCOOLING >25ºF
	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 <u>OR</u> • 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

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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 <u>OR</u> • Condenser air ejector radiation, R-15 – HIGHER THAN NORMAL <u>OR</u> • SG blowdown radiation, R-19 – HIGHER THAN NORMAL <u>OR</u> • ERDADS SG or secondary radiation readings – HIGHER THAN NORMAL <u>OR</u> • 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.
		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.

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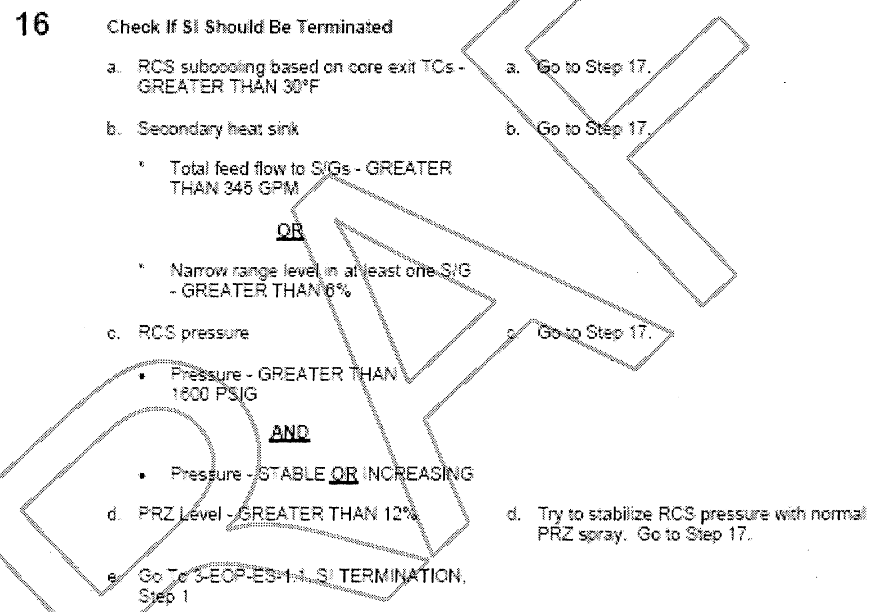
Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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

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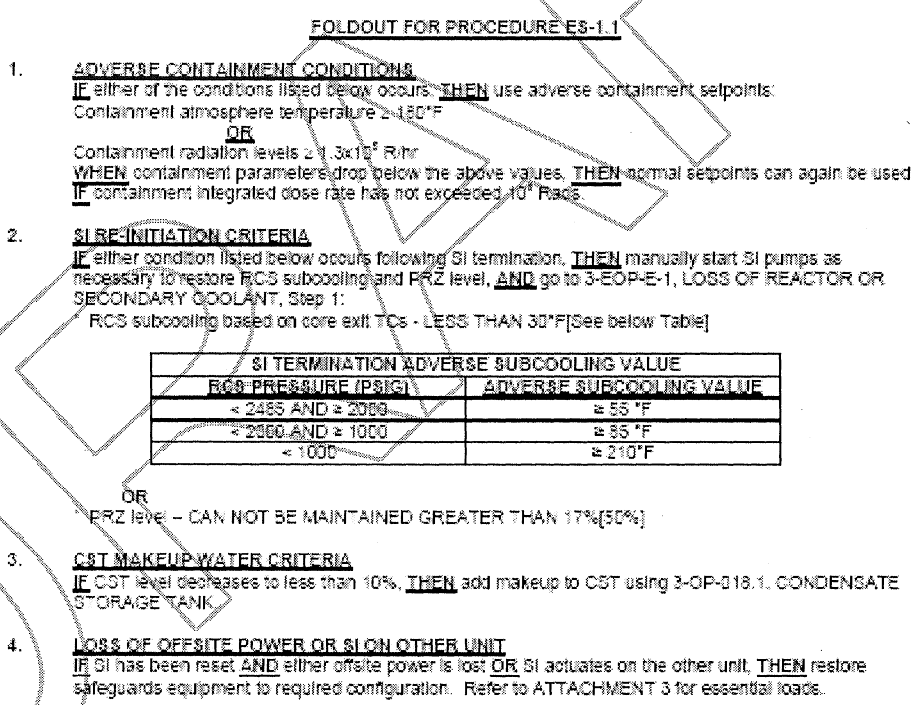
Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

Time	Position	Applicant's Actions or Behavior
		NOTE *Foldout page is required to be monitored throughout this procedure.*
	US	

FOLDOUT FOR PROCEDURE ES-1.1

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. SI RE-INITIATION CRITERIA
IF either condition listed below occurs following SI termination, THEN manually start SI pumps as necessary to restore RCS subcooling and PRZ level, AND 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]

SI TERMINATION ADVERSE SUBCOOLING VALUE	
RCS PRESSURE (PSIG)	ADVERSE SUBCOOLING VALUE
< 2485 AND ≥ 2000	≥ 55 °F
< 2000 AND ≥ 1000	≥ 85 °F
< 1000	≥ 210°F

OR
* PRZ level – CAN NOT BE MAINTAINED GREATER THAN 17%[50%]

3. 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.

4. 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.

		Note: US reviews foldout page

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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.

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Event Description: A steam line break occurs on the common header to the HP turbine resulting in an automatic reactor trip signal. Automatic trips are blocked requiring a manual reactor trip. Manual reactor trip from the console fails requiring the operator to trip the unit from VPB. 3B main steam isolation valve fails to automatically close requiring manual operation to terminate the steam leak.

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 <u>AND</u> Place In Standby • RHR pumps • High-head SI pumps
	RO	**6** Verify SI Flow <u>NOT</u> 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 <u>AND</u> 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. <u>IF</u> PRZ level can <u>NOT</u> be maintained, <u>THEN</u> 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		

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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 • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC	Close the Load Center supply breakers.
	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 • 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.

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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.
		Note: BOP starts 3A ICW PP, 3B fails to start if attempted	

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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.

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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.
		Note: 3A SI PP fails to start, BOP stops one of the unit 4 SI pumps.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 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
		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 • MOV-3-1417 • MOV-3-1418	b. Stop all RCPs
		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.: 4 Event No.: 4 att.3 Page 7 of 11

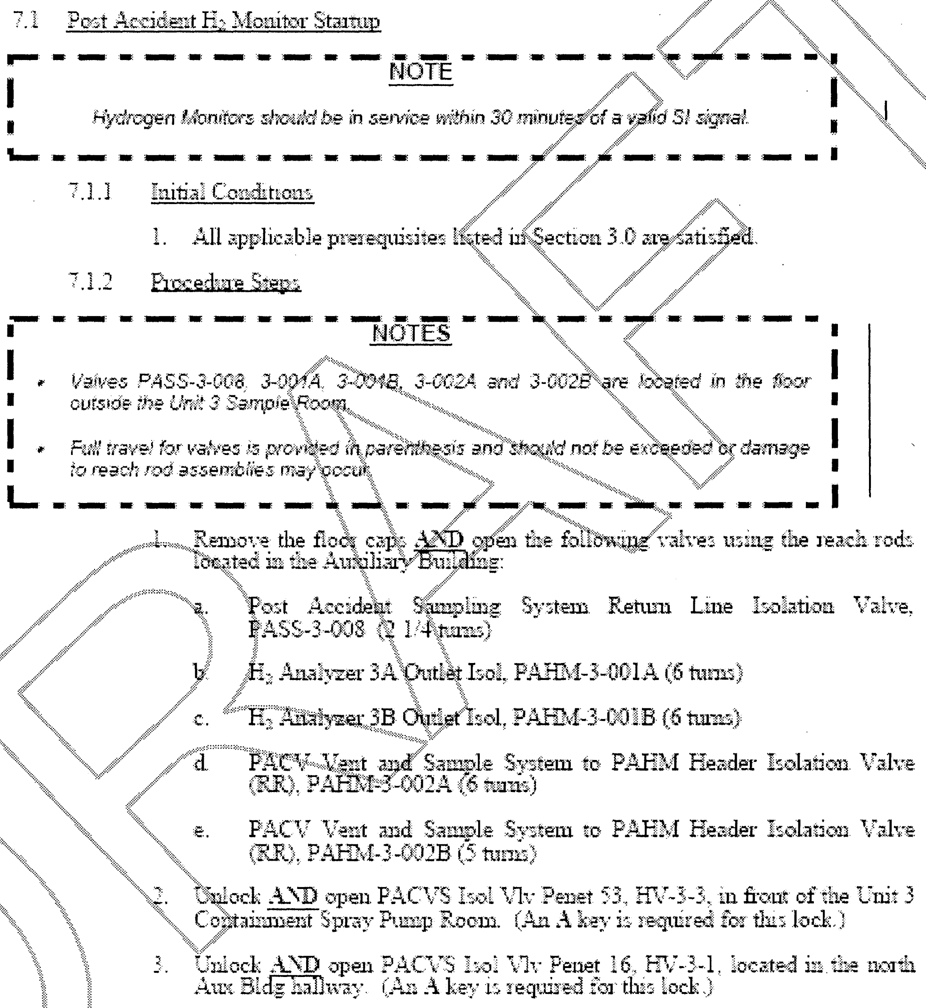
Event Description: 3-EOP-E-0 Attachment 3 actions

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
		Note: BOP will call NSO to align PAHM. 3-OP-094 steps listed below.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 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

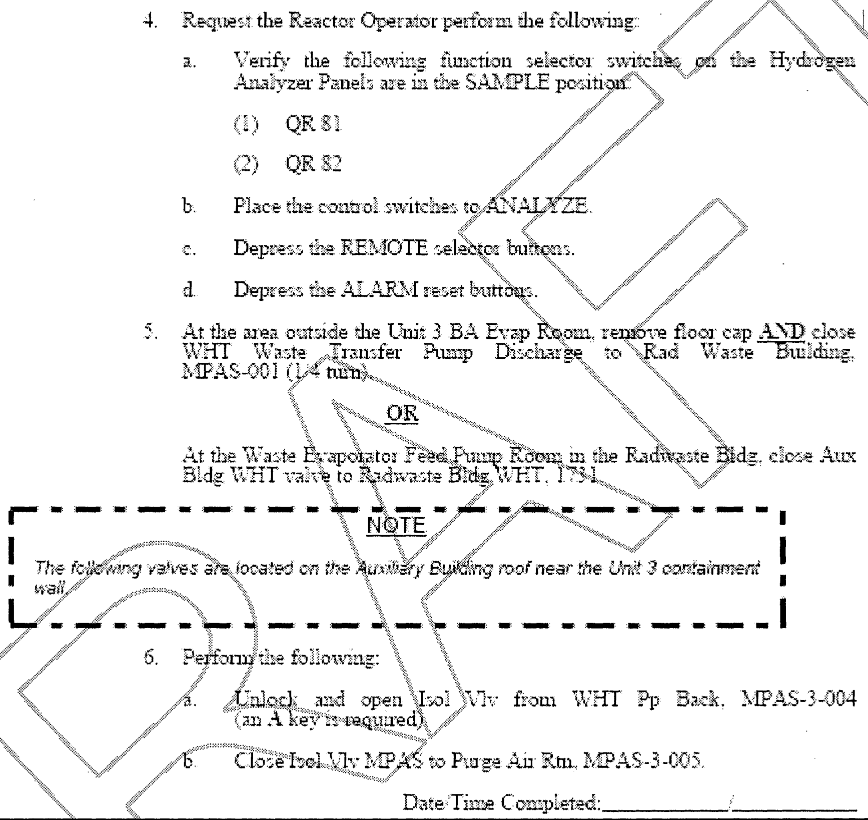
NOTES

- *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.: 4 Event No.: 4 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, 1751. <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.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 4 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.: 4 Event No.: 4 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
		Note: BOP informs US of completion and manual start of 3A ICW pump ***Note: BOP should receive a turnover from the RO and continue in the EOP network.***

NRC XXIV_NRC_SEN_4

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 #5 Event Description

Facility: Turkey Point Scenario No.: 5 MOD 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 1000%

Online risk – green

B train protected both units

Event No.		Event Type*	Event Description
1	TFH1TV60 = -1 TFBVCO1 = -1 TVHPBOTL = .00005	(I)RO (C)RO (TS,I,C)SRO	LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.
2	TVHPBOTL = 0.0006	(R)RO (C)RO (N)BOP (TS,R,C)SRO	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	TCE2E01T = -1 TCE2E07 = -1 TFP8SWYD = -1	(M)ALL (C,C)BOP (C,C)SRO	Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.
4	TVHPBOTL = 0.006	(M)ALL (C)RO (C)SRO	The RCS leak increases requiring 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 #5

Event 1 – LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

Event 2 - 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.

Event 3 – Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Event 4 – The RCS leak increases requiring safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Scenario XXIV NRC 5

Simulator Operating Instructions

Setup

Reset to IC-1 (100% MOL)

Open & execute lesson file SRO_XXIV_NRC_5.lsn

Place simulator in run

Start 3B charging pump and secure 3C charging pump

Trigger lesson step: SETUP – 3A/B EDG START FAILURE (actuates TFQ5FA = T, TFQ5ASFB = T)

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 – MAIN TURBINE TRIP FAILURE (actuates TFU10005 = T)

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 – LT-3-460 FAIL LOW – LCV-3-460 FAIL CLOSE

Initiated immediately after shift turnover.

LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

Trigger lesson step **Event 1 – LT-3-460 FAIL LOW – LCV-3-460 FAIL CLOSE** (actuates TFH1TV60 = -1, TFBVC01 = -1, TVHPBOTL = 0.0005)

The Crew responds per 3-ONOP-041.6 Pressurizer Level Control Malfunction and ARP097.CR

3-OP-047 CVCS- charging and letdown

Step 2 – Respond as NSO; acknowledge direction to check CCW flow on FI-3-624 between 200 and 238 gpm. Report back in two minutes, 219 gpm

If called respond as I&C, acknowledge direction to check 460CX relays energized. Report back after five minutes that the relays are energized.

Event 2 – 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 3 and 4 - OPEN SWYD GCBs – TRIP U4 / 300 GPM LEAK

Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring 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 3 – OPEN SWYD GCBs – TRIP U4**
(actuates TCE2E01T = -1, TCE2E07T = -1, TFP8SWYD = -1, TVHPBOTL = 0.006)

The Crew responds per 3-EOP-E-0 and 3-EOP-E-1

3-EOP-E-1

Step 4 – Respond as Chemistry; acknowledge direction to take periodic samples of all S/Gs and check DAM1 monitor reading. No response required

Step 4 – Respond as Health Physics; acknowledge direction to take radiation readings on main steamlines. After 10 minutes report radiation readings at background.

Step 15.a.1 – Respond as System Dispatcher, acknowledge request to restore the switchyard power. No response required

Step 15.a.3.b – Respond as unit 4 RO, acknowledge direction to start one train of chilled water. Report back after two minutes that a train of chilled water is running.

Step 16 - Respond as NSO, acknowledge direction to unlock and close breakers per step 16 of 3-EOP-E-1. **Trigger** lesson step, **EVENT 4 – CLOSE BREAKERS.**

Step 17 - Respond as NSO; acknowledge direction to close radiation shield doors for the containment spray pump and charging pump rooms.

Step 18.4 - Respond as H.P.; acknowledge direction to take surveys in the pipe and valve and electrical penetration rooms.

Step 18.c - Respond as Chemistry; acknowledge direction to align PASS for sampling the RCS.

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-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 4 – 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

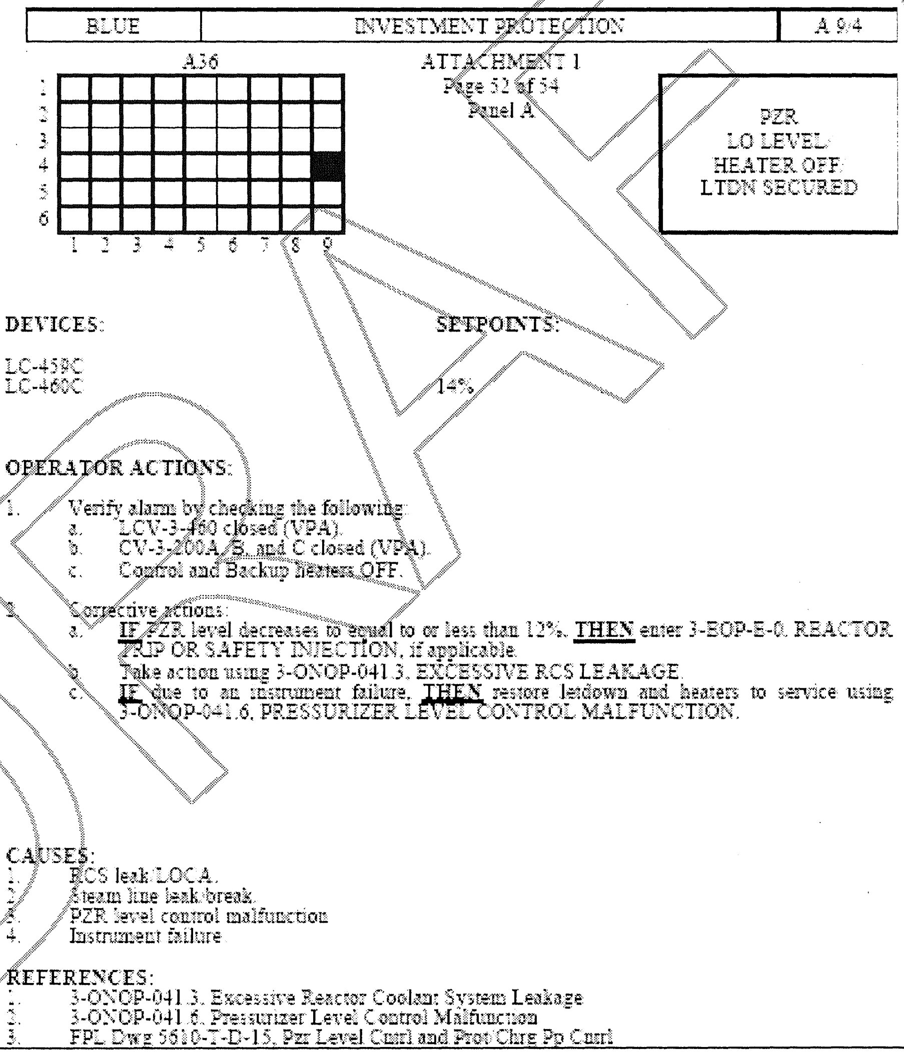
Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 1 Page 1 of 8

Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

Time	Position	Applicant's Actions or Behavior
Trigger, **EVENT 1- LT-3-460 FAIL LOW – LCV-3-460 FAIL CLOSE**		
	RO	Determines LT-3-460 failed low by the following: • Alarm A 8/4, Pzr lo-lo level alert • Alarm A 9/4, Pzr low lvl htr off & letdown secured • Alarm B 3/1, Pzr heater contr fan off • LT-3-460 indication • Letdown isolation, Pzr htrs off
	BOP	Refers to ARPs
		Note: 3-ARP-097.CR A 9/4 below. 2-3 gpm leak may not be detected prior to 30 gpm surge line leak.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 1 Page 2 of 8

Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

Time	Position	Applicant's Actions or Behavior
	BOP	 BLUE INVESTMENT PROTECTION A 9/4 A36 ATTACHMENT 1 Page 52 of 54 Panel A PZR LO LEVEL/ HEATER OFF/ LTDN SECURED **DEVICES:** LC-459C LC-460C **SETPOINTS:** 14% **OPERATOR ACTIONS:** 1. Verify alarm by checking the following: a. LCV-3-460 closed (VPA). b. CV-3-200A, B, and C closed (VPA). c. Control and Backup heaters OFF. 2. Corrective actions: a. **IF** PZR level decreases to equal to or less than 12%, **THEN** enter 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, if applicable. b. Take action using 3-ONOP-041.3, EXCESSIVE RCS LEAKAGE. c. **IF** due to an instrument failure, **THEN** restore letdown and heaters to service using 3-ONOP-041.6, PRESSURIZER LEVEL CONTROL MALFUNCTION. **CAUSES:** 1. RCS leak/LOCA. 2. Steam line leak/break. 3. PZR level control malfunction 4. Instrument failure **REFERENCES:** 1. 3-ONOP-041.3, Excessive Reactor Coolant System Leakage 2. 3-ONOP-041.6, Pressurizer Level Control Malfunction 3. FPL Dwg 5610-T-D-15, Pzr Level Cntrl and Prot/Chrg Pp Cntrl
	US	Directs response per 3-ONOP-041.6, Pressurizer level control malfunction.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 1 Page 3 of 8

Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

Time	Position	Applicant's Actions or Behavior
		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	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.
		Note: RO selects position 2, 461 replace 460.
	RO	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.
	RO	5.3 IF affected charging pump is not able to maintain programmed level per Enclosure 1, THEN start additional pumps as necessary to restore programmed level per Enclosure 1. 5.3.1 After programmed level has been restored, if troubleshooting of affected charging pump is desired, then refer to 3-OP-047, CVCS - Charging and Letdown, Troubleshooting Guide. 5.3.2 If affected charging pump is not required, then shut down the affected charging pump using 3-OP-047, CVCS - CHARGING AND LETDOWN.
	RO	5.4 IF LR-3-459 is selected to a defective channel, THEN place CHANNEL SELECT PRESSURIZER LEVEL RECORDER in another position.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 1 Page 4 of 8

Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak..

Time	Position	Applicant's Actions or Behavior
	RO	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.
		Note: LT-3-460 will not open
	RO	5.6 **IF** normal letdown can NOT be re-established, **THEN** place excess letdown in service using 3-OP-047, CVCS - CHARGING AND LETDOWN.
		Note: 3-OP-047 next page
	RO	5.7 **IF** control malfunction caused pressurizer heaters to deenergize, **THEN** restore PRZ heaters to automatic operation or take manual control.
	RO US	5.8 Maintain pressurizer level to be consistent with programmed level as indicated in Enclosure 1. 5.9 Perform actions required by 3-ONOP-049.1, DEVIATION OR FAILURE OF SAFETY RELATED OR REACTOR PROTECTION CHANNELS.
	US	Directs 3-ONOP-049.1

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 1 Page 5 of 8

Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

Time	Position	Applicant's Actions or Behavior
	RO	7.12 Guidance for Placing Excess Letdown In Service 7.12.1 Initial Conditions 1. All applicable prerequisites listed in Section 3.0 are satisfied. 7.12.2 Procedure Steps 1. Verify Excess Ltdn Hx CCW Outlet, CV-3-739, is open. 2. Verify greater than 200 gpm and less than or equal to 238 gpm CCW flow on flow indicator FI-3-624 (located in the pipe and valve room). 3. Verify Excess Ltdn Iso Valve, CV-3-387, is closed. 4. Verify Excess Ltdn Divert to WDS, CV-3-389, is aligned to the VCT (Switch to NORMAL). 5. Slowly open Excess Letdown Flow Controller, HCV-3-137, to allow excess letdown lines to backfill. 6. **WHEN** a minimum of 5 minutes have elapsed, **THEN** close Excess Letdown Flow Controller, HCV-3-137. 7. Open Excess Ltdn Isol Valve, CV-3-387 **AND** observe Containment Sump level for indication that RV-3-304 may have lifted. CAUTION *If Excess Letdown Heat Exchanger outlet temperature exceeds 185°F, then VCT may have an excessive heatup rate.* 8. Slowly open Excess Letdown Flow Controller, HCV-3-137, allowing the heat exchanger to warmup. 9. Monitor heat exchanger outlet temperature at Excess Ltdn Hx Temp Indicator, TI-3-139. 10. **IF** VCT Divert to Hold-up Tk, LCV-3-115A, reaches the 100 percent divert position (Red light ON, Green light OFF) **OR** if desired to direct water to the RCDT, **THEN** align Excess Ltdn Divert to WDS, CV-3-389, to the RCDT (Switch to DIVERT). 11. Enter completion of this procedure subsection in the Unit Narrative Log.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 1 Page 6 of 8

Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

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.
		Note: LR-3-459 is in an alternate channel, performed earlier
	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.
		Note: LC-459G may be 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.: 5 Event No.: 1 Page 7 of 8

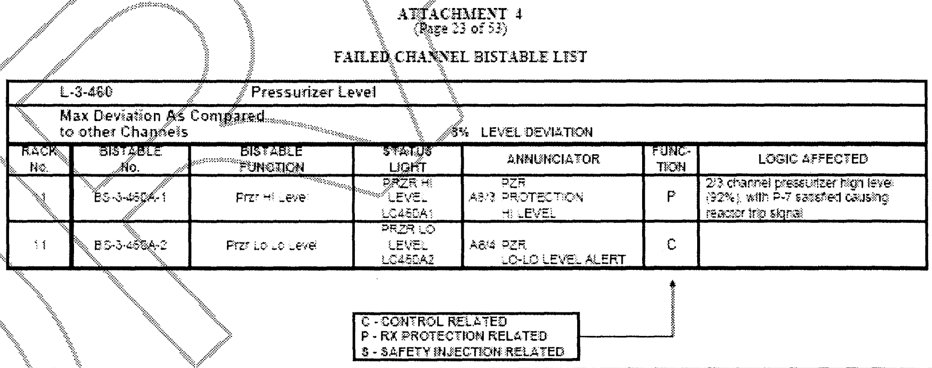
Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>US</td><td>
<p>TABLE 3.3-1</p>
<p>REACTOR TRIP SYSTEM INSTRUMENTATION</p>
<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>1. Manual Reactor Trip</td><td>2
2</td><td>1
1</td><td>2
2</td><td>1, 2
3*, 4*, 5*</td><td>1
9</td></tr>
<tr><td>2. Power Range, Neutron Flux</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. High Setpoint</td><td>4</td><td>2</td><td>3</td><td>1, 2</td><td>2</td></tr>
<tr><td>b. Low Setpoint</td><td>4</td><td>2</td><td>3</td><td>1##, 2</td><td>2</td></tr>
<tr><td>3. Intermediate Range, Neutron Flux</td><td>2</td><td>1</td><td>2</td><td>1##, 2</td><td>3</td></tr>
<tr><td>4. Source Range, Neutron Flux</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. Startup</td><td>2</td><td>1</td><td>2</td><td>2#</td><td>4</td></tr>
<tr><td>b. Shutdown**</td><td>2</td><td>0</td><td>2</td><td>3, 4, 5</td><td>5</td></tr>
<tr><td>c. Shutdown</td><td>2</td><td>1</td><td>2</td><td>3*, 4*, 5*</td><td>9</td></tr>
<tr><td>5. Overtemperature ΔT</td><td>3</td><td>2</td><td>2</td><td>1, 2</td><td>13</td></tr>
<tr><td>6. Overpower ΔT</td><td>3</td><td>2</td><td>2</td><td>1, 2</td><td>13</td></tr>
<tr><td>7. Pressurizer Pressure-Low (Above P-7)</td><td>3</td><td>2</td><td>2</td><td>1</td><td>6</td></tr>
<tr><td>8. Pressurizer Pressure--High</td><td>3</td><td>2</td><td>2</td><td>1, 2</td><td>6</td></tr>
<tr><td>9. Pressurizer Water Level--High (Above P-7)</td><td>3</td><td>2</td><td>2</td><td>1</td><td>13</td></tr>
<tr><td>10. Reactor Coolant Flow--Low</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>a. Single Loop (Above P-8)</td><td>3/loop</td><td>2/loop</td><td>2/loop</td><td>1</td><td>6</td></tr>
<tr><td>b. Two Loops (Above P-7 and below P-8)</td><td>3/loop</td><td>2/loop</td><td>2/loop</td><td>1</td><td>6</td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td>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.</td></tr>
<tr><td></td><td></td><td><i>Note: functional unit # 9, action 13. 6 hrs. to trip bistables</i></td></tr>
<tr><td></td><td>RO</td><td>5.5.1 Take appropriate actions as specified in Technical Specifications.</td></tr>
<tr><td></td><td></td><td><p>CAUTION</p><p><i>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.</i></p></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 1 Page 8 of 8

Event Description: LT-3-460 fails low causing letdown isolation. A 2-3 gpm RCS leak begins concurrent with the LT-3-460 failure. Operators respond per 3-ONOP-041.6, but discover that LCV-3-460 will not reopen. Excess letdown is placed in service and charging flow reduced. Tech Specs are consulted, 3-ONOP-049.1 used to remove the failed channel. 3-ONOP-041.3 may also be referenced for the RCS leak.

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.



ATTACHMENT 4
(Page 23 of 53)

FAILED CHANNEL BISTABLE LIST

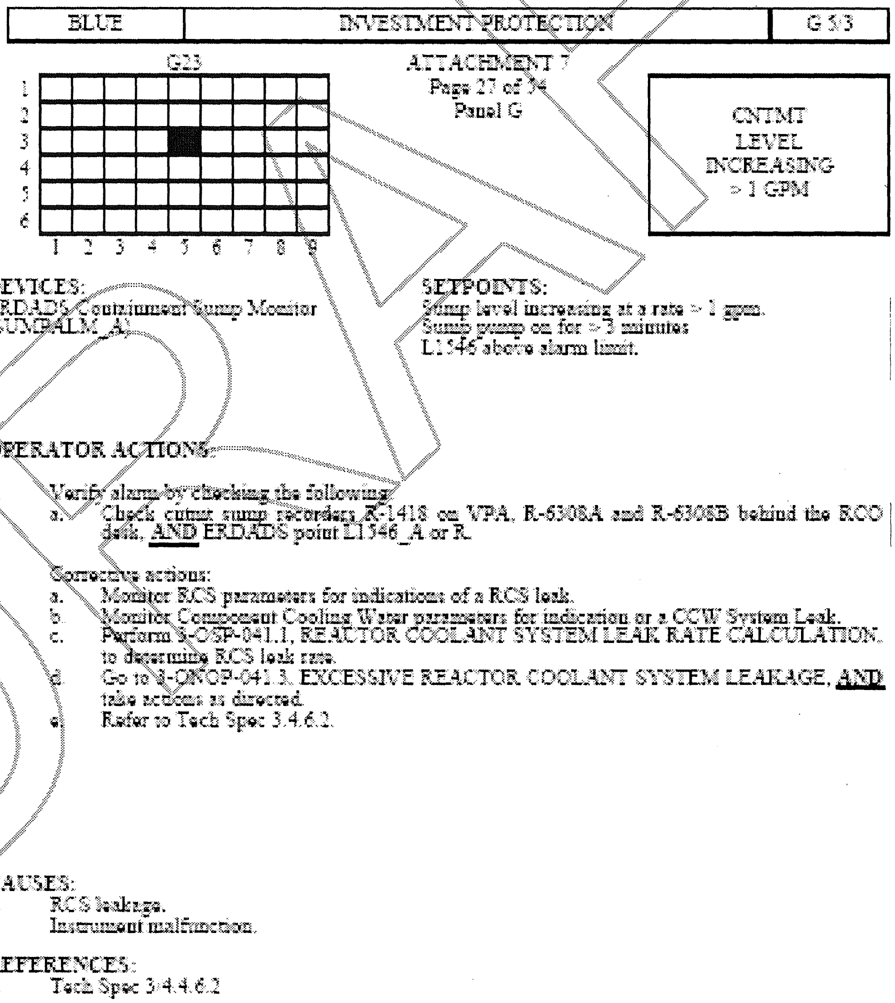
L-3-460	Pressurizer Level					
Max Deviation As Compared to other Channels			5% LEVEL DEVIATION			
RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNCTION	LOGIC AFFECTED
1	BS-3-460A-1	Przr Hi Level	PRZR HI LEVEL LC460A1	A8/3 PZR PROTECTION HI LEVEL	P	2/3 channel pressurizer high level (92%), with P-7 satisfied causing reactor trip signal
11	BS-3-460A-2	Przr Lo Lo Level	PRZR LO LEVEL LC460A2	A8/4 PZR LO-LO LEVEL ALERT	C	

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

Note: Following identification of bistables, continue toevent 2.

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**		
		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 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 B. 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
		Note: excess letdown may be secured if in service.

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 <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
		Note: HCV-3-121 may be closed from previous steps
	RO	**2** **Check RCS Inventory Decreasing** Go to Step 10.
		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 <u>OR</u> • 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 • <u>IF</u> leakage is from the RHR System, <u>THEN</u> perform ATTACHMENT 1 <u>OR</u> • 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.

Time	Position	Applicant's Actions or Behavior
	BOP	11 Check For Additional Indications Of RCS Leakage a. Verify R-11 - STABLE OR DECREASING 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. b. Verify R-12 - STABLE OR DECREASING 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. c. Verify R-14 - STABLE OR DECREASING c. Perform 3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE, while continuing with this procedure. d. Verify SG tubes - INTACT • R-15 - STABLE OR DECREASING • R-19 - STABLE OR DECREASING • SECONDARY SAMPLE RESULTS d. Perform 3-ONOP-071.2, STEAM GENERATOR TUBE LEAKAGE, while continuing with this procedure. e. Verify RCS to Component Cooling Water boundary - INTACT • R-17A STABLE OR DECREASING • R-17B STABLE OR DECREASING e. Perform 3-ONOP-067, RADIOACTIVE EFFLUENT RELEASE, while continuing with this procedure.

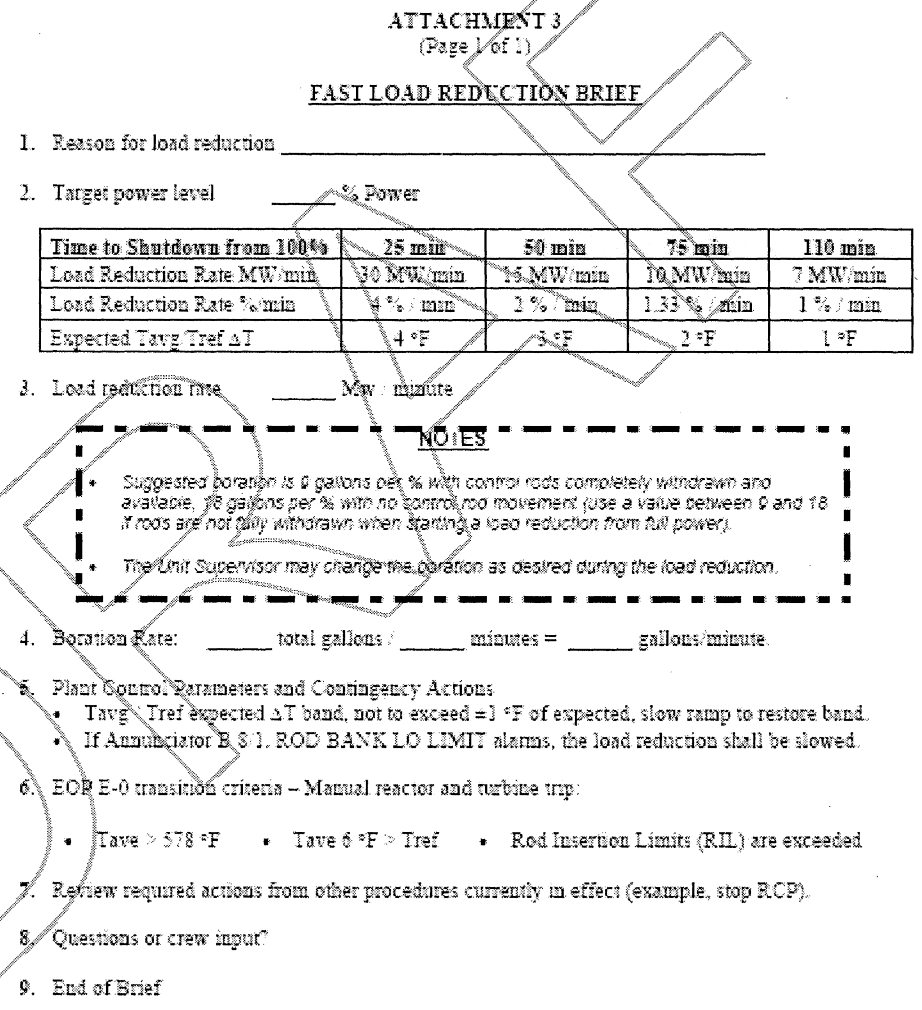
Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 4 of 9

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	**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.
		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>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	<u>FOLDOUT PAGE</u> 1. **3-EOP-E-0 Transition Criteria** <u>IF</u> any of the following limits are reached, <u>THEN</u> trip the Reactor and Turbine <u>AND</u> 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** <u>WHEN</u> reactor power has changed by greater than or equal to 15 percent, <u>THEN</u> notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4. 3. **Restore Blender to AUTO** <u>WHEN</u> boration is complete, <u>THEN</u> 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 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 <u>IF</u> boration is not required, <u>THEN</u> go to Step 3.
	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. <u>IF</u> boration is used, <u>THEN</u> 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
		<u>NOTE</u> *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. <u>IF</u> directed by the Unit Supervisor, <u>THEN</u> 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.

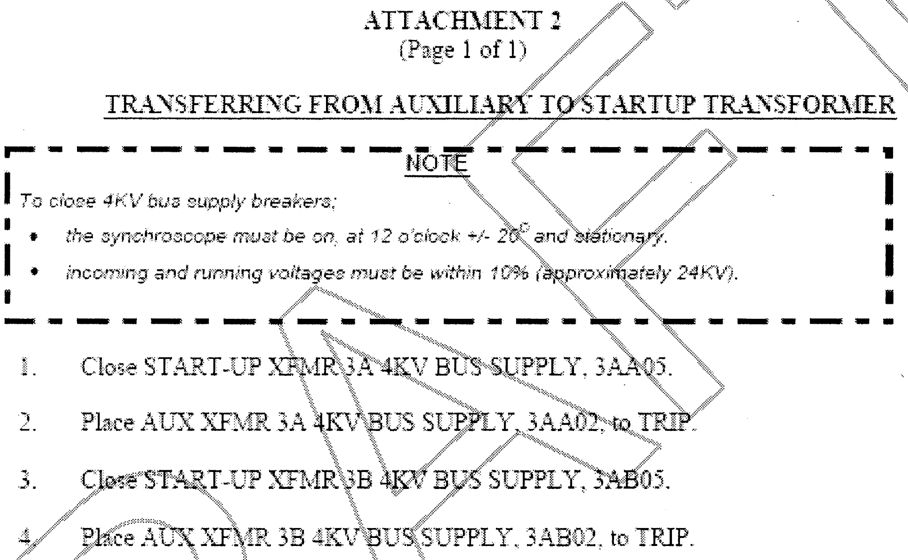
Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 8 of 9

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.
		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.
		Note: Aux. steam supplied from unit 3 from turnover brief.
		Note: After 5 to 10% load reduction trigger next event.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 3 Page 1 of 8

Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Time	Position	Applicant's Actions or Behavior
		Trigger, **EVENT 3 – OPEN SWYD GCBs – TRIP U4**
	RO / BOP	Recognize and report the loss of offsite power based upon: • Numerous alarms associated with loss of offsite power • Units 3 and 4 start-up voltage lights out • Switch yard voltage indication at zero • Primary response to loss of load • Secondary response to loss of load
	US	Directs the reactor and turbine tripped immediate operator actions of 3-EOP-E-0 to be performed
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	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.
		Note: Reactor is manually tripped from the console
		Note: 300 gpm pressurizer surge line leak is initiated automatically with the loss of off site power.

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

Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	BOP √	**2** Verify Turbine Trip a. All turbine stop or associated control valves – CLOSED a. Manually trip turbine. <u>IF</u> unable to verify turbine trip, <u>THEN</u> 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. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> close main steamline isolation and bypass valves. c. Check Mid and East GCBs – OPEN (Normally 30 second delay) c. Manually open breakers. <u>IF</u> breakers do <u>NOT</u> open, <u>THEN</u> actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s)
		Note: Turbine fails to trip manually; MSIVs and bypass valves are verified closed. MSR main steam supply stop valves are closed
		Critical task: (WOG) Failure to manually trip the turbine prior to completing immediate operator actions.

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Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

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) **<u>IF</u>** neither 3A nor 3B 4 KV bus is energized, **<u>THEN</u>** 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) **<u>IF</u>** lockout of 3D 4 KV bus **<u>NOT</u>** present, **<u>THEN</u>** 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.
		Note:3A and 3B EDGs are emergency started

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 3 Page 4 of 8

Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	RO	**4** Check If SI Is Actuated * SI Annunciators - ANY ON OR * Safeguards equipment – AUTO STARTED Perform the following: a. Check if SI is required: * Low pressurizer pressure – 1730 psig OR * High containment pressure – 4 psig OR * High steam line differential pressure – 100 psid OR * High steam flow with low S/G pressure - 614 psig OR low Tavg (543 F) OR * RCS subcooling based on core exit TCs - LESS THAN 30°F[210°F] OR * PRZ level - CAN NOT BE MAINTAINED GREATER THAN 12%[50%] b. IF SI is required, THEN manually actuate SI and containment isolation phase A AND go to Step 5. c. IF SI is NOT required, THEN 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.
		Note: Depending on timing, conditions for SI may not be pesent when first checked. Transition will be made to 3EOP-ES-0.1. Within a few minutes transition back to 3-EOP-E-0 STEP 1 will be made for initiation of safety injection. Automatic SI is blocked requiring manual actuation. The first few steps of ES-0.1 are included.

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

Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	US	Directs response per 3-EOP-ES-0.1
		CAUTION *If SI actuation occurs during this procedure, 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, is required to be performed starting at Step 1.*
		NOTE *Foldout page is required to be monitored throughout this procedure.*
		FOLDOUT FOR PROCEDURE ES-0.1 1. SI ACTUATION CRITERIA IF either condition listed below occurs, THEN actuate SI, actuate containment isolation phase A, and go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1: * RCS subcooling based on core exit TCs - LESS THAN 30°F OR * PRZ level - CAN NOT BE MAINTAINED GREATER THAN 12% 2. EMERGENCY BORATION CRITERIA IF one of the following conditions exists, THEN emergency borate using 3-ONOP-046.1, EMERGENCY BORATION, until termination criteria are met. a. Any RCS Cold Leg temperature decreases to less than 525°F b. Two or more control rods NOT fully inserted. 3. 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. 4. RED PATH SUMMARY IF any condition listed below occurs, THEN go to 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES, Step 1: a. Subcriticality: Nuclear power - GREATER THAN 5% b. Core Cooling: Core exit TCs - GREATER THAN 1200°F c. Heat Sink: Narrow range level in all S/Gs - LESS THAN 6% AND total feedwater flow - LESS THAN 345 GPM d. Integrity: Cold leg temperature decrease - GREATER THAN 100°F IN LAST 60 MINUTES AND any RCS cold leg temperature - HAS BEEN LESS THAN 290°F e Containment: Containment pressure - GREATER THAN 55 PSIG
		Note: transition will be made back to 3-EOP-E-0 step 1 based on pressurizer level < 12%.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 3 Page 6 of 8

Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Time	Position	Applicant's Actions or Behavior		
	BOP	1	Check Power Available to BOTH UNIT 3 AND UNIT4	IF Loss of ALL AC Power exists on Unit 4 AND only one Unit 3 4KV bus is energized AND from an EDG, THEN go to Attachment 2 of this procedure.
	BOP	2	Check AFW Pumps - AT LEAST TWO RUNNING	IF both units require AFW, THEN perform the following: a. Verify all RCPs – TRIPPED. b. Establish 270 gpm AFW flow to each unit. c. Use a setpoint of 270 gpm for required AFW flow instead of the 345 gpm specified in subsequent steps and procedures.
	RO	3	Maintain RCS Cold Leg Temperature a. All RCS Cold Leg Temperatures - GREATER THAN OR EQUAL TO 525°F b RCS Cold Leg Temperature * STABLE AT 547°F OR * TRENDING TO 547°F OR * Stable at post trip value - LESS THAN 547°F	a. Emergency borate for uncontrolled cooldown using 3-ONOP-046.1, EMERGENCY BORATION while continuing with this procedure. b. Perform the following: 1) IF temperature less than 547°F AND temperature is decreasing, THEN perform the following: a) Stop dumping steam. b) Verify S/G blowdown isolation valves closed. c) IF cooldown continues, THEN control total feed flow. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6% in at least one S/G. d) IF cooldown continues due to excessive steam flow, THEN close main steamline isolation and bypass valves. 2) IF temperature greater than 547°F AND temperature is increasing, THEN perform the following: * Dump steam to condenser. OR * Dump steam using S/G steam dump to atmosphere valves.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 3 Page 7 of 8

Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	BOP	**4** Check Feedwater Status a Check RCS average temperatures - LESS THAN 554°F — a. **WHEN** temperature less than 554°F, **THEN** do Steps 4b, 4c, 4d, and 4e. Continue with Step 5. b Stop all but one main feedwater pump c. Verify main feedwater flow control valves – CLOSED AND IN MANUAL — c. Manually close valves. d. Verify feedwater isolation valves – CLOSED — d. Locally close valves. • MOV-3-1407 • MOV-3-1408 • MOV-3-1409 e. Verify all S/G levels – GREATER THAN OR EQUAL TO 6% NARROW RANGE — e. Establish greater than 345 gpm feed flow to the S/Gs from one of the following: • Feedwater system on feedwater bypass valves **OR** • AFW
	RO	**5** Verify All Control Rods – FULLY INSERTED — **IF** two or more control rods **NOT** fully inserted, **THEN** emergency borate for stuck control rods using 3-ONOP-046.1, EMERGENCY BORATION, while continuing with this procedure.
	RO	**6** Verify Charging - IN SERVICE — Perform the following: a. Verify VCT makeup set for automatic control. b. Start at least one charging pump. c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, and charging pump speed to establish desired flow. d. **IF** charging flow can **NOT** be established, **THEN** start one SI pump for RCS inventory control using 3-ONOP-047.1, LOSS OF ALL CHARGING FLOW IN MODES 1-4, while continuing with this procedure.

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

Event Description: Following a 10% load reduction, offsite power is lost. The turbine fails to auto or manually trip preventing a reactor trip from turbine trip. The reactor is tripped manually. The failure of the turbine to trip requires the MSIVs to be closed. The A and B EDGs fail to auto start requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	RO	7 Check PRZ Level - GREATER THAN 15% Perform the following: a. Verify letdown isolated. b. Verify excess letdown isolated. c. Verify PRZ heaters - OFF. d. Control charging to restore PRZ level greater than 15%. e. <u>WHEN</u> PRZ level greater than 15%, <u>THEN</u> do Steps 8 and 9. Continue with Step 10.
		Note: transition will be made back to 3-EOP-E-0 step 1 based on pressurizer level < 12%.
	US	Directs response per 3-EOP-E-0 starting at step 1.
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	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. <u>IF</u> reactor power is greater than 5% <u>OR</u> intermediate range power is <u>NOT</u> stable or decreasing, <u>THEN</u> 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.
		Note: Containment temperature will reach adverse containment setpoint during this event.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 1 of 18

Event Description: The RCS leak increases requiring safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
	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).
		Note: MSIVs and bypassed are closed
	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.
		Note: 3A and 3B EDGs emergency started earlier

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 2 of 18

Event Description: The RCS leak increases requiring safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
____ Auto SI Signal ____ SI and Phase A initiated	**RO** √	**4** Check If SI Is Actuated * SI Annunciators - ANY ON OR * Safeguards equipment – AUTO STARTED Perform the following: a. Check if SI is required: * Low pressurizer pressure – 1730 psig OR * High containment pressure – 4 psig OR * High steam line differential pressure – 100 psid OR * High steam flow with low S/G pressure - 614 psig OR low Tavg (543 F) OR * RCS subcooling based on core exit TCs - LESS THAN 30°F[210°F] OR * PRZ level - CAN NOT BE MAINTAINED GREATER THAN 12%[50%] b. IF SI is required, THEN manually actuate SI and containment isolation phase A AND go to Step 5. c. IF SI is NOT required, THEN 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.
		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.: 5 Event No.: 4 Page 3 of 18

Event Description: The RCS leak increases requiring 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 ≥ 1.3×10^5 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 50 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**
		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.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 4 of 18

Event Description: The RCS leak increases requiring 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. **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%] b. Maintain feed flow to S/G narrow range levels between 15%[32%] and 50%.	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.
		Note: narrow range levels <32%(adverse conditions) Verifies AFW flow >345 gpm.		

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Event Description: The RCS leak increases requiring 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
		Note: Step 9.b transitions to step 10
	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 8%[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.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 6 of 18

Event Description: The RCS leak increases requiring 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 — 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
		Note: If excess letdown was placed in service earlier and not secured, it will be secured here.
	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
		Note: All RCPs secured

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 7 of 18

Event Description: The RCS leak increases requiring 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 – * 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 a. Go to Step 14.
	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.
		Note: No faulted or ruptured S/Gs

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Event Description: The RCS leak increases requiring 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-3-6309B 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.
		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.
	US	Directs response per 3-EOP-E-1
		NOTE *Foldout page is required to be monitored throughout this procedure*
		Note: See fold out next page
	US	Reviews foldout page with crew

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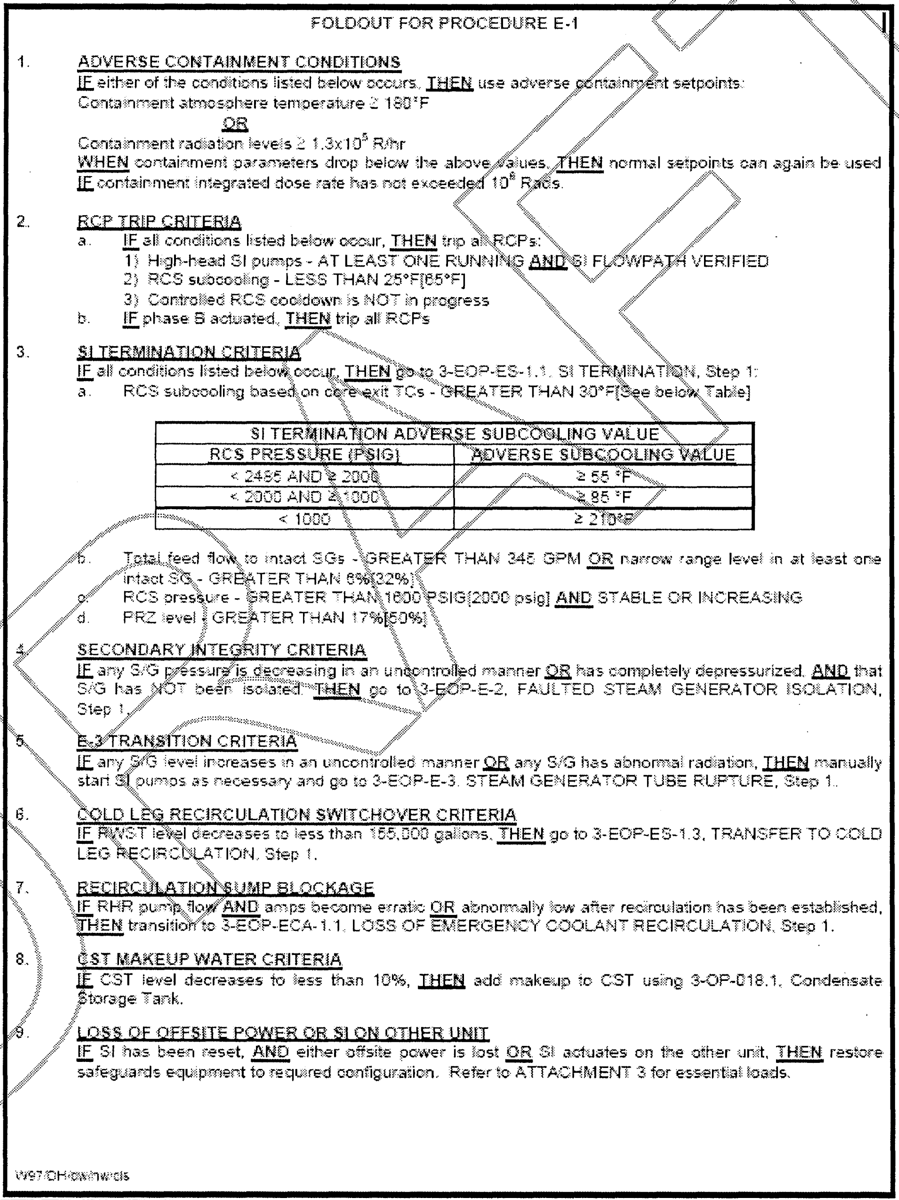
Event Description: The RCS leak increases requiring safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

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.

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Event Description: The RCS leak increases requiring 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 b. High-head SI pumps - AT LEAST ONE RUNNING c. RCS Subcooling - LESS THAN 25°F[65°F] d. Controlled plant cooldown – <u>NOT</u> IN PROGRESS e. Stop all RCPs	a. Go to Step 2. b. Go to Step 2. c. Go to Step 2. d. Go to Step 2.
		Note: All RCPs secured	
	BOP	**2** **Check If S/Gs Are <u>NOT</u> Faulted** a. Check pressures in all S/Gs – • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	a. <u>IF</u> any S/G is faulted <u>AND</u> that S/G has <u>NOT</u> previously been isolated, <u>THEN</u> 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%] b. Control feed flow to maintain narrow range level between 15%[32%] and 50% c. Narrow range level - LESS THAN 50%	a. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. c. Stop feed flow to any S/G with narrow range level greater than 50%. <u>IF</u> narrow range level in any S/G continues to increase in an uncontrolled manner, <u>THEN</u> 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.: 5 Event No.: 4 Page 11 of 18

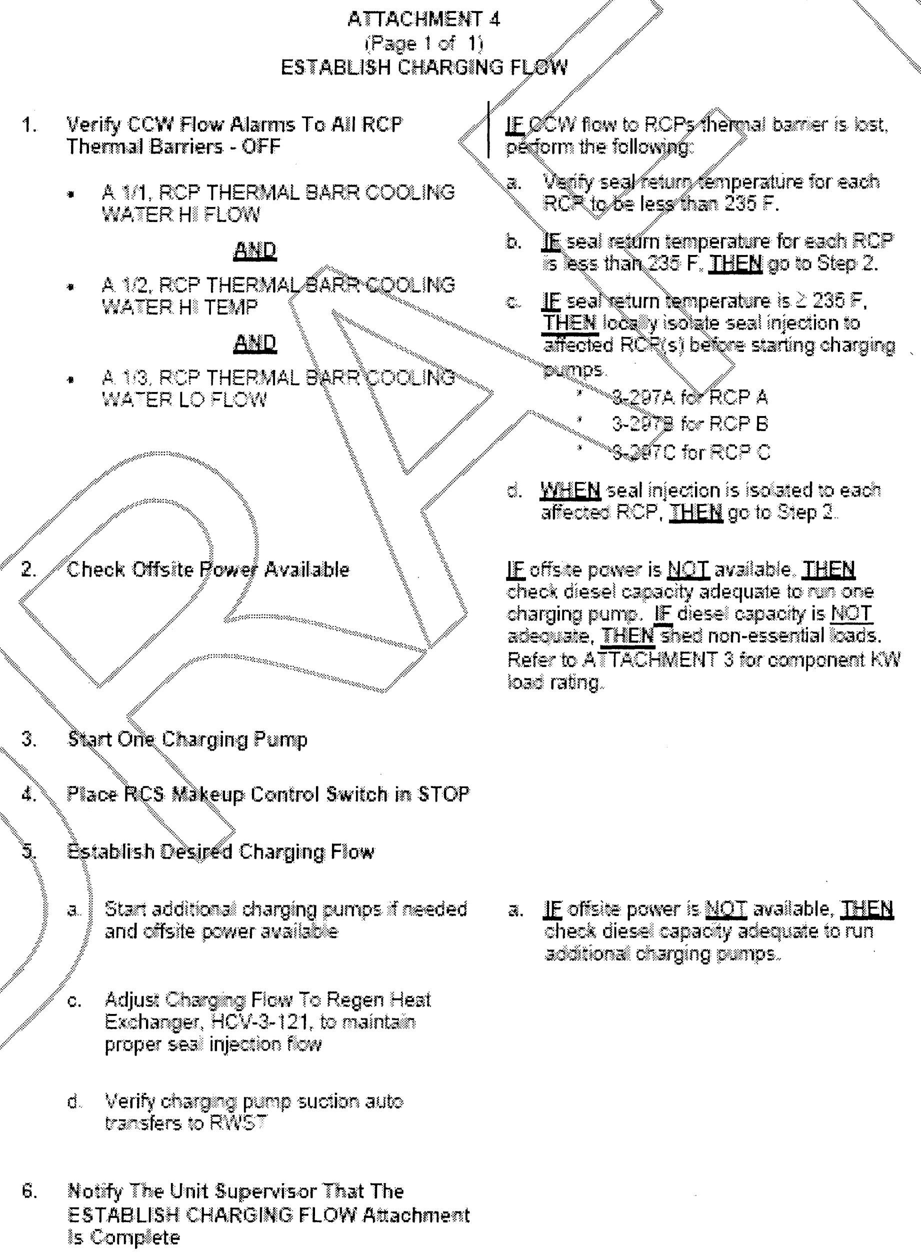
Event Description: The RCS leak increases requiring safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

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 — a. Restore power to block valves b. PORVs - CLOSED — 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. Block valves - AT LEAST ONE OPEN — 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 — a. Perform Attachment 4 to establish charging 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

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 12 of 18

Event Description: The RCS leak increases requiring safety injection that fails to auto initiate. Manual initiation of SI and phase A is required.

Time	Position	Applicant's Actions or Behavior
		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.: 5 Event No.: 4 Page 13 of 18

Event Description: The RCS leak increases requiring 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 — b. IF neither condition satisfied, THEN go to Step 12. * 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%] c. RCS pressure — c. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 12. • Pressure - GREATER THAN 1600 PSIG[2000 PSIG] • Pressure - STABLE OR INCREASING d. PRZ level - GREATER THAN 17%[50%] e. Go to 3-EOP-ES-1.1, SI TERMINATION, Step 1
		Note: foldout back on page 9 of this section, transitions to step 12.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 14 of 18

Event Description: The RCS leak increases requiring 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 a. Observe CAUTION prior to Step 13 AND go to Step 13. 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 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. 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
		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] a. IF RHR Flow greater than 1000 gpm, THEN go to Step 15. b. Check RHR flow – LESS THAN 1000 gpm b. Go to Step 14. c. Verify SI - RESET d. Stop RHR pumps AND place in standby
		Note: RHR pumps are secured

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 15 of 18

Event Description: The RCS leak increases requiring 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 <u>OR</u> INCREASING • Check RCS pressure - STABLE <u>OR</u> DECREASING Observe NOTE prior to Step 1 <u>AND</u> 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 <u>AND</u> 3C transformer. 2) <u>WHEN</u> offsite power has been restored to Unit 3 startup transformer <u>OR</u> 3C transformer, <u>THEN</u> restore offsite power to 4KV 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 train of chilled water for computer room. <u>IF</u> adequate diesel capacity is <u>NOT</u> available, <u>THEN</u> 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
		Note: Directs U4 RO to start chilled water

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 16 of 18

Event Description: The RCS leak increases requiring 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 IF cold leg recirculation capability can NOT be verified, THEN go to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
		Note: Directs breakers to be unlocked and closed
	BOP	**17** Locally Verify Radiation Shield Doors - CLOSED • Containment spray pump room • Charging pump room
		Note: Directs doors closed

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 17 of 18

Event Description: The RCS leak increases requiring 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.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 18 of 18

Event Description: The RCS leak increases requiring 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] a. Perform the following: 1) <u>IF</u> RHR pump flow greater than 1000 gpm, <u>THEN</u> go to Step 20. 2) <u>IF</u> RHR pump flow less than or equal to 1000 gpm, <u>THEN</u> go to 3–EOP–ES–1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1. b. 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.

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

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

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 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
		Note:* *BOP is required to go back to the contaiment isolation racks and rest the six phase A lockout relays, (three lockout relays on each rack)

Op-Test No.: 2009-301 Scenario No.: 5 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 • MOV-3-1417 • MOV-3-1418	b. Stop all RCPs
		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.: 5 Event No.: 4 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
		Note: BOP will call NSO to align PAHM. 3-OP-094 steps listed below.

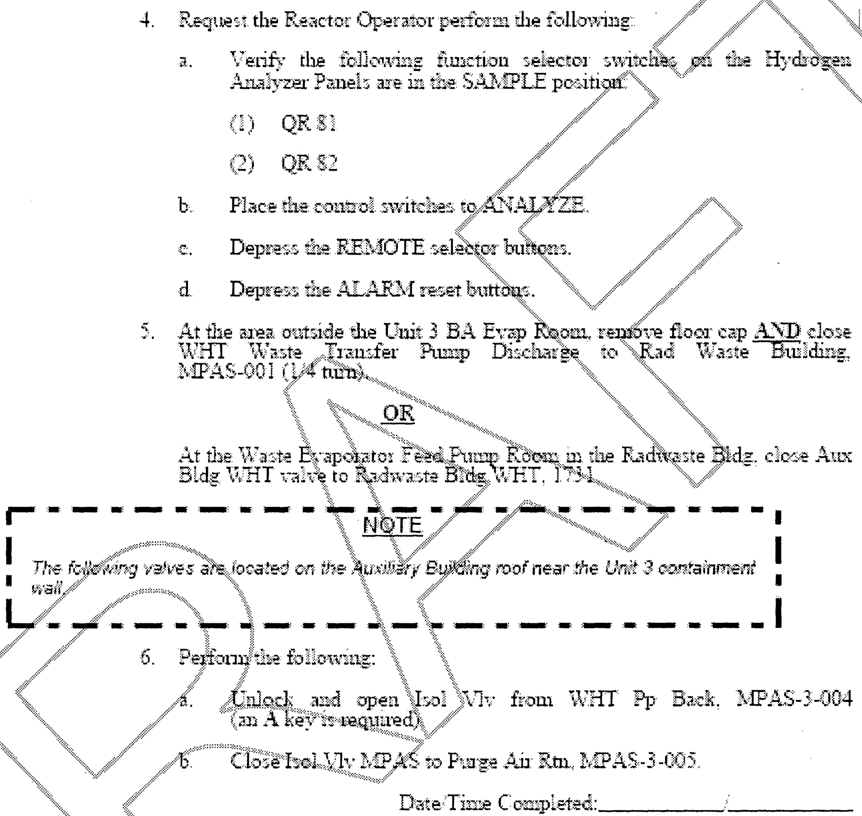
Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 att.3 Page 8 of 11

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.: 5 Event No.: 4 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.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 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.: 5 Event No.: 4 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
		Note: BOP informs US of completion of attachment 3. ***Note: BOP should receive a turnover from the RO and continue in the EOP network.***

NRC XXIV_NRC_SEN_5

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:	758
Gross Leakrate:	.03		Gross Leakrate:	.03
RCS Boron Conc:	670		RCS Boron Conc:	200

Operational Concerns:

3C charging pump – OOS due to packing leakage. Scheduled to return in 14 hours. Thunderstorms are 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:	574.2
RCS Pressure:	2250
RCS Boron Conc:	670

RCS Leakrate	
Gross:	.03
Unidentified	.01
Charging Pps:	.02

Accumulator Ref Levels	
A	6615
B	6641
C	6627

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.

Facility:	Turkey Point	Scenario No.: 6 MOD	Op Test No.: 2009-301
Examiners:	________________	Candidates:	________________ US
	________________		________________ RO
	________________		________________ BOP

Initial Conditions: Mode 2, 4% power, MOL. Turbine rolling at 1800 RPM ready to sync generator to grid. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Turnover: Equipment OOS: None significant

Place unit on line and increase power per 3-GOP-301 beginning with step 5.52.2

Event No.		Event Type*	Event Description
1		(N) ALL	Place unit on line per 3-GOP-301 beginning with step 5.52.2 Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.
1a	TFFXOILB = T	(TS) SRO	Once feed regulating valves are placed in automatic, an NSO calls in that the B AFWP governor has an oil leak.
2	TVKD001X = 1.0 / 2 min ramp TFK3B11S = T	(C) SRO/BOP	3A (running) TPCWP bearing failure. Failure of 3B (standby) TPCWP to automatically start following trip of running pump. The crew responds per 3-ONOP-008 and manually starts the 3B TPCWP.
3	TFF1M86H = T	(I) BOP (I,TS) SRO	3B S/G controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). Manual operator action is required to control 3B s/g level and avoid a reactor trip. The crew responds per 3-ONOP-049.1.
4	TFS1MREH = T TFSVV13A = T	(R) SRO/BOP (C) RO (C)SRO	PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew responds per 0-ADM-200 for a secondary plant transient. Manual turbine load reduction is required to return reactor power to 30%. Once power is stabilized at 30%, the CV-3-1608 isolation valve is closed, but some ADV steam leakage still exists.
5	TVUJINF = 0.95 TVUJINFB=0.95 TVUJINFC=0.95 TVUJINFD=0.95	(C)BOP (M) ALL (C)SRO	Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.
6	TFP8SWYD = T TFQ5GAFS = T TFQ6XABF = T TFK3B11S = T TFFXM05 = T K30P11BG = F K30P11BR = F	(C) BOP (C)SRO	The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.
6a			The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50]% or SI actuated due to the effects of the steam leak.

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

Turkey Point 2009-301 Scenario #6

Event 1 - Place unit on line per 3-GOP-301 beginning with step 5.52.2 Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Event 1a - Once feed regulating valves are placed in automatic, an NSO calls in that the B AFWP governor has an oil leak.

Event 2 - 3A (running) TPCWP bearing failure. Failure of 3B (standby) TPCWP to automatically start following trip of running pump. The crew responds per 3-ONOP-008 and manually starts the 3B TPCWP.

Event 3 - 3B s/g controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). Manual operator action is required to control 3B s/g level and avoid a reactor trip. The crew responds per 3-ONOP-049.1.

Event 4 - PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew responds per 0-ADM-200 for a secondary plant transient. Manual turbine load reduction is required to return reactor power to 30%. Once power is stabilized at 30%, the CV-3-1608 isolation valve is closed, but some ADV steam leakage still exists.

Event 5 - Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.

Event 6 - The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Event 6a - The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50]% or SI actuated due to the effects of the steam leak.

Scenario XXIV NRC 6

Simulator Operating Instructions

Setup

Restore IC-20 (4% MOL, Ready to sync generator to grid)

Place simulator in run

Trigger lesson steps:
SETUP - 3B TPCWP AUTO START FAIL (actuates TFK3B11S = T then F when IMK3RB11)
SETUP - 3A EDG START FAIL (actuates TFQ5GAFS = T)
SETUP - 3B 4KV BUS STRIPPING FAIL (actuates TFQ6XABF = T)
SETUP - B AFWP GOV OIL LEAK (actuates TFFXOILB = T)
SETUP - MOV-3-1405 FAILS TO OPEN (actuates TFFXM05 = T)

Start train A chilled water and secure train B chilled water (CR HVAC panel).

Acknowledge any alarms and place simulator in freeze.

Provide shift turnover checklists & copy of 3-GOP-301 completed up to step 5.52.2 The crew is to place the unit on line and increase power to 30% for a flux map.

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.

This scenario requires the use of a surrogate operator for SGWLC. He will turn over and leave when FRVs are in automatic.

Event 1/1a - Place unit on line / B AFWP out of service

Initiated by crew based on shift turnover.

The crew performs 3-GOP-301 beginning at step 5.52.2 to synchronize generator to grid, increase power and swap s/g level control to main feed reg valves controlling in automatic. Note that a surrogate operator will be required to maintain SG level.

Respond if asked as SM that auto synchronization is to be used for placing the main generator on line. (Step 5.54 is n/a)

Respond as System if notified of placing Unit 3 on the grid and increasing power to 30% (135 MWe). If asked about VARS, request 100 MVAR out at 100% power.

Respond as Chemistry when notified to sample for 15% power change (TS 3.4.8)

Respond as NSO when notified to commence purging MSRs per 3-OP-072.1

Respond as NSO if directed to complete 3-OP-072 section 5.0 to place steam traps in service. After 7-10 min. report complete.

Respond as NSO if directed to perform local actions to initiate MSR tube bundle purge per 3-OP-072.1.

Once feed regulating valves are placed in automatic, call in as a turbine bldg. NSO and **report that the B AFWP governor has an oil leak** (oil leak entered at setup).

Respond as NSO if directed to mechanically trip B AFWP. Click on Schema→ FEEDWATER→AUX F/W STEAM→LOA→TCF5MTB - LOA AFW TURB B MECH TRIP →TRUE then INSERT. Report when complete.

Respond as NSO if directed to verify GCM filter free of oil & set H2 gas flow at 16. After 2-4 min., report complete.

Respond as NSO if directed to complete 3-OP-072 section 5.0 to place steam traps in service. After 7-10 min. report complete.

Respond as NSO if directed to perform local actions to initiate MSR tube bundle purge per 3-OP-072.1.

Respond as NSO if directed to check Bently-Nevada for turbine vibration alarm. Reset expected turbine eccentricity alarm. Click on Schema→TURBINES→TURBOVISORY →LOA→TCUFRST – TURBINE BENTLY-NEVADA ALARM RESET→TRUE then INSERT.

Respond as SM if asked about transferring main turbine load from the governor to the load limit. Direct crew to wait until after power reaches 30% power before doing this.

Respond as NSO if directed to check PSS voltmeter inside the voltage regulator cabinet. Report back that meter reads zero volts.

Respond if asked as Chemistry to verify SGs are within 0-NCOP-002 limits. As chemistry request power be held at or below 30% until SG chemistry verified within limits.

As Reactor Engineering, request power be held at 30% until flux map complete.

Respond as SM/FS if asked to verify 3-OSP-089 step 7.1.2 completed during turbine startup. Report that this surveillance requirement met satisfactorily.

Respond as FS/NSO if asked about status of hydrogen gas dryer. Report that it is in service.

Respond as FS/NSO if asked to begin placing MSRs in service per 3-OP-072.1.

Power should be stabilized at 30%, Tavg = 554.5°F & turbine load = 225 MWe.

Event 2 - 3A TPCWP bearing failure

Once steam dumps have been realigned for normal at power operation (or as directed by lead examiner), trigger lesson step **EVENT 2 - 3A TPCWP BEARING FAILURE** (actuates TVKD001X = 1.0 on 2 min ramp).

Annunciators I-5/1, 5/2 & 5/4 all alarm when 3A TPCWP trips. The crew responds per 3-ONOP-008. The BOP will need to start 3B TPCWP manually since the auto start function was failed at startup.

Respond as NSO if directed to locally check 3A TPCWP. Report back that the inboard motor bearing is smoking and very hot. If directed to do post-start checks on 3B TPCWP, report back that the pump is running normally.

Respond as NSO when directed to locally check TPCW supply temp (TI-3-1432) <110°F and stable/decreasing. Click on Schema→COMMON SERVICES→TURBINE PLANT COOLING→TPCW HEAT EXCHANGERS♦→report TPCW supply header temperature at top of page.

Respond as NSO when directed to locally verify TPCW basket strainer Δp. From TPCW HEAT EXCHANGERS system mimic page, click on FROM ICW PUMPS♦→report Δp's on basket strainers downstream of POV-4882 & 4883.

Respond as NSO when directed to check temperature of components cooled by TPCW. After 8-10 min., report all temperatures stable.

When requested as OCC, after 8-10 min rack out breaker 3AA11 by triggering lesson step **EVENT 2 - RACK OUT BKR 3AA11** (actuates TAK3A11P = RACKOUT (3)).

Event 3 - FT-3-487 fails high

Trigger lesson step **EVENT 3 - FT-3-487 FAILS HIGH** (actuates TF1M87H = T).
This causes FT-3-487 to fail high which causes FCV-3-488 to fail closed. To avoid automatic reactor trip on 3B s/g low level, the operator must take manual control of FCV-3-488 and restore feed flow and return s/g level back to program. The crew responds per 3-ONOP-049.1 and takes FT-3-487 out of service. 3B s/g level control is returned to automatic using FT-3-486 for control.

Respond as WCC if directed to initiate a PWO and contact I&C. Also respond as WCC if directed to generate an ECO for the bistables tripped per 3-ONOP-049.1.

Respond as FS/NSO if directed to reset the AMSAC TROUBLE alarm (D-7/6) at the AMSAC panel in the Cable Spreading Room. After 2-4 min., **trigger** lesson step **EVENT 3 - RESET AMSAC TROUBLE** (actuates TCL4RST = T). Report when complete.

Event 4 - PT-3-1608 fails high / CV-3-1608 fails open

After FT-3-487 bistables tripped & 3B SG level control returned to automatic, trigger lesson step **EVENT 4 - PT-3-1608 FAILS HIGH / CV-3-1608 FAILS OPEN** (actuates TFS1MREH = T & TFSVV49D=0.1 then TFSVV13A = T 5 sec later).

CV-3-1608 fails open and increases steam flow. Without operator action, power will eventually stabilize at 34-35%. Consistent with 0-ADM-200 sect. 5.4.3 for a secondary plant transient, manual turbine load is reduced to return reactor power to 30%.

If crew is slow to take action, call as reactor engineering and ask why power is so far over the 30% hold which was supposed to be in progress.

Respond as NSO if directed to close the air isolation valve and bleed air off the CV-3-1608 operator. *This will have no effect.* Report steam continues to come out of the silencer with the greatest noise/vibration on CV-3-1608.

Once power is stabilized at 30%, CV-3-1608 can be locally isolated. When directed as NSO, wait 2-4 min then trigger lesson step **EVENT 4 - LOCALLY ISOLATE CV-3-1608** (actuates TASBV003 = 0.0 on 1 min ramp). When complete, report that with the valve closed, although much less than before, some steam flow is still visible out the silencer. Respond if called as the WCC to get Mechanical assistance in isolating 3C SG ADV.

Event 5 - Exciter air cooler TPCW blockage / Reactor trip

After FT-3-487 failure crew brief, trigger lesson step **EVENT 5 - EXCITER AIR COOLER TPCW BLOCKAGE** (actuates TVUJINF = 0.98, TVUJINFB = 0.98, TVUJINFC = 0.98 & TVUJINFD = 0.98 all on 1 min ramp)**.**

This will cause exciter air temperature to increase. The crew responds per 3-ARP-097.CR for annunciator E-9/4. When exciter hot gas temperature reaches 90℃, the crew manually trips the reactor and 3-EOP-E-0 immediate actions are performed.

Events 6 - Loss of all AC power

After the immediate actions of 3-EOP-E-0 are completed, trigger lesson steps **EVENT 6 - 3AB11 STUCK CLOSED** (actuates TFK3B11S = T) **, then EVENT 6 - LOSS OF SWITCHYARD** (actuates TFP8SWYD = T, K30P11BG = F, K30P11BR = F, TCE2E01T = T & TCE2E07T = T).

This causes a loss of AC power from the startup transformer. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started. The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 failure to open (entered at setup) with B AFWP OOS (from event 1) requires C AFWP to supply both units.

Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown breaker trip circuit control power fuse and can not be opened from VPA. Prior to closure of the SBO tie from unit 4, 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.1or 3-EOP-ECA-0.2 depending on plant conditions at that time.

Respond as NSO if directed to locally trip 3B1 & 3B2 CWP breakers 3AB16 & 3AB18. **Trigger** lesson step **EVENT 6 - TRIP 3AB16 AND 3AB18** (actuates TCK4CC = F then TCK 4DC = F 1 min later). Report when complete.

If called as NSO to investigate breaker 3AB11, report that the breaker is closed, the blue & white lights are on while the red & green lights are off (indicative of a blown trip circuit fuse - reference PTN EWD 5613-E-27 sheet 1B).

Respond as NSO if asked to locally reset 3A EDG start failure relay by pressing alarm reset pushbutton. Report back that the 3A EDG turbocharger suffered catastrophic failure with considerable damage to EDG exhaust piping.

Respond as NSO if asked to check which unit CCW is supplying U4 HHSIPs. Report that U4 CCW is supplying U4 HHSIPs.

Respond as NSO if asked to locally open MOV-3-843A or B. After 2-4 min., **trigger either** lesson step **EVENT 6 - LOCALLY OPEN MOV-843A** (actuates TFMVV01O = T) or **EVENT 6 - LOCALLY OPEN MOV-843B** (actuates TFMVV02O = T). Report when complete.

Respond as NSO if asked to locally isolate RCP seals by closing 3-297A/B/C, MOV-3-381 & MOV-3-626. **Trigger** lesson step **EVENT 6 - LOCALLY ISOLATE RCP SEALS** (actuates TAHN97A = 0.0, TAHN97B = 0.0 after 1 min delay, TAHN97C = 0.0 after 2 min delay, TFBVC60 = T after 3 min delay & TFKV626C = T after 4 min delay). Report when complete.

Respond as NSO if directed to open AFSS-3-007 to restore train 2 steam flow to C AFWP. After 1-3 min., **trigger** lesson step **EVENT 6 - OPEN AFSS-3-007** (actuates TAFF07 = 1.0 on 30 sec ramp). Report when complete.

Respond as NSO if directed to deenergize and close MOV-3-1405. After 1-3 min., **trigger** lesson step **EVENT 6 - DEENERGIZE MOV-1405** (actuates TCF5MA27 = F).

Respond as NSO if asked about status of steam from the 3C SG ADV CV-3-1608. Report that steam is still coming out of the silencer on the unit 3 main steam platform.

Respond as U4 RO when status of U4 4kV buses is requested. Report that 4A & 4B 4kV buses are both on their respective EDGs and 4D 4kV bus is aligned to 4B 4kV bus.

Respond as U4 RO when requested to place 4B 4kV bus non-running ESF loads in P-T-L or OFF. **Trigger** lesson step **EVENT 6 - 4B 4KV ESF LOADS PTL** (actuates TCE2E24T = T, TCE2E20T = T & TCE2E27T = T). If 4B HHSIP is not running, **trigger** lesson step **EVENT 6 - 4B HHSIP PTL** (actuates TFM2D4BS = T & V80H30 = T). After 1-3 min., report complete.

Respond as U4 RO when requested to close 4AD07. **Trigger** lesson step **EVENT 6 - CLOSE 4AD07** (actuates TCE2E33C = T).

Respond as U4 RO when asked about 4B EDG loading. Click on Schema→STANDBY POWER & SYNC→EMERGENCY DIESEL LOGIC & PROT→EDG 4A & 4B ♦ and report MW reading under breaker 4AB21.

After 3A 4kV bus energized from the SBO x-tie, between steps 32 & 35 of 3-EOP-ECA-0.0 call as NSO and tell crew that 3AB11 is being opened locally. **Trigger** lesson step **EVENT 6 - LOCALLY OPEN 3AB11** (actuates TFK3B11S = F followed by TCK3B11C = F 5 sec later).

Respond as U4 RCO if directed to perform steps 35b-e of 3-EOP-ECA-0.0.

Respond as NSO when directed to start SFP cooling water pump. Tell RO just before starting, then **trigger** lesson step **EVENT 6 - START SFPCWP** (actuates TCC4CL15 = T).

Event 6a - Loss of all AC power recovery

This event entered when 3-EOP-ECA-0.0 completed. Transition is made to 3-EOP-ECA 0.2 since SI is required (based on PZR level <17%) due to the leak on 3C SG ADV CV-3-1608.

Respond as NSO if directed to check if MOV-3-1426 & 1427 are closed. After 1-3 min., report that these valves are closed. *Note that it is not required to close MOV-3-6386 since MOV-3-381 is closed in the same line.*

Respond as NSO when directed to place PAHMS in service on unit 3. After 8-12 minutes, **trigger** lesson step **EVENT 6 - PLACE U3 PAHMS IN SERVICE** (actuates TAC2V02A = 1.0, TAC2V02B = 1.0, TAAAV21 = 1.0, TAAAV22 = 1.0 & TACA005 = 0.0). Report when complete.

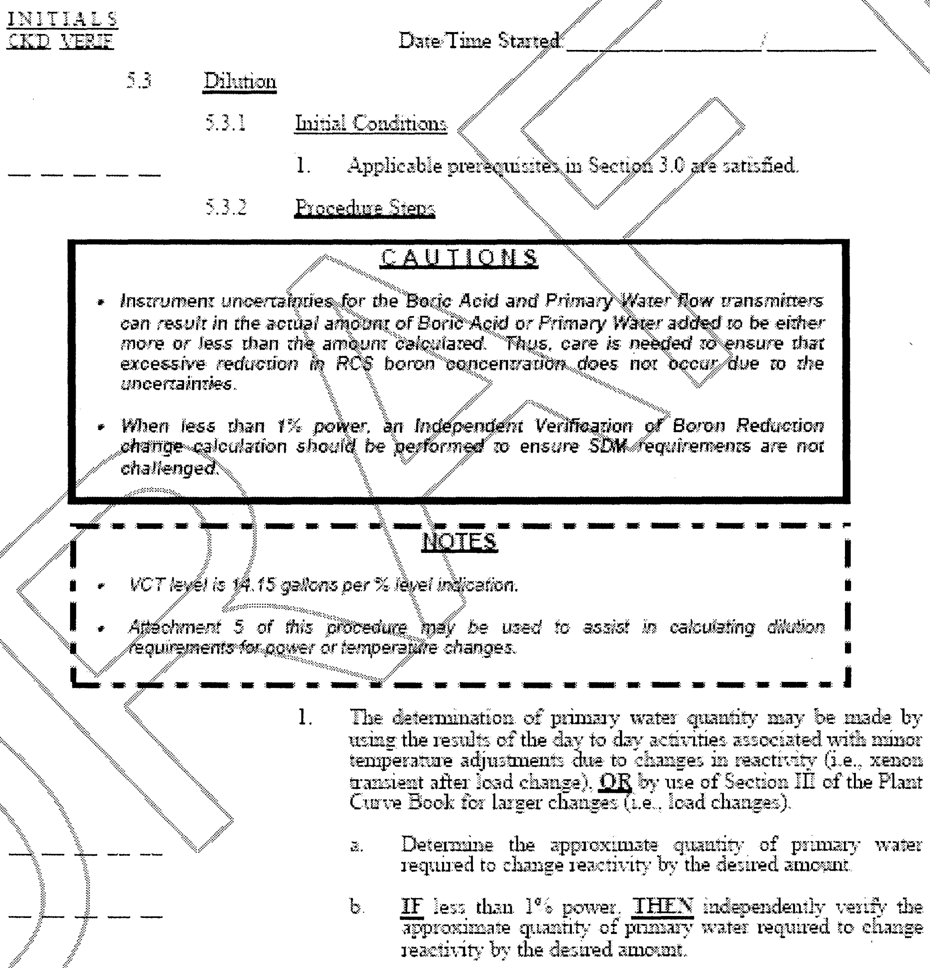
Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 1 Page 1 of 13

Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
		Note: Following a turn over brief, the crew will resume 3GOP-301 at step 5.52.2.
	US	5.52.2 **WHEN** Main Turbine Trip Testing is complete, **THEN** perform the following to raise power in preparation for synchronizing and loading the main generator:
		NOTES • *When reactor power is greater than 5 percent, Mode 1, Power Operation, is entered.* • *Communication between the Reactor Operators on the control board is critical during plant startup. ROs must inform each other of important parameter changes such as reactor and turbine power, S/G levels, changes in blowdown flow and SDTA valve position.* • *Tavg should be controlled between 547°F and 551°F.* • *Annunciator B 4/4, TAVG/ TAVG-TREF DEVIATION, may alarm while waiting to load the main generator. The alarm should clear as the main generator is loaded.*
	RO	1. Commence a reactor power increase to between 5 and 7 percent by dilution using 0-OP-046, CVCS – Boron Concentration Control, **OR** by withdrawing control rods.
		Note: A dilution will be started to increase power. 0OP-046 steps for dilution listed next for reference.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 1 Page 2 of 13

Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	RO	

INITIALS
CKD VERIF

Date/Time Started ________ / ________

5.3 Dilution

5.3.1 Initial Conditions

_ _ _ _ _ 1. Applicable prerequisites in Section 3.0 are satisfied.

5.3.2 Procedure Steps

CAUTIONS

- *Instrument uncertainties for the Boric Acid and Primary Water flow transmitters can result in the actual amount of Boric Acid or Primary Water added to be either more or less than the amount calculated. Thus, care is needed to ensure that excessive reduction in RCS boron concentration does not occur due to the uncertainties.*
- *When less than 1% power, an Independent Verification of Boron Reduction change calculation should be performed to ensure SDM requirements are not challenged.*

NOTES

- *VCT level is 14.15 gallons per % level indication.*
- *Attachment 5 of this procedure may be used to assist in calculating dilution requirements for power or temperature changes.*

1. The determination of primary water quantity may be made by using the results of the day to day activities associated with minor temperature adjustments due to changes in reactivity (i.e., xenon transient after load change), **OR** by use of Section III of the Plant Curve Book for larger changes (i.e., load changes).

   _ _ _ _ _ a. Determine the approximate quantity of primary water required to change reactivity by the desired amount.

   _ _ _ _ _ b. **IF** less than 1% power, **THEN** independently verify the approximate quantity of primary water required to change reactivity by the desired amount.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 1 Page 3 of 13

Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	RO	INITIALS CKD VERIF 5.3.2.1 (Cont'd) c. Set the Primary Water Totalizer to the determined amount of water by performing the following: (1) Press LIMIT 1. (2) Press CLR. (3) Enter desired amount using numeric keypad. (4) Press ENT. (5) Press COUNT A. (6) Press LIMIT 1 and verify desired amount was properly entered. (7) Press COUNT A. d. Record initial VCT Level, LI-*-115 _______ / _______ / _______ / _______ / _______ 2. Adjust the setpoint on the Primary Water Flow Controller, FC-*-114A to the desired flow rate. **NOTES** • *DILUTE (via FCV-*-114B) is the preferred switch position to minimize the impact to the RCP seals by preheating the water in the VCT and ensuring RCS hydrogen concentration is maintained.* • *ALT DILUTE (via FCV-*-113B) is recommended only when rapid load change or rod movement requires compensation or when immediate reactivity control is desired.* 3. Place the Reactor Makeup Selector Switch in DILUTE or ALT DILUTE. 4. Perform the following: a. Turn the RCS Makeup Control Switch to START. b. Verify Red START light is energized. c. **IF** the Reactor Makeup Selector Switch is in DILUTE **AND** FCV-*-114B, Blender to VCT valve closes due to flow deviation, **THEN** place FCV-*-114B switch to OPEN. d. **IF** the Reactor Makeup Selector Switch is in ALT DILUTE **AND** FCV-*-114B OR FCV-*-113B closes due to flow deviation, **THEN** place FCV-*-114B switch or FCV-*-113B switch to OPEN.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 1 Page 4 of 13

Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	RO	INITIALS CKD VERIF

5.3.2 (Cont'd)

______ 5. Verify expected primary water flow rate by observing FR-*-113 **AND** ensuring that flow rate is consistent with the flow rate determined in Substep 5.3.2.2.

______ 6. **IF** the desired boron concentration **OR** Tavg is achieved before the setting on the batch totalizer automatically stops, **THEN** place the RCS Makeup Control Switch to STOP.

______ 7. **WHEN** dilution has stopped, **THEN** verify the following switches are in AUTO **AND** the valves are closed:

- a. Boric Acid to Blender, FCV-*-113A
- b. Primary Water to Blender, FCV-*-114A
- c. Blender to Charging Pump Suction, FCV-*-113B
- d. Blender to VCT, FCV-*-114B

______ 8. **IF** consecutive dilutions are desired **AND** with Shift Manager approval, **THEN** mark N/A Substeps 5.3.2.9 through 5.3.2.13 and return to Substep 5.3.2.1.

______ 9. Place the Reactor Makeup Selector Switch to AUTO.

10. Perform the following:

______ a. Turn the RCS Makeup Control Switch to START.

______ b. Verify Red START light is energized.

______ 11. Record final VCT Level, LI-*-115

______ / ______ / ______ / ______ / ______

CAUTIONS

- *If sample results differ significantly from expected values, the Shift Manager shall be notified. Further dilution of the RCS is permissible; however, care should be taken to ensure excessive reduction in RCS boron concentration does not occur.*
- *While VCT Level Controller LC-*-112A, is in MANUAL, continuous monitoring of VCT level is required.*

______ 12. **IF** it is desired to conserve RCS inventory, **THEN** perform the following:

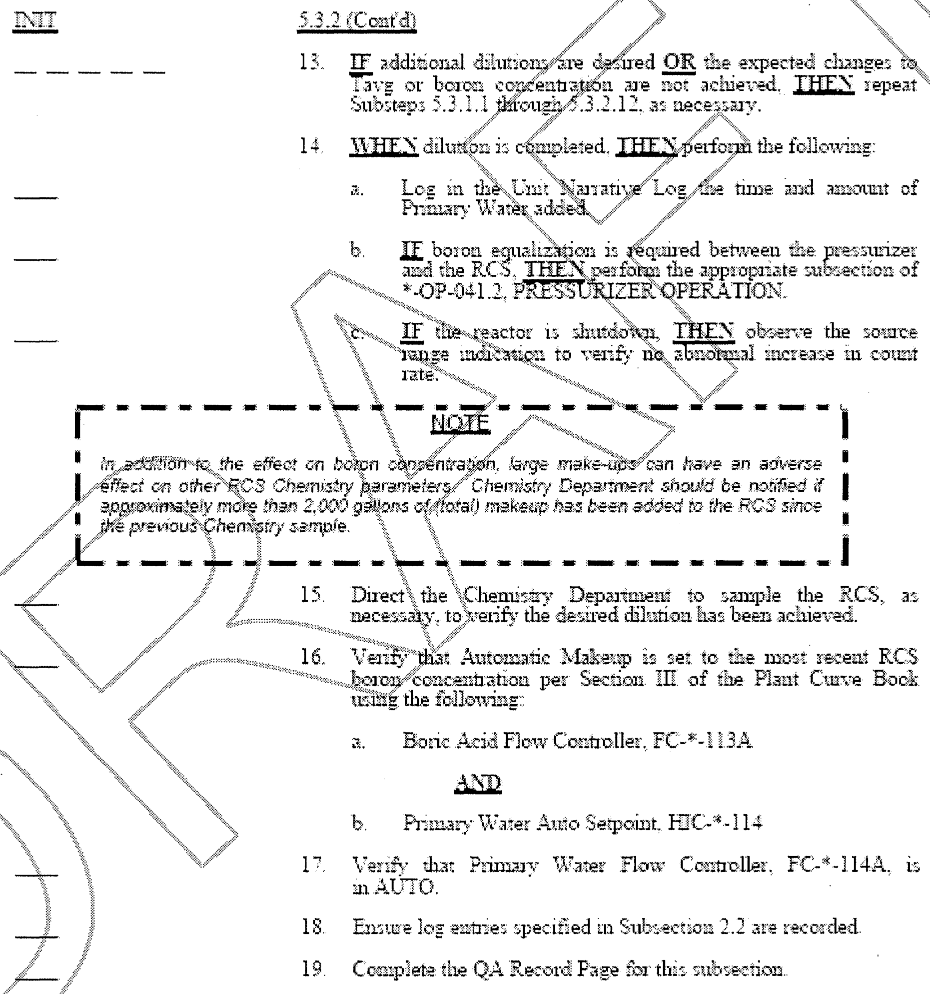
______ a. **WHEN** VCT level is in the range of 37 to 42 percent, **THEN** place VCT Level Controller, LC-*-112A, to MANUAL.

______ b. Manually drive the demand on VCT Level Controller, LC-*-112A, to zero.

______ c. Place VCT Level Controller, LC-*-112A, to AUTO.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 1 Page 5 of 13

Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	RO	 INIT 5.3.2 (Cont'd) _ _ _ _ _ _ 13. **IF** additional dilutions are desired **OR** the expected changes to Tavg or boron concentration are not achieved, **THEN** repeat Substeps 5.3.1.1 through 5.3.2.12, as necessary. 14. **WHEN** dilution is completed, **THEN** perform the following: ___ a. Log in the Unit Narrative Log the time and amount of Primary Water added. ___ b. **IF** boron equalization is required between the pressurizer and the RCS, **THEN** perform the appropriate subsection of *-OP-041.2, PRESSURIZER OPERATION. ___ c. **IF** the reactor is shutdown, **THEN** observe the source range indication to verify no abnormal increase in count rate. NOTE *In addition to the effect on boron concentration, large make-ups can have an adverse effect on other RCS Chemistry parameters. Chemistry Department should be notified if approximately more than 2,000 gallons of (total) makeup has been added to the RCS since the previous Chemistry sample.* ___ 15. Direct the Chemistry Department to sample the RCS, as necessary, to verify the desired dilution has been achieved. ___ 16. Verify that Automatic Makeup is set to the most recent RCS boron concentration per Section III of the Plant Curve Book using the following: a. Boric Acid Flow Controller, FC-*-113A **AND** b. Primary Water Auto Setpoint, HIC-*-114 ___ 17. Verify that Primary Water Flow Controller, FC-*-114A, is in AUTO. ___ 18. Ensure log entries specified in Subsection 2.2 are recorded. ___ 19. Complete the QA Record Page for this subsection.
		NOTE *Changes to blowdown flow should be minimized during main generator loading to 40 MWe. If blowdown flow is needed to control SG level or RCS temperature, then blowdown flow may be adjusted accordingly.*
	BOP	2. **IF** blowdown flow is established, **THEN** maintain stable.

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	BOP	3. Align the SDTA controllers as follows: a. Ensure two SDTA controllers are in automatic. b. Ensure one SDTA controller is in manual and maintaining Tavg two to four degrees higher than Tref.
		NOTES • *The intent is to have all three SDTA valves throttled open to maintain Tavg greater than Tref and reactor power below P7 (Target is 5 to 7 percent).* • *The SDTA controllers should be adjusted so that the valves do not close at the same time, but operate on a staggered basis and throttle closed as the main generator is loaded.* • *A difference of approximately 20 psi should be used as the initial staggered setting.* • *The SDTA controller settings may be adjusted in small increments as necessary to maintain steam flow from all three steam generators.* • *The steam generator with the lower setpoint will require additional feed flow.*
	BOP	c. Adjust the setpoints for SDTA controllers in automatic for staggered operation. d. Adjust the setpoint for SDTA controller in manual to 1000 psig. e. Use the SDTA controller in manual to make minor adjustments to Tavg, as necessary.
		NOTE *The following step may be performed as SDTA controllers are adjusted and steam generator levels are stabilized.*
	BOP	5.52.3 Perform the following in preparation for synchronizing the main generator: 1. Verify that the Main Exciter DC Regulator Control is in the full lower position (approximately 10 percent on DC Regulator Control Indicator).
		NOTE *The generator leads backup distance relay is susceptible to vibration with the generator field circuit breaker open and may cause a generator lockout and subsequent turbine trip. To prevent this occurrence, the paddle is removed from this relay during the Main Turbine Startup and is installed prior to closing the generator field circuit breaker.*

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
		NOTE *The generator leads backup distance relay is susceptible to vibration with the generator field circuit breaker open and may cause a generator lockout and subsequent turbine trip. To prevent this occurrence, the paddle is removed from this relay during the Main Turbine Startup and is installed prior to closing the generator field circuit breaker.*
	BOP	2. Direct SOA to install the relay paddle to restore the generator leads backup distance (LTD) SAM timer relay in Cabinet 3C106 in the Cable Spreading Room.
		NOTES • *Annunciator E 8/2, GEN FIELD FORCING/VOLT REG LIMITING, may come in and clear.* • *When the exciter field breaker is closed, the exciter amps and generator voltage may vary based on generator conditions, i.e. cold from a refueling outage or relatively hot from a SNO. If exciter amps or generator voltage are not within the specified band, System Engineering shall be contacted for further guidance.*
	BOP BOP BOP	3. Close the exciter field breaker and verify response on Control Room or local exciter field ammeter between greater than 0 and 90 amps. 4. Verify three generator voltmeter readings are indicating between greater than 0 and 17 KV. 5. Slowly increase generator voltage by raising the DC regulator control in small step changes. a. Verify exciter field ammeter responds with each adjustment. b. Verify all three generator voltmeters are indicating equal values.
		CAUTION ***Generator operation greater than 23,100 volts may damage the generator windings. Exciter field current is limited to 135 amps at no-load to ensure acceptable generator voltage.***
	BOP	6. Raise generator voltage until voltage is between 21.5 KV and 22.5 KV on all three phases with exciter field amps between 100 amps and 130 amps on the generator voltmeters and exciter field ammeter. (The Control Room or local exciter field ammeter may be used.)

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	BOP	7. Place the Voltage Regulator Control Switch in the TEST position.
		NOTE *The regulator mismatch meter may oscillate about the zero point due to minor speed changes.*
	BOP BOP BOP BOP BOP	8. Slowly adjust the AC regulator control to null the AC-DC regulator mismatch meter. 9. Place the Voltage Regulator Control Switch in the ON position. 10. Place the Generator Synchronizing East Bus Control in the MANUAL position. 11. Adjust the turbine speed using the Generator Governor Speed Changer Control until the synchroscope Indicator is rotating slowly in the FAST direction. 12. Adjust the AC regulator control to set the incoming voltage equal to the running voltage.
	RO	5.52.4 **WHEN** reactor power is between 5 and 7 percent, **THEN** verify the following parameters are stable or indicate a very slow rate of change: • Tavg (549° to 551°F) • PRZ level (on program for Tavg) • Steam Generator levels (46 to 54 percent)
		NOTES • *If auto synchronizing is inoperable or undesirable, the Shift Manager may authorize the use of Manual Synchronizing Mode.* • *In Auto Mode, the turbine speed and generator voltage are automatically adjusted, which may require several minutes to satisfy the system logic.* • *If the auto synchronizing pushbutton is held for greater than 10 seconds, the auto-synchronizing logic will be disabled before a second auto-synchronizing attempt at breaker closure is initiated.*

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	BOP	5.53 Perform auto synchronization as follows: (N/A if manual mode is used.) 5.53.1 Place the Gen Synchronizing East Bus Control to the AUTO position. 5.53.2 Verify East Bus Breaker white light above synchroscope flashes at 12 o'clock position, indicating synchronized conditions. 5.53.3 Verify the Inadvertent Protection Scheme Armed amber light above the synchroscope is LIT.
		NOTES • *If East Bus Breaker fails to close, the Power Coordinator in Systems Operations needs to be notified prior to attempting to synchronize with the Mid Bus Breaker, since realignment of the switchyard may be required. (The Systems Operator/Power Coordinator evaluates system conditions to determine if the high line should be isolated before closing the Mid Bus Breaker, and will work with the plant to expedite any necessary switching.) [Commitment - Step 2.3.1]* • *If the generator is motored at 2 MW or more incoming for 30 seconds, the reverse power relay will initiate generator lockout.*
	BOP	5.53.4 Before the synchroscope reaches the 11 o'clock position, depress and hold the AUTO Synchronizing Button.
	BOP	5.53.5 **WHEN** the GCB closes, **THEN** perform the following: 1. Observe the East Bus Breaker indicating lights to verify breaker closure (red on; green off). 2. **IF** main generator load is less then 10 MWe, **THEN** increase load to approximately 10 MWe using the Generator Governor Speed Changer Control. 3. Place synchroscope in the OFF position. 4. Match the flag on the East Bus Generator GCB Control Switch by taking the switch to CLOSE. 5. Verify the Inadvertent Protection Scheme Armed amber light above the synchroscope is OFF. 6. Verify Generator Amps are within 2 percent on all three phases.
		NOTES • *To prevent excessive changes in S/G pressure and level, the SDTA valves should be checked to verify that they are responding prior to each additional load step.* • *Increasing main generator load shall be coordinated with the operator controlling steam generator levels.*

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	5.55 Perform the following to increase turbine load: 5.55.1 Monitor automatic control program values using the Plant Curve Book Section IV, Figure 5, **AND** notify the Shift Manager of any unexpected deviations.
		NOTE *The following step is performed by the operator controlling steam generator levels and pressures.*
	BOP	5.55.2 **IF** the Steam Dump to Atmosphere (SDTA) valves are being used, **THEN** perform the following steps until all SDTA valves are closed and the Tavg - Tref deltaT is within the band provided by the US. 1. Verify the SDTA controllers in automatic are closing the SDTA valves as steam is drawn off to the turbine. 2. Slowly close the SDTA valve in manual to balance steam flow with the SDTA valves in automatic and make minor adjustments to Tavg, as necessary.
		NOTES • *When the SDTA valves are operating properly, there should be a balance between the SDTA valves closing and main turbine steam usage, with little perturbation in main steam header pressure as load is increased.* • *The SDTA valves can be verified to be closing by observing main steam header pressure recover as the main generator is loaded.* • *The SDTA controller settings may be adjusted in small increments as necessary to maintain steam generator levels.* • *It should not be necessary to close the SDTA valve in manual as a pre-emptive action when the main generator output breaker is closed.*
	BOP	3. Observe main steam header pressure while loading the main generator to maintain a balance between the SDTA valves closing and the steam being used to increase load.
	BOP	4. **WHEN** steam generator levels and pressures stabilize following a load increase, **THEN** notify the operator controlling the main generator to increase load by 5 to 10 MWe.
	BOP	5. Continue monitoring and controlling in the steps above until Step 6 below is completed.

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
		NOTE *The SDTA valves should be closed by approximately 40 MWe.*
	BOP	6. **WHEN** the SDTA valves in automatic are closed, **THEN** ensure the SDTA valve in manual is closed and Tavg/Tref are within the band provided by US.
	BOP	7. Align the SDTA controllers for automatic operation as follows: a. Verify Steam Dump to Atmosphere Valve, CV-3-1606, is CLOSED. (1) Adjust the controller setpoint to 1000 psig. (2) Ensure the controller is in AUTO. b. Verify Steam Dump to Atmosphere Valve, CV-3-1607, is CLOSED. (1) Adjust the controller setpoint to 1000 psig. (2) Ensure the controller is in AUTO. c. Verify Steam Dump to Atmosphere Valve, CV-3-1608, is CLOSED. (1) Adjust the controller setpoint to 1000 psig. (2) Ensure the controller is in AUTO.
	BOP	8. Perform the following to align the steam dump to condenser for AUTO: a. Place the Steam Dump to Condenser Control switch in the ON position. b. Momentarily place the Mode Selector switch to RESET. c. Place the Mode Selector Switch to AUTO.
		CAUTIONS • *Communication between the Reactor Operators on the control board is critical during plant startup. ROs must inform each other of important parameter changes such as reactor and turbine power, S/G levels, and changes in blowdown flow.* • *Intermediate Range to Power Range overlap is required prior to blocking the Intermediate Range Trip and the Power Range LO Range Trip.* • *Block of the Intermediate Range Trip and the Power Range LO Range Trip is required prior to increasing power greater than 20 percent.*

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	R)	5.57 Perform the following to slowly increase reactor power: 5.57.1 **WHEN** S/G levels are stable, **THEN** continue to increase reactor power by dilution using 0-OP-046, CVCS – Boron Concentration Control, **OR** by withdrawing control rods. 5.57.2 Monitor and adjust S/G levels in response to rising reactor power and turbine load.
	RO	5.58 **WHEN** Reactor Power level is greater than 10 percent, **THEN** perform the following: 5.58.1 Verify POWER ABOVE P-10 status light on VPA is ON. 5.58.2 Verify AT POWER TRIPS BLOCKED status light on VPA goes OFF. 5.58.3 Press **AND** hold for 2 to 4 seconds Train A and Train B Intermediate Range Trip Push to Block pushbuttons on the Reactor Console. 5.58.4 Verify 25% INTER RNG TRIP BLOCKED status light on VPA is ON. 5.58.5 Press **AND** hold for 2 to 4 seconds Train A and Train B Power Lo Range Trip Push to Block pushbuttons on the Reactor Console. 5.58.6 Verify 25% PWR RNG TRIP BLOCKED status light on VPA is ON. 5.58.7 Verify the following on ERDADS: 1. Intermediate Range NIS Trip blocked 2. NIS LO Power Range Trip blocked
	BOP BOP	5.59 Notify Chemistry Lab that RCS sampling is required by Technical Specification 3.4.8. 5.60 Perform the following as load is increased: 5.60.1 Complete Section 5.0 of 3-OP-072, Main Steam System. 5.60.2 Verify the Feedwater Pump Turbine Runback switch on 3C01 is in DEFEAT. 5.60.3 Commence purging the MSR tube bundles using 3-OP-072.1, Moisture Separator Reheaters.
		Note: BOP may direct field actions of 3-OP-072 and 3-OP-072.1 to be completed.
		CAUTION *Prior to opening the feedwater isolation MOVs, evaluate for leak-by.*

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Event Description: Place unit on line per 3-GOP-301 beginning with step 5.52.2. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Time	Position	Applicant's Actions or Behavior
	BOP	5.61 **WHEN** power is between 10 and 20%, **THEN** stop the power increase and perform the following to place the FRVs in automatic: 5.61.1 Ensure open the Feedwater Isolation valves: • FW Isol Stm Gen 3A, MOV-3-1407 • FW Isol Stm Gen 3B, MOV-3-1408 • FW Isol Stm Gen 3C, MOV-3-1409
		NOTES • *FRVs in the following steps can be placed in service in any order* • *The controlling channels of feed flow and steam flow can be changed at the discretion of the US*
	SUR	5.61.2 Transfer the 3A steam generator level controls to automatic as follows:
		Note: Surrogate transfers all FRVs to automatic control.
	BOP	5.61.5 Verify that each S/G level is being automatically controlled.
	BOP	5.61.6 Verify the main feedwater control valves are in AUTO: • FCV-3-478 • FCV-3-488 • FCV-3-498
	BOP	5.61.7 Verify the FW Bypass Valves are CLOSED: • FCV-3-479 • FCV-3-489 • FCV-3-499

EVENT 1a: Once feed regulating valves are placed in automatic, call in as a turbine bldg. NSO and report that the B AFWP governor has an oil leak (oil leak entered at setup).

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Event Description: Once feed regulating valves are placed in automatic, an NSO calls in that the B AFWP governor has an oil leak.

Time	Position	Applicant's Actions or Behavior
	BOP	Relays report from NSO of oil leak on B AFWP governor
	US	Declares B AFWP out of service Determines TS 3.7.1.2 action statement 3 applies: • Verify two operable independent AFW trains in 4 hr • Fix B AFWP in 30 days Directs WCC to have Mechanical troubleshoot & fix B AFWP Directs WCC to generate & hang ECO on B AFWP
		3.7.1.2 Two independent auxiliary feedwater trains including 3 pumps as specified in Table 3.7-3 and associated flowpaths shall be OPERABLE. APPLICABILITY: MODES 1, 2 and 3 ACTION: 1) With one of the two required independent auxiliary feedwater trains inoperable, either restore the inoperable train to an OPERABLE status within 72 hours, or place the affected unit(s) in at least HOT STANDBY within the next 6 hours* and in HOT SHUTDOWN within the following 6 hours. 2) With both required auxiliary feedwater trains inoperable, within 2 hours either restore both trains to an OPERABLE status, or restore one train to an OPERABLE status and follow ACTION statement 1 above for the other train. If neither train can be restored to an OPERABLE status within 2 hours, verify the OPERABILITY of both standby feed-water pumps and place the affected unit(s) in at least HOT STANDBY within the next 6 hours* and in HOT SHUTDOWN within the following 6 hours. Otherwise, initiate corrective action to restore at least one auxiliary feedwater train to an OPERABLE status as soon as possible and follow ACTION statement 1 above for the other train. 3) With a single auxiliary feedwater pump inoperable, within 4 hours, verify OPERABILITY of two independent auxiliary feedwater trains, or follow ACTION statements 1 or 2 above as applicable. Upon verification of the OPERABILITY of two independent auxiliary feedwater trains, restore the inoperable auxiliary feedwater pump to an OPERABLE status within 30 days, or place the operating unit(s) in at least HOT STANDBY within 6 hours* and in HOT SHUTDOWN Within the following 6 hours. The provisions of Specification 3.0.4 are not applicable during the 30 day period for the inoperable auxiliary feedwater pump.
		Note: following T.S. reference, trigger event 2- 3A TPCWP BEARING FAILURE.

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Event Description: 3A (running) TPCWP bearing failure. Failure of 3B (standby) TPCWP to automatically start following trip of running pump. The crew responds per 3-ONOP-008 and manually starts the 3B TPCWP.

Time	Position	Applicant's Actions or Behavior
	RO	Recognizes/reports annunciator I-5/1, 5/2 & 5/4 alarms
	US	Directs response per 3-ONOP-008
		CAUTIONS - *If a turbine plant 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 2008-903)* **NOTE** *If turbine lube oil cooler outlet temperature increases to greater than 125 °F, emergency cooling may be established using ATTACHMENT 1.*
	BOP	**1** Check All Turbine Plant Cooling Water Pump Alarms - OFF • I 5/1, TPCWP A/B MOTOR OVERLOAD • I 5/2, TPCWP A/B TRIP • I 5/3, TPCWP A/B MOTOR BRG HI TEMP Perform the following: a. Determine affected turbine plant cooling water pump. b. Check if standby turbine plant cooling water pump auto-started. IF standby turbine plant cooling water pump did not auto-start AND offsite power is available, THEN start standby turbine plant cooling water pump. c. Stop affected turbine plant cooling water pump.
	BOP	**2** Verify Turbine Plant Cooling Water Pumps - AT LEAST ONE RUNNING Perform the following: a. IF offsite power is available, THEN start one turbine plant cooling water pump. b. IF neither turbine plant cooling water pump can be started, THEN manually trip reactor AND main turbine.
	BOP	**3** Check Turbine Plant Cooling Water Header Pressure • I 5/4, TPCW HI TEMP/LO PRESS NOT LIT IF TPCW header pressure is less than 75 psig, THEN start a second TPCW pump.

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

Event Description: 3A (running) TPCWP bearing failure. Failure of 3B (standby) TPCWP to automatically start following trip of running pump. The crew responds per 3-ONOP-008 and manually starts the 3B TPCWP.

Time	Position	Applicant's Actions or Behavior
	BOP	4 **Check Proper Intake Cooling Water Lineup To Turbine Plant Cooling Water Heat Exchangers** a. Check Safety Injection on Unit 3 - TERMINATED a. Go to Step 5. b. Check both ICW To TPCW Heat Exchanger valves - OPEN • POV-3-4882 • POV-3-4883 b. Perform the following: 1) Verify proper instrument air alignment to valves using 3-OP-013, INSTRUMENT AIR SYSTEM. 2) **IF** flow was not reduced for ICW Pump flow restrictions, **THEN** open at least one ICW To TPCW Heat Exchanger valve. * POV-3-4882 * POV-3-4883 3) **IF** neither ICW To TPCW Heat Exchanger valve can be opened, **THEN** manually trip reactor **AND** main turbine.
	RO	5 **Check For Abnormal Surge Tank Level** a. Check alarm I 5/5, TPCW SURGE TANK HI/LO LEVEL – ON a. Go to Step 12. b. Dispatch operator to locally monitor turbine plant cooling water surge tank level
		12 **Check 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. Open TPCW Hx Combined ICW Outlet Valve, 3-50-401 as necessary to maintain Turbine Plant Cooling Water Supply Header Temperature less than 110°F. 2. Verify proper heat exchanger alignment. 3. Start all available ICW Pumps using 3-OP-019, INTAKE COOLING WATER SYSTEM

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Event Description: 3A (running) TPCWP bearing failure. Failure of 3B (standby) TPCWP to automatically start following trip of running pump. The crew responds per 3-ONOP-008 and manually starts the 3B TPCWP.

Time	Position	Applicant's Actions or Behavior
	BOP	**13** Locally Verify Turbine Plant Cooling Water Basket Strainer ΔP - LESS THAN 1.5 PSID • DPI-3-1400 • DPI-3-1401 IF any turbine plant cooling water basket strainer ΔP is greater than 1.5 psid, THEN locally backwash turbine plant cooling water basket strainer(s) using 3-OP-019, INTAKE COOLING WATER SYSTEM.
	BOP	**14** Check Alarm F 6/5, GEN RTD HI-HI TEMP – OFF Manually trip reactor and main turbine.
	BOP	**15** Check The Following Generator Alarms – OFF • E 9/4, GEN EXCITER AIR HI TEMP • F 2/5, ISOL PHASE DUCT BANK HI TEMP • F 6/4, GEN RTD HI TEMP Perform the following: a. Remove reactive load from main generator. b. Monitor Generator Exciter temperatures closely. c. IF Generator Exciter temperature reaches 60 deg (R-347 pt 5 or 6), THEN reduce load to 80% power. d. IF Generator Exciter temperature reaches 65 deg (R-347 pt 5 or 6), THEN trip the reactor and turbine AND perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. e. IF necessary, THEN shutdown the unit as directed by Shift Manager using one of the following: * 3-GOP-103, POWER OPERATION TO HOT STANDBY. OR * 3-ONOP-100, FAST LOAD REDUCTION. OR * Manually trip reactor and main turbine. f. IF any seal oil system cooler is overheating, THEN perform the following: 1) WHEN main turbine has been tripped, THEN purge generator with carbon dioxide using 3-OP-090, GAS EVOLUTIONS IN THE MAIN GENERATOR. 2) WHEN hydrogen has been purged from generator, THEN shutdown seal oil system using 3-OP-087.1, TURBINE GENERATOR SEAL OIL SYSTEM.

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

Event Description: 3A (running) TPCWP bearing failure. Failure of 3B (standby) TPCWP to automatically start following trip of running pump. The crew responds per 3-ONOP-008 and manually starts the 3B TPCWP.

Time	Position	Applicant's Actions or Behavior
	BOP	**16** Check The Following Pump Alarms – OFF • D 5/4, SGFP A MOTOR BRG HI TEMP • D 6/4, SGFP B MOTOR BRG HI TEMP • D 8/3, HDP A MOTOR BRG HI TEMP • D 8/5, HDP B MOTOR BRG HI TEMP • D 9/3, COND PUMP A MOTOR BRG HI TEMP • D 9/4, COND PUMP B MOTOR BRG HI TEMP • F 6/1, COND PUMP C MOTOR BRG HI TEMP Perform the following: a. Reduce power as directed by Shift Manager to allow stopping of affected pump(s) using one of the following: • 3-GOP-103, POWER OPERATION TO HOT STANDBY **OR** • 3-ONOP-100, FAST LOAD REDUCTION **OR** • Manually trip reactor. b. **WHEN** power has been reduced, **THEN** stop affected pump(s).
	BOP	**17** Check Proper Turbine Plant Cooling Water System Operation a. Check alarm I 5/4, TPCW HI TEMP/LO PRESS - OFF b. Check alarm I 5/5, TPCW SURGE TANK HI/LO LEVEL - OFF Perform the following: 1) Remove reactive load from main generator. 2) Reduce unit load as directed by Shift Manager to prevent component damage using: • 3-GOP-103, POWER OPERATION TO HOT STANDBY. **OR** • 3-ONOP-100, FAST LOAD REDUCTION. **OR** • Manually trip reactor and main turbine. 3) Continue efforts to restore normal system lineup.
	BOP	**18** Check Temperature Of Components Supplied By Turbine Plant Cooling Water - STABLE OR DECREASING • Main feedwater pump oil coolers • Heater drain pumps • Condensate pumps • Seal oil system • Instrument air compressors • Turbine lube oil coolers • Exciter air coolers • Generator hydrogen coolers • Iso-phase coolers Perform the following: a. Verify proper supply and return valve alignment on affected component(s) using 3-OP-008, TURBINE PLANT COOLING WATER SYSTEM. b. **IF** affected component has automatic temperature control, **THEN** manually operate temperature control valve **AND** temperature control bypass valve as necessary to maintain normal component temperatures. c. Vent affected component(s) using 3-OP-008, TURBINE PLANT COOLING WATER SYSTEM. d. **IF** turbine lube oil cooler outlet, temperature increases to greater than 125°F, **THEN** establish emergency cooling to turbine lube oil coolers using ATTACHMENT 1.

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Event Description: 3B s/g controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). Manual operator action is required to control 3B s/g level and avoid a reactor trip. The crew responds per 3-ONOP-049.1.

Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes / reports failure of FT-3-487 high and loss of FW to 3B S/G as indicated by: FI-3-487 indication on VPA FCV-3-488 closed in automatic 3B feed / steam flow deviation alarms 3B S/G level indications lowering
	BOP	Takes manual control of FCV-3-488 and restores 3B S/G level to program.
	US	Directs the performance 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.

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

Event Description: 3B s/g controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). Manual operator action is required to control 3B s/g level and avoid a reactor trip. The crew responds per 3-ONOP-049.1.

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.
		Note: transfers controlling FW flow channel for 3B SG to channel IV. Steam flow may also be transferred.
	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.
		Note: determines T.S. 3.3.1 function 12 applies.

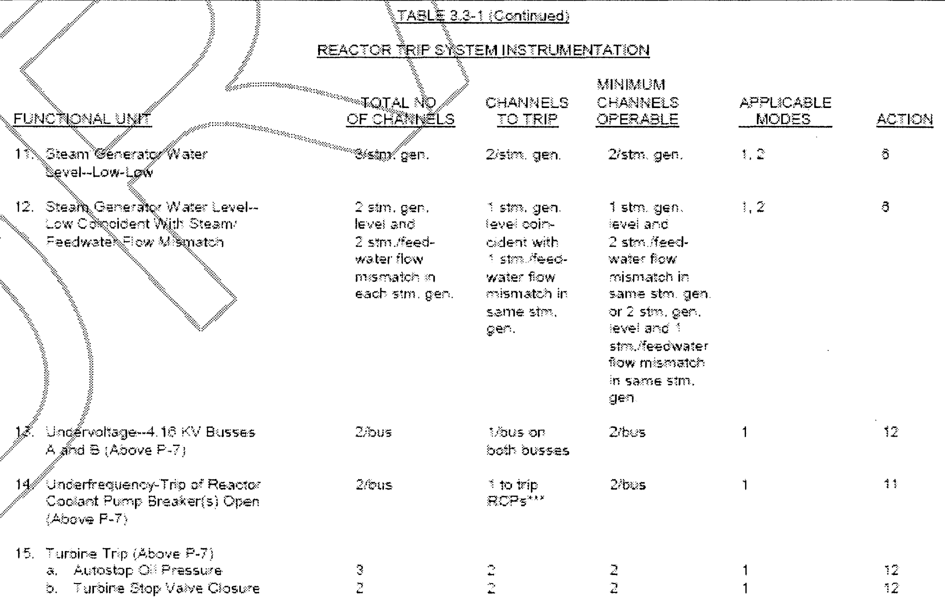


TABLE 3.3-1 (Continued)

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	8
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

ACTION 8 - 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.

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

Event Description: 3B s/g controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). Manual operator action is required to control 3B s/g level and avoid a reactor trip. The crew responds 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>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.</td></tr>
<tr><td></td><td></td><td>ATTACHMENT 4
(Page 17 of 53)

FAILED CHANNEL BISTABLE LIST
<table>
<tr><td colspan="3">F-3-487 Steam Generator B Main Feedwater Flow</td><td colspan="4">Ref Dwgs 5610-T-L1, Sh 19; 5610-T-D-17</td></tr>
<tr><td colspan="3">Max Deviation As Compared to other Channels</td><td colspan="4">0% ≤ Power < 10%, MAX DEV 7.0 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</td></tr>
<tr><th>RACK No.</th><th>BISTABLE No.</th><th>BISTABLE FUNCTION</th><th>STATUS LIGHT</th><th>ANNUNCIATOR</th><th>FUNCTION</th><th>LOGIC AFFECTED</th></tr>
<tr><td>18</td><td>BS-3-488B-1</td><td>FW to SF Mismatch Logic</td><td>S/G B STM-FW FLO DEV FC488B1</td><td></td><td>P</td><td>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</td></tr>
<tr><td>18</td><td>BS-3-488B-2</td><td>SF > FW Alarm</td><td></td><td>C 5/2 SG B STEAM > FEED</td><td>C</td><td></td></tr>
<tr><td>18</td><td>BS-3-488C</td><td>FW > SF Alarm</td><td></td><td>C 4/2 SG B FEED > STEAM</td><td>C</td><td></td></tr>
</table></td></tr>
<tr><td></td><td></td><td><i>Note: Determines BS-3-488B1, BS-3-488B2, and BS-3-488C need to be tripped.</i></td></tr>
<tr><td></td><td>BOP</td><td>Obtains keys and opens protection rack 18

Trips bistables BS-3-488B1, BS-3-488B2 & BS-3-488C</td></tr>
<tr><td></td><td>RO</td><td>Checks correct bistable status light energized in response to tripping bistables (FC488B1).

Checks correct annunciators on in response to tripping bistables (C-4/2 & C-5/2).</td></tr>
<tr><td></td><td>BOP</td><td>5.15 **IF** any Feedwater Control Valve is in Manual control due to this failure, **THEN** load (MWe) should be maintained as steady as possible until all Feedwater Control Valves are restored to Automatic control.</td></tr>
</table>

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

Event Description: 3B s/g controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). Manual operator action is required to control 3B s/g level and avoid a reactor trip. The crew responds per 3 ONOP-049.1.

Time	Position	Applicant's Actions or Behavior
		NOTE *Equipment which is removed from service in order to comply with Tech Spec action requirements (e.g., inoperable protection/safeguards instrumentation) may be returned to service in order to demonstrate its operability or the operability of other equipment under administrative controls per Tech Spec 3.0.6. In this case, the time must be limited to that required for testing or to demonstrate operability and no other preventative or corrective maintenance may be performed under Tech Spec 3.0.6. Administrative controls shall include an entry in the EOOS Logbook or LAN program citing Tech Spec 3.0.6. Other administrative controls should be used, such as Unit Narrative Log entries, test procedures or work instructions, or EQO Caution or Danger tags. 0-ADM-536, Technical Specification Bases Control Program, contains additional information.*
	BOP	5.16 Initiate a Plant Work Order **AND** notify the I&C Supervisor.
	BOP	5.17 **IF** maintenance is **NOT** to be performed immediately, **THEN** verify Subsection 5.11 complete **AND** issue a clearance for each bistable switch that was placed in the tripped position in accordance with 0-ADM-212, In-Plant Equipment Clearance Orders.
		Note: Following completion of tripping bistables, event 4 may be initiated by triggering EVENT 4 – PT-3-1608 FAILS HIGH / CV-3-1608 FAILS OPEN. Bistable tripping may be skipped if desired.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 4 Page 1 of 2

Event Description: PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew responds per 0-ADM-200 for a secondary plant transient. Manual turbine load reduction is required to return reactor power to 30%. Once power is stabilized at 30%, the CV-3-1608 isolation valve is closed, but some ADV steam leakage still exists

Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes/reports lowering generator MW and PT-3-1608 failed high & CV-3-1608 failed open as evident by: • PT-3-1608 indication • CV-3-1608 position indication • Steam noise present • 3C SG steam flow indication • Primary plant responses, Tavg indcation, reactor power increase
	RO	Recognizes/reports 4-5% reactor power increase Recognizes/reports Tavg < Tref
	US	Determines CV-3-1608 failure open caused Tavg-Tref deviation Directs taking manual control of CV-3-1608.
	BOP	Takes manual control of CV-3-1608 and determines valve will not close in manual.
	US	When informed of CV-3-1608 failure, directs local isolation of CV-3-1608
		Note: 0-ADM-200 provides guidance to use the secondary plant to restore Tave to Tref. Operators shouldperform actions necessary to stabilize the unit.

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

Event Description: PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew responds per 0-ADM-200 for a secondary plant transient. Manual turbine load reduction is required to return reactor power to 30%. Once power is stabilized at 30%, the CV-3-1608 isolation valve is closed, but some ADV steam leakage still exists

Time	Position	Applicant's Actions or Behavior
	BOP	Consistent with 0-ADM-200 section 5.4.3 guidance for response to secondary pant transient: 1. Reduces turbine load to match Tavg = Tref 2. Attempts manual closure of CV-3-1608 & determines CV-3-1608 failed open 3. Directs NSO locally investigate CV-3-1608 4. Relays report from NSO of steam coming from unit 3 silencer 5. Directs NSO locally close CV-3-1608 isolation valve 6. Relays report from NSO that steam flow not completely stopped with isolation valve closed. 7. Adjusts turbine load as necessary to match Tavg = Tref
	US	Determines CV-3-1608 isolation valve leaking by Directs WCC have Mechanical maintenance investigate CV-3-1608 Directs caution tag generated for CV-3-1608 in manual
		Note: Following stabilization of unit, trigger EVENT 5 – EXCITER AIR COOLER TPCW BLOCKAGE.

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

Event Description: Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.

Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes / reports annunciator E-9/4 alarming
	RO	Reads actions for 3-ARP-097.CR for annunciator E-9/4
	BOP	Performs actions consistent with 3-ARP-097.CR for annunciator E-9/4 as read by RO 1. Verifies alarm using recorder R-3-347 (VPA) 2. Monitors exciter air temperature closely 3. If hot air temp ≥ 87°C reduce MVAR while maintaining grid voltage ≥ 232 kV 4. If hot air temp ≥ 87°C with MVAR=0, maintain grid voltage ≥ 232 kV & reduce generator load using 3-ONOP-100 until hot air temp < 87°C 5. If hot air temp ≥ 87°C & increasing due to unknown cause advises US to consider tripping reactor & turbine 6. If hot air temp > 90°C & no expectation of fast recovery advises US to tripping reactor & turbine and enter 3-EOP-E-0
	US	Determines hot air temp > 90°C & no expectation of fast recovery Directs reactor trip Directs crew perform immediate actions of 3-EOP-E-0.

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

Event Description: Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.

Time	Position	Applicant's Actions or Behavior
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	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 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).

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

Event Description: Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.

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.: 6 Event No.: 5 Page 4 of 6

Event Description: Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.

Time	Position	Applicant's Actions or Behavior
	RO	**4** Check If SI Is Actuated * SI Annunciators - ANY ON OR * Safeguards equipment – AUTO STARTED Perform the following: a. Check if SI is required: * Low pressurizer pressure – 1730 psig OR * High containment pressure – 4 psig OR * High steam line differential pressure – 100 psid OR * High steam flow with low S/G pressure - 614 psig OR low Tavg (543 F) OR * RCS subcooling based on core exit TCs - LESS THAN 30°F[210°F] OR * PRZ level - CAN NOT BE MAINTAINED GREATER THAN 12%[50%] b. IF SI is required, THEN manually actuate SI and containment isolation phase A AND go to Step 5. c. IF SI is NOT required, THEN 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.
		Note: following verification SI not required, trigger **EVENT 6 – 3AB11 STUCK CLOSED**, then trigger **EVENT 6 – LOSS OF SWITCHYARD.**
		Note: crew will transition back to 3-EOP-E-0 step 1.

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

Event Description: Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.

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).
		Note: all valves were previously verified closed		

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

Event Description: Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds per 3-ARP-097.CR for annunciator E-9/4. The crew manually trips the reactor when exciter hot gas temperature exceeds 90°C and performs the actions of 3-EOP-E-0. Once the reactor is tripped, the switchyard relays out. 3B EDG starts but fails to automatically load 3B 4kv bus due to a bus stripping failure. 3A EDG fails to start and can not be manually started.

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

3 **Verify Power To Emergency 4 KV Buses**

<table>
<tr><td>a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED</td><td>a. Perform the following:
1) Attempt to emergency start any Unit 3 available diesel generator.
2) <u>IF</u> neither 3A nor 3B 4 KV bus is energized, <u>THEN</u> go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1.</td></tr>
<tr><td>b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED</td><td>b. Attempt to emergency start the de-energized Unit 3 bus diesel generator.</td></tr>
<tr><td>c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS</td><td>c. Perform the following:
1) <u>IF</u> lockout of 3D 4 KV bus <u>NOT</u> present, <u>THEN</u> 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.</td></tr>
</table>

</td></tr>
<tr><td></td><td></td><td><i>Note: Attempts emergency start of 3A EDG but EDG has start failure. 3B EDG running with output breaker open.</i></td></tr>
<tr><td></td><td>US</td><td>Determines neither 4KV bus is energized and transitions to 3-EOP-ECA-0.0 Loss of all AC step 1.</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 6 Page 1 of 19

Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior	
	RO	Directs performance of 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	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.
	BOP	2 Verify Turbine Trip a. All turbine stop valves - CLOSED b. Verify Moisture Separator Reheater Steam Valves - CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves c. Mid and East GCBs - OPEN (Normally 30 seconds delay)	a. Manually trip turbine. IF turbine will NOT trip, THEN close main steamline isolation and bypass valves. b. Manually close valves. IF any valve can NOT be closed, THEN close main steam isolation and bypass valves. 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 • 8W88

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 6 Page 2 of 19

Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**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
	BOP	**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. 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.
		Note: MOV-3-1405 fails to open. BOP Establishes 270 gpm AFW

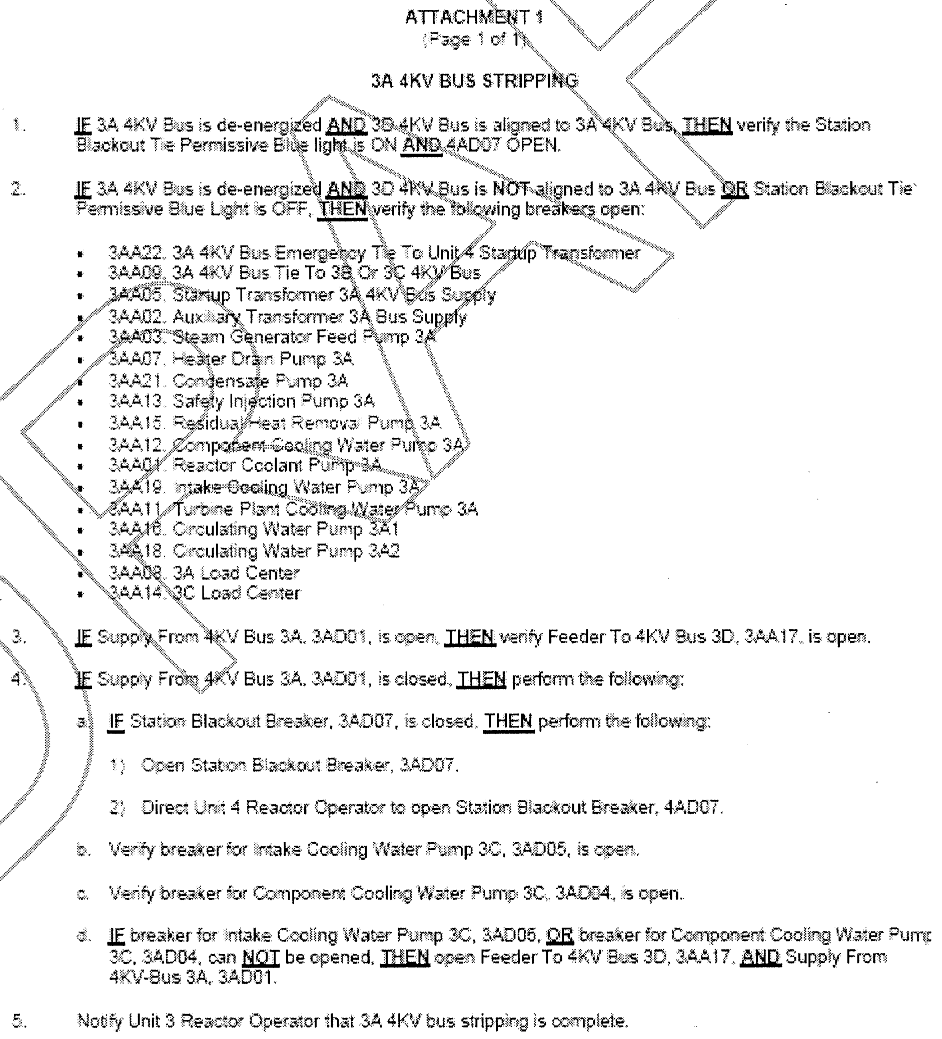
Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 6 Page 3 of 19

Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie fromunit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
		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.* 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	**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
		Note: Step 5.c RNO transitions to step 6. Attachments 1 and 2 listed next for reference.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 6 Page 4 of 19

Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBOtie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	BOP	 ATTACHMENT 1 (Page 1 of 1) 3A 4KV BUS STRIPPING 1. IF 3A 4KV Bus is de-energized AND 3D 4KV Bus is aligned to 3A 4KV Bus, THEN verify the Station Blackout Tie Permissive Blue light is ON AND 4AD07 OPEN. 2. IF 3A 4KV Bus is de-energized AND 3D 4KV Bus is NOT aligned to 3A 4KV Bus OR Station Blackout Tie Permissive Blue Light is OFF, THEN 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. IF Supply From 4KV Bus 3A, 3AD01, is open, THEN verify Feeder To 4KV Bus 3D, 3AA17, is open. 4. IF Supply From 4KV Bus 3A, 3AD01, 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, 3AD04, can NOT be opened, THEN open Feeder To 4KV Bus 3D, 3AA17, AND Supply From 4KV-Bus 3A, 3AD01. 5. Notify Unit 3 Reactor Operator that 3A 4KV bus stripping is complete. ***Note: Verifies 3A 4KV bus stripped***

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	BOP	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. ***Note: 3B 4KV bus not stripped due to breaker 3AB11 closed***

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	BOP	**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.
	BOP	**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.
		Note: directs start failure reset locally for 3A EDG.
	BOP	**8** Try To Reenergize The A 4KV Bus From 3A Emergency Diesel Generator a. Manually start 3A emergency diesel generator from Control Room * Emergency start OR * Rapid start OR * Normal start a. Go to Step 9. 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.
		Note: NSO reports failure of the 3A EDG turbocharger

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	BOP	9 Try To Reenergize The B 4KV Bus From 3B Emergency Diesel Generator a. Manually start 3B emergency diesel generator from Control Room — a. Go to Step 10 * Emergency start OR * Rapid start OR * Normal start 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.
		Note: determines 3AB11 breaker preventing completion of bus stripping, continues to step 10.

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	BOP	**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
		Note: BOP will use 3-ONOP-004.2 and 3-ONOP-004.3 to restore power to the 4KV buses. Both are listed at the end of the scenario for reference. 3-ONOP-004.2 will be the success path via the station blackout tie.
		Note: RO and US continue in 3-EOP-ECA-0.0. Steps completed depend on timing of restoration of power to3A 4KV bus via the SBO tie. They will go to step 32 when power is restored.
		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.*

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**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
	RO	**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 — 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. • 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%] 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
		Note: Determines Pzr level can not be maintained >17%, starts U4 HHSIP when MOV-3-843A/B opened.

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
______	**RO** √	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
		Note: critical task: (WOG) Failure to isolate RCP seal injection to the RCPs prior to starting a charging pump. (ECA-0.0, task H).
	RO	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: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**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 a. Isolate faulted S/G(s): 1) Verify SI - RESET. 2) Isolate AFW flow. 3) IF steam supply from intact S/G(s) to any AFW pump NOT available, THEN reposition AFW steam supply cross-connect valves, AFSS-3-006 and AFSS-3-007 to provide steam from intact S/G(s) to all AFW pumps. Maintain steam flow to AFW pumps while repositioning cross-connect valves. 4) Perform the following: a) Open AFW pump steam supply MOV breaker on faulted S/G(s). b) Close AFW pump steam supply MOV on faulted S/G(s). 5) Verify S/G blowdown isolation valves - CLOSED. 6) Verify S/G sample lines - ISOLATED. 7) Verify faulted S/G(s) steam dump to atmosphere valve closed. IF valve NOT closed, THEN manually close.
		Note: Determines CV-3-1608 failed open and local isolation valve closed but leaks by.
		CAUTION *If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heat sink.*

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**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.
		Note: Directs NSO to open AFSS-3-007 to restore A AFWP. Once this is done, increases AFW flow to >345gpm to 3A and 3B S/Gs.
	RO	**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	**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	**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

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**25** Check CST Level - GREATER THAN 10% — Add makeup to the CST from any available source using 3-OP-018.1, CONDENSATE STORAGE TANK. <u>OR</u> 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.* **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.*

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO √	**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. 2) Go to Step 27. d. Check S/G pressures - LESS THAN 180 PSIG d. 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
		Note: Critical task: (WOG/PRA) While depressurizing the SG(s) at maximum rate, fails to meet any of the following limiting conditions: 1) SG depressurization is initiated within 100 minutes of SBO initiation, 2) SG depressurization not commenced until 6% NR level is established and is stopped if at least one SG can't be maintained above 6%, 2) SG pressure is not decreased below 80 psig, 3) RCS cold leg temperatures do not decrease less than 320 F, and 4) the reactor doesn't restart as indicated by a positive SUR on the NIS that causes the plant to heat up. (ECA-0.0, Task G

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**27** **Check Reactor Subcritical** • Intermediate range channels - ZERO OR NEGATIVE STARTUP RATE • Source range channels - ZERO OR NEGATIVE STARTUP RATE Control S/G steam dump to atmosphere valves to stop S/G depressurization and allow RCS to heat up.
		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	**28** **Check SI Signal Status** a. SI - HAS BEEN ACTUATED b. Verify SI - RESET a. WHEN SI actuated, THEN do Steps 28b, 29, 30 and 31. Continue with Step 32.
	RO	**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	**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: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	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	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: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior	
	BOP	**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 b. Check 3A and 3B 4KV buses - AT LEAST ONE ENERGIZED	a. <u>IF</u> the energized Unit 3 4KV bus is being fed from the Station Blackout Tie <u>AND</u> ONLY ONE Unit 4 4KV bus is energized <u>AND</u> from an EDG, <u>THEN</u> perform the following: 1) Stabilize S/G pressures by setting S/G steam dump to atmosphere valve controllers to maintain S/G pressures stable <u>OR</u> by manually controlling S/G steam dump to atmosphere valves to maintain stable S/G pressure. 2) Go to Attachment 4 of this procedure. b. Continue to control RCS conditions and monitor plant status: 1) Check status of local actions: • 4KV bus power restoration • RCP seal isolation • DC power supply 2) <u>IF</u> boric acid storage tank room temperature less than 55°F, <u>THEN</u> consult TSC staff for possible boric acid concentration reduction or drainage of the boric acid storage tanks. 3) <u>IF</u> spent fuel pit low level alarm is ON, <u>THEN</u> 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 <u>AND</u> INVERTER ROOM SUPPLEMENTAL COOLING. 5) Observe CAUTION prior to Step 15 <u>AND</u> return to Step 15.
	BOP	**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: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

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	**35** Verify The Following Equipment Loaded On Energized 4KV Buses a. 480 volt load centers a. Manually close load control center breakers to energize 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

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Event Description: The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 fails to open and with B AFWP OOS with an oil leak requires C AFWP to supply both units. Manual bus stripping is performed with the exception of 3B TPCWP breaker 3AB11 which has a blown control power fuse and can not be opened from VPA. 3A 4kV bus is repowered via the SBO tie from unit 4. Then 3AB11 is locally opened allowing 3B EDG to reenergize 3B & 3D 4kV bus. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	US	**36** Select Recovery Procedure a. Verify SI <u>NOT</u> 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 b. Go to 3-EOP-ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Step 1 a. Go to 3-EOP-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
		Note: Determines Pzr level , 17%, directs transition to 3EOP-ECA-0.2

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Event Description: The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50] % or SI actuated due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	US	Directs performance of actions 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	1 Verify SI - RESET
	RO	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.
	BOP	3 Check SI Valve Amber Lights On VPB - ALL BRIGHT Manually align valves to establish proper SI alignment.
	RO	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, 3-738.

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

Event Description: The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50] % or SI actuated due to the effects of the steam leak.

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	**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.
		CAUTION *CCW System load requirements of 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION, SHALL NOT be exceeded.*
	RO	**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.

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

Event Description: The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50] % or SI actuated due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**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
		Note: starts 3A and 3B HHSIPs and secures U4 HHSIP.
	RO	**8** Manually Load The Following Equipment On Energized Buses a. Start two RHR pumps b. Start two emergency containment cooler fans c. Ensure closed breaker 30806, EMERGENCY CONTAINMENT FILTER FAN 3B, on MCC 3D and start two emergency containment filter fans
		NOTE *Hydrogen Monitors are required to be in service within 30 minutes of a valid SI signal.*
	BOP	**9** Direct Operator To Place Hydrogen Monitors In Service Using 3-OP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM
		CAUTION *If CST level decreases to less than 10%, makeup water sources for CST will be necessary to maintain a secondary heat sink.*

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

Event Description: The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50] % or SI actuated due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	BOP	**10** **Maintain Intact S/G Levels** a. Narrow range level – GREATER THAN 6%[32%] a. Maintain AFW flow greater than 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. <u>IF</u> AFW flow is less than 345 gpm, <u>THEN</u> perform the following: 1) Verify AFW pump steam supply MOV on intact S/G(s) - OPEN * MOV-3-1403 for S/G A * MOV-3-1404 for S/G B * MOV-3-1405 for S/G C 2) Establish required AFW flow using 3-ONOP-075, AUXILIARY FEEDWATER SYSTEM MALFUNCTION. 3) Verify AFW pumps - AT LEAST ONE RUNNING 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%.
	RO	**11** **Verify Containment Isolation Phase A Valve White Lights on VPB – ALL BRIGHT** Perform the following: a. Manually actuate containment isolation phase A. b. <u>IF</u> any containment isolation phase A valve is <u>NOT</u> closed, <u>THEN</u> manually close valve. <u>IF</u> valve(s) can <u>NOT</u> be manually closed, <u>THEN</u> manually or locally isolate affected containment penetration.
	BOP	**12** **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

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

Event Description: The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50] % or SI actuated due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	RO	**13** **Verify Containment Spray NOT Required** a. Containment pressure – HAS REMAINED LESS THAN 20 PSIG a. Perform the following: 1) Verify containment spray valves in proper emergency alignment. <u>IF</u> <u>NOT</u>, <u>THEN</u> manually align valve(s) as necessary. <u>IF</u> valve(s) can <u>NOT</u> be manually aligned, <u>THEN</u> locally align valve(s). 2) Manually load one Containment Spray Pump. 3) Verify containment isolation phase B valve(s) closed. <u>IF</u> <u>NOT</u>, <u>THEN</u> manually close valve(s). <u>IF</u> valve(s) can <u>NOT</u> be manually aligned, <u>THEN</u> locally align valve(s). 4) Go to Step 15.
	RO	**14** **Align Containment Spray Pump Switches** a. Check RWST level - GREATER THAN 155,000 GALLONS a. Perform the following: 1) Place one containment spray pump in standby. 2) Maintain one containment spray pump in PULL-TO-LOCK. 3) Go to Step 15. b. Place both Containment Spray Pumps in STANDBY
	RO	**15** **Check RCP Seal Isolation Status** a. RCP seal injection isolation valves outside containment - CLOSED • 3-297A • 3-297B • 3-297C a. Locally close valves before starting charging pump.
		<u>NOTE</u> *FRPs may now be implemented as necessary*

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Event Description: The crew stabilizes the plant using 3-EOP-ECA-0.2 since PZR level < 17[50]% or SI actuated due to the effects of thesteam leak.

Time	Position	Applicant's Actions or Behavior
	US	**16** Go To 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1
		Note: scenario is terminated upon completion of 3-EOP-ECA-0.2

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4.

Time	Position	Applicant's Actions or Behavior
	BOP	Uses 3-ONOP-004.2 to restore power to the 3A 4KV bus

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.*

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	**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
		Note: attachment 1 completed earlier
		CAUTION *Emergency Diesel Generators should NOT be run unloaded for more than 4.5 hours.*
	BOP	**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.*
	BOP	**3** Verify SI Reset — Reset SI.
		CAUTION *The affected EDG may Auto-Start when the Lockout Relay is reset in Step 4.*

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	**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.
		CAUTION *Steady state loading on each Unit 3 EDG shall NOT exceed 2500 KW. Load transients up to 2750 KW are acceptable when starting additional equipment.* **NOTES** • *When Unit 3 startup transformer is available, offsite power to 3A 4KV bus should be restored using 3-ONOP-004.1, SYSTEM RESTORATION FOLLOWING LOSS OF OFFSITE POWER.* • *If a 3A Sequencer failure has occurred and SI has actuated, the 3A EDG output breaker may not close unless SI is reset.*

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	**5** Try To Reenergize 3A 4KV Bus From 3A Emergency Diesel Generator a. Manually start 3A Emergency Diesel Generator from Control Room • Emergency start OR • Rapid start OR • Normal start RNO a. Perform the following: 1) IF 3A and 3B 4KV buses are both deenergized, THEN observe NOTE prior to Step 6 AND go to Step 6. 2) Direct operator to locally start 3A Emergency Diesel Generator using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE. 3) IF 3A Emergency Diesel Generator can NOT be started, THEN observe NOTE prior to Step 6 AND go to Step 6. b. Verify 3A 4KV bus stripping from ATTACHMENT 1 - COMPLETE RNO b. WHEN bus stripping is complete, THEN go to Step 5c. c. Check 3A Sequencer - OPERABLE RNO c. Verify SI - RESET. d. Manually synchronize 3A Emergency Diesel Generator to 3A 4KV bus RNO d. Locally synchronize 3A Emergency Diesel Generator to 3A 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE. e. Check 3A 4KV bus - ENERGIZED RNO e. Perform the following: 1) Shut down 3A Emergency Diesel Generator using 3-OP-023, EMERGENCY DIESEL GENERATOR. 2) Observe NOTE prior to Step 6 AND continue with Step 6. f. Go to Step 18
		Note: 5.a RNO directs 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: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	**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
		Note: SUT not available
		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.*

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

<table>
<tr><th>Time</th><th>Position</th><th>Applicant's Actions or Behavior</th></tr>
<tr><td></td><td>BOP</td><td>
7 Try To Reenergize 3A 4KV Bus From Unit 4 Startup Transformer
<table>
<tr><td>a. Check Unit 4 Startup Transformer Potential White Light on VPA - ON</td><td>a. Observe CAUTION and NOTE prior to Step 8 AND go to Step 8.</td></tr>
<tr><td>b. Check Unit 4 Startup Transformer Lockout Relay – RESET</td><td>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 8 AND go to Step 8.</td></tr>
<tr><td>c. Locally unlock and rack in 3A 4KV Bus Emergency Tie to Unit 4 Startup Transformer, 3AA22</td><td>c. Observe CAUTION and NOTE prior to Step 8 AND go to Step 8.</td></tr>
<tr><td>d. Verify 3A 4KV bus stripping from ATTACHMENT 1 – COMPLETE</td><td>d. WHEN bus stripping is complete, THEN go to Step 7e.</td></tr>
<tr><td>e. Verify SI – RESET</td><td>e. Reset SI.</td></tr>
<tr><td>f. Close 3A 4KV Bus Emergency Tie to Unit 4 Startup Transformer, 3AA22</td><td>f. Locally close breaker.</td></tr>
<tr><td>g. Check 3A 4KV Bus - ENERGIZED</td><td>g. Observe CAUTION and NOTE prior to Step 8 AND go to Step 8.</td></tr>
<tr><td>h. Go to Step 16</td><td></td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td><i>Note: U4 SUT not available</i></td></tr>
<tr><td>____
Start 10 min clock</td><td>BOP
√</td><td>
<u>CAUTION</u>
<i>The Station Blackout Tie Line may be used only when both the 3A and 3B 4KV buses are deenergized.</i>

<u>NOTE</u>
<i>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.</i>
</td></tr>
<tr><td></td><td></td><td><i>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./3-ONOP-004.3</i></td></tr>
</table>

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	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 Manager wants to energize 3A 4KV bus from 3C 4KV bus using ATTACHMENT 2, while continuing with this procedure. b. 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	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.
	BOP	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, 3AD08 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.
		Note: realigns 3D 4KV bus to 3A 4KV bus per RNO steps.

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	**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 - All load breakers on 3A and 3D 4KV buses b. <u>IF</u> station blackout permissive can <u>NOT</u> be satisfied, <u>THEN</u> go to Step 15.
	BOP	**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. <u>IF</u> 4D 4KV bus can <u>NOT</u> be energized, <u>THEN</u> 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.*

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	**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.
		Note: U4 RO places non running safeguards equipment in pull to lock
		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.*
	BOP √	**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)
______ Bus energized	BOP	**15** Verify 3A 4KV Bus - ENERGIZED ***Note: BOP should inform US that 3A 4KV bus is energized via the station blackout tie.***

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Event Description: 3A 4kV bus is repowered via the SBO tie from unit 4 using 3-ONOP-004.2

Time	Position	Applicant's Actions or Behavior
	BOP	**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	**17** Locally Verify No Breaker Targets Exist On 3A 4KV Bus Breakers IF any 3A 4KV bus breaker target is in, THEN DO NOT energize the associated component until cause of breaker target is determined and corrected.
	BOP	**18** Verify 3A 4KV Bus Is The First Bus Energized 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 Go to Step 19
		Note: exits 3-ONOP-004.2 back to 3-EOP-ECA-0.0.

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Event Description: 3B 4kV bus is repowered via the 3B Emergency Diesel following opening of breaker 3AB11 per 3-ONOP-004.3

Time	Position	Applicant's Actions or Behavior
	BOP	Uses 3-ONOP-004.3 to restore power to the 3B 4KV bus
		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 3B 4KV Bus is supplying power to Unit 4 AND offsite power to 3B 4KV Bus is lost, 3B Emergency Diesel Generator output breaker will NOT close until the Station Blackout Breaker, 3AD07, has been manually opened.*
	BOP	1 Verify Bus Stripping On 3B 4KV Bus a. Verify 3B 4KV bus stripping using ATTACHMENT 1 b. Check 3B 4KV bus - AUTOMATICALLY REENERGIZED b. Observe CAUTION prior to Step 2 AND go to Step 2. c. Return to procedure and step in effect
		Note: Restoration of 3B 4KV bus cannot be completed until breaker 3AB11 is opened locally to complete attachment1 bus stripping.
		Note: 3B EDG output breaker will not close automatically due to 3B sequencer being inoperable.

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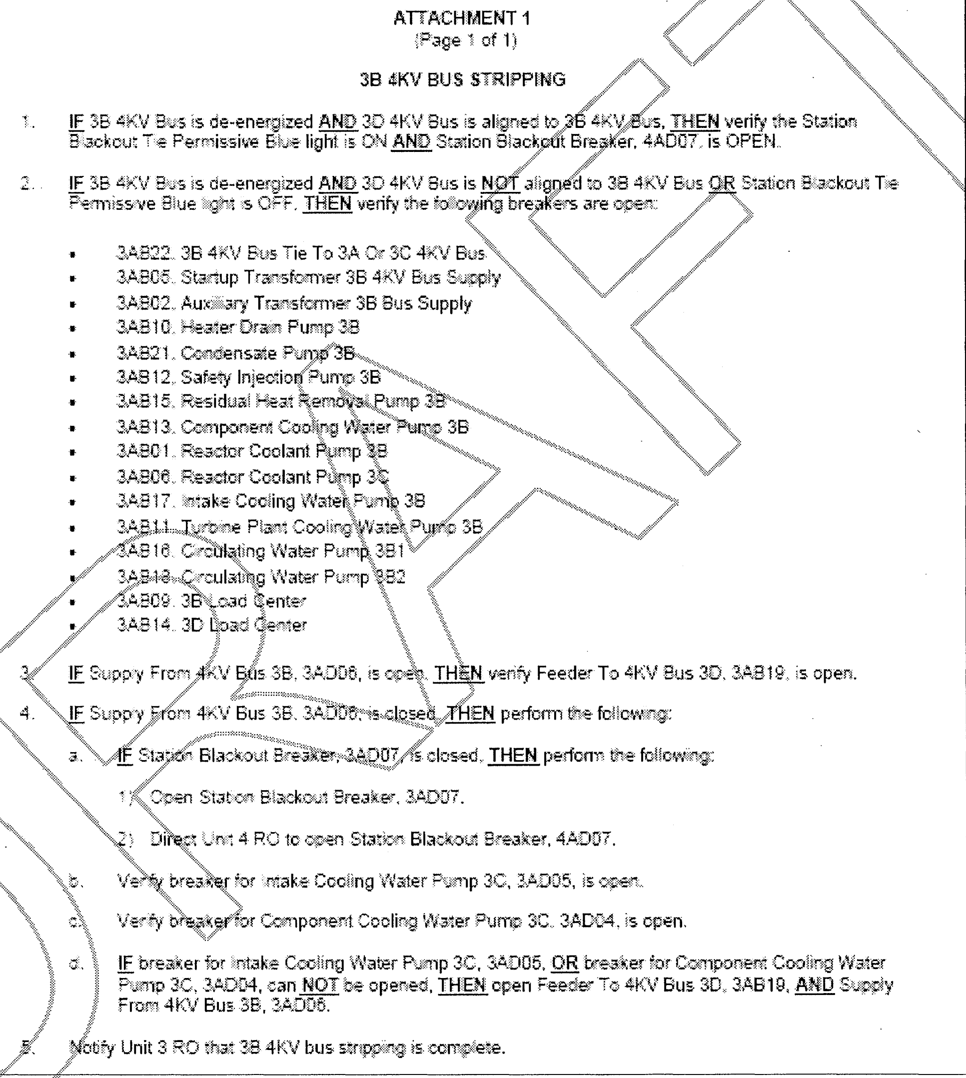
Event Description: 3B 4kV bus is repowered via the 3B Emergency Diesel following opening of breaker 3AB11 per 3-ONOP-004.3

Time	Position	Applicant's Actions or Behavior
		 **ATTACHMENT 1** (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 Station Blackout Breaker, 4AD07, is 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 are 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 RO 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, 3AD04, can NOT be opened, THEN open Feeder To 4KV Bus 3D, 3AB19, AND Supply From 4KV Bus 3B, 3AD06. 5. Notify Unit 3 RO that 3B 4KV bus stripping is complete.
	BOP	Directs NSO to open 3AB11, 3B TPCWP breaker locally.
		Note: NSO will call to inform US breaker is being opened following restoration of 3A 4KV bus via the SBO tie. Following 3AB11 breaker opening the 3B EDG breaker will be closed manually.

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

Event Description: 3B 4kV bus is repowered via the 3B Emergency Diesel following opening of breaker 3AB11 per 3-ONOP-004.3

Time	Position	Applicant's Actions or Behavior
	BOP	**2** Check 3B 4KV Bus Lockout Relay – RESET Perform the following: a. IF the 3A and 3B 4KV buses are both deenergized, THEN reset 3B 4KV bus lockout relay. b. IF 3A 4KV bus is energized, THEN perform the following: 1) Determine and correct cause of 3B 4KV bus lockout relay actuation. 2) WHEN cause of 3B 4KV bus lockout relay actuation is determined and corrected, THEN reset lockout relay. c. WHEN 3B 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.*
	BOP	**3** Verify SI Reset Reset SI.
		CAUTION *The affected EDG may Auto-Start when the Lockout Relay is reset in Step 4.*
	BOP	**4** Check 3B Emergency Diesel Lockout Relay - RESET Perform the following: a. IF 3A 4KV bus is energized, THEN try to determine and correct cause of 3B Emergency Diesel Lockout Relay actuation. b. Locally reset 3B Emergency Diesel Start Failure Relay. c. IF the 3A and 3B 4KV buses are both deenergized, THEN reset 3B Emergency Diesel Lockout Relay. d. IF 3B Emergency Diesel Lockout Relay can NOT be reset, THEN observe NOTE prior to Step 6 AND go to Step 6.
		CAUTION *Steady state loading on each Unit 3 EDG shall NOT exceed 2500 KW. Load transients up to 2750 KW are acceptable when starting additional equipment.*

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Event Description: 3B 4kV bus is repowered via the 3B Emergency Diesel following opening of breaker 3AB11 per 3-ONOP-004.3

Time	Position	Applicant's Actions or Behavior
		NOTES • *When Unit 3 startup transformer is available, offsite power to 3B 4KV bus should be restored using 3-ONOP-004.1, SYSTEM RESTORATION FOLLOWING LOSS OF OFFSITE POWER.* • *If a 3B Sequencer failure has occurred and SI has actuated, the 3B EDG output breaker may not close unless SI is reset.*
	BOP	**5** Try To Reenergize 3B 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. Perform the following: 1) IF 3A and 3B 4KV buses are both deenergized, THEN observe NOTE prior to Step 6 AND go to Step 6. 2) Direct operator to locally start 3B Emergency Diesel Generator using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE. 3) IF 3B Emergency Diesel Generator can NOT be started, THEN observe NOTE prior to Step 6 AND go to Step 6. b. Verify 3B 4KV bus stripping from ATTACHMENT 1 – COMPLETE b. WHEN bus stripping is complete, THEN go to Step 5c. c. Check 3B Sequencer – OPERABLE 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. e. Check 3B 4KV bus – ENERGIZED e. Perform the following: 1) Shut down 3B Emergency Diesel Generator using 3-OP-023, EMERGENCY DIESEL GENERATOR. 2) Observe NOTE prior to Step 6 AND continue with Step 6. f. Go to Step 15
		Note: 3B EDG will be manually synchronized to the bus
	BOP	**15** Verify SI – RESET Reset SI.
	BOP	**16** Locally Verify No Breaker Targets Exist On 3B 4KV Bus Breaker IF any 3B 4KV bus breaker target is in, THEN DO NOT energize the associated component until cause of breaker target is determined and corrected.
		Note: dispatches NSO to check breaker targets

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Event Description: 3B 4kV bus is repowered via the 3B Emergency Diesel following opening of breaker 3AB11 per 3-ONOP-004.3

Time	Position	Applicant's Actions or Behavior
	BOP	**17** Re-energize Load Center 3B a. Close 3B Load Center Breaker, 3AB09 a. Sequencer failure may have occurred; perform the following: 1) Locally place the sequencer XS-1 key switch to the OFF position. 2) Attempt to close 3B Load Center Breaker, 3AB09. b. Check Load Center 3B - ENERGIZED b. Perform the following: 1) Locally verify 3B Feed From 3B 4KV Bus Breaker, 30210 - CLOSED. 2) <u>IF</u> 3B Load Center can <u>NOT</u> be reenergized, <u>THEN</u> consult with the Shift Manager to determine if 3B Load Center should be reenergized from opposite train source using 3-OP-006, 480 VOLT SWITCHGEAR SYSTEM.
	BOP	**18** Re-energize Load Center 3D a. Close 3D Load Center Breaker, 3AB14 a. Sequencer failure may have occurred; perform the following: 1) Locally place the sequencer XS-1 key switch to the OFF position. 2) Attempt to close 3D Load Center Breaker, 3AB14. b. Check Load Center 3D - ENERGIZED b. Perform the following: 1) Locally verify 3D Feed From 3B 4KV Bus Breaker, 30410 - CLOSED. 2) <u>IF</u> 3D Load Center can <u>NOT</u> be reenergized, <u>THEN</u> consult with the Shift Manager to determine if 3D Load Center should be reenergized from opposite train source using 3-OP-006, 480 VOLT SWITCHGEAR SYSTEM.
	BOP	**19** Check 3H Load Center – ALIGNED TO AN ENERGIZED LOAD CENTER Manually align 3H Load Center to an energized load center.
		CAUTION *The CCW System loads requirements of 3-OP-030, COMPONENT COOLING WATER SYSTEM, shall not be exceeded.* NOTE *If any component powered from a deenergized motor control center must be started, the affected motor control center needs to be reenergized using 3-OP-007, 480 VOLT MOTOR CONTROL CENTER.*

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

Event Description: 3B 4kV bus is repowered via the 3B Emergency Diesel following opening of breaker 3AB11 per 3-ONOP-004.3

Time	Position	Applicant's Actions or Behavior
	BOP	**20** **Restart Components Supplied By 3B 4KV Bus As Directed By The Shift Manager** a. Safety Related Components • 3B Intake Cooling Water Pump • 3B Component Cooling Water Pump • 3B High-Head SI Pump • 3B Residual Heat Removal Pump • 3B Containment Spray Pump • 3A Emergency Containment Filter Fan • 3B Emergency Containment Filter Fan (if 3D MCC aligned to 3B Bus) • 3A Emergency Containment Cooler • 3B Emergency Containment Cooler (if 3D MCC aligned to 3B Bus) • 3B Turbine Plant Cooling Water Pump b. HVAC Equipment • Computer Room Chiller • Battery Room Air Conditioner E16E (30609) a. Sequencer failure may have occurred; perform the following: 1) Locally place the sequencer XS-1 key switch to the OFF position. 2) Attempt to close affected breaker.
	BOP	**21** **Check If Additional Loads On 3B 4KV Bus Should Be Started** a. Check 3B 4KV bus - ENERGIZED BY UNIT 3 STARTUP TRANSFORMER b. Restart components supplied by 3B 4KV bus as directed by the Shift Manager • 3B1 Circulating Water Pump • 3B2 Circulating Water Pump • 3B Condensate Pump • 3B Heater Drain Pump • 3B Reactor Coolant Pump • 3C Reactor Coolant Pump • SFP Exhaust Fan • B Auxiliary Building Exhaust Fan (if A fan not running) c. Notify Chemistry to verify proper operation of the plant SPING units a. Go to Step 22. b. Sequencer failure may have occurred, perform the following: 1) Locally place the sequencer XS-1 key switch to the OFF position. 2) Attempt to close affected breakers.

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

Event Description: 3B 4kV bus is repowered via the 3B Emergency Diesel following opening of breaker 3AB11 per 3-ONOP-004.3

Time	Position	Applicant's Actions or Behavior
	BOP	**22** Check Station Blackout Breaker, 3AD07 – OPEN Perform the following: a. <u>IF</u> 3B 4KV bus is energized from Unit 4 using station blackout tie line, <u>THEN</u> go to Step 24. b. <u>IF</u> 3A 4KV bus is energized from Unit 4 using station blackout tie line, <u>THEN</u> consult with the Shift Manager to determine if Station Blackout Breaker, 3AD07, should be opened. c. Return to procedure and step in effect.
		Note: 22.b. NRO returns to 3-EOP-ECA-0.0

NRC XXIV_NRC_SEN_6

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:	2		**Mode:**	1
Power:	4		**Power:**	100
MWe:	0		**MWe:**	756
Gross Leakrate:	.02		**Gross Leakrate:**	.02
RCS Boron Conc:	1140		**RCS Boron Conc:**	286

Operational Concerns:

3rd RO assigned to control steam generator levels while in manual level control.

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

Turbine rolling at 1800 RPM ready to sync generator to grid. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map. 3-GOP-301 in progress at step 5.52.2.

Unit 3 Status

Reactor Operator

Mode:	**2**
Power:	**4**
MWe:	**0**
Tavg:	**549.5**
RCS Pressure:	**2250**
RCS Boron Conc:	**1140**

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

Accumulator Ref Levels	
A	**6614**
B	**6631**
C	**6621**

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 4.
Condenser inleakage 0 scfm.