FACILITY NAME: Turkey Point Section 4

REPORT NUMBER: 2009-302

DRAFT SIMULATOR SCENARIOS

CONTENTS:

- ☒ **Draft Simulator Scenarios**
  - **Each containing ES-D-1 "Scenario Outline"**
  - **Each containing ES-D-2 "Required Operator Actions"**

Location of Electronic Files:

_____

_____

_____

_____

Submitted By: Edwin Fox, Jr. Verified By: Mark J. Riches

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:	75		Power:	100
MWe:	543		MWe:	756
Gross Leakrate:	.02		Gross Leakrate:	.02
RCS Boron Conc:	755		RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: 3B Charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	75
MWe:	543
Tavg:	566
RCS Pressure:	2250
RCS Boron Conc:	755

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:

Immediately after shift turnover swap ICW pumps to 3A and 3B running using 3-NOP-19 step 4.2.1.5.
Operators to support the evolution have been briefed and are on station. Maintain 75% steady state power.

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.

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, 75% MOL

Turnover: Equipment OOS: 3B Charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

Immediately after shift turnover swap ICW pumps to 3A and 3B running using 3-NOP-19 step 4.2.1.5. The shift manager has granted permission to perform the evolution. Operators to support the evolution have been briefed and are on station. Maintain 75% power.

Online risk – green

B train protected both units

Event No.		Event Type	Event Description
1		(N) SRO (N) BOP	Swap running ICW pumps using 3-NOP-19 step 4.2.1.5.
2	TFLIC81=T	(C) RO (C)(TS) SRO	Control bank D rod (M10) drops into the core the crew responds using 3-ONOP-028.3
3		(R) ALL	The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the dropped rod.
4	TCE6DS4C = 0	(C) RO (C) SRO (TS) SRO	120 VAC power panel 3P09 is deenergized. The crew stabilizes the plant using 3-ONOP-003.9. The RO reduces charging flow to control Pressurizer Pressure and Pressurizer Level. The SRO addresses TS LCO 3.4.3 and 3.8.3.1
4a		(C) BOP	Steam Generator 3B level controls are in AUTO LOCKUP. The BOP will adjust blowdown flow as needed to control B S/G level.
5	TVSBVL5 0.2 ramp 10:00	(M) ALL	A Main Steam Line leak upstream of the MSIV's begins and gradually degrades. The crew responds using 3-EOP-E-0. 3-MOV-843A fails to auto open when SI actuates. The crew manually opens 3-MOV-843A.
6	TFSWX6C=T	(C) BOP	Transition is made to 3-EOP-E-2, the 3B MSIV fails to auto close. The crew manually closes the MSIV and isolates feed to the faulted S/G.
7			Once the 3B S/G has been isolated, the crew will transition to 3-EOP-E-1 and subsequently to 3-EOP-ES 1.1 to terminate SI.

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

Turkey Point 2009-301 Scenario #1

Event 1 – The crew will swap running ICW pumps using 3-NOP-19 step 4.2.1.5.

Event 2 – Control bank D rod (M10) will drop fully into the core, the crew responds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.

Event 3 – The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the dropped rod.

Event 4 – 120 VAC power panel 3P09 is deenergized. The crew stabilizes the plant using 3-ONOP-003.9. Since letdown is lost, the RO reduces charging flow to control Pressurizer Pressure and Pressurizer Level. The SRO addresses TS LCO 3.4.3 and 3.8.3.1

Event 4a – Steam Generator 3B level controls are in AUTO LOCKUP. The BOP will adjust blowdown flow as needed to control B S/G level.

Event 5 – A Main Steam Line Leak upstream of the MSIV's begins and gradually degrades. The reactor trips and the crew responds using 3-EOP-E-0. During the performance of 3-EOP-E-0, cold leg injection valve 3-MOV-843A fails to auto open when SI actuates. The crew manually opens 3-MOV-843A to initiate Train A injection flow.

Event 6 – The crew completes the applicable steps of 3-EOP-E-0 and transitions to 3-EOP-E-2. The 3B MSIV fails to auto close during the steam line break, the crew manually closes the MSIV and isolates feed to the faulted S/G. **Critical Task**

Event 7 – Once the 3B S/G has been isolated, the crew will transition to 3-EOP-E-1 and subsequently to 3-EOP-ES 1.1 to terminate SI. **Critical Task**

Scenario XXV NRC 1 Simulator Operating Instructions

Setup

Restore IC-16 (75% power MOL)

- Open & execute lesson file SRO_XXV_NRC_1.lsn
- Place simulator in run

Trigger lesson step:

- SETUP – 3B Charging pump OOS. Removes 3B charging pump from service. (Actuates TAB1POSM = RACKOUT)
- SETUP - PV2605 FAILS OPEN (Actuates TFSVVX6C T)
- Place clearance info tag on 3B Charging Pump start switch
- Start 3A ICWP and stop 3B ICWP.
- Provide an in progress procedure 3-NOP-019 step 4.2.1.5
- Provide shift turnover checklists
- Set ERDADS on VPA and at the RCO desk to the Utilities screens.
- Perform Simulator Operator Checklist

Event 1 – Swap running ICW pumps using 3-NOP-19 step 4.2.1.5.

Initiated immediately after shift turnover.

If directed, respond as ANPO if directed to perform pre-start checks for 3B ICW pump & post-shutdown checks for 3A ICWP. Report all checks satisfactory.

Step 7.1.3.1 - The BOP starts the 3B ICW pump and stops the 3C ICW pump

When directed by the lead examiner, **trigger lesson step "EVENT 2 - DROP CBD ROD M10"** **(actuates TFLIC81=T).**

Event 2 – Control bank D rod (M10) Drop

Control bank D rod (M10) will drop fully into the core, the crew responds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.

If directed, respond as Reactor Engineering when notified of rod drop. If directed as the STA, come to the control room and perform hourly QPTRs.

If directed, respond as WCC/I&C when notified of the dropped rod & the need to reset PRNI hi flux trip setpoint. Respond that an I&C technician respond as requested.

Event 3 – Fast Load Reduction

The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the dropped rod.

If directed, respond as System when called about load reduction.

If directed, respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast laod reduction.

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

If directed, respond as FS/NSO to align aux steam using attachment 1. No response back required.

If directed, respond as SNPO if directed to increase CCW→NRHX flow. Click on SCHEMATICS→COMMON SERVICES→COMPONENT COOLING→report the CCW flow shown adjacent to the NRHX. This should let the crew know that flow has already been increased (2 charging pumps & 2 orifices already in service).

Event 4 – LOSS OF 3P09

120 VAC power panel 3P09 main feeder breaker fails leaving 3P09 deenergized. The crew responds using 3-ONOP-003.9 to control Pressurizer and Steam Generator level.

When directed by the lead examiner, trigger lesson step **EVENT 4 - LOSS OF 3P09 (actuates TCE6DS4C = 0).**

If directed, respond as FS/TO to inspect 3P09 & 3D inverter. After 1-3 min, report 3P09 deenergized with the main feeder breaker tripped.

If directed, respond as FS if directed to restore power using 3-ONOP-3.9 Attachment 1, wait 1-3 min then trigger the following lesson steps.

EVENT 4 - OPEN 3D INVERTER CB6 (actuates TCEDI4C = F)

EVENT 4 - OPEN ALL 3P09 BREAKERS (actuates TCE6217S = T)

EVENT 4 - OPEN ALL 3P24 BREAKERS (actuates TCC2DLM3 = F, TCC2DLM = F, TCM2DX3M = F, TCC2DLE = F, TCC2DPE = F, TCF1DA3M = F, TCK72407 = F, TCCMP248 = F, TCN1409M = F, TCN1410M = F & TCN1411M = F)

Call the control room as FS/TO and inform them you are performing 3-ONOP-3.9 attachment 1 step 7 and the Main Feeder breaker for 3P09 will not close.

If directed, respond as WCC to contact Electrical Maintenance and plant management.

If directed, respond as WCC to prepare a PWO/Clearance.

Event 5 – Main Steam Line Leak

A Main Steam Line Leak upstream of the MSIV's begins and gradually degrades. The crew responds using 3-EOP-E-0. During the performance of 3-EOP-E-0, cold leg injection valve 3-MOV-843A fails to auto open when SI actuates. The crew manually opens 3-MOV-843A to initiate Train A injection flow.

When directed by the lead examiner, **trigger lesson step EVENT 5 - Main Steam Line Leak** (actuates TVSBVL5 0.2 ramp 10:00)

When the reactor trips, **ensure lesson step EVENT 5 - MOV 3 843A Fails to Auto Open is inserted.** (actuates TFL3S12D=T)

If directed, respond as FS/TO to investigate the source of the steam leak, make a report of an extreme amount of steam and loud noise coming from the main steam platform but cannot determine the exact source.

Due to the loss of 3-P09, the indication for various valves are lost. Acknowledge as FS/TO/SNPO to isolate valves as directed by the Control Room. (3-SV-2911 and 2912.)

When directed respond as the FS/SNPO to place PAHMS in service, **trigger lesson step EVENT 3 - ALIGN PAHM FOR** SERVICE (actuates TAC2V02A=1.0/30 sec delay, TAC2V02B=1.0/1 min delay, TAAAV21=1.0/ 2 min delay, TAAAV22=1.0/3.5 min delay & TACA005=0.0). Report completion 10-15 min later.

If directed, respond as Chemistry to sample S/G, monitor DAM-1

If directed, respond as HP to perform surveys.

Event 6 – PV2605 FAILS OPEN

Transition is made to 3-EOP-E-2, the 3B MSIV fails to auto close. The crew manually closes the MSIV and isolates feed to the faulted S/G.

When the crew manually closes 3-PV-2605, **ensure lesson step SETUP - PV2605 FAILS OPEN is removed** (TFSWX6C=F)

When directed respond as the FS/TO wait 3 minutes and **trigger lesson step EVENT 6 – DEENERGIZE & LOCALLY CLOSE MOV-3-1404** (actuates TCF5M527=F, TFFXC04 = T). Report when complete.

Event 7 – SI Termination

Once the 3B S/G has been isolated, the crew transitions to 3-EOP-ES 1.1 to terminate SI.

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

Event Description: The crew will swap running ICW pumps using 3-NOP-19 step 4.2.1.5.

Time	Position	Applicant's Actions or Behavior
		Procedure Note: When starting ICW Pumps, the maximum flow rates for the inservice HXs may be exceeded. The high flow rate is acceptable provided the duration of high flow is minimized.
		Procedure Note: Operation of an ICW Pump is permitted up to 19,000 gpm. If an ICW Pump is operated in excess of 19,000 gpm, then flow should be reduced to less than 19,000 gpm as soon as possible. If an ICW pump has operated at flows greater than 19,000 gpm for more than twenty (20) minutes, then once pump flow has been reduced to 19,000 gpm or less, the IST Coordinator should be notified to perform vibration and pump DP testing per 3-OSP-019.1, Intake Cooling Water Pump Inservice Test to ensure the integrity of the affected pump.
		CAUTION Intake Cooling Water Pump Motor starting limits: • With motor at ambient temperature, two successive starts are allowed with the motor coasting to rest between starts. • With motor at operating temperature, one start is allowed. Subsequent starts require that the motor is allowed to cool by standing idle for one hour or by running for one-half hour.
	SRO	Directs evolution using 3-NOP-19
	BOP	START 3B ICW PUMP from VPA. CHECK 3B ICW PUMP Motor Amps at VPA stabilizes to less than 49 amps. CHECK PI-3-1451, PRESS IND FOR INTAKE COOLING WTR PUMP B indicates between 11 and 35 psig. Stops 3C ICW pump
		Examiner note: When the 3C ICW pump is stopped, proceed to evert 2

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

Event Description: Control bank D rod (M10) will drop fully into the core, the crew responds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 2 - DROP CBD ROD M10" (actuates TFLIC81=T).		
	RO	Recognizes and reports rod M10 drop.
	BOP	Addresses Alarm Response for B-2/2, 2/3, 4/4, 6/4, 7/1, 9/3 and G-5/2.
	SRO	Directs response using 3-ONOP-028.3
		NOTES • *Foldout page is required to be monitored throughout this procedure.* • *Misaligned rods are addressed by 3-ONOP-028.1, RCC Misalignment.*
	CREW	Reviews foldout page (See page 10)
	RO	Checks M-10 the only dropped rod.
	SRO	Checks reactor in MODE 1
	RO	Places rod control 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.***
	RO	Verifies PLCS and PPCS controlling in AUTO
	BOP	Reduces main turbine load as needed to match Tavg & Tref within 3 degrees.
	BOP	Verifies FWCS controlling in AUTO
	BOP	Compares AFD to RAOC limit (PCB sect 5 fig 1 also found in ARP book) & determines AFD within limit

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

Event Description: Control bank D rod (M10) will drop fully into the core, the crewresponds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs RE or the STA to initiate hourly QPTR calculation using 3-OSP-059.10 until results sat or power < 50%
		EXAMINER NOTE: Satisfies compliance with LCO 3.2.4
	SRO	Declares M-10 rod inoperable per LCO 3.1.3.1
		EXAMINER NOTE: 3.1.3.1 All full length (shutdown and control) rodsshall be OPERABLE and positioned within the Allowed Rod Misalignment between the Analog Rod Position Indication and the group step counter demand position within one hour after rod motion. The Allowed Rod Misalignment shall be defined as: b. for THERMAL POWER greater than 90% of RATED THERMAL POWER, the Allowed Rod Misalignment is ± 12 steps. APPLICABILITY: MODES 1* and 2* ACTION: d. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than the Allowed Rod Misalignment of Specification 3.1.3.1, POWER OPERATION may continue provided that within one hour either: 1. The rod is restored to OPERABLE status within the Allowed Rod Misalignment of Specification 3.1.3.1, or 2. The remainder of the rods in the bank with the inoperable rod are aligned to within the Allowed Rod Misalignment of Specification 3.1.3.1 of the inoperable rod while maintaining the rod sequence and insertion limits of Specification 3.1.3.6; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or 3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 3 of 6

Event Description: Control bank D rod (M10) will drop fully into the core, the crew responds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.

Time	Position	Applicant's Actions or Behavior
		a) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the power range neutron flux high trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER. THERMAL POWER shall be maintained less than or equal to 75% of RATED THERMAL POWER until compliance with ACTIONS 3.1.3.1.d.3.c and 3.1.3.1.d.3.d below are demonstrated, and b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F_N^{\Delta H}$ are verified to be within their limits within 72 hours
	SRO	Makes decision to reduce Reactor Power To Less Than 50% Within 1 Hour
	SRO	Transitions to 3-ONOP-100 while continuing in 3-ONOP-28.3
		Examiner Note: 3-ONOP-28.3 details continued on page 8, 3-ONOP-100 actions continued on the next page.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 3 Page 1 of 4 Event Description The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the dropped rod.		
Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-ONOP-100.
	SRO	Performs 3-ONOP-100 brief. (See next page)
	CREW	Reviews 3-ONOP-100 foldout page actions (See page 11)
	SRO	Determines 18 gal/% boric acid addition is required.
	RO	Initiates boration: 1. Sets BA totalizer as directed (18 gal/% for 20% load decrease = 360 gal BA) 2. Takes FC-3-113A pot →8.0 or as directed 3. RMSS→BORATE 4. RMCS→START
	RO	Adjusts FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate
	BOP	Reduces turbine load. • Maintains Tavg less than 5°F above Tref • Maintains rods greater than insertion limit.
		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.*
	CREW	Notifies plant management and System of the impending unit shutdown.
	RO	Check pressurizer level following program
	CREW	Verifies load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3 (see next page)

ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction _____

2. Target power level _____ % Power

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

3. Load reduction rate _____ Mw / minute

NOTES

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

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

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

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

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

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

8. Questions or crew input?

9. End of Brief

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

Event Description The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the dropped rod.

Time	Position	Applicant's Actions or Behavior
	BOP	Reduces turbine load. • Maintains Tavg less than 5°F above Tref • Maintains rods greater than insertion limit.
		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.*
	CREW	Notifies plant management and System of the impending unit shutdown.
	RO	Check pressurizer level following program
	CREW	Verifies load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 4 of 6 Event Description: Control bank D rod (M10) wil drop fully into the core, the crew responds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE : LCO 3.1.3.6 The control banks shall be limited in physical insertion specified in the Rod Bank Insertion Limits curve, defined in the CORE OPERATING LIMITS REPORT. APPLICABILITY: MODES 1* and 2* ** ACTION: With the control banks inserted beyond the above insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2 either: a. Restore the control banks to within the limits within 2 hours, or b. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the bank position specified in the Rod Bank Insertion Limits curve, defined in the CORE OPERATING LIMITS REPORT, or c. Be in at least HOT STANDBY within 6 hours.
		EXAMINER NOTE : Reducing power to within the limits of the COLR satisfies compliance with LCO 3.1.3.6 action b
	SRO	Determines annunciator B-9/3 is locked in and directs RPI/step counter comparison every 4 hours
		EXAMINER NOTE 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.
	SRO	Directs notification of Reactor Engineering about dropped rod (if not already done)
	SRO	Determines Shutdown Margin is adequate since RCS boron greater than or equal to pre-event value

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 5 of 6 Event Description: Control bank D rod (M10) will drop fully into the core, the crew responds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE : Satisfies compliance with LCO 3.1.1.1
	SRO	Directs notification of I&C of potential need to reset PRNI hi flux trip setpoint using 3-OSP-059.4
	SRO	Directs RE or STA to perform a Shutdown Margin calculation using 0-OP-028.2
		EXAMINER NOTE: When power has been sufficiently reduced, proceed to EVENT 3

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 2 Page 6 of 6
Event Description: Control bank D rod (M10) will drop fully into the core, the crew responds using 3-ONOP-028.3 by placing rod control to manual and reducing main turbine load to stabilize the plant. The SRO addresses LCO 3.1.1.1, 3.1.3.1, 3.1.3.6 and 3.2.4.
3-ONOP-28.3 Foldout Page

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 4 of 4
Event Description The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the dropped rod.
3-ONOP-100 Foldout Page

1. 3-EOP-E-0 Transition Criteria

IF any of the following limits are reached, **THEN** trip the Reactor and Turbine **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:

a. RCS Tavg - GREATER THAN 578 °F

b. RCS Tavg - GREATER THAN Tref by 6 °F

c. Rod Insertion Limits are exceeded as indicated by:
   - Rod Position Bank D Insertion Limit Recorder (VPA)
   - Stepcounters on console
   - Plant Curve Book Section 7, Figure 3

2. Notify Chemistry Department

WHEN reactor power has changed by greater than or equal to 15 percent, **THEN** notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.

3. Restore Blender to AUTO

WHEN boration is complete, **THEN** restore the Blender to AUTO as follows.

a. Place the Reactor Makeup Selector Switch to AUTO

b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired

c. Place the RCS Makeup Control Switch to START

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

Event Description: 120 VAC power panel 3P09 is deenergized. The crew responds using 3-ONOP-003.9 to control Pressurizer Pressure, Pressurizer Level, and Steam Generator level. The SRO addresses LCO 3.8.3.1

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 4 - LOSS OF 3P09 (actuates TCEDS4C = 0).		
	BOP	Recognizes and reports loss of 3P09.
	SRO	Directs response using 3-ONOP-003.9
	BOP	Reports 3B SG level changing uncontrollably.
	CREW	Directs FS restore power to 3P09 using 3-ONOP-003.9 Attachment 1
		CAUTIONS • *An Auto Safety Injection will occur following a reactor trip if Tavg is equal to or less than 543°F.* • *If the pressurizer sprays were open prior to the loss of 3P09, RCS pressure will continue to decrease after the Reactor Trip occurs.*
		NOTES • *Step 1 is an immediate action step.* • *All 3P09 (YELLOW) channel indication/controls are affected by failure of 3P09. Enclosure 1 provides a listing of lost functions, indications, and controls.*
	SRO	Checks reactor trip has not occurred nor required
	SRO	Checks Unit 3 in Mode 1
	RO	Verifies rod control is in MANUAL.
	BOP	Places Steam Dump to Condenser Mode Selector to MANUAL.
	RO	Controls Pressurizer pressure by manually changing charging flow.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.:4 Page 2 of 3

Event Description: 120 VAC power panel 3P09 is deenergized. The crew responds using 3 ONOP-003.9 to control Pressurizer Pressure, Pressurizer Level, and Steam Generator level The SRO addresses LCO 3.8.3.1

Time	Position	Applicant's Actions or Behavior
		CAUTION *Steam Generator 3B level controls are in AUTO LOCKUP.*
		NOTES • *3B Steam Generator Levels may be adjusted by controlling Blowdown Flow.* • *3A and 3C Steam Generator level controllers should remain in Automatic.*
	BOP	Controls B SG level by changing blowdown.
	CREW	Discusses reactivity effects of changing blowdown flow.
		CAUTION *If Tavg decreases to less than 543°F, an automatic Safety Injection will occur due to High Steam Flow coincident with Low Tavg.*
	CREW	Maintain The Following Plant Parameters -IN NORMAL CONTROL BANDS • Tavg • Reactor power • Pressurizer Pressure • Pressurizer Water level • Steam Generator Water level
	SRO	Directs efforts to restore power to 3P09, ultimately power restoration to 3-P09 will not be successful.
	SRO	IF power can NOT be restored to 3P09 within 1 hour, THEN perform the actions of Technical Specifications as directed by the Shift Manager.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.:4 Page 3 of 3 Event Description: 120 VAC power panel 3P09 is deenergized. The crew responds using 3-ONOP-003.9 to control Pressurizer Pressure, Pressurizer Level, and Steam Generator level. The SRO addresses LCO 3.8.3.1		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE 3.8.3.1 The following electrical busses* shall be energized in the specified manner with the tie breakers open between redundant busses within the unit** and between the busses of Units 3 and 4.
		j. 120 Volt AC Vital Panel 3P09 and 3P24 energized from its associated inverter connected to D.C. Bus 4A.**** (**** A back-up inverter may be used to replace the normal inverter, provided the normal inverter on the same DC bus for the opposite unit is not replaced at the same time.) APPLICABILITY: MODES 1, 2, 3, and 4. ACTION: c. With one A.C. vital panel either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) Reenergize the A.C. vital panel within 2 hours or be in at least HOT STANDBY within the next 12 hours and in COLD SHUTDOWN within the following 30 hours; and (2) reenergize the A.C. vital panel from an inverter connected to its associated D.C. bus
		EXAMINER NOTE Proceed to event 5

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 1 of 4 Event Description: A Main Steam Line Leak upstream of the MSIV's begins and gradually degrades. The reactor trips and the crew responds using 3-EOP-E-0.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 5 - Main Steam Line Leak (actuates TVSBVL5 0.2 ramp 10:00)		
	CREW	Recognizes the onset of the main steam line leak
	SRO	Directs a manual trip of the reactor
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	Performs immediate actions of 3-EOP-E-0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing May manually actuate Safety Injection, checks SI if an auto actuation occurs.
	BOP	Performs immediate actions of 3-EOP-E-0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSR steam supply MOVs • May manually isolate the 3B MSIV • Mid & East GCBs open Verifies power to emergency 4kV buses • Determines both 3A & 3B 4kV buses energized with 3D 4kV bus energized from 3B 4kV bus

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

Event Description: A Main Steam Line Leak upstream of the MSIV's begins and gradually degrades. The reactor trips and the crew responds using 3-EOP-E-0.

Time	Position	Applicant's Actions or Behavior
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	CREW	Monitors 3-EOP-E-0 Foldout page (see page 18)
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification (See next page for detailed actions)
	RO	Isolates AFW flow to the 3B S/G.
	SRO	Directs RO in performance of 3-EOP-E-0 subsequent actions.
	RO	Checks all AFW Pumps RUNNING
	RO	Checks AFW valve alignment proper
	RO	Verifies total AFW flow greater than 345 gpm.
	RO	Checks RCP thermal barrier alarms off.
	RO	Adjusts total AFW flow to 345 gpm to "A" & "C" S/G.
	RO	Checks PRZ PORVs, Spray Valves and Excess Letdown Isolated
	RO	Checks if RCPs should be stopped (may already be tripped based on foldout page criteria). If subcooling is less than 25°, trips RCP's.
	CREW	Diagnoses the main steam line break
	SRO	Transitions to 3-EOP-E-2
	BOP	Continues performance of 3-EOP-E-0 Attachment 3 Prompt Action Verification
	STA	Provides the RO with stabilization S/G pressure information.
	RO	Stabilizes RCS temperature using Steam Dump to Atmosphere Valves

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 5 Page 3 of 4

Event Description: During the performance of 3-EOP-E-0, cold leg injection valve 3-MOV-843A fails to auto open when SI actuates. The crew manually opens 3-MOV-843A to initiate Train A injection flow.

Time	Position	Applicant's Actions or Behavior
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification • Manually isolates the 3B MSIV • Places Main Feed pump HS to STOP • Reduces Feedwater control valve signal to 0 • Places FWIV MOV-3-1407, 1408 & 1409 HS to CLOSE • Places SI Cold Leg Injection valve 3-MOV-843A HS to OPEN • Places the Unit 4 HHSI pumps HS to STOP • Depresses SI reset PB • Resets Cont Isolation Phase A • If RCP's running, places 3-MOV-1417 and 1418 to OPEN • If RCP's running, places Normal Containment Coolers HS to START
	BOP	Directs SNPO to align PAHMS per 3-OP-094

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

Event Description: A Main Steam Line Leakupstream of the MSIV's begins and gradually degrades. The reactor trips and the crew responds using 3-EOP-E-0.

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[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.

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

Event Description: The crew completes the applicable steps of 3-EOP-E-0 and transitions to 3-EOP-E-2. The 3B MSIV fails to auto close during the steam line break, the crew manually closes the MSIV and isolates feed to the faulted S/G.

Time	Position	Applicant's Actions or Behavior
	SRO	Transitions to 3-EOP-E-2.
	SRO	Directs response using 3-EOP-E-2
		CAUTIONS • *At least one S/G must be maintained available for RCS cooldown.* • *Any faulted S/G or secondary break is required to be maintained isolated during subsequent recovery actions unless needed for RCS cooldown.*
		NOTE *RCS hot leg temperature should be stabilized using steam dumps when the faulted S/G has blown down to less than 10% S/G wide range indication.*
	RO	Manually closes 3-PV-2605 "B" S/G MSIV (if not already closed)
	RO	Verifies "B" S/G was faulted.
		CAUTION *If the AFW pumps are the only available source of feed flow, a steam supply to the AFW pumps must be maintained from at least one S/G.*
	RO	Isolates AFW to the 3B S/G and maintains greater than 345 gpm total AFW flow to the 3A and 3C S/Gs. (May already be complete in 3-EOP-E-0)
	RO	Directs SNPO/TO/FS to de-energize & close 3B SG AFW steam supply isolation MOV-3-1404.
		Crew Critical Task Isolate feed and steam for the faulted SG prior to transitioning from E-2.
	CREW	Verifies 3B S/G is isolated
	BOP	Directs chemistry to sample S/G, monitor DAM-1
	BOP	Directs HP to survey Main Steam Lines

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

Event Description: The crew completes the applicable steps of 3-EOP-E-0 and transitions to 3-EOP-E-2. The 3B MSIV fails to auto close during the steam line break, the crew manually closes the MSIV and isolates feed to the faulted S/G.

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 ≥ 1.3×10^5 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.

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

Event Description: Once the 3B S/G has been isolated, the crew will transition to 3-EOP-E-1 and subsequently to 3-EOP-ES 1.1 to terminate SI.

Time	Position	Applicant's Actions or Behavior
	SRO	Transitions to 3-EOP-E-1.
	SRO	Directs response using 3-EOP-E-1.
		NOTE *Foldout page is required to be monitored throughout this procedure.*
	CREW	Monitors 3-EOP-E-1 Foldout page (see page 23 for foldout)
	RO	Monitors for continued RCP operation (if RCP's are running).
	BOP	Checks "B" S/G isolated
	BOP	Controls AFW flow to maintain "A" & "C" S/G NR levels 15%-50%
	CREW	Directs Chemistry to take activity samples on all S/Gs & DAM1 monitor readings.
	CREW	Directs HP to take main steam line radiation readings.
		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	Check PRZ PORVs and Block Valves CLOSED
	RO	Verifies SI - RESET
	RO	Verifies Containment Isolation Phase A - RESET
	BOP	Verifies Instrument Air Containment Isolation, CV-3-2803 - OPEN AND Verifies instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG
	BOP	Checks power supply to all Charging Pumps - ALIGNED TO OFFSITE POWER

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 7 Page 2 of 5 Event Description: Once the 3B S/G has been isolated, the crew will transition to 3-EOP-E-1 and subsequently to 3-EOP-ES 1.1 to terminate SI.		
Time	Position	Applicant's Actions or Behavior
	RO	Performs Attachment 4 to establish charging. • Checks RCP thermal barrier alarms off. • Starts One Charging Pump • Places RCS Makeup Control Switch in STOP • Starts additional charging pumps if needed and offsite power available • Adjusts Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow • Verifies charging pump suction auto transfers to RWST if required.
	SRO	Checks if SI Should be Terminated • RCS subcooling based on core exit TCs -GREATER THAN 30°F • 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% • Pressure - GREATER THAN 1600 PSIG AND • Pressure - STABLE OR INCREASING • PRZ level - GREATER THAN 17%
	SRO	Transitions to 3-EOP-ES-1.1

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 6 Page 3 of 5

Event Description: The crew completes the applicable steps of 3-EOP-E-0 and transitions to 3-EOP-E-2. The 3B MSIV fails to auto close during the steam line break, the crew manually closes the MSIV and isolates feed to the faulted S/G.

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 ≥ 1.3×10^5 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.

Op-Test No.: 2009-301 Scenario No.: 1 Event No.: 7 Page 4 of 5 Event Description: Once the 3B S/G has been isolated, the crew will transition to 3-EOP-E-1 and subsequently to 3-EOP-ES 1.1 to terminate SI.		
Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-EOP-ES-1.1.
	CREW	Monitors 3-EOP-ES-1.1 Foldout page (see page 25 for foldout)
	RO	Verifies SI - RESET
	RO	Verifies Containment Isolation Phase A - RESET
	BOP	Verifies Instrument Air Containment Isolation, CV-3-2803 - OPEN AND Verifies instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG
	RO	Checks Charging Flow Established
	RO	Places both RHR pump HS to OFF Places both HHSI pump HS to OFF
		CREW CRITICAL TASK: Limit HHSI operating time at shutoff head on minimum flow recirculation to 55 minutes during a steamline break.
	RO	Verifies SI flow not required. RCS subcooling based on core exit TCs - GREATER THAN 30°F AND PRZ level - GREATER THAN 17%
		EXAMINER NOTE **The scenario is terminated when Safety Injection is terminated in 3-EOP-ES-1.1.**

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

Event Description: Once the 3B S/G has been isolated, the crew will transition to 3-EOP-E-1 and subsequently to 3-EOP-ES 1.1 to terminate SI.

3-EOP-ES-1.1 Foldout Page

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 ≥ 1.3×10^5 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 10^8 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 RE-INITIATION 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.

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:	762	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	680	RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	100
MWe:	762
Tavg:	574
RCS Pressure:	2250
RCS Boron Conc:	680

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:

none

Upcoming Major POD Activities:

Immediately after shift turnover perform the Quarterly IST of 3-OSP-206.2 section 7.3. TPCW HX ICW Isolation Valves POV-3-4882 & 4883 stroke time test. The shift manager has granted permission to perform the test. Operators to support the evolution have been briefed and are on station. Maintain 100% steady state power.

Upcoming ECOs to Hang and /or Release:

none

Evolutions or Compensatory Actions in Progress:

none

General Information, Remarks, and Operator Work Around Status:

Aux. steam supply aligned from unit 4.
Condenser inleakage 0 scfm.

TP-2009-301 Scenario #2 Event Description

Facility:	Turkey Point	Scenario No.:	2 NEW	Op Test No.:	2009-301
Examiners:		Candidates:		US	
				RO	
				BOP	

Initial Conditions: Mode 1 100% MOL.

Turnover: Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

Immediately after shift turnover perform the Quarterly IST of 3-OSP-206.2 section 7.3. TPCW HX ICW Isolation Valves POV-3-4882 & 4883 stroke time test. The shift manager has granted permission to perform the test. Operators to support the evolution have been briefed and are on station. Maintain 100%.

Online risk – green

B train protected both units

Event No.		Event Type	Event Description
1	TFKC882A= T	(N) BOP (N) SRO (TS) SRO	TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3 During the test, the valve will fail to close and will be declared inoperable.
2	TVHNL1B = 8.7 e-04 3 min ramp	(R) ALL	3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.
3	TFBVSHRA =T	(C) RO (C) SRO	When the power reduction has started, the 3A BATP shaft shears, the crew will initiate boration by starting the 3B BATP using 3-ONOP-46.4
4	TFS1MBWL =T	(I) BOP (TS, I) SRO	3A S/G pressure transmitter PT-3-475 fails low. The crew manually controls 3A S/G level manually to maintain plant operation using the ARP and 3-ONOP-49.1.
5	TVHHPBFB = 1 3 min ramp		3B RCP shaft seizes due to the onset of the seal failure. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a local reactor trip.
6	TFHP1CLK= 0.5 3 min ramp.	(M)ALL	Crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA develops through a gradually degrading code safety valve. The crew transitions to 3-EOP E-1 and trips RCP's.

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

Turkey Point 2009-301 Scenario #2

Event 1 – The crew will perform TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable.

Event 2 – 3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Event 3 - When the power reduction has started, the 3A BATP shaft shears, the crew will initiate boration by starting the 3B BATP using 3-ONOP-46.4

Event 4 – 3A S/G pressure transmitter PT-3-475 fails low. The crew manually controls 3A S/G level manually to maintain plant operation using the ARP and 3-ONOP-49.1.

Event 5 –The 3B RCP shaft seizes due to the onset of the seal failure. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration and manual turbine trip. **Critical Task**

Event 6 – The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps. **Critical Task**

Scenario XXV NRC 2 Simulator Operating Instructions

Setup

Restore IC-1 (100% power MOL)

- Open & execute lesson file SRO_XXV_NRC_2.lsn
- Place simulator in run

Trigger lesson step:

- SETUP – 3B Charging pump OOS. Removes 3B charging pump from service.

  (Actuates TAB1POSM = RACKOUT)

- SETUP – ATWS **(actuates TFL2XASE = T, TFL2XBSE = T TFL4AF=T)**
- Place clearance info tag on 3B Charging Pump start switch
- Provide an in progress procedure 3-OSP-206.2 step 7.3.9
- Provide shift turnover checklists
- Set ERDADS on VPA and at the RCO desk to the Utilities screens.
- Place a stopwatch on the Unit Supervisor desk.
- Perform Simulator Operator Checklist

Event 1 POV-3-4882 & 4883 Stroke Time Test

Initiated immediately after shift turnover.

The crew will perform TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable.

When the BOP has placed the HS for POV-3-4882 to close, **ensure lesson step EVENT 1 - POV-3-4882 FAIL TO CLOSE is inserted after 30 seconds.** (actuates TFKC882A with a 30 second delay.)

If directed, respond as SM, grant permission to perform this test.

If directed, respond as FS and report local valve position indication section of the test is not required.

If directed, respond as FS/TO and report POV-3-4882 is in mid position and has stopped moving. There is no apparent cause for the failure of the valve.

If directed, respond as SM and acknowledge the failure of POV-3-4882.

If directed, respond as WCC if requested to prepare a PWO/Clearance and notify maintenance.

Event 2 3B RCP #1 Seal Failure and Fast Load Reduction

The 3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1

When directed by the lead examiner, **trigger lesson step EVENT 2 - 3B RCP #1 seal failure.** (actuates TVHNL1B = 8.7 e-04 3 min ramp)

If directed, wait 3 to 5 minutes and respond as SNPO, "Seal Injection flow to all RCP's is 8 gpm."

The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the 3B RCP seal failure.

If directed, respond as System when called about load reduction.

If directed, respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast laod reduction.

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

If directed, respond as FS/TO to align aux steam using attachment 1. No response back required.

If directed, respond as SNPO. After 1-3 min **Trigger lesson step EVENT 2 - INCREASE NRHX FLOW TO 780 GPM** (actuates TAKA834 = 0.6). Report when complete.

Event 3 3A BATP Shaft Shear

When the power reduction has started, the 3A BATP shaft shears, the crew will initiate boration by starting the 3B BATP using 3-ONOP-46.4

When directed by the lead examiner, **trigger lesson step EVENT 3 – 3A BATP Shaft Shear.** **(actuates TFE3GA25=T)**

If directed, respond as WCC to prepare a PWO/Clearance.

If directed, respond as SNPO if directed to inspect 3A BATP. After 2-4 min., report 3A BATP coupling has failed and the motor is still running.

Event 4 PT-3-475 Fails Low

The 3A S/G pressure transmitter PT-3-475 fails low. The crew will take manual control of 3A S/G by controlling FCV-3-478 to maintain plant operation using 3-ONOP-49.1.

When directed by the lead examiner, **trigger lesson step EVENT 4 PT-3-475 Fails Low.** **(actuates TFS1MBWL =T)**

If directed, respond as WCC if requested to prepare a PWO/Clearance and notify I&C.

If directed, respond as I&C and acknowledge request to troubleshoot and repair PT-3-475.

If directed, respond as TO to inspect the main steam platform area around PT-3-475. Wait 5 minutes and report that you observe no apparent damage.

If directed, respond as FS/TO if directed to reset AMSAC. Wait 3 min, then **trigger EVENT 4,** Reset AMSAC (**actuates TCL4RST = T**). Report when complete.

Event 5 3B RCP Shaft Seizes

The 3B RCP shaft seizes due to the onset of the seal failure. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration and manual turbine trip.

When directed by the lead examiner, **trigger lesson step EVENT 5 - 3B RCP shaft seizes** **(actuates TVHHPBFB = 1 with a 3 min ramp.)**

If directed to locally trip the reactor, respond as TO/FS. When directed by the lead evaluator, **trigger lesson step EVENT 5 - LOCALLY OPEN RX TRIP BKRS** **(actuates TFL2XASE=F then TFL2XBSE=F 15 sec later)**. Report when complete.

Event 6 Pressurizer Safety Valve failure

The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-0 and ultimately 3-EOP-E-1. The reactor coolant pumps will be tripped when subcooling is lost.

When directed by the lead examiner, **trigger lesson step EVENT 6 – Pressurizer Safety Valve failure.** **(actuates TFHP1CLK=0.5 3 min ramp.)**

When directed respond as the FS/SNPO to place PAHMS in service, **trigger lesson step EVENT 6 - ALIGN PAHM FOR** SERVICE **(actuates TAC2V02A=1.0/30 sec delay, TAC2V02B=1.0/1 min delay, TAAAV21=1.0/ 2 min delay, TAAAV22=1.0/3.5 min delay & TACA005=0.0)**. Report completion 10-15 min later.

If directed, respond as Chemistry to sample S/G, monitor DAM-1

If directed, respond as HP to perform surveys.

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

Event Description: The crew will perform TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs 3-OSP-206.2 section 7.3 actions.
	BOP	Places 3A TPCW Hx Isolation Valve POV-3-4882 handswitch to CLOSE. Notes
After the BOP places POV-3-4882 HS to close, direct facility operator to trigger lesson step EVENT 1 - POV-3-4882 FAIL TO CLOSE is inserted after 30 seconds. (actuates TFKC882A with a 30 second delay.)		
		NOTE *The tested Intake Cooling Water Valves are operable if all test values are within the specified ranges.*
		Examiner Note: TPCW Hx Isolation Valve POV-3-4882 and 4883 will have a significant delay from the time of switch actuation until the time the valve begins to stroke.
	BOP	Notes POV-3-4882 does not fully close
	SRO	Declares A ICW INOPERABLE and enters LCO 3.7.3.b action c
		Examiner Note: 3.7.3 The Intake Cooling Water System (ICW) shall be OPERABLE with: b. Two ICW headers. c. With only one ICW header OPERABLE, restore two headers to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
When the SRO has addressed Tech Specs for ICW, direct facility operator to trigger lesson step EVENT 2 - 3B RCP #1 seal failure. (actuates TVHNL1B = 8.7 e-04 3 min ramp)		

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

Event Description: 3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior
		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.*
	RO	Notes increasing trend on FR-3-154A
	BOP	Verifies alarm A 1/5 and 6/5
	SRO	Directs response using 3-ONOP-041.1.
	CREW	Reviews 3-ONOP-041.1 foldout page actions (see page 3)
	RO	Checks For Proper Seal Injection Flow, may dispatch SNPO to a local seal injection verification.
	RO	Verifies seal leakoff is NOT within the limits of enclosure 1.
	SRO	Goes to step 16
		NOTE *An RCP STANDPIPE HI LEVEL alarm is indication of 0.5 gpm flow past the number two seal.*
	SRO	Determines 3B RCP Seal Leakoff flow is greater than 5.5
	RO	Checks RCP Seal Bypass Valve CV-3-307 - CLOSED
	SRO	Determines 3B RCP Seal Leakoff flow is less than 6 gpm.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 2 of 5		
Event Description: 3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.		
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.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 3 of 5 Event Description: 3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.		
Time	Position	Applicant's Actions or Behavior
	SRO	Transitions to 3-ONOP-100
	SRO	Conducts a crew brief to conduct a power reduction, to trip the reactor and trip 3B RCP.
	SRO	Directs response using 3-ONOP-100.
	SRO	Performs 3-ONOP-100 brief (see next page).
	CREW	Reviews 3-ONOP-100 foldout page actions (see page 6)
	SRO	Determines 9 gal/% boric acid addition is required.
	RO	Initiates boration: 1. Sets BA totalizer as directed (9 gal/% for 100% load decrease = 900 gal BA) 2. Takes FC-3-113A pot →8.0 or as directed 3. RMSS→BORATE 4. RMCS→START
	RO	Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate
	BOP	Reduces turbine load. • Maintains Tavg less than 5°F above Tref • Maintains rods greater than insertion limit.
		EXAMINER NOTE When the initial boration has been established, proceed to EVENT 4.

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

Event Description: 3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction _____

2. Target power level _____ % Power

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

3. Load reduction rate _____ Mw / minute

NOTES

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

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

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

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

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

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

8. Questions or crew input?

9. End of Brief

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 2 Page 5 of 5		
Event Description: 3B RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.		
Time	Position	Applicant's Actions or Behavior
3-ONOP-100 Foldout page		

1. 3-EOP-E-0 Transition Criteria

IF any of the following limits are reached, **THEN** trip the Reactor and Turbine **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:

a. RCS Tavg - GREATER THAN 578 °F

b. RCS Tavg - GREATER THAN Tref by 6 °F

c. Rod Insertion Limits are exceeded as indicated by:
- Rod Position Bank D Insertion Limit Recorder (VPA)
- Stepcounters on console
- Plant Curve Book Section 7, Figure 3

2. Notify Chemistry Department

WHEN reactor power has changed by greater than or equal to 15 percent, **THEN** notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.

3. Restore Blender to AUTO

WHEN boration is complete, **THEN** restore the Blender to AUTO as follows.

a. Place the Reactor Makeup Selector Switch to AUTO

b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired

c. Place the RCS Makeup Control Switch to START

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 3 Page 1 of 2 Event Description: When the power reduction has started, the 3A BATP shaft shears, the crew will initiate boration by starting the 3B BATP using 3-ONOP-46.4		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 4 – 3A BATP Shaft Shear. (actuates TFE3GA25=T)		
	RO	Observes alarm A 2/5 and no flow on FR-3-113
	RO	Places makeup control switch to STOP
	RO	May start 3B Boric Acid Transfer Pump and stop the 3A Boric Acid Transfer Pump.
	SRO	Transitions to 3-ONOP-46.4
	SRO	Directs response using 3-ONOP-46.4
	RO	Check boric acid or primary water makeup flow rates- ABNORMAL
	RO	Verify RCS makeup control switch is in MID position with makeup system stopped
		NOTES • *Steps 4 through 26 will need to be repeated as necessary to maintain an adequate suction source for the charging pumps and proper boron concentration until repairs are completed.* • *One percent VCT level indication is approximately 14.1 gallons.*
	RO	Check the reactor makeup selector switch in BORATE
	SRO	Determines additional boric acid should be added
	SRO	Determines Boric Acid flow rate was LESS THAN EXPECTED BEFORE THE MAKEUP SYSTEM WAS STOPPED
	RO	Calculate the amount of boric acid needed
	RO	Verifies FC-3-113A pot →8.0 or as directed
	RO	Sets BA totalizer as directed
	RO	Place the reactor makeup selector switch to BORATE
	RO	Turn the RCS makeup control switch to START

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

Event Description: When the power reduction has started, the 3A BATP shaft shears, the crew will initiate boration by starting the 3B BATP using 3-ONOP-46.4

Time	Position	Applicant's Actions or Behavior
	RO	Starts 3B Boric Acid Transfer Pump, if not already complete.
	RO	Stops 3A Boric Acid Transfer Pump, if not already complete.
		NOTE *Normal Differential Pressure across the Boric Acid Filters should be less than 10 PSID when boric acid flow has been established.*
	RO	Check Flow Rate On FR-3-113
		EXAMINER NOTE Boric Acid flow has been established, the crew proceeds with reducing power.
	RO	Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate
	BOP	Reduces turbine load. 1. Maintains Tavg less than 5°F above Tref 2. Maintains rods greater than insertion limit.
		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.*
	CREW	Notifies plant management and System of the impending unit shutdown.
	RO	Check pressurizer level following program
	CREW	Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3
	RO	Monitor RCP seal leakoff during the downpower.
		EXAMINER NOTE: When power has been sufficiently reduced, proceed to EVENT 4

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 4 Page 1 of 3

Event Description: 3A S/G pressure transmitter PT-3-475 fails low. The crew controls 3A S/G level manually to maintain plant operation using 3-ONOP-49.1.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 4 - PT-3-475 Fails Low. (actuates TFS1MBWL =T)		
	BOP	Observes alarms C-4/1, 5/1 & 6/1, C-9/3 & D-7/6
	SRO	Directs response using 3-ONOP-049.1, may direct suspension of the boration.
	SRO	Observes indicators PT-3-475 / FT-3-474 failing low and compares to adjacent loops and known plant parameters and conditions.
	SRO	Verifies no off-normal conditions exist on the adjacent channels.
	BOP	Manually controls FCV-3-478 and returns S/G level to program using 3-ARP-097.CR
	BOP	When 3A S/G level on program, selects FT-3-475 (channel 4 steam flow) for FCV-3-478 control & returns FCV-3-478 to AUTO.
	SRO	Refers to LCO 3.3.1, Table 3.3-1, Functional Unit 12 action 6 & LCO 3.3.2, Table 3.3-2 Functional Unit 1e/1f/ 4d action 15 (b/s trip in 6 hr)
	SRO	Makes determination to trip the following bistables within 6 hours. • BS-3-474 (rack 16) & BS-3-475 / 478B1 / 478B2 / 478C (rack 17)
		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.*
		EXAMINER NOTE When the SRO selects which bistables to trip, proceed to event 5.
		EXAMINER NOTE See next two pages for applicable Tech Specs.

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

Event Description: 3A S/G pressure transmitter PT-3-475 fails low. The crew controls 3A S/G level manually to maintain plant operation using 3-ONOP-49.1.

Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: 3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE. APPLICABILITY: As shown in Table 3.3-1. ACTION: As shown in Table 3.3-1.
		<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>12. Steam Generator Water Level--Low Coincident With Steam/ Feedwater Flow Mismatch</td><td>2 stm. gen. level and 2 stm./feed-water flow mismatch in each stm. gen</td><td>1 stm. gen. level coin-cident with 1 stm./feed-water flow mismatch in same stm. gen.</td><td>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.</td><td>1, 2</td><td>6</td></tr></table>
		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.
		EXAMINER NOTE: 3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-2 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-3. APPLICABILITY: As shown in Table 3.3-2. ACTION: As shown in Table 3.3-2.

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

Event Description: 3A S/G pressure transmitter PT-3-475 fails low. The crew controls 3A S/G level manually to maintain plant operation using 3-ONOP-49.1.

Time	Position	Applicant's Actions or Behavior

		FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
		1 Safety Injection (Feedwater Isolation)					
		e. High Differential Pressure Between the Steam Line Header and any Steam Line	3/steam line	2/steam line in any steam line	2/steam line	1 2, 3*	15
		f. Steam Line flow--High Coincident with:	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3*	15
		Steam Generator Pressure--Low	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2 3*	15
		or T_{avg}--Low	1/loop	1/loop in any two loops	1/loop in any two loops	1, 2. 3*	25
		4. Steam Line Isolation					
		4. Steam Line Isolation (Continued)					
		d. Steam Line Flow--High Coincident with: Steam Generator Pressure--Low	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3	15
			1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1. 2, 3	15
		or T_{avg}--Low	1/Loop	1/loop in any two loops	1/loop in any two loops	1. 2, 3	25
		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.					

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

Event Description: The 3B RCP shaft seizes due to the onset of the seal failure. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration and manual turbine trip.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 5 - 3B RCP shaft seizes (actuates TVHHPBFB = 1 with a 3 min ramp.)		
	RO/BOP	Observes alarms F 1/1, B 1/2 and C 2/5 (first out)
	RO	Observes increasing amps for 3B RCP and Low Coolant Flow Loop B RPS bistables tripped
	US	Directs manual reactor trip when the RCS Low Flow trip setpoint is exceeded.
		EXAMINER NOTE The 3B RCP amps peg high in approx. 1 min and the trip setpoint for RCS Loop Low Flow is exceeded in approx. 1.5 min.
	RO	Attempts to manually trip the reactor when the RCS Low Flow trip setpoint is exceeded.
	SRO	Enters 3-EOP-E-0 then directs transition to 3-EOP-FR-S.1.
	SRO	Directs response using 3-EOP-FR-S.1
		CAUTION *RCPs should not be tripped with reactor power GREATER THAN 5%.*
		NOTE *Steps 1 and 2 are IMMEDIATE ACTION steps.*
	RO	Verifies the reactor not tripped.
	RO	Ensures control rods drive in.
	BOP	Manually trips turbine & closes MSR steam supply MOVs
	BOP	Ensures all AFW pump turbines start.

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

Event Description: The 3B RCP shaft seizes due to the onset of the seal failure. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration and manual turbine trip.

Time	Position	Applicant's Actions or Behavior
	RO	Initiates Emergency Boration Of RCS 1. Verify charging pumps – AT LEAST ONE RUNNING IN MANUAL 2. Stops makeup system 3. Manually starts Boric Acid Pump 3B 4. Opens Emergency Boration Valve, MOV-3-350
	RO	Verifies HCV-3-121 & CV-3-310A open
	RO	Establish emergency boration flow by manually adjusting charging pump speed to: FI-3-110 – GREATER THAN 60 GPM FI-3-122A – GREATER THAN 45 GPM
		CREW CRITICAL TASK: Insert negative reactivity into the core by manually inserting RCCAs or establishing emergency boration flow to the RCS prior to completing step 4 of 3-EOP-FR-S.1.
	RO	Checks PRZ Pressure - LESS THAN 2335 PSIG
	RO	Verify Containment Instrument Air Bleed Isolation valves– CLOSED • CV-3-2819 • CV-3-2826
		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.*
	CREW	Directs the FS/TO locally trip the Reactor Trip Breakers & MG set input & output breakers

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

Event Description: The 3B RCP shaft seizes due to the onset of the seal failure. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration and manual turbine trip.

Time	Position	Applicant's Actions or Behavior
		Examiner note: When the crew directs AND when the emergency boration has been established, direct the facility operator to **trigger lesson step EVENT 5 - LOCALLY OPEN RX TRIP BKRS** (actuates TFL2XASE=F then TFL2XBSE=F 15 sec later).
	RO	May trip 3B RCP if Rx Power is less than 5% and the 3B RCP is still running.
	RO	Monitor Reactor Subcritical • Power range channels – LESS THAN 5% • Intermediate range channels – NEGATIVE STARTUP RATE
	SRO	Observes Caution prior to Step 17 and goes to Step 17
		CAUTION ***Boration should continue during subsequent actions until adequate shutdown margin is obtained.***

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 1 of 8

Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 6 - Pressurizer Safety Valve failure. (actuates TFHP1CLK=0.5 3 min ramp.)		
	SRO	Transitions to 3-EOP-E-0 step 1
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	Performs immediate actions of 3-EOP-E-0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing May manually actuate Safety Injection, checks SI if an auto actuation occurs.
	BOP	Performs immediate actions of 3-EOP-E-0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSR steam supply MOVs • Mid & East GCBs open Verifies power to emergency 4kV buses • Determines both 3A & 3B 4kV buses energized with 3D 4kV bus energized from 3B 4kV bus
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	CREW	Monitors 3-EOP-E-0 Foldout page (see page 18)

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

Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor istripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.

Time	Position	Applicant's Actions or Behavior
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification (See next page for detailed actions)
	RO	Trips the 3B RCP when the Reactor Trip is verified.
	RO	Trips RCP's on loss of subcooling when the HHSI flowpath is established.
		CREW CRITICAL TASK: Trip RCPs due to a loss of subcooling during a SBLOCA prior to completing step 12 of 3EOP-E-0.
	SRO	Directs RO in perfomance of 3-EOP-E-0 subsequent actions.
	RO	Checks all AFW Pumps RUNNING
	RO	Checks AFW valve alignment proper
	RO	Verifies total AFW flow greater than 345 gpm.
	RO	Checks RCP thermal barrier alarms off.
	RO	Limits total AFW flow to 345 gpm max S/G's.
	RO	Checks PRZ PORVs, Spray Valves and Excess Letdown Isolated
	CREW	Diagnoses the small break LOCA.
	SRO	Transitions to 3-EOP-E-1.
	BOP	Continues performance of 3-EOP-E-0 Attachment 3 Prompt Action Verification

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 4 of 8 Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.		
Time	Position	Applicant's Actions or Behavior
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification • Places Main Feed pump HS to STOP • Places FWIV MOV-3-1407, 1408 & 1409 HS to CLOSE • Places SI Cold Leg Injection valve 3-MOV-843A HS to OPEN • Places the Unit 4 HHSI pumps HS to STOP • Depresses SI reset PB • Resets Cont Isolation Phase A
	BOP	Directs SNPO to align PAHMS per 3-OP-094

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

Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.

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 $\geq$ 180°F

   OR

   Containment radiation levels $\geq 1.3 \times 10^5$ 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[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.

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 5 of 8

Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.

Time	Position	Applicant's Actions or Behavior
	SRO	Transitions to 3-EOP-E-1.
	SRO	Directs response using 3-EOP-E-1.
		NOTE *Foldout page is required to be monitored throughout this procedure.*
	CREW	Monitors 3-EOP-E-1 Foldout page (see page 22 for foldout)
	RO	Trips RCP's on loss of subcooling when the HHSI flowpath is established. (From foldout page, may already be complete in 3-EOP-E-0)
		CREW CRITICAL TASK: Trip RCPs due to a loss of subcooling during a SBLOCA prior to completing step 12 of 3-EOP-E-0.
	BOP	Checks no S/G are faulted
	BOP	Controls AFW flow to maintain S/G NR levels 15%-50%
	CREW	Directs Chemistry to take activity samples on all S/Gs & DAM-1 monitor readings.
	CREW	Directs HP to take main steam line radiation readings.
		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	Check PRZ PORVs and Block Valves CLOSED
	RO	Verifies SI - RESET
	RO	Verifies Containment Isolation Phase A - RESET
	BOP	Verifies Instrument Air Containment Isolation, CV-3-2803 – OPEN and instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG

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

Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.

Time	Position	Applicant's Actions or Behavior
	BOP	Checks power supply to all Charging Pumps - ALIGNED TO OFFSITE POWER
	RO	Ensures charging pumps running Performs Attachment 4 to establish charging if no charging pumps running. • Checks RCP thermal barrier alarms off. • Starts One Charging Pump • Places RCS Makeup Control Switch in STOP • Starts additional charging pumps if needed and offsite power available • Adjusts Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow • Verifies charging pump suction auto transfers to RWST
	RO	Verifies SI can not be terminated.
	RO	Verifies Containment Spray not running.
		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	Checks If RHR Pumps Should Be Stopped • Checks RCS pressure - GREATER THAN 250 PSIG • Checks RHR flow – LESS THAN 1000 gpm • Verifies SI - RESET • Places both RHR pump HS in OFF and STBY

Op-Test No.: 2009-301 Scenario No.: 2 Event No.: 6 Page 7 of 8		
Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE **The scenario is terminated when transition has been made to 3-EOP-E-1 and when the RHR pumps have been stopped.**

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

Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. A SBLOCA will develop through a gradually degrading code safety valve. Once the reactor is tripped, the crew will transition to 3-EOP-E-1 and trip the reactor coolant pumps.

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 ≥ 1.3×10^5 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.

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:	763	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	680	RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	100
MWe:	763
Tavg:	574
RCS Pressure:	2250
RCS Boron Conc:	680

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:

Immediately after shift turnover add 500 gallons of primary water to RWST at 100 gpm using 0-OP-46 starting at step 7.5.2.1. Operators to support the evolution have been briefed and are on station. RWST boron concentration is 2143 ppm. Maintain 100% power.

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.

TP-2009-301 Scenario #3 Event Description

Facility:	Turkey Point	Scenario No.:	3 NEW	Op Test No.:	2009-301
Examiners:		Candidates:			US
					RO
					BOP

Initial Conditions: Mode 1 100% power MOL.

Turnover: Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

Immediately after shift turnover add 500 gallons of primary water to RWST at 100 gpm using 0-OP-46 starting at step 7.5.2.1. The shift manager has granted permission to perform the evolution. Operators to support the evolution have been briefed and are on station. RWST boron concentration is 2143 ppm. Maintain 100% power.

Online risk – green

B train protected both units

Event No.		Event Type	Event Description
1	TAMHTMRT = 2650000.0 TABM365B= 1.0	(N) RO (N) SRO	Make up 500 gallons of water to RWST. (0-OP-046 section 7.5)
2	TFH1TU59= T	(I) RO/SRO (TS) SRO	LT-3-459 fails high which lowers 3C charging pump to minimum speed. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-459 from service.
3	TVHHSGB= 0.003 &	(C) RO/SRO (TS) SRO	A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3-ONOP-071.2. The RO increases letdown and starts an additional charging pump in response to the SGTL.
3a	TFSWV8BA =T	(C) BOP	Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The BOP will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.
4	N/A	R (ALL)	The crew will initiate a boration and reduce turbine load using 3-ONOP-71.2 in response to the SGTL.
5	TFS1MWEH =T	(I) BOP (TS,I) SRO	Controlling steam flow channel for 3B S/G, FT-3-474, fails high. The crew manually controls 3B S/G level manually to maintain plant operation using the ARP and 3-ONOP-49.1.
6	TFFW98C=T		3C FRV fails closed, reactor trips on low S/G level, crew enters 3-EOP-E-0
7	TVHHSGB= 5 TFKC882A = T	(M) ALL	When the reactor has tripped, the tube leak on 3B S/G will degrade into a tube rupture, the crew will stop feeding the 3B S/G and transition to 3-EOP-E-3. POV-4883, TPCW isolation, fails to close automatically, an operator will manually close POV-4883. Following the transition to 3-EOP-E-3, the crew isolates the 3B S/G and performs a cooldown of the RCS or transitions to 3-EOP-ECA-3.1

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

Turkey Point 2009-301 Scenario #3

Event 1 – The crew will initiate an addition of 500 gallons of water to the RWST using 0-OP-046 section 7.5.

Event 2 – LT-3-459 fails high which lowers 3C charging pump to minimum speed. The crew responds using the ARP and 3-ONOP-041.6 to remove LT-3-459 from service.

Event 3 – A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3-ONOP-071.2. The crew increases letdown and starts an additional charging pump in response to the SGTL.

Event 3a – Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The BOP will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.

Event 4 – The crew will initiate a boration and reduce turbine load using 3-ONOP-71.2 in response to the SGTL.

Event 5 – 3B S/G steam flow transmitter PT-3-475 fails low. The crew manually controls 3B S/G level manually to maintain plant operation using the ARP and 3-ONOP-49.1.

Event 6 – When control of the 3B S/G has been established the 3C feed regulating valve will close, the reactor will trip on low S/G level and the crew will transition to 3-EOP-E-0.

Event 7 – When the reactor has tripped, the tube leak on 3B S/G will degrade into a tube rupture, the crew will stop feeding the 3B S/G and transition to 3-EOP-E-3. **Critical Task**. POV-4883, TPCW isolation, fails to close automatically, an operator will manually close POV-4883. Following the transition to 3-EOP-E-3, the crew isolates the 3B S/G (**Critical Task)** and performs a cooldown of the RCS or transitions to 3-EOP-ECA-3.1.

Scenario XXV NRC 3 Simulator Operating Instructions

Setup

Restore IC-1 (100% power 1 MOL)

- Open & execute lesson file SRO_XXV_NRC_3.lsn
- Place simulator in run

Trigger lesson step:

- SETUP – 3B Charging pump OOS. Removes 3B charging pump from service.

  (Actuates TAB1POSM = RACKOUT)

- SETUP - Reduce RWST level. (actuates TAMHTMRT = 2650000)
- SETUP - ALIGN CVCS M/U TO RWST
- SETUP - FCV-3-6278B Auto Close Failure (actuates TFSWV8BC=T)
- SETUP – POV-3-4883 FAILS TO CLOSE(actuates TFKC882A = T)
- Place clearance info tag on 3B Charging Pump start switch
- Provide an in progress procedure 0-OP-046 step 7.5.2.1
- **Complete 0-OP-046 section 7.5.2 for a primary water addition up to step 7.5.2.1**
- Provide shift turnover checklists
- Set ERDADS on VPA and at the RCO desk to the Utilities screens.
- Perform Simulator Operator Checklist

Event 1 – M/U TO RWST

Initiated immediately after shift turnover.

The crew will initiate an addition of 500 gallons of water to the RWST using 0-OP-046 section 7.5.

If directed, respond as SNPO to close 3-365A & B. Wait 1-3 min then **trigger lesson step EVENT 1 - SECURE CVCS M/U TO RWST** (actuates TABM365B = 0.0). Report when complete.

If directed, respond as Chemistry regarding RWST sampling by stating that last RWST boron concentration = 2143 ppm.

If directed, respond as WCC to prepare a PWO/Clearance.

Event 2 – LT-3-459 FAILS HIGH

LT-3-459 fails high which lowers 3C charging pump to minimum speed. The crew responds using the ARP and 3-ONOP-041.6 to remove LT-3-459 from service.

When directed by the lead examiner, **trigger lesson step EVENT 2 LT-3-459 FAILS HIGH** (actuates TFH1TU59=T).

If directed, respond as the SM and/or WCC, acknowledge the failure of the LT-3-459.

Event 3 – 3B SG 3 GPM TUBE LEAK

A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3-ONOP-071.2. The crew increases letdown and starts additional charging pumps in response to the SGTL. Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The crew will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.

When directed by the lead examiner, **trigger lesson step EVENT 3 – 3B SG 3 GPM TUBE LEAK** (actuates TVHHSGB=0.003).

If directed, respond as HP to perform surveys.

If directed, respond as Chemistry to perform 0-NCAP-104, increase sampling frequency of S/G and to monitor DAM-1 and SPNG. After 10-15 min., confirm 3B S/G tube leak increase.

Ensure **lesson step EVENT 2 - FCV-3-6275 Manual Close executes** when the SGBD flow controller output has been reduced to 0.

Event 4 – Fast Load Reduction

The crew will initiate a boration and reduce turbine load using 3-ONOP-71.2 in response to the SGTL.

If directed, respond as System when called about load reduction.

If directed, respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast load reduction.

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

If directed, respond as SNPO. After 1-3 min **Trigger lesson step EVENT 4 - INCREASE NRHX FLOW TO 780 GPM** (actuates TAKA834 = 0.6). Report when complete.

When directed as FS/TO to locally downpower and close MOV-3-1404 wait 3 minutes and **trigger lesson step EVENT 4 - CLOSE/DEENERGIZE MOV-3-1404** **(actuates TCF5M527=F & after 2 min delay TFFXC04=T)**. Report when complete.

When directed, respond as FS/TO to align aux steam supply from U4. Wait 5 min and report when complete, no action required.

Event 5 – FT-3-474 Fails High

Controlling steam flow channel for 3A S/G, FT-3-474 fails high, the BOP will need to take manual control of 3A SG level control using FCV-3-478. FT-3-474 is removed from service per 3-ONOP-049.1. Once FT-3-475 is selected for steam flow input to 3A SG level control, FCV-3-478 can be returned to automatic.

When directed by the lead examiner, **trigger lesson step EVENT 5 FT-3-474 Fails High.** **(actuates TFS1MWEH =T)**

If directed, respond as WCC if requested to prepare a PWO/Clearance and notify I&C.

If directed, respond as I&C and acknowledge request to troubleshoot and repair PT-3-475.

Event 6 – FCV-498 Fails Closed

When control of the 3B S/G has been established the 3C feed regulating valve will close, the reactor will trip on low S/G level and the crew will transition to 3-EOP-E-0.

When directed by the lead examiner, **trigger lesson step EVENT 6 – FCV-498 FAIL CLOSE** **(actuates TFFVV98C)**

When directed, respond as the FS/SNPO to place PAHMS in service, **trigger lesson step EVENT 6 - ALIGN PAHM FOR** SERVICE **(actuates TAC2V02A=1.0/30 sec delay, TAC2V02B=1.0/1 min delay, TAAAV21=1.0/ 2 min delay, TAAAV22=1.0/3.5 min delay & TACA005=0.0)**. Report completion 10-15 min later.

If directed, respond as Chemistry to sample S/G, monitor DAM-1

If directed, respond as HP perform surveys.

Event 7 – Post trip 3B SGTR

Event 7 – When the reactor has tripped, the tube leak on 3B S/G will degrade into a tube rupture, the crew will stop feeding the 3B S/G and transition to 3-EOP-E-3. **Critical Task**. POV-4883, TPCW isolation, fails to close, an operator will manually close POV-4883. Following the transition to 3-EOP-E-3, the crew isolates the 3B S/G **(Critical Task)** and performs a cooldown of the RCS or transitions to 3-EOP-ECA-3.1.

When the reactor is tripped, **ensure trigger lesson step EVENT 7 – 3B SGTR** **(actuates TVHHSGB 5)**.

If directed, respond as FS/TO to locally downpower and close MOV-3-1404 wait 3 minutes and **trigger lesson step EVENT 4 - CLOSE/DEENERGIZE MOV-3-1404** (actuates TCF5M527=F & after 2 min delay TFFXC04=T). Report when complete.

If directed, respond as FS/TO. After 5 minutes report "Main Steam to Aux Steam Header Isolation Valve, 3-10-007 and Steam Traps 1 through 13 have been isolated." (No simulator action is required.)

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

Event Description: The crew will initiate an addition of 500 gallons of water to the RWST using 0-OP-046 section 7.5.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs action using 0-OP-046 section 7.5.
		CAUTION ***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.***
		NOTES • *The RWST makeup shares the same line as Safety Injection Pump recirculation. Operation of safety injection pumps with recircirculation flow aligned to the affected RWST will affect RWST makeup flow rates.* • *VCT level is 14.15 gallons per % level indication.* • *When the RWST boron concentration is greater than 2050 ppm, makeup may be accomplished by using primary water only. When this method is used, caution shall be exercised to ensure that the RWST is not diluted below a concentration of 1950 ppm.* • *If planning to make up only primary water to the RWST, then steps designated with an asterisk (*) can be marked N/A.* • *If Annunciator G 8/2, RWST Tech Spec Min Level, is received prior to makeup, approximately 4000 gallons of makeup will be required to clear the alarm.* • *The RWST Hi Level alarm setpoint is 332,000 gallons with a margin of error of 1675 gallons. If filling above 332,000 gallons, RWST Hi Level is an expected alarm.*
	RO	Record the unit number on the QA Record Page.
	RO	Determine the approximate boric acid and primary water flows AND volumes needed to obtain the desired blend concentration
		Examiner Note: From the initiating cue, "Immediately after shift turnover add 500 gallons of primary water to RWST at 100 gpm."
		CAUTION ***Tavg and reactor power are required to be monitored for changes during makeup to the RWST. [Commitment - Step 2.3.2]***

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 1 Page 1 of 3 Event Description: The crew will initiate an addition of 500 gallons of water to the RWST using 0-OP-046 section 7.5.		
Time	Position	Applicant's Actions or Behavior
	RO	Verifies the following valves closed: • Blender to Charging Pump Suction, FCV-3-113B • Blender to VCT, FCV-3-114B • Manual Emerg Boration Isol, 3-356
	RO	Place the following control switches to CLOSE • Blender to Charging Pump Suction, FCV-3-113B • Blender to VCT, FCV-3-114B
	RO	Verifies Emergency Boration Valve, MOV-3-350, is closed.
	RO	Places RCS Makeup Control Switch to STOP.
	RO	Directs SNPO to Unlock and open Blender Disch to RWST Stop Vlv, 3-365A and open Blender Disch to RWST, 3-365B.
	RO	Places Primary Water Flow Controller, FCV-3-114A, to MANUAL AND adjust the output on the demand meter to zero.
	RO	Set the Primary Water Totalizer to 500 gallons by performing the following:
	RO	a. Press LIMIT 1. b. Press CLR. c. Enter desired amount using numeric keypad. d. Press ENT. e. Press COUNT A. f. Press LIMIT 1 and verify desired amount was properly entered. g. Press COUNT A.

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

Event Description: The crew will initiate an addition of 500 gallons of water to the RWST using 0-OP-046 section 7.5.

Time	Position	Applicant's Actions or Behavior
		Examiner Note: From the initiating cue, "Immediately after shift turnover add 500 gallons of primary water to RWST at 100 gpm"
		NOTES • *The Boric Acid addition will stop automatically when the Boric Acid Totalizer reaches the pre-set value.* • *The Primary Water flow will continue and the Primary Water Totalizer will count as long as FCV-*-114A is open.*
	RO	Turn the RCS Makeup Control Switch to START.
	RO	Verify Red START light is energized.
	RO	Place the control switch for Primary Water to Blender, FCV-3-114A, to OPEN.
	RO	Adjust Primary Water Flow Controller, FCV-3-114A, to 100 gpm.
	RO	Verify proper flow to the RWST by observing an increase in RWST level AND a decrease in BAST and PWST levels as applicable.
	RO	IF primary water addition is complete before boric acid addition is complete, THEN close Primary Water to Blender Valve, FCV-3-114A.
	CREW	Directs SNPO to close and lock Blender Disch to RWST Stop Valve, 3-365A and Close Blender Disch to RWST Valve 3-365B.
		EXAMINER NOTE: When the direction to close and lock Blender Disch to RWST Stop Valve, 3-365A and Close Blender Disch to RWST Valve 3-365B has been given, proceed to EVENT 2

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

Event Description: LT-3-459 fails high which lowers 3C charging pump to minimum speed. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-459 from service.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 2 LT-3-459 FAILS HIGH (actuates TFH1TU59=T).		
	RO	Observes alarms A-8/3, 9/3 and G 1/1
	SRO	Directs response using 3-ONOP-041.6, Pressurizer Level Control Malfunction and 3-ONOP-49.1 to remove LT-3-459 from service.
		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	Observes indicator LI-3-459 failing high and compares to LI-3-460 AND LI-3-461
	RO	Places CHANNEL SELECT PRESSURIZER LEVEL CONTROL switch to position 3
	RO	May place MASTER CHARGING PUMP CONTROLLER, LC-3-459G in MANUAL
	RO	Places CHANNEL SELECT PRESSURIZER LEVEL RECORDER to position 2 or 3.
	RO	Maintains pressurizer level to be consistent with programmed level as required.
	SRO	Directs response using 3-ONOP-049.1.
	SRO	Refers to LCO 3.3.1, Table 3.3-1, Functional Unit 9 action 13

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

Event Description: LT-3-459 fails high which lowers 3C charging pump to minimum speed. The crew responds using the ARP, 3-ONOP-041.6 and 3-ONOP-49.1 to remove LT-3-459 from service.

Time	Position	Applicant's Actions or Behavior
		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.***
	SRO	Makes determination to trip the following bistables within 6 hours. • BS-3-459A-1 & BS-459A-2
		EXAMINER NOTE When the SRO selects which bistables to trip, proceed to event 3.
		EXAMINER NOTE 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

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

Event Description: A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3-ONOP-071.2. The crew increases letdown and starts additional charging pumps in response to the SGTL. Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The crew will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT2 3B SG 3 GPM TUBE LEAK" (actuates TVHHSGB=0.003).		
	RO BOP	Observes increase in 3B SG tube leak rate • Annunciator H-1/4 (PRMS HI radiation) • R-3-15 SJAE effluent PRMS rising/alarming • R-3-19 SGBD PRMS rising/alarming (eventually) • SJAE SPING RAD-3-6417 rising/alarming (see ERDADS)
	RO BOP	Observes increase in 3B SG tube leak rate • Annunciator H-1/4 (PRMS hi radiation) • Slight increase in charging flow to maintain PZR level • Charging/letdown flow mismatch increases to 3 gpm (see ERDADS)
	SRO	Directs response using 3-ONOP-71.2.
		NOTE *Foldout Page shall be monitored throughout this procedure.*
	CREW	Reviews 3-ONOP-71.2 foldout page actions (See page 11)

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

Event Description: A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3 ONOP-071.2. The crew increases letdown and starts additional charging pumps in response to the SGTL. Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The crew will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.

Time	Position	Applicant's Actions or Behavior
	BOP	Checks R-15 High Alarm and R-19 High Alarm light - ON
		NOTE *A PRMS source check on a channel with a HIGH Alarm may be inconclusive since the effect of the source may not cause a noticeable change in the readout.*
	BOP	1. Checks R-3-15 and R-19 alarms valid a. Checks readout on alarming R-3-15 and R19 ≥ ALARM SETPOINT b. Checks channel operability: 1) Depresses and holds FAIL/TEST pushbutton on alarming R-3-15 and R-3-19. 2) Checks readout = 288K **OR** 289K 3) Releases FAIL/TEST pushbutton c. Observes CAUTION prior to Step 6 **AND** go to Step 6
	BOP	When R-3-19 is observed to be increasing or has a valid alarm, closes FCV-3-6278B based on foldout page direction.
		EXAMINER NOTE: The trend on 3-R-19 begins increasing approximately 10 minutes after the SGTL commences.
		CAUTIONS • *Maximum allowed specific activity of secondary coolant is less than or equal to 0.10 μCi/gm Dose Equivalent I-131. (Reference T.S. 3.7.1.4.)* • *Use of the Steam Dump to Atmospheric valves should be limited to minimize uncontrolled release of radionuclides to the environment. If S/G Steam Dumps to Atmosphere must be used, use only the unaffected S/G dump valves if possible.*
	RO	Observes PZR level – STABLE and can be maintained that way since charging can keep up with 2 gpm tube leak

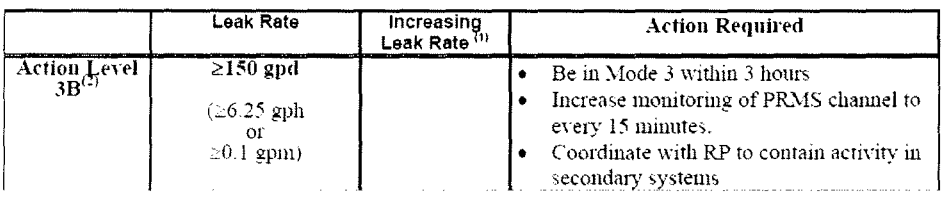
Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3 Page 3 of 6

Event Description: A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3 ONOP-071.2. The crew increases letdown and starts additional charging pumps in response to the SGTL. Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The crew will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.

Time	Position	Applicant's Actions or Behavior
	BOP	When R-3-19 is observed to have a valid alarm, closes FCV-3-6278B.
	SRO	Directs Shift Engineer Approximate Tube Leakage Using • 3-OSP-041.1, RCS LEAK RATE CALCULATION • Unit 3 SJAE SPING Primary to SecondaryLeak Rate Graph in the Plant Curve Book (Section 5, Figure 14) AND record on Attachment 5 • Unit 3 R-15 Primary to Secondary Leak Rate Graph in the Plant Curve Book (Section 5, Figure 15) AND record on Attachment 5
		NOTES • *Additional Chemistry personnel may be needed for sampling and analysis.* • *SJAE SPING and R-15 are the quickest indications of increasing leak due to radioactive gases being carried over in the steam to the condenser. Air in-leakage greater than 5.5 SCFM will dilute this indication.* • *DAM-1 and R-19 are slower and may take several hours to stabilize for accurate indication due to the process delay times.*
	CREW	Identifies leaking S/G: a. Monitors the following for S/G tube leak indications: • Unexplained increase in any S/G level • High radiation detected on a S/G sample, main steam line, AFW steam supply line (if running) or S/G Blowdown line • Unexplained difference between steam and feed flow • Increasing radiation levels indicated on R-15, R-19, SPING, AND DAM-1

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

Event Description: A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3 ONOP-071.2. The crew increases letdown and starts additional charging pumps in response to the SGTL. Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The crew will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.

Time	Position	Applicant's Actions or Behavior
	CREW	Continues performing actions of 3-ONOP-071.2 as directed by US: b. Directs Radiation Protection to perform the following: • Monitor radiation levels on Main Steam Lines, AFW steam supply line (if running) & S/G Blowdown lines • Monitor airborne activity at Steam Jet Air Ejectors c. Directs Nuclear Chemistry to perform thefollowing: • Perform 0-NCAP-104, PRIMARY TO SECONDARY LEAK RATE CALCULATION • Increase S/G sampling frequency as determined by Nuclear Chemistry • Monitor DAM-1 and SJAE SPING readings
		NOTES • *Sampling of Condenser water for activity is required prior to dumping/rejecting water.* • *The following step is to provide guidance for continued unit operation when Primary-to-Secondary leakage has been CONFIRMED. These actions are to ensure that an identified leak is isolated prior to S/G tube failure.* • *Any tube leakage rate-of-change determination should be performed over at least a 30-minute period to eliminate the possibility of inappropriate actions being taken in the case of instrument spikes.*
	SRO	Determines a shutdown is required due to the SGTL being greater than 150 gpd
		

	Leak Rate	Increasing Leak Rate [1]	Action Required
Action Level 3B[2]	≥150 gpd (≥6.25 gph or ≥0.1 gpm)		• Be in Mode 3 within 3 hours • Increase monitoring of PRMS channel to every 15 minutes. • Coordinate with RP to contain activity in secondary systems

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 3 Page 5 of 6 Event Description: A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3-ONOP-071.2. The crew increases letdown and starts addtional charging pumps in response to the SGTL. Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The crew will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: 3.4.6.2 Reactor Coolant System operational leakage shall be limited to: c. 150 gallons per day primary-to-secondary leakage through any one steam generator (SG), APPLICABILITY: MODES 1, 2, 3 and 4. ACTION: a. With any PRESSURE BOUNDARY LEAKAGE, or with primary-to-secondary leakage not within limit, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
	SRO	Performs the following prior to commencing load reduction: • Notifies System Dispatcher about load reduction • Briefs Control Room personnel using Foldout Page • Uses page boost to notify plant personnel of load reduction
	CREW	Notify the Shift Manager to Review the Following Procedures AND Make Any Required Notifications • 0-EPIP-20101, Duties of Emergency Coordinator • 0-ADM-115, Notification of Plant Events • Verify NRC Resident notified of Fast Load Reduction and S/G Tube Leakage

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

Event Description: A 3 gpm tube leak develops on the 3B S/G, the crew transitions to 3-ONOP-071.2. The crew increases letdown and starts additional charging pumps in response to the SGTL. Blowdown control valve FCV-3-6278B will fail to close automatically when R-19 alarms. The crew will manually close FCV-3-6278B to isolate the 3B S/G from Blowdown.

1. **3-EOP-E-0 TRANSITION CRITERIA**

a) **IF** any of the following limits are reached, **THEN** trip the Reactor and Turbine **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.
   1) RCS Tavg GREATER THAN 578 Deg
   2) RCS Tavg GREATER THAN Tref by 6 degrees F
   3) The REQUIRED shutdown rate violates Rod Insertion Limits

b) **IF** any of the following limits are reached, **THEN** trip the Reactor and Turbine, initiate Safety Injection and Phase A, **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.
   1) RCS Leakage greater than Charging Pump capacity **AND** letdown isolated
   2) PZR Level can NOT be maintained within 10% of program

2. **STANDARD BRIEFING**

a) Specify shutdown rate.

Time for S/D from 100%	30 min	1 hr.	1.5 hrs.	2 hrs.
Approx. Load Ramp Rate	30 MW/min	15 MW/min	10 MW/min	7 MW/min

b) Target Power Level – If the unit is not to be taken off-line.
c) Current S/G Tube Leakage and affected S/G
d) Cover any actions required after the unit is off-line. (Example – Feed flow to the affected and unaffected S/Gs)
e) Method of Reactivity Control – Control Rods, Boration, or Both.

3. **PLANT ANNOUNCEMENT**

Notify plant personnel via the plant page of any potential hazardous effluent release **AND** to stand clear of the SJAE and Blowdown piping. Notify non-essential personnel to stay clear of the Power Block.

4. **BLOWDOWN RELEASE PATH ISOLATION**

IF PRMS R-19 Count Rate is increasing **OR** High Alarm is present, **THEN** verify the following:
a) Steam Generator Blowdown Flow Control Valves are Closed
   - FCV-3-6278A
   - FCV-3-6278B
   - FCV-3-6278C
b) Blowdown Tank to Canal Level Control Valve, LCV-3-6265B is closed
c) **WHEN** R-19 High Alarm is present, **THEN** verify NO FLOW on S/G Sample Flow Indicators at the Cold Chem Lab (Ensures Sample Valves SV-3-2800, SV-3-2801, SV-3-2802 are closed.)

5. **AFW STEAM SUPPLY RELEASE PATH ISOLATION**

WHEN the affected Steam Generator is identified, **THEN** perform the following:
a) Verify Steam Supply aligned to both trains of AFW from the Intact Steam Generators
b) Verify closed **AND** de-energize the affected Steam Generator AFW Steam Supply MOV using Attachment 2.

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

Event Description: The crew will initiate a boration and reduce turbine load using 3-ONOP-71.2 in response to the SGTL.

Time	Position	Applicant's Actions or Behavior
		CAUTIONS • *For a shutdown at the maximum rate, boration should be initiated PROMPTLY to avoid exceeding rod insertion limits.* • *Shutdown rates greater than 5% full power per minute (~35 Mwe/Min) may place the unit in an uncontrolled condition and should be avoided.* • *Control Rod motion may cause axial flux difference to deviate outside of the Target Band without necessitating corrective actions until the load reduction is terminated.*
	RO	Initiates boration per 3-ONOP-071.2: a. Establishes desired boration rate using normal boration flowpath 1) Places Reactor Makeup Selector Switch to BORATE 2) Places RCS Makeup Control Switch to START 3) Sets FC-3-113A potentiometer to 8.0 or as directed b. Sets Boric Acid Totalizer to Sets Boric Acid Totalizer to 850 gal
	SRO	Determines approximately 850 gal of boric acid required to shutdown for present conditions.
	RO	Starts an additional Charging Pump. Places an additional letdown orifice in service Directs SNPO to increase CCW flow to the NRHX
	BOP RO	Reduces plant load at a rate determined by SM as follows: a. Reduce turbine load while verifying Auto Rod Insertion (Tavg should not exceed Tref by more than 5°F) b. Monitors Control Rod Position (RO) > RIL (Ann. B-8/1 & 2)
		EXAMINER NOTE: When power has been reduced a sufficient amount, proceed to EVENT 4.

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

Event Description: Controlling steam flow channel for 3A S/G, FT-3-474 fails high, the BOP will need to take manual control of 3A SG level control using FCV-3-478. FT-3-474 is removed from service per 3-ONOP-049.1. Once FT-3-475 is selected for steam flow input to 3A SG level control, FCV-3-478 can be returned to automatic.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT4 FT-3-474 Fails High." (actuates TFS1MWEH =T)		
	BOP	Observes alarms C-4/1, 5/1 & 6/1, & D-7/1
	SRO	Directs response using 3-ONOP-049.1.
	SRO	Observes indicator FT-3-474 failing high and compares to adjacent loops and known plant parameters and conditions.
	SRO	Verifies no off-normal conditions exist on the adjacent channels.
	BOP	Manually controls FCV-3-478 and returns S/G level to program using 3-ARP-097.CR
	BOP	When 3A S/G level on program, selects FT-3-475 (channel 4 steam flow) for FCV-3-478 control & returns FCV-3-478 to AUTO.
	SRO	Refers to LCO 3.3.1, Table 3.3-1, Functional Unit 12 action 6 & LCO 3.3.2, Table 3.3-2 Functional Unit 1f/ 4d action 15 (b/s trip in 6 hr)
	SRO	Makes determination to trip the following bistables within 6 hours. • BS-3-474 (rack 16) & BS-478B1 / 478B2 / 478C (rack 17)
		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.*
		EXAMINER NOTE When the SRO selects which bistables to trip, proceed to next event.
		EXAMINER NOTE See next two pages for applicable Tech Specs.

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

Event Description: Controlling steam flow channel for 3A S/G, FT-3-474 fails high, the BOP will need to take manual control of 3A SG level control using FCV-3-478. FT-3-474 is removed from service per 3-ONOP-049.1. Once FT-3-475 is selected for steam flow input to 3A SG level control, FCV-3-478 can be returned to automatic.

Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: 3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE. APPLICABILITY: As shown in Table 3.3-1. ACTION: As shown in Table 3.3-1.

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
12. Steam Generator Water Level--Low Coincident With Steam/Feedwater Flow Mismatch	2 stm. gen. level and 2 stm./feed-water flow mismatch in each stm. gen	1 stm. gen. level coin-cident with 1 stm./feed-water flow mismatch in same stm. gen.	1 stm. gen. level and 2 stm./feed-water flow mismatch in same stm. gen. or 2 stm. gen. level and 1 stm./feedwater flow mismatch in same stm. gen.	1, 2	6

		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.
		EXAMINER NOTE: 3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-2 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-3. APPLICABILITY: As shown in Table 3.3-2. ACTION: As shown in Table 3.3-2.

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

Event Description: Controlling steam flow channel for 3A S/G, FT-3-474 fails high, the BOP will need to take manual control of 3A SG level control using FCV-3-478. FT-3-474 is removed from service per 3-ONOP-049.1. Once FT-3-475 is selected for steam flow input to 3A SG level control, FCV-3-478 can be returned to automatic.

Time	Position	Applicant's Actions or Behavior

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1 Safety Injection (Feedwater Isolation)					
e. High Differential Pressure Between the Steam Line Header and any Steam Line	3/steam line	2/steam line in any steam line	2/steam line	1 2, 3*	15
f Steam Line flow--High Coincident with:	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3*	15
Steam Generator Pressure--Low	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3*	15
or T_{avg}--Low	1/loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3*	25
4. Steam Line Isolation					
4. Steam Line Isolation (Continued)					
d Steam Line Flow--High Coincident with: Steam Generator Pressure--Low	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3	15
	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3	15
or T_{avg}--Low	1/Loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3	25

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.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 6 Page 1 of 1 Event Description: When control of the 3B S/G has been established the 3C feed regulating valve will close, the reactor will trip on low S/G level and the crew will transition to 3EOP-E-0.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson stepEVENT 6 – FCV-498 FAIL CLOSE (actuates TFFVV98C)		
	CREW	Recognizes the loss of feed to the 3C S/G
	BOP	Recognizes and reports dropping 3C SG levels and feedwater flows • Annunciators C-5/3 (SG steam > feed flow) • Annunciators 6/3 (SG level deviations) • Decreasing level in 3C SG
	SRO	Directs a manual trip of the reactor
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	Performs immediate actions of 3-EOP-E-0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing Determines SI not actuated
	BOP	Performs immediate actions of 3-EOP-E-0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSR steam supply MOVs • Mid & East GCBs open Verifies power to emergency 4kV buses • Determines both 3A & 3B 4kV buses energized with 3D 4kV bus energized from 3B 4kV bus

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 1 of 10

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3-EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.

Time	Position	Applicant's Actions or Behavior
		Examiner note: When Immediate Operator Actions are complete, proceed to EVENT7
Direct facility operator to trigger lesson stepEVENT 7 – 3B SGTR (actuates TVHHSGB 0.5 with a 3 min ramp).		
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	CREW	Monitors 3-EOP-E-0 Foldout page (see page 25)
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification (See next page for detailed actions)
	SRO	Directs RO in performance of 3-EOP-E-0 subsequent actions.
	RO	Checks all AFW Pumps RUNNING
	RO	Checks AFW valve alignment proper
	RO	Verifies total AFW flow greater than 345 gpm.
	RO	Checks RCP thermal barrier alarms off.
	RO	Limit total AFW to 345 gpm, stop feeding the "B" S/G
		CREW CRITICAL TASK: Isolate feedwater flow into the 3B S/G prior to completing step 8 of 3-EOP-E-3
	RO	Checks PRZ PORVs, Spray Valves and Excess Letdown Isolated
	RO	May trip RCPs if subcooling is less than 25 deg with HHSI flow.
	CREW	Diagnoses the SGTR on the 3B S/G

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 2 of 10

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.

Time	Position	Applicant's Actions or Behavior
	SRO	Transitions to 3-EOP-E-3
	BOP	Continues performance of 3-EOP-E-0 Attachment 3 Prompt Action Verification
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification • Manually isolates the 3B MSIV • Places Main Feed pump HS to STOP • Places FWIV MOV-3-1407, 1408 & 1409 HS to CLOSE • Closes POV-3-4883 • Places the Unit 4 HHSI pumps HS to STOP • Depresses SI reset PB • Resets Cont Isolation Phase A • Closes CV-3-6275B
	BOP	Directs SNPO to align PAHMS per 3-OP-094

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 3 of 10

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-EOP-E-3.
		NOTES • *FOLDOUT Page shall be monitored for the remainder of this procedure.* • *Personnel will be necessary for sampling during this procedure.*
	CREW	Monitors 3-EOP-E-3 Foldout page (see page 26)
	RO	Trips RCP's on loss of subcooling when the HHSI flowpath is established. (May already be complete in 3-EOP-E-0)
	CREW	Directs Radiation Protection to perform radiation readings on main steam lines AND blowdown lines Direct Chemistry to sample the steamlines for activity
	SRO	Determines the 3B S/G is ruptured due to an unexpected increase in narrow range level
		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.*
	BOP	Adjusts 3B SG steam dump to atmosphere setpoint to 1060 psig.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 4 of 10

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.

Time	Position	Applicant's Actions or Behavior
	RO	Verifies SI and AMSAC reset.
	SRO	Determines AFWSS train 1 from 3C SG & train 2 from 3A SG
	BOP	Closes MOV-3-1404 and directs FS/TO to open breaker 30833
	RO	Verifies CV-3-6275B closed
		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.*
	SRO	Verifies MOV-3-1427/1426/1425 already closed
		CREW CRITICAL TASK Isolate steam flow out of a ruptured the 3B S/G prior to completing step 7 of 3-EOP-E-3
		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.: 7 Page 5 of 10

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3-EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3.

Time	Position	Applicant's Actions or Behavior
	SRO	Verifies 3B SG level > 6% and all feed to 3B SG isolated
		CREW CRITICAL TASK: Isolate feedwater flow into the 3B S/G prior to completing step 8 of 3-EOP-E-3
	SRO	Verifies the 3B S/G is ISOLATED FROM INTACT S/Gs
	SRO	Verifies 3B SG pressure > 500 psig
		EXAMINER NOTE: If the 3B S/G decreases to less than 500 psig go to page23 for 3-EOP-ECA-3.1 entry
		NOTE *If RCPs are not running, the following steps may cause a false Integrity Status Tree indication for the ruptured loop. Disregard the ruptured loop T-cold indication until after performing Step 34.*
	SRO	Determines required CET temperature for cooldown based on 3B SG pressure.
		LOWEST RUPTURED S/G PRESSURE (PSIG) / REQUIRED CORE EXIT TEMPERATURE (°F) Greater than or equal to 1100 — 513°F [466°F] 1000 to 1099 — 501°F [447°F] 900 to 999 — 488°F [426°F] 800 to 899 — 474°F [400°F] 700 to 799 — 458°F [385°F] 600 to 699 — 441°F [369°F] 500 to 599 — 420°F [350°F]
	BOP	Fully opens 3A & 3C steam dumps to atmosphere.

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 6 of 10

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.

Time	Position	Applicant's Actions or Behavior
	BOP	Controls AFW flow to intact SGs to maintain NR level 15-50%
		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	Verifies PORV's closed.
		CAUTION *If offsite power is lost after SI is reset, manual action may be required to restart safeguards equipment using 3-EOP-E-0, Attachment 3.*
	RO	Verifies SI & phase A reset
	BOP	Verifies CV-3-2803 open & IA pressure > 95 psig
		CAUTION *RCS pressure is required to be monitored. If RCS pressure decreases in an uncontrolled manner to less than 250 psig[650 psig], the RHR pumps must be manually restarted to supply water to the RCS.*
	RO	Verifies RCS pressure > 250 psig & stops RHR pumps
	RO	Starts a charging pump, stops RCS makeup, takes running charging pump speed to maximum & adjusts HCV-3-121 for proper seal inj. flow.
	RO	Verifies charging pump suction auto transfers to RWST
	RO	Informs US when CET temperature < value from step 11a table
	SRO	Verifies RCS CET subcooling > 50°F
	BOP	Closes 3B & 3C SG steam dump to atmosphere when CET temperature < value from previous page table

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 6 of 10		
Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE **The scenario is terminated when the crew completes the RCS cooldown of 3-EOP-E-3**

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 7 of 10 Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: Entered if the 3B S/G decreases to less than 500 psig during event6
	SRO	Transitions to 3-EOP-ECA-3.1.
		EXAMINER NOTE **The scenario is terminated when the crew transitions to 3-EOP-ECA-3.1**

Op-Test No.: 2009-301 Scenario No.: 3 Event No.: 7 Page 8 of 9

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS.

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[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.

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

Event Description: When the crew has addressed the Immediate Operator Actions, the tube leak on 3B S/G will gradually degrade into a tube rupture, the crew will transition to 3EOP-E-3 and stop feeding the 3B S/G. The 3B MSIV fails closed and 3B S/G Atmospheric Dump to Atmosphere valve opens. Crew isolates the 3B S/G using 3-EOP-E-3 and performs a cooldown of the RCS..

3-EOP-E-3 Foldout Page

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 **AND** the TSC has determined that containment integrated dose rate has not exceeded 10^6 Rads, **THEN** normal setpoints can be used.

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 not initiated
   b. **IF** phase B actuated, **THEN** trip all RCPs.

3. **SI REINITIATION CRITERIA**
   IF SI has been terminated **AND** either condition listed below occurs, **THEN** manually start SI pumps as necessary to restore RCS subcooling and PRZ level **AND** go to 3-EOP-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:
   * RCS subcooling based on core exit TCs - LESS THAN 30°F[210°F]
     OR
   * PRZ level – CAN **NOT** BE MAINTAINED 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. **MULTIPLE TUBE RUPTURE CRITERIA**
   IF any intact S/G level increases in an uncontrolled manner **OR** any intact S/G has abnormal radiation, **THEN** stabilize the plant **AND** return 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. **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.

8. **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.

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:	344	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	839	RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	50
MWe:	344
Tavg:	558
RCS Pressure:	2250
RCS Boron Conc:	839

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:	
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:

Immediately after shift turnover perform RHR pump 3A monthly operability test, 3-OSP-050.2, starting at step 7.1.23. Operators to support the evolution have been briefed and are on station. Maintain 50% steady state power.

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.

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 50% power MOL.

Turnover: Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

Immediately after shift turnover perform RHR pump 3A monthly operability test, 3-OSP-050.2, starting at step 7.1.23. The shift manager has granted permission to perform the test. Operators to support the evolution have been briefed and are on station. Maintain 50% power.

Online risk – green

B train protected both units

Event No.		Event Type	Event Description
1	TAM1D3AS =3	(N) RO/SRO (TS)SRO	The crew will perform RHR pump 3A monthly operability test, 3-OSP-050.2. During the test, the pump will be declared inoperable and taken out of service due to high pump vibrations induced by bearing failure.
2	TFKCSMB= T	(C) BOP (C,TS) SRO	3B ICW Pump shaft shears, crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.
3	TVFCLK1 = 0.3 5 min ramp	(R) ALL	Degrading condenser vacuum due to a condenser shell leak. The crew responds using 3-ONOP-014 and reduces unit load to stabilize condenser vacuum.
4	TFS1MAML = T	(I) RO (TS,I)SRO	Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond using 3-ONOP-028 and then 3-ONOP-049.1 to address the failed channel.
5	TFGFRPT=T	(C) BOP (C)SRO	Main Generator Regulator PT failure, crew verifies DC Regulator control and places Main Generator Voltage Regulator to test using the ARP.
6	TFP8SWYD = T TFQ5GAFS = T TFQ5B20A = TTFG1B86S = T	(M)ALL	Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie. The crew will isolate seal injection to the RCP's prior to starting a charging pump.
7			The crew will transition following power restoration to 3-EOP-ECA-0.1 and will isolate seal injection to the RCP's prior to starting a charging pump or to ECA-0.2 and manually start one Unit 3 HHSI pump.

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

Turkey Point 2009-301 Scenario #4

Event 1 – The crew will perform RHR pump 3A monthly operability test, 3-OSP-050.2. During the test, the pump will be declared inoperable and taken out of service due to high pump vibrations induced by bearing failure.

Event 2 – The 3B ICW Pump shaft shears, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.

Event 3 – A condenser shell leak will cause degrading condenser vacuum, the crew directs response using 3-ONOP-014 to stabilize condenser vacuum. The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the degrading condenser vacuum.

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

Event 5 – The Main Generator voltage regulator will experience a PT failure, the crew verifies DC regulator control and places Main Generator voltage regulator to test using the ARP.

Event 6 – A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie. **Critical Task.** The crew will isolate seal injection to the RCP's prior to starting a charging pump. **Critical Task**

EVENT 7 - The crew will transition following power restoration to 3-EOP-ECA-0.1 and will isolate seal injection to the RCP's prior to starting a charging pump **Critical Task** or to 3-EOP ECA-0.2 and manually start one Unit 3 HHSI pump. **Critical Task**

Scenario XXV NRC 4 Simulator Operating Instructions

Setup

Restore IC-2 (50% power MOL)

- Open & execute lesson file SRO_XXV_NRC_4.lsn
- Place simulator in run

Trigger lesson step:

- SETUP – 3B Charging pump OOS. Removes 3B charging pump from service.

  (Actuates TAB1POSM = RACKOUT)

- SETUP –3A EDG Fails To Start (actuates TAQ5GAFS=T)
- SETUP –3B EDG Output Breaker Fails To Close (actuates TFQ5B20A=T)
- SETUP – OPEN 3-741A (actuates TAMR1V29 = 1.0)
- Place clearance info tag on 3B Charging Pump start switch
- Provide an in progress procedure 3-OSP-050.2. step 7.1.22
- Provide shift turnover checklists
- Set ERDADS on VPA and at the RCO desk to the Utilities screens.
- Perform Simulator Operator Checklist

Event 1 – 3A RHR Surveillance

Initiated immediately after shift turnover.

The crew will perform RHR pump 3A monthly operability test, 3-OSP-050.2. During the test, the pump will be declared inoperable and taken out of service due to high pump vibrations induced by bearing failure.

Following turnover call the CR as FS, request the crew perform step 7.1.23 of 3-OSP-050.2.

1 minute after start, call the CR as FS to report 3A RHR pump very noisy and vibrating badly.

Steps 7.1.33 & 34 are not applicable.

If directed, perform steps 7.1.35 through 7.1.37. **Trigger lesson step EVENT 1 - CLOSE 3-741A** (actuates TAMR1V29 =0.0 on 1 min ramp).

Step 7.1.38 is not applicable. Steps 7.1.39 through 7.1.43 are performed in the field, but no simulator action is required.

If directed, respond as FS to report to the crew that the 3A RHRP test is complete and unsatisfactory (steps 7.1.44 & 46).

Steps 7.1.45 & 47 are not applicable.

If directed, acknowledge as SM regarding 3A RHRP unsatisfactory surveillance results.

If directed as OCC to remove 3A RHRP from service, rack out breaker, **trigger lesson step EVENT 1 - RACK OUT 3A RHRP BKR** (actuates TAM1D3AS = 3).

If the breaker is not racked out, to prevent further 3A RHRP use, **trigger lesson step EVENT 1 - 3A RHRP SHAFT SHEAR** (actuates TFMUM01S = T).

If directed, respond as WCC regarding troubleshooting & repair of 3A RHRP.

Event 2 – 3B ICW Pump Shaft Shears

The 3B ICW Pump shaft shears, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.

When directed by the lead examiner, **trigger lesson step EVENT 2 - 3B ICWP SHAFT SHEAR** (actuates TFKCSMB = T).

If directed, wait three minutes and respond as the FS/ANPO to:

- perform pre-start checks for 3A ICWP. Report back that pump is ready to start.
- locally inspect the 3B ICWP. Report back that coupling between motor & pump shaft has failed.
- perform post-start checks for 3A ICWP. Report back that pump is operating normally.

- locally investigate breaker 3AB17. Report back that the breaker is open, but otherwise normal.

- walk down the ICW system to look for leaks. After 4-6 min, report no ICW system leaks are visible.

If directed, wait three minutes and respond as the TO to report TPCW HXs ICW flow. Click on SCHEMA → COMMON SERVICES → INTAKE COOLING → report TPCW HX ICW total flow as indicated on ICW system mimic (or use default value of 5800 gpm).

If directed, respond as SNPO if directed to report CCW HXs ICW flow. From ICW system mimic, report indicated CCW HX ICW total flow (or use default value of 13600 gpm).

If directed, respond as TO if directed to check TPCW supply temperature (TI-3-1432) < 105°F. From ICW system mimic, touch TPCW ♦ & report system temp TE-1472/TI-1432 at top left of TPCW mimic (approx 99°F and stable).

If directed, respond as WCC to prepare a PWO/Clearance.

If directed, respond as FS/ANPO to rack out 3B ICWP breaker 3AB17. After 8-12 min, **trigger** lesson step **EVENT 2 - RACK OUT 3B ICWP BKR** (actuates TAK2B17P = 3).

Event 3 – Condenser Shell Leak

A condenser shell leak will cause degrading condenser vacuum, the crew directs response using 3-ONOP-014 to stabilize condenser vacuum. The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the degrading condenser vacuum.

When directed by the lead examiner, **trigger lesson step EVENT 3 – LOSS OF CONDENSER VACUUM** (actuates TVFCLK1 = 0.3 5 min ramp)

ATTENTION: monitor Main Condenser vacuum, adjust the severity of TVFCLK1 to maintain a vacuum > 24.5 in hg.

If directed, respond as FS/TO, acknowledge direction to place the steam jet air ejector (SJAE) hogging jet in service. Wait one minute **then Trigger lesson step, EVENT 3 – PLACE SJAE IN SERVICE**. (actuates TAFB072 and TAFB010). Inform control room hogging jet in service after 3 minutes.

If directed, respond as FS/TO, acknowledge direction to the close hogging jet drain, 3-30-045. No simulator action is required, report complete after 3 minutes.

If directed, respond as FS/TO, acknowledge direction to verify CV-3-2210 for proper operation.

Standby air ejectors are in service

If directed, respond as System when called about load reduction.

If directed, respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast laod reduction.

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

If directed, respond as FS/TO to align aux steam using attachment 1. No response back required.

When directed by the lead evaluator following a 3 to 5% load reduction, **trigger lesson step, EVENT 3 – RESTORE VACUUM.** (deletes TVFCLK1)

Event 4 – PT-3-447 Slowly Fails Low

Following the load reduction, PT-3-447 slowly fails low resulting in continuous control rod insertion. The crew will respond using 3-ONOP-028 and place rod control to MANUAL to stop the control rod insertion and 3-ONOP-049.1 to address the failed instrument.

When directed by the lead examiner, **trigger lesson step EVENT 4 – PT-3-447 FAIL LOW** (actuates TVS1SALO -1.0 1 min ramp)

If directed, respond as FS/TO. Bypass AMSAC power 2 input & reset trouble alarm after 2-4 min., **trigger lesson step EVENT 1- AMSAC – BYPASS POWER 2 INPUT & RESET ALARM** (actuates TCL4P2BA(B)=T, TCL4RST=T). Report completion when Annunciator D-7/6 clears.

If directed, respond as WCC if requested to prepare a PWO/Clearance and notify I&C.

If directed, respond as I&C and acknowledge request to troubleshoot and repair PT-3-447

Event 5 – Generator PT Failure

The Main Generator voltage regulator will experience a PT failure, the crew verifies DC regulator control and places Main Generator voltage regulator to test using the ARP.

When directed by the lead examiner, **trigger lesson step EVENT 5 - Generator PT Failure** (actuates TFGFRPT=T)

Event 6 – LOOP Loss of All AC

Event 6 – A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B.

The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.
Critical Task

When directed by the lead examiner, **trigger lesson step EVENT 6 LOSS OF ALL AC** (actuates TFP8SWYD = T, TFQ5GAFS = T, TFQ5B20A = T, TFG1B86S = T, TCE2E01T=-1, TCE2E07T=T, & TCE6DR5C=F)

If directed, respond as FS/SNPO, acknowledge direction to locally open 3-MOV-843A&B. After 3 minutes **TRIGGER lesson step EVENT 6 - LOCALLY OPEN 3-MOV-843 A and B** (actuates TFMVV01O & TFMVV02O=T)

If directed, respond as FS/ANPO, acknowledge direction to locally reset 3A EDG lockout relay. After 2 minutes **TRIGGER lesson step EVENT 6 - ATTEMPT LOCAL RESET OF 3A EDG** (actuates TCQ586AR). Report back lockout will not reset.

If directed, respond as FS/ANPO, acknowledge direction to locally synchronize 3B emergency diesel generator to 3B 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE. After 10 minutes, notify CR using 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. **TRIGGER lesson step EVENT 6 – 3B EDG LOCAL OPERATION** (actuates TAQ5LRSB LOCAL, TCQ5XS3B=F & TCQ5XS1B=F) After 3 minutes inform CR 3A EDG output breaker will not close.

If directed, respond as FS/ANPO to take 3A EDG MCSS to OFF & rack out 3AA20, **trigger lesson step EVENT 6 – 3A EDG MCSS OFF & RO 3AA20** (actuates TAQ5LRSA=0 & TAQ5A20P=3). Report when complete.

If directed, respond as FS/ANPO after 1 to 2 minutes report the 3"B" EDG is running but the output breaker 3AB20 is open. There are no visible problems with the breaker and no visible problems with the 3"B" 4 kv bus.

If directed, respond as WCC, after 10 minutes report Electrical Maintenance has performed a visual inspection of output breaker 3AB20 and can find no visible problem

If directed to rack out 3AB20, respond as FS/ANPO after 1 to 2 minutes, **trigger lesson step EVENT 6 - RACK OUT 3 "B" EDG OUTPUT BREAKER 3AB20,** (actuates TAQ5B20P RACKOUT) report when complete

If directed, respond as FS/TO, acknowledge direction to reduce DC bus loading as necessary using ATTACHMENT 3.

3-ONOP-04.2

If directed, respond as the unit 4 RO "Unit 4 has also lost offsite power." "Both Unit 4 EDG's are supplying power to their respective 4kv busses." "The 4B EDG is supplying power to the 4D 4kV bus."

If directed, respond as the unit 4 RO, acknowledge request to place all non running safeguards equipment on 4B 4KV bus in off or pull to lock, **trigger lesson step EVENT 6 – U4 SAFEGUARDS EQUIP TO STOP OR PTL,** report all non running safeguards equipment is in stop or pull to lock when complete.

If directed, respond as the unit 4 RO, acknowledge direction to close 4AD07 breaker. After 15 sec **trigger lesson step EVENT 6 – CLOSE 4AD07**. Report 4AD07 breaker closed.

If directed, respond as the FS/TO, acknowledge direction to locally verify no breaker targets exist on 3B 4KV bus breakers. After 4 minutes report no targets exist on 3B 4KV bus breakers.

Event 7 – 3-EOP-ECA-0.1 or ECA 0.2 Response

The crew will transition is to 3-EOP-ECA-0.1 or ECA 0.2 following power restoration depending on the extent of the cooldown of the RCS. The crew will isolate seal injection to the RCP's prior to starting a charging pump. **Critical Task**

If directed, respond as FS/SNPO to place PAHMS in service, **trigger lesson step EVENT 7 - ALIGN PAHM FOR** SERVICE (actuates TAC2V02A=1.0/30 sec delay, TAC2V02B=1.0/1 min delay, TAAAV21=1.0/ 2 min delay, TAAAV22=1.0/3.5 min delay & TACA005=0.0). Report completion 10-15 min later.

If directed, respond SNPO, **trigger lesson step EVENT 7 Locally Isolate RCP Seals** (actuates TAHN97A, B & C=0) Report when complete.

If directed, respond SNPO, **trigger lesson step EVENT 7 Locally Isolate MOV-3-626 and 381 Seals** (actuates TCK1938M=T & TFBVC60=T)

If directed, respond as Chemistry to sample S/G, monitor DAM-1

If directed, respond as HP perform surveys.

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

Event Description: The crew will perform RHR pump 3A monthly operability test, 3OSP-050.2. During the test, the pump will be declared inoperable and taken out of service due to high pump vibrations induced by bearing failure.

Time	Position	Applicant's Actions or Behavior
		NOTES • *Steps marked with an * are only required to be performed for the quarterly pump IST. These steps should be marked N/A if performing only the monthly DP test.* • *Steps 7.1.1 through 7.1.6 may be performed in any order.*
	SRO	Directs evolution using 3-ONOP-014.
	RO	Starts 3A RHR pump and records start time.
		EXAMINER NOTE: One minute after the pump start, the CR receives a call informing 3A RHR pump is vibrating excessively. This requires skipping steps 7.1.24 thru 7.1.31.1
		CAUTION ***RHR Pump 3A should be observed for any abnormal condition requiring shutdown.***
	SRO	Directs RO to stop the 3A RHR pump
	RO	Stops the 3A RHR pump (May place the pump control switch in pull-to-lock position).
	RO	Directs SNPO to close and lock the RHR Recirc Line Isolation, 3-741A.
	SRO	Declares 3A RHRP inoperable and notifies SM.
	CREW	Directs FS/WCC to take actions to rackout 3A RHR pump breaker.
	SRO	Implements LCO 3.5.2.c Action g.

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 1 Page 2 of 2 Event Description: The crew will perform RHR pump 3A monthly operability test, 3OSP-050.2. During the test, the pump will be declared inoperable and taken out of servicedue to high pump vibrations induced by bearing failure.		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: LCO 3.5.2 The following Emergency Core Cooling System (ECCS) equipment and flow paths shall be OPERABLE: c. Two OPERABLE RHR pumps with discharge aligned to the RCS cold legs Action g With an ECCS subsystem inoperable due to an RHR pump being inoperable, restore the inoperable RHR pump to OPERABLE status within 7 days or be in as least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
		EXAMINER NOTE: Proceed to EVENT 2

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 1 of 3 Event Description: The 3B ICW Pump shaft shears, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT2 3B ICWP SHAFT SHEAR (actuates TFKCSMB = T).		
	BOP	Observes reduced 3B ICWP amps & annunciator I-4/4
	BOP	Refers to ARP for annunciator I-4/4
	SRO	Directs response using 3-ONOP-019. May direct response from the ARP.
		Examiner Note: If 3-ONOP-19 is NOT entered, observe 3A ICW pump is started and go to page 4 for TS LCO enty.
	CREW	Reviews 3-ONOP-19 foldout page actions (See page 5)
		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)*
	RO	Observes all ICWP alarms off (ann. I-4/1, 4/2 & 4/3)
	RO	Observes traveling screens clean (ann. I-3/3 OFF & $\Delta p < 7.5"H_20$)
	BOP	Verifies Intake Cooling Water Pumps – AT LEAST ONE RUNNING
	BOP	Manually starts 3A ICW Pump, stops the 3B ICW pump.
		NOTE *An operable intake cooling water header consists of an intact header being supplied by at least one intake cooling water pump.*

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

Event Description: The 3B ICW Pump shaft shears, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.

Time	Position	Applicant's Actions or Behavior
	BOP	Observes alarm I 4/4, ICW HEADER A/B LO PRESS - OFF
	BOP	Observes ICW pressure >10 psig & < 35 psig on PI-3-1619 & PI-3-1620
		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.***
	RO	Verifies SI terminated
	BOP	Verifies POV-3-4882 & 4883 both open
		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.***
	BOP	Observes I-5/4 (TPCW hi temp/lo press) OFF
	BOP	Directs TO to check TPCW supply temperature TI-3-1432 stable or decreasing
		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.***
	BOP	Verifies CCW supply temp < 120°F and stable/decreasing with ann. H-8/5 OFF.
	BOP	Repeats check for normal TPCW conditions
	BOP	Repeats check for normal CCW conditions
	CREW	Notifies WCC to initiate PWO & repair
	SRO	Implements LCO 3.7.3.a actions a & b (72 hr until 3B ICW pump bkr racked out then 14 day with 3A & 3C ICWP on independent power supplies)

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 2 Page 3 of 3 Event Description: The 3B ICW Pump shaft shears, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.		
		EXAMINER NOTE: LCO 3.7.3 a The Intake Cooling Water System (ICW) shall be OPERABLE with Three ICW pumps Action b With only one ICW pump OPERABLE or with two ICW pumps OPERABLE but not from independent power supplies, restore two pumps from independent power supplies to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Then to: Action a With only two ICW pumps with independent power supplies OPERABLE, restore the inoperable ICW pump to OPERABLE status within 14 days or be in HOT STANDBY within thenext 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable. (Once the 3B ICW pump breaker is racked out.)
		EXAMINER NOTE: Proceed to EVENT 3

1. **TRIP CRITERIA**

   - Component Cooling Water temperature as read on TI-3-607A and TI-3-607B cannot be maintained less than 120°F.
   - Turbine or Generator bearing temperatures cannot be maintained less than 180°F.

2. **MINIMUM FLOW REQUIREMENTS FOR CCW HXs**

   While isolating a CCW/ICW strainer, ICW flow less than minimum required through the CCW HXs can be tolerated without entry into Technical Specification Action 3.0.3, provided flow is restored to the minimum allowable, as determined by 3-NOP-019, Intake Cooling Water System, in less than 5 minutes by reopening the strainer isolation valves. If flow is below the minimum allowable value for greater than 5 minutes, then entry into Technical Specification Action 3.0.3 is started at the point where flow first fell below the minimum value. [Reference 3.1.4]

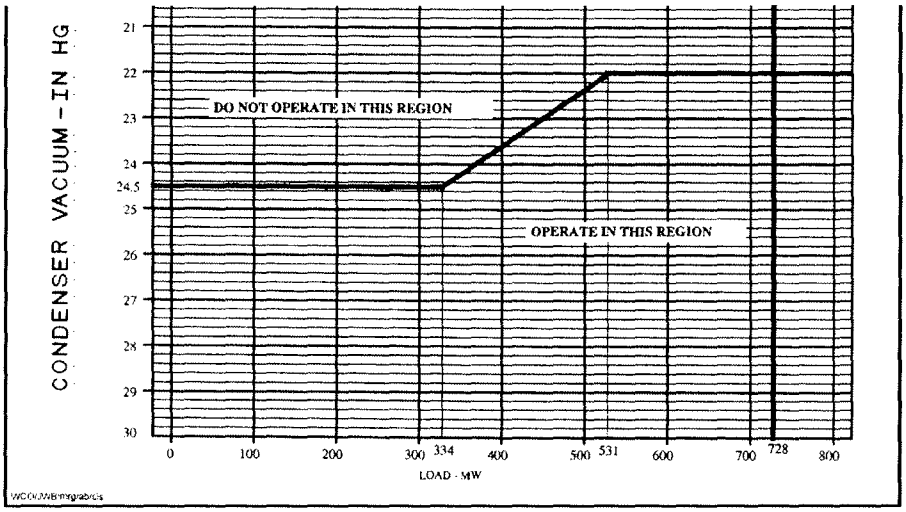
Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 3 Page 1 of 5

Event Description: A condenser shell leak will cause degrading condenser vacuum, the crew directs response using 3-ONOP-014 to stabilize condenser vacuum. The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the degrading condenser vacuum.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT3 LOSS OF CONDENSER VACUUM **(actuates TVFCLK1 = 0.3 5 min ramp)**		
		NOTE *Diverse indications of condenser vacuum should be used to validate the loss of vacuum including ERDADS back pressure.*
	BOP	Observes condenser vacuum lowering by diverse indications: • Main condenser vacuum lowering • Main Generator load decreasing • Main condenser air in-leakage increasing
	SRO	Directs response using 3-ONOP-014.
		CAUTION ***Hot water may be emitted from the silencer causing the potential for personnel injury.***
	CREW	Directs FS/TO to place the SJAE hogging jet in service
		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*
	CREW	Directs FS/TO to Close Hogging Jet Drain, 3-30-045.
	CREW	Directs FS/TO to place the standby set in service using Attachment 1

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 3 Page 2 of 5

Event Description: A condenser shell leak will cause degrading condenser vacuum, the crew directs response using 3-ONOP-014 to stabilize condenser vacuum. The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the degrading condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	SRO	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.
		ENCLOSURE 1 (Page 1 of 1) CONDENSER VACUUM LIMITATIONS
		
	SRO	Transitions to 3-ONOP-100
	SRO	Directs response using 3-ONOP-100.
	SRO	Performs 3-ONOP-100 brief. (See page 9)
	CREW	Reviews 3-ONOP-100 foldout page actions (See page 10)
	SRO	Determines 9 gal/% boric acid addition is required.

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

Event Description: A condenser shell leak will cause degrading condenser vacuum, the crew directs response using 3-ONOP-014 to stabilize condenser vacuum. The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the degrading condenser vacuum.

Time	Position	Applicant's Actions or Behavior
	RO	Initiates boration: 1. Sets BA totalizer as directed (9 gal/% for 50% load decrease = 450 gal BA) 2. Takes FC-3-113A pot →8.0 or as directed 3. RMSS→BORATE 4. RMCS→START
	RO	Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate
	BOP	Reduces turbine load. • Maintains Tavg less than 5°F above Tref • Maintains rods greater than insertion limit.
		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.*
	CREW	Notifies plant management and System of the impending unit shutdown.
	RO	Check pressurizer level following program
	CREW	Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3
		EXAMINER NOTE: When power has been sufficiently reduced, proceed to EVENT 4

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

Event Description: A condenser shell leak will cause degrading condenser vacuum, the crew directs response using 3-ONOP-014 to stabilize condenser vacuum. The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the degrading condenser vacuum.

ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction _____

2. Target power level _____ % Power

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

3. Load reduction rate _____ Mw / minute

NOTES

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

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

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

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

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

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

8. Questions or crew input?

9. End of Brief

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 3 Page 5 of 5
Event Description: A condenser shell leak will cause degrading condenser vacuum, the crew directs response using 3-ONOP-014 to stabilize condenser vacuum. The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the degrading condenser vacuum.
3-ONOP-100 Foldout page

1. 3-EOP-E-0 Transition Criteria

IF any of the following limits are reached, **THEN** trip the Reactor and Turbine **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:

a. RCS Tavg - GREATER THAN 578 °F

b. RCS Tavg - GREATER THAN Tref by 6 °F

c. Rod Insertion Limits are exceeded as indicated by:
- Rod Position Bank D Insertion Limit Recorder (VPA)
- Stepcounters on console
- Plant Curve Book Section 7, Figure 3

2. Notify Chemistry Department

WHEN reactor power has changed by greater than or equal to 15 percent, **THEN** notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.

3. Restore Blender to AUTO

WHEN boration is complete, **THEN** restore the Blender to AUTO as follows.

a. Place the Reactor Makeup Selector Switch to AUTO

b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired

c. Place the RCS Makeup Control Switch to START

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

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

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT4 PT-3-447 FAIL LOW (actuates TVS1SALO-1.0 1 min ramp)		
	BOP	Observes alarms C-8/3 & D-7/6
	SRO	Directs response using 3-ONOP-28 and then 3-ONOP-049.1, may direct suspension of the boration.
	SRO	Observes indicators PT-3-447 failing low and compares to adjacent loops and known plant parameters and conditions.
	SRO	Verifies no off-normal conditions exist on the adjacent channels.
	RO	Places rod control to MANUAL.
	RO	Withdraws rods to restore Tavg to Tref
	BOP	Selects PT-3-446 for control.
		NOTE *A few minutes needs to elapse between the time First Stage Pressure is transferred and Rod Control is returned to Automatic. This will preclude the possibility of the power mismatch circuitry causing undesired rod motion.*
	RO	Places rod control to AUTO
	SRO	Refers to LCO 3.3.1, Table 3.3-1, Functional Unit 17B action 7 & LCO 3.3.2, Table 3.3-2 Functional Unit 1f/ 4d action 15 (b/s trip in 6 hr)
	SRO	Makes determination to trip the following bistables within 6 hours. • BS-3-475 (rack 24) & BS-3-447 1/2 BS-3-485/495 (rack 25)
	CREW	Directs FS/TO bypass AMSAC PT-3-447 (power 2) input.
	BOP	Places steam dump to condenser control to RESET & then to AUTO
	CREW	Directs WCC to initiate PWO/troubleshooting/repair

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

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

Time	Position	Applicant's Actions or Behavior
		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.*
		EXAMINER NOTE When the SRO selects which bistables to trip, proceed to Event 5.
		EXAMINER NOTE See next two pages for applicable Tech Specs.

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

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

Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: 3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE. APPLICABILITY: As shown in Table 3.3-1. ACTION: As shown in Table 3.3-1.

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
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

		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.
		EXAMINER NOTE: 3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-2 shall be OPERABLE with their Trip Setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-3. APPLICABILITY: As shown in Table 3.3-2. ACTION: As shown in Table 3.3-2.

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

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

Time	Position	Applicant's Actions or Behavior

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1 Safety Injection (Feedwater Isolation)					
f. Steam Line flow--High Coincident with:	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3*	15
Steam Generator Pressure--Low	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3*	15
or T_{avg}--Low	1/loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3*	25
4. Steam Line Isolation					
4. Steam Line Isolation (Continued)					
d. Steam Line Flow--High Coincident with: Steam Generator Pressure--Low	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3	15
	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3	15
or T_{avg}--Low	1/Loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3	25

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.

EXAMINER NOTE:

Proceed to EVENT 5

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Event Description: The Main Generator voltage regulator will experience a PT failure, the crew verifies DC regulator control and places Main Generator voltage regulator to test using the ARP.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT5 Generator PT Failure (actuates TFGFRPT=T)		
	BOP	Observes alarms E-7/6, 8/5 & 9/3
	SRO	Directs response using the ARP
	BOP	Verify generator voltage regulator transfers to manual.
	BOP	Place the voltage regulator selector switch in the test position.
	BOP	Adjust voltage manually using the DC regulator. (As required)
	CREW	Notify Electrical Dept.
	CREW	Notify the System Dispatcher within 30 minutes of changing generator MVAR loading or changing the status of generator voltage controls and the duration of the instability and then log the notification in the Unit Narrative Log.
		EXAMINER NOTE: Proceed to EVENT 6

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT6 LOSS OF ALL AC (actuates TFP8SWYD = T, TFQ5GAFS = T, TFQ5B20A = T, TFG1B86S = T, TCE2E01T=T, TCE2E07T=T)		
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	Performs immediate actions of 3-EOP-E-0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing
	BOP	Performs immediate actions of 3-EOP-E-0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSIV's • Mid & East GCBs open Verifies NO power to emergency 4kV buses
	SRO	Transitions to 3-EOP-ECA-0.0

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 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	Performs immediate actions of 3-EOP-ECA-0.0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing
	BOP	Performs immediate actions of 3-EOP-ECA-0.0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSIV's • Mid & East GCBs open
	RO	Checks PRZ PORVs – CLOSED
	RO	Closes Letdown isolation valves
	RO	Checks Excess letdown isolation valves – CLOSED
	BOP	Checks all AFW Pumps RUNNING
	BOP	Verifies total AFW flow greater than 345 gpm.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

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	Verify 4KV bus stripping using ATTACHMENTS 1 and 2
	RO	Verify SI - RESET
		EXAMINER NOTE: The SRO will probably choose to implement Attachment 2 for expediency since the 3D 4kv bus is aligned to the 3B 4kv bus. Either attachment is acceptable. See the following two pages for ATTACHMENTS 1 and 2
	SRO	Checks the A and B 4KV buses de-energized and goes to step 6.
	RO	Verifies The A And B 4KV Bus Lockout Relays – RESET
	RO	Directs FS/ANPO to locally reset 3A emergency diesel start failure relay by depressing the alarm reset pushbutton. The relay WILL NOT reset.
	RO	Verifies 3B Emergency Diesel Generator Lockout Relays- RESET
		EXAMINER NOTE: Go to page 21

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

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.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

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.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
	SRO	Verifies 3B 4KV bus stripping from ATTACHMENT 2 - COMPLETED
	RO	Verifies SI - RESET
	RO	Attempts to manually synchronize 3B emergency diesel generator to 3B 4KV bus. Directs FS/ANPO to locally synchronize the 3B EDG. The 3B bus WILL NOT be energized by the 3B EDG.
	SRO	Checks the 3A and 3B 4KV buses de-energized.
	SRO	Directs BOP to restore AC power using 3-ONOP-004.3, LOSS OF 3B 4KV BUS.
	SRO	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.
		EXAMINER NOTE: SRO directs the BOP to recover power to the 3B 4kv bus from the Unit 4B EDG through the 4D 4kv bus and the SBO tie. See page 26 for details. The SRO will continue to progress through 3-EOP-ECA 0.0 while the BOP is restoring power through the SBO tie. The SRO will go to step 32 when 4kv power is restored. The crew may take the following actions depending on the length of time required to restore power to the 4kv bus
		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	Places non running Unit 3 ESF equipment in stop or PTL
	RO	Emergency containment filter fans – STOP AND OPEN Breaker 30806, Emergency Containment Filter Fan 3B, on MCC 3D
	RO	Places Unit 4 HHSI pumps in PTL

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	IF SI occurs, directs FS/SNPO to locally open MOV-3-843 A and B
	RO	Directs SNPO to locally close 3-297 A/B/C MOV-3-626 and MOV-3-381
		CREW CRITICAL TASK: Isolate RCP seal injection to the RCPs prior to starting a charging pump.
	RO	Checks the following CLOSED • Main steamline isolation and bypass valves • Main feedwater control and bypass valves • S/G blowdown isolation 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.*
	SRO	Checks S/Gs are NOT Faulted.
		CAUTION *If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heat sink.*
	RO	Controls AFW flow to maintain narrow range S/G level between 15% and 50%
	SRO	Checks S/G Tubes are NOT Ruptured
	SRO	Goes 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.*

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Direct operator to reduce DC bus loading as necessary using ATTACHMENT 3 and to periodically monitor DC power supply voltage
	RO	Checks CST Level - GREATER THAN 10%
	SRO	**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.*
	RO	Depressurizes S/G to 180 psig, using S/G steam dump to atmosphere valves at maximum rate and maintaining: • S/G narrow range levels - GREATER THAN 6% IN AT LEAST ONE S/G • RCS cold leg temperatures - GREATER THAN 350°F • Manually control S/G steam dump to atmosphere to maintain S/G pressures at 180 psig
	CREW	Checks Reactor Subcritical
		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	Checks SI ACTUATED and reset

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
	RO	Verifies Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT
	RO	Unit 3 containment purge exhaust and supply fans - OFF
	RO	Verifies Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT
	CREW	Checks Containment Pressure – HAS REMAINED LESS THAN 20 PSIG
		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.*
	SRO	Check Core Exit TCs - LESS THAN 1200°F
	SRO	Notes QSPDS Channel A not functioning, monitors CET using QSPDS Channel B.
	CREW	Checks 3B 4KV buses ENERGIZED from the Unit 4 EDG's
	BOP	Stabilizes S/G Pressures
		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.*

Op-Test No.: 2009-301 Scenario No.: 4 Event No.: 6 Page 10 of 16 Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.		
Time	Position	Applicant's Actions or Behavior
	CREW	Verify Equipment Loaded On Energized 4KV Buses
	SRO	Transitions to 3-EOP-ECA-0.1 if SI is not required
	SRO	Transitions to 3-EOP-ECA-0.2 if SI actuates or Pressurizer level is less than 17%
		Examiner Note: For 3-EOP-ECA-0.1 details go to page 32. For 3-EOP-ECA-0.2 details go to page 33.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
		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	Performs 3-ONOP-004.3 as directed to restore 3B 4kV bus.
		EXAMINER NOTE: Steps annotated by * were previously completed in 3-EOP-ECA-0.0
	BOP	*Verifies Bus Stripping On 3B 4KV Bus*
		CAUTION ***Emergency Diesel Generators should NOT be run unloaded for more than 4.5 hours.***
	BOP	*Checks 3B 4KV Bus Lockout Relay – RESET*
		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	*Verifies SI Reset*

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
		CAUTION ***The affected EDG may Auto-Start when the Lockout Relay is reset in Step 4.***
	BOP	*Checks 3B Emergency Diesel Lockout Relay– RESET*
		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 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	*Directs FS/ANPO to locally synchronize 3B Emergency Diesel Generator to 3B 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE.*
	BOP	*Verifies 3B 4KV bus stripping from ATTACHMENT 1 – COMPLETE*
	BOP	*Directs FS/ANPO to Shut down 3B Emergency Diesel Generator using 3-OP-023, EMERGENCY DIESEL GENERATOR.*
		NOTE *Verifying that SI is reset prior to closing Startup Transformer bus supply breakers should help to ensure the breaker will close.*
	BOP	Checks Unit 3 Startup Transformer Potential White Light on VPA– NOT ON
		EXAMINER NOTE: Start time for the CT begins at step 7 of ONOP 4.3

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
		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.*
	BOP	Prepares to energize 3B 4kv bus from SBO tie. 1. Checks 3A 4kv bus de-energized. 2. Checks 4A and 4B 4kv busses energized. 3. Checks 3D 4kv bus LO relays reset. 4. Checks 3D 4kv bus aligned to 3B 4kv bus. 5. Verifies SBO tie 3AD07 permissive light ON. 6. Checks 4D 4kv bus energized.
		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.*
	BOP	Directs the Unit 4 RO to place non-running safeguards equipment in PULL-TO-LOCK or STOP on the Unit 4B 4KV bus.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B.The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie

Time	Position	Applicant's Actions or Behavior
		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	Closes 3AD07
		EXAMINER NOTE: Stop time for the CT ends when 3AD07 is closed.
		CREW CRITICAL TASK: Energize the required 4KV bus from station blackout tie within 10 minutes after reading caution before step 7 of 3/4-ONOP-004.2 or step 6 of 3/4-ONOP-004.3 during a loss of all AC.
	BOP	Directs U4 RO close 4AD07
	BOP	**Verifies 3B 4KV Bus - ENERGIZED**
		Verifies 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	Directs FS/TO to verify no relay targets on the 3B 4 kv bus. Energizes the B, D & H load centers.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

Time	Position	Applicant's Actions or Behavior
		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.*
	BOP	Starts the 3C ICW and 3B CCW pumps.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds per 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but its output breaker fails to close. QSPDS Channel A fails, the crew monitors CET using QSPDS Channel B. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power using the blackout tie.

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.

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

Event Description: The crew will transition is to 3-EOP-ECA-0.1 or ECA 0.2 following power restoration depending on the extent of the cooldown of the RCS. The crew will isolate seal injection to the RCP's prior to starting a charging pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-EOP-ECA-0.1
		CAUTION *If an SI signal is actuated prior to Step 11 of this procedure, it needs to be reset to permit manual loading of equipment on an ac bus.*
		NOTE *CSF status trees are required to be monitored for information only. FRPs shall NOT be implemented prior to completion of Step 11.*
	RO	Directs FS/SNPO to locally close the RCP seal injection isolation valves before starting charging pump: • 3-297A • 3-297B • 3-297C
		CREW CRITICAL TASK: Isolate RCP seal injection to the RCPs prior to starting a charging pump.
		EXAMINER NOTE: **The scenario is terminated when RCP seal injection isolation valves are isolated in ECA-0.1 or earlier, at the discretion of the lead evaluator.**

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

Event Description: The crew will transition is to 3-EOP-ECA-0.1 or ECA 0.2 following power restoration depending on the extent of the cooldown of the RCS. The crew will isolate seal injection to the RCP's prior to starting a charging pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 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	Verifies SI - RESET
	RO	Checks RWST Level - GREATER THAN 155,000 GALLONS
	RO	Checks SI Valve Amber Lights On VPB – ALL BRIGHT
	RO	Closes RCP Thermal Barrier CCW Outlet, MOV-3-626
		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	Starts 2 ICW pumps
		Verifies ICW To TPCW Heat Exchanger – ISOLATED • POV-3-4882 • POV-3-4883
		Checks intake cooling water headers - TIED TOGETHER
		CAUTION ***CCW System load requirements of 3-ONOP-030, COMPONENT COOLING WATER MALFUNCTION, SHALL NOT be exceeded.***

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

Event Description: The crew will transition is to 3-EOP-ECA-0.1 or ECA 0.2 following power restoration depending on the extent of the cooldown of the RCS. The crew will isolate seal injection to the RCP's prior to starting a charging pump.

Time	Position	Applicant's Actions or Behavior
	RO	Checks CCW Heat Exchangers - THREE IN SERVICE
	RO	Starts 2 CCW pumps
	RO	Checks CCW headers – TIED TOGETHER
	RO	Starts 1 Unit 3 HHSI and ensures 1 Unit 4 HHSI pump are running.
		CREW CRITICAL TASK: **Manually establish flow from at least 2 HHSI pumps prior to completing step 7 of 3-EOP-ECA-0.2 with a valid SI signal present**
		EXAMINER NOTE: **The scenario is terminated when a HHSI Pump is started in ECA-0.2 or earlier, at the discretion of the lead evaluator.**

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:	421	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	804	RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	60
MWe:	421
Tavg:	561
RCS Pressure:	2250
RCS Boron Conc:	804

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:

Immediately after shift turnover reduce letdown flow to 60 gpm and remove one charging pump from service using 3-OP-047 starting at step 7.11.2.4. Operators to support the evolution have been briefed and are on station. Maintain power at 60% steady state.

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.

TP-2009-301 Scenario #5 Event Description

Facility:	Turkey Point	Scenario No.:	5 NEW	Op Test No.:	2009-301
Examiners:	_____	Candidates:	_____		US
	_____		_____		RO
	_____		_____		BOP

Initial Conditions: Mode 1 60% MOL.

Turnover: Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

Immediately after shift turnover reduce letdown flow to 60 gpm and remove one charging pump from service using 3-OP-047 starting at step 7.11.2.4. The shift manager has granted permission to perform the evolution. Operators to support the evolution have been briefed and are on station. Maintain 60% power.

Online risk – green

B train protected both units

Event No.		Event Type	Event Description
1	TAKA834= 0.5	(N) RO (N) SRO	Reduce letdown flow to 60 gpm and secure one charging pump using 3-OP-047.
2	TVFABP6A= 0.35 2 min ramp	(C) BOP (C) SRO	3A Condensate Pump bearing high temperature requiring manual start of 3C Condensate pump.
3	TFH1TU44= T	(I)RO/SRO (TS)SRO	Pressurizer pressure transmitter PT-3-444 fails high, crew responds using 3-ONOP-41.5 to establish RCS pressure control.
4	TVHHCLB= 8.0 E-06 TVHHCLB=. 4.0 E-05	(C) RO/SRO (TS) SRO	An RCS leak develops, the crew responds using 3-ONOP-41.3 to start a charging pump.
5	TVHHCLB=. 4.0 E-04	(R) ALL	The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the RCS leak. The RCS leak will progressively degrade and the crew will isolate letdown. The leak will continue to degrade which will require a manual reactor trip when RCS inventory cannot be maintained within the capacity of the Charging Pumps.
6	TVHHCLB= 2.0 / 3:00 ramp	(M) ALL	When the Reactor trips, the RCS leak will get progressively worse. The crew transitions to 3-EOP-E-1 to address the large break LOCA.
6a	TFQ6A2BF= T	(C) BOP	The 3A RHR shaft shears and the3B RHRP fails to automatically start, the crew will initiate a manual start during 3-EOP-E-0 Attachment 3.
6b	TFL3S1=T TFL3S2=T	(C) BOP	Containment Spray fails to actuate, the crew will manually initiate at least one train of Containment Spray during 3-EOP-E-0 Attachment 3

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

Turkey Point 2009-301 Scenario #5

Event 1 –The crew will reduce letdown flow to 60 gpm and secure one charging pump using 3-OP-047.

Event 2 – The 3A Condensate pump bearing will develop high a temperature condition but not trip. The crew will manually start of 3C Condensate pump and secure the 3A Condensate pump.

Event 3 – Pressurizer pressure transmitter PT-3-444 fails high, crew responds using 3-ONOP-41.5 to establish RCS pressure control.

Event 4 – An RCS leak develops, the crew responds using 3-ONOP-41.3 to start a charging pump.

Event 5 – The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the RCS leak. The RCS leak will progressively degrade and the crew will isolate letdown. The leak will continue to degrade which will require a manual reactor trip when RCS inventory cannot be maintained within the capacity of the Charging Pumps.

Event 6 – When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Once the crew addresses the diagnostic steps of 3-EOP-E-0 the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump during 3-EOP-E-0 Attachment 3. **Critical Task**

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray during 3-EOP-E-0 Attachment 3. **Critical Task**

Scenario XXV NRC 5 Simulator Operating Instructions

Setup

Restore IC-24 (60% power EOL)

- Open & execute lesson file SRO_XXV_NRC_5.lsn
- Place simulator in run

Trigger lesson step:

- SETUP – 3B Charging pump OOS. Removes 3B charging pump from service. (Actuates TAB1POSM = RACKOUT)
- SETUP - 3A RHR Pump Motor Failure **(Actuates TFE2GA15=T)**
- SETUP – 3B RHRP Fails To Auto Start **(Actuates TFQ6A2BF=T)**
- SETUP - Containment Spray Fails to Actuate **(Actuates TFL3S1& TFL3S2=T)**
- Place clearance info tag on 3B Charging Pump start switch
- Bypass the LD Demineralizers by placing the Letdown Divert Valve 3-TCV-143 handswitch to DIVERT.
- Provide an in progress procedure 0-OP-047 step 7.11.2.4
- Provide shift turnover checklists
- Set ERDADS on VPA and at the RCO desk to the Utilities screens.
- Perform Simulator Operator Checklist

Event 1 – Reduce Letdown Flow

Initiated immediately after shift turnover.

The crew will reduce letdown flow to 60 gpm and secure one charging pump using 3-OP-047.

If directed, respond as HP when notified of upcoming letdown flow change to support additional monitoring, as required.

If directed, respond as SNPO. After 1-3 min **trigger lesson step EVENT 1 - Adjust CCW Flow to NRHX** (actuates TAKA834 = 0.5). Report when complete.

Event 2 – 3A Condensate Pump Bearing Failure

The 3A Condensate pump bearing will develop high a temperature condition but not trip. The crew will manually start of 3C Condensate pump and secure the 3A Condensate pump.

When directed by the lead examiner, **trigger lesson step EVENT 2 - 3A Conds Pump Bearing Failure** (actuates TVFABP6A = 0.35 2 min ramp)

If directed, respond as FS/SO to inspect 3A Condensate Pump, state that the lower motor bearing is smoking with paint scorching on the bearing housing. Recommend tripping the Condensate Pump before further damage occurs.

When directed by the lead examiner, if the BOP fails to trip 3A Condensate Pump, **trigger lesson step EVENT 2 - 3A Conds Pump TRIP** (actuates TVFABP6A = 0.40 on 10 sec ramp)

Event 3 – PT-3-444 Fails High

Pressurizer pressure transmitter PT-3-444 fails high, crew responds using 3-ONOP-41.5 to establish RCS pressure control.

When directed by the lead examiner, **trigger lesson step EVENT 3 - PT-3-444 FAIL HIGH** (actuates TFH1TU44=T)

If directed, respond as WCC if requested to prepare a PWO/Clearance and notify I&C.

If directed, respond as I&C and acknowledge request to troubleshoot and repair PT-3-444.

Event 4 – RCS Leak

An RCS leak develops, the crew responds using 3-ONOP-41.3 to start a charging pump.

When directed by the lead examiner, **trigger lesson step EVENT 4 – 3 gpm RCS Leak** (actuates TVHHCLB= 8.0 E-06)

Event 5 – Fast Load Reduction/RCS Leak Degrades

The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the RCS leak. The RCS leak will progressively degrade and the crew will isolate letdown. The leak will continue to degrade which will require a manual reactor trip when RCS inventory cannot be maintained within the capacity of the Charging Pumps.

Respond as System when called about load reduction.

Respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast laod reduction.

Respond as chemistry to take samples. No response back required.

Respond as FS/NSO to align aux steam using attachment 1. No response back required.

When directed by the lead examiner, **trigger lesson step EVENT 5 – 30 gpm RCS Leak** **(actuates TVHHCLB= 4.0 E-05)**

When directed by the lead examiner, **trigger lesson step EVENT 5 – 300 gpm RCS Leak** **(actuates TVHHCLB= 4.0 E-04)**

Event 6 – LBLOCA

When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3-EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

When directed by the lead examiner, **trigger lesson step EVENT 6 – LBLOCA** **(actuates TVHHCLB= 2.0 / 3:00 ramp)**

If directed respond as the FS/SNPO to place PAHMS in service, **trigger lesson step EVENT 6 - ALIGN PAHMS** **(actuates TAC2V02A=1.0/30 sec delay, TAC2V02B=1.0/1 min delay, TAAAV21=1.0/ 2 min delay, TAAAV22=1.0/3.5 min delay & TACA005=0.0)**. Report completion 10-15 min later.

If directed respond as the FS/TO to inspect 3B RHRP breaker 3AB15. After 1-3 min., report no apparent problem.

If directed respond as the FS/TO to inspect 3B RHRP. After 1-3 min., report no apparent problem.

If directed respond as Chemistry to sample S/G, monitor DAM-1

If directed respond as HP to perform surveys.

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

Event Description: The crew will reduce letdown flow to 60 gpm and secure one charging pump using 3-OP-047.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs 3-OP-047 section 7.11.2.4
		CAUTIONS • *Changing letdown flow without changing CCW flow to the Non-Regenerative Heat Exchanger will result in a reactivity change.* • *Example: Increasing letdown temperature will cause a release of boron from the demineralizers (negative reactivity). Decreasing letdown temperature will cause the demineralizers to remove boron from the RCS (positive reactivity).* • *Filter DP changes should be anticipated prior to changing letdown flowrates. Filter DPs will change as a flowrate ratio square function (i.e., $\Delta P_2=\Delta P_1 x(\text{flowrate}_2/\text{flowrate}_1)^2$). RCP seal water injection flowrates are expected to more than double when letdown flowrates are increased greater than 100 gpm.*
		NOTE *With two charging pumps running and in automatic control, a prolonged pressurizer high level may cause the Pressurizer Master Controller to reduce speed on the running charging pumps below the pump oil trip speed.*
	RO	Takes manual control of running charging pumps and maintains greater than 20% demand on both running charging pumps while maintaining Pressurizer level.
	RO	Places PCV-3-145, Low Pressure Letdown Controller, Manual-Auto Station is in MANUAL.
	RO	While monitoring letdown pressure on PI-3-145, adjust Low Pressure Letdown Controller, PCV-3-145, to obtain a letdown pressure of 300 psig.
		NOTES • *Substeps 7.11.2.4.d and 7.11.2.4.e should be performed concurrently using two operators, one to perform the valve maneuvers and the other to perform any PCV-3-145 adjustments necessary to prevent going beyond the pressures specified.* • *The operator adjusting PCV-3-145 should take a **bump** closed as soon as a decrease in flow rate or pressure is detected to prevent flashing.*

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

Event Description: The crew will reduce letdown flow to 60 gpm and secure one charging pump using 3-OP-047.

Time	Position	Applicant's Actions or Behavior
	RO	WHEN letdown pressure is stable in manual, THEN closes the desired open orifice stop valve.
	BOP	Adjusts Low Pressure Letdown Controller, PCV-3-145, in manual to maintain pressure above 150 psig as indicated on PI-3-145.
	RO	Adjusts Low Pressure Letdown Controller, PCV-3-145, in manual to normal operating band.
		CAUTION ***Automatic charging pump control should not be restored until pressurizer level is at program level to prevent charging pump trip on low speed.***
	RO	Places Low Pressure Letdown Controller, PCV-3-145, in AUTO.
	CREW	Directs SNPO to adjust Non-regen HX Temp Control Vlv TCV-3-144 Bypass, 3-834, as necessary to maintain stable letdown temperature on TI-3-143. (VPA)
	RO	Verifies all running charging pumps are in manual speed control.
	RO	Slowly decreases the charging pump speed on the pump being removed from service.
	RO	WHEN minimum demand on the Demand Meter (20 to 25 percent) for the pump to be shutdown has been established, THEN turns the pump control switch to OFF.
		EXAMINER NOTE: When the RO has established single charging pump operations proceed to event 2
	RO	WHEN Pressurizer level is at program level, THEN restore automatic charging pump control.
	RO	Verifies Letdown Demineralizer Divert Valve, TCV-3-143, is in the AUTO position and the green DEMINS light is lit.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 2 Page 1 of 1 Event Description: The 3A Condensate pump bearing will develop high a temperature condition but not trip. The crew will manually start of 3C Condensate pump and secure the 3A Condensate pump.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 2 3A Conds Pump Bearing Failure" **(actuates TVFABP6A = 0.35 2 min ramp)**		
	BOP	Observes annunciator D 9/1 "COND PUMP A/B/C MOTOR OVERLOAD"
		EXAMINER NOTE: The magnitude of the malfunction is large enough to initiate the MOTOR OVERLOAD alarm but does not result in a 3A Condensate pump breaker trip.
	SRO	Directs response using the ARP
	BOP	Monitors SGFP suction pressure.
	BOP	Starts 3C Condensate pump.
		EXAMINER NOTE: When the BOP has started the 3C Condensate pump proceed to event 3
	BOP	Stops 3A Condensate pump.
	BOP	Checks associated feed train components for proper operation.
	CREW	Directs TO to verify the condensate pump recirculation valves closed and motor amps locally.
	CREW	Directs OCC/WCC rack out breaker 3AA21 & generate ECO

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 3 Page 1 of 4 Event Description: Pressurizer pressure transmitter PT-3-444 fails high, crew responds using 3-ONOP-41.5 to establish RCS pressure control.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 3 PT-3-444 FAIL HIGH (actuates TFH1TU44=T)		
	RO	Observes the following: • RCS pressure decreasing. • PZR pressure control channel PT-3-444 pegged high • one PORV (PCV-3-455C) open with no actual high pressure condition
	RO	Observes the following alarms: • Annunciator A-4/1, PORV/SAFETY VALVE OPEN • Annunciator A-9/2, PZR CONTROL HI/LO PRESS • Annunciator A-9/5, PZR PRESSURE CONTROLLER HI OUTPUT
	SRO	Directs response using the ARP and 3-ONOP-41.5
	RO	Alarm Response actions: • Closes PORV PCV-3-455C • Takes manual control of Pressurizer Master Controller 3-PC-444J to close PZR Spray valves(s).
		NOTE *Foldout page is required to be monitored throughout this procedure.*

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 3 Page 2 of 4

Event Description: Pressurizer pressure transmitter PT-3-444 fails high, crew responds using 3-ONOP-41.5 to establish RCS pressure control.

Time	Position	Applicant's Actions or Behavior
		CAUTION ***The Master Controller should be operated carefully (Normal controller output for 2235 psig is 42.5 percent demand; 92 percent demand will open PCV-3-455C). If the following conditions are met, an excessive increase in controller output could cause Power Operated Relief Valve PCV-3-455C to open:*** ***1. PCV-3-455C hand switch in AUTO.*** ***2. Pressurizer pressure is greater than or equal to 2000 psig, or OMS switch in LO Press Ops.***
	CREW	Reviews 3-ONOP-41.5 foldout page actions (See page 7)
	RO	Checks PT-3-444 - FAILED by comparison with adjacent pressure channels and known plant parameters
		EXAMINER NOTE: Steps annotated with * may have already been performed in the ARP.
	RO	*Closes PORV PCV-3-455C*
	RO	*Takes manual control of Pressurizer Master Controller 3-PC-444J to close PZR Spray valves(s).*
	SRO	Recognizes requirement for LCO 3.2.5 Action b entry.
		EXAMINER NOTE: 3.2.5 The following DNB-related parameters shall be maintained within the following limits: b. Pressurizer Pressure ≥ 2200 psig APPLICABILITY: MODE 1 ACTION: With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less then 5% of RATED THERMAL POWER within the next 4 hours.

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

Event Description: Pressurizer pressure transmitter PT-3-444 fails high, crew responds using 3-ONOP-41.5 to establish RCS pressure control.

Time	Position	Applicant's Actions or Behavior
	RO	Checks PT-3-445 - NOT FAILED by comparison with adjacent pressure channels and known plant parameters
	RO	Checks both PORVs closed
		CAUTION ***A fire in containment or the 3B 4KV Switchgear Room may cause spurious actuation of and give false valve position indication for Auxiliary Spray Valve, CV-3-311.***
	RO	Checks PZR spray valves closed. Since PZR pressure is less than normal: • Places PCV-3-455A in MANUAL and CLOSE. • Places PCV-3-455B in MANUAL and CLOSE. • Verifies CV-3-311 (Aux Spray) is CLOSED.
	SRO	Determines Pressurizer pressure can be maintained greater then 2000 psig.
	BOP RO	Checks PZR Safety Valves closed by observing: PZR PORV/Safety acoustic monitor LEDs - NOT LIT PZR safety line temperatures at or near normal • PZR safety line temperature, TI-3-465 • PZR safety line temperature, TI-3-467 • PZR safety line temperature, TI-3-469
	RO	Checks PZR Pressure Stable Or Increasing
		EXAMINER NOTE: When the crew has stabilized Pressurizer pressure proceed to event 4

FOLDOUT FOR PROCEDURE 3-ONOP-041.5

1. **FAILED INSTRUMENT ISOLATION**

   a. **IF** any Pressurizer Pressure control Instrument Loop fails, **THEN** place applicable control switches to a position that isolates the failed instrument.

2. **IF** PZR pressure cannot be maintained greater than 2000 psig, **THEN** perform the following:

   a. Continue efforts to restore PZR pressure and

   b. Trip the reactor and turbine and go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION.

3. **PORV ISOLATION/LEAKING PORV IDENTIFICATION**

   a. **IF** any PORV is OPEN **OR** Leaking **AND** pressure is less than 2235 psig, **THEN** CLOSE the applicable PORV and/or Block valve.

   b. The following are indications of leakage from a PZR PORV and should be used to identify and isolate a leaking PORV:

      1) PZR relief line temperature, TI-3-463, INCREASING.

      2) PZR relief tank level, LI-3-470, INCREASING.

      3) PZR relief tank temperature, TI-3-471, INCREASING.

      4) PZR relief tank pressure, PI-3-472, INCREASING.

      5) PZR PORV/SAFETY ACOUSTIC MONITOR, LEDs LIT.

4. **OPEN/LEAKING PZR SAFETY VALVE IDENTIFICATION**

   a. The following are indications that a PZR safety is open or leaking:

      1) PZR Safety line temperature, TI-3-465, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2.

      2) PZR Safety line temperature, TI-3-467, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2.

      3) PZR Safety line temperature, TI-3-469, INCREASING or at saturation temperature associated with the PZR relief tank pressure per Attachment 2.

      4) PZR relief tank level, LI-3-470, INCREASING.

      5) PZR relief tank temperature, TI-3-471, INCREASING.

      6) PZR relief tank pressure, PI-3-472, INCREASING.

      7) PZR PORV/Safety Acoustic Monitor, LEDs LIT.

5. **SPURIOUS ACTUATION OF CV-3-311 AUXILIARY SPRAY VALVE** due to fire in Containment or 3B 4KV Switchgear Room

   a. **IF** pressurizer pressure is decreasing and Auxiliary Spray Valve, CV-3-311, is suspect, **THEN** reduce charging to one charging pump on slow speed **AND** close charging to RCS Control Valve HCV-3-121.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 1 of 2 Event Description: An RCS leak develops, the crew responds using 3-ONOP-41.3 to start a charging pump.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT4 – 9 gpm RCS Leak" (actuates TVHHCLB= 8.0 E-06)		
	RO	Observes a change in the RCS Inventory balance on ERDADS
	RO	Observes alarm G 5/3
	SRO	Directs response using 3-ONOP-41.3
	CREW	Reviews 3-ONOP-41.3 foldout page actions (See page 9)
	RO	Checks RCS Inventory decreasing goes to step 10
	SRO	Directs STA to determine RCS leak rate using 3-OSP-041.1, REACTOR COOLANT SYSTEM LEAKRATE CALCULATION
		EXAMINER NOTE RCS leakrate should be approximately 9 gpm
	SRO	Determines the RCS leak is unidentified and is not isolable goes to step 11.
	BOP	Verifies process radiation monitors stable.
	SRO	Recognizes requirement for LCO 3.4.6.2 Action b entry.
		3.4.6.2.b Reactor Coolant System operational leakage shall be limited to 1 GPM UNIDENTIFIED LEAKAGE APPLICABILITY: MODES 1, 2, 3 and 4. Action 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.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 4 Page 2 of 2 Event Description: An RCS leak develops, the crew responds using 3-ONOP-41.3 to start a charging pump.		
Time	Position	Applicant's Actions or Behavior
When the examinee has recognized LCO 3.4.6.2.b entry, direct facility operator to trigger lesson step "EVENT 5 – 30 gpm RCS Leak" (actuates TVHHCLB= 4.0 E-05)		
	RO	Observes an increase in the RCS Inventory balance on ERDADS
	RO	Starts 3C Charging pump.
	SRO	Transitions to 3-ONOP-100

FOLDOUT FOR PROCEDURE 3-ONOP-041.3

1. **3-EOP-E-0 TRANSITION CRITERIA**
   IF Unit 3 is in Modes 1 through 3 greater than 1000 psig with the Safety Injection System aligned for injection **AND** either of the following occurs, **THEN** verify the Reactor tripped **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:
   a. RCS leakage greater than charging pump capacity and letdown isolated.
   b. PZR level – CAN **NOT** BE MAINTAINED GREATER THAN 12%[50%].

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

Event Description: The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the RCS leak. The RCS leak will progressively degrade and the crew will isolate letdown. The leak will continue to degrade which will require a manual reactor trip when RCS inventory cannot be maintained within the capacity of the Charging Pumps.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-ONOP-100
	SRO	Performs 3-ONOP-100 brief (See next page).
	CREW	Reviews 3-ONOP-100 foldout page actions. (See page 13)
	SRO	Determines 9 gal/% boric acid addition is required.
	RO	Initiates boration: 1. Sets BA totalizer as directed (9 gal/% for 60% load decrease = 540 gal BA) 2. Takes FC-3-113A pot →8.0 or as directed 3. RMSS→BORATE 4. RMCS→START
	RO	Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate
	BOP	Reduces turbine load. 1. Maintains Tavg less than 5°F above Tref 2. Maintains rods greater than insertion limit.
	CREW	Notifies plant management and System of the impending unit shutdown.
	RO	Checks pressurizer level following program
	CREW	Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3

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

Event Description: The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the RCS leak. The RCS leak will progressively degrade and the crew will isolate letdown. The leak will continue to degrade which will require a manual reactor trip when RCS inventory cannot be maintained within the capacity of the Charging Pumps.

ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction _____

2. Target power level _____ % Power

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

3. Load reduction rate _____ Mw / minute

NOTES

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

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

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

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

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

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

8. Questions or crew input?

9. End of Brief

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 5 Page 3 of 4 Event Description: The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the RCS leak. The RCS leak will progressively degrade and the crew will isolate letdown. The leak will continue to degrade which will require a manual reactor trip when RCS inventory cannot be maintained within the capacity of theCharging Pumps.		
Time	Position	Applicant's Actions or Behavior
When the crew has sufficiently reduced power directfacility operator to trigger lesson step "EVENT 5 – 300 gpm RCS Leak" (actuates TVHHCLB= 4.0 E-04)		
	RO	Observes RCS Inventory decreasing
	RO	Isolates letdown.
	RO	Observes RCS Inventory continuing to decrease with: • Charging flow - MAXIMUM • Letdown flow - ISOLATED
	SRO	Directs a manual Reactor Trip and transitions to 3-EOP-E-0

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 5 Page 4 of 4		
Event Description: The crew will initiate a boration and reduce turbine load using 3-ONOP-100 in response to the RCS leak. The RCS leak will progressively degrade and the crew will isolate letdown. The leak will continue to degrade which will require a manual reactor trip when RCS inventory cannot be maintained within the capacity of the Charging Pumps.		
Time	Position	Applicant's Actions or Behavior

1. 3-EOP-E-0 Transition Criteria

IF any of the following limits are reached, **THEN** trip the Reactor and Turbine **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:

a. RCS Tavg - GREATER THAN 578 °F

b. RCS Tavg - GREATER THAN Tref by 6 °F

c. Rod Insertion Limits are exceeded as indicated by:
- Rod Position Bank D Insertion Limit Recorder (VPA)
- Stepcounters on console
- Plant Curve Book Section 7, Figure 3

2. Notify Chemistry Department

WHEN reactor power has changed by greater than or equal to 15 percent, **THEN** notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.

3. Restore Blender to AUTO

WHEN boration is complete, **THEN** restore the Blender to AUTO as follows.

a. Place the Reactor Makeup Selector Switch to AUTO

b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired

c. Place the RCS Makeup Control Switch to START

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

Event Description: When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3-EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs a manual trip of the reactor
Direct facility operator to trigger lesson step "EVENT6 LBLOCA" (actuates TVHHCLB= 2.0 / 3:00 ramp)		
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	Performs immediate actions of 3-EOP-E-0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing Determines SI has actuated
	BOP	Performs immediate actions of 3-EOP-E-0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSR steam supply MOVs • Mid & East GCBs open Verifies power to emergency 4kV buses • Determines both 3A & 3B 4kV buses energized with 3D 4kV bus energized from 3B 4kV bus

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 6 Page 2 of 8

Event Description: When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3-EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

Time	Position	Applicant's Actions or Behavior
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	CREW	Monitors 3-EOP-E-0 Foldout page (See page 20 for foldout)
	RO	Trips RCP's based on loss of subcooling with HHSI flow into the RCS.
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification (See page 3 for detailed actions)
	SRO	Directs RO in performance of 3-EOP-E-0 subsequent actions.
	RO	Checks all AFW Pumps RUNNING
	RO	Checks AFW valve alignment proper
	RO	Verifies total AFW flow greater than 345 gpm.
	RO	Checks RCP thermal barrier alarms off.
	RO	Adjusts total AFW flow to 345 gpm max.
	RO	Checks PRZ PORVs, Spray Valves and Excess Letdown Isolated
	CREW	Diagnoses the LOCA
	BOP	Continues performance of 3-EOP-E-0 Attachment 3 Prompt Action Verification

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

Event Description: When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3-EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

Time	Position	Applicant's Actions or Behavior
	STA	STA observes a RED PATH for Containment Integrity and recommends entry to 3-FRP-P-1
	SRO	Transitions to 3-FRP-P-1
	SRO	Directs 3-FRP-P-1 response
		CAUTION *If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heatsink.*
	RO	Check RCS Pressure - LESS THAN 650 PSIG and RHR flow greater than 1000 gpm.
	SRO	Transitions to 3-EOP-E-1.

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 6 Page 4 of 8

Event Description: When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3-EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

Time	Position	Applicant's Actions or Behavior
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification • Places Main Feed pump HS to STOP • Places FWIV MOV-3-1407, 1408 & 1409 HS to CLOSE • Manually starts 3B RHR pump • Manually stops 3A RHR pump • Places the Unit 4 HHSI pumps HS to STOP • Depresses SI reset PB • Resets Cont Isolation Phase A • Manually starts at least one train of Containment Spray.
	BOP	**CREW CRITICAL TASK: Manually start at least one RHR pump following a large LOCA prior to completing E-0 (Attachment 3 step 7).**
	BOP	**CREW CRITICAL TASK: Manually start at least one RHR pump following a large LOCA prior to completing E-0 (Attachment 3 step 7).**
	BOP	Directs SNPO to align PAHMS per 3-OP-094

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

Event Description: When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3-EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs 3-EOP-E-1 response
	BOP	**NOTE** *Foldout page is required to be monitored throughout this procedure*
	CREW	Monitors 3-EOP-E-1 Foldout page (see page 21 for foldout)
	RO	Verifies RCP's stopped.
	BOP	Checks no S/G are faulted
	BOP	Controls AFW flow to maintain S/G NR levels 15%-50%
	CREW	Directs Chemistry to take activity samples on all S/Gs & DAM1 monitor readings.
	CREW	Directs HP to take main steam line radiation readings.
		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	Check PRZ PORVs and Block Valves CLOSED
	RO	Verifies SI - RESET
	RO	Verifies Containment Isolation Phase A and B - RESET
	BOP	Verifies Instrument Air Containment Isolation, CV-3-2803 - OPEN AND Verifies instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG

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

Event Description: When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3 EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crewwill manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

Time	Position	Applicant's Actions or Behavior
	BOP	Checks power supply to all Charging Pumps - ALIGNED TO OFFSITE POWER
	RO	Performs Attachment 4 to establish charging. • Checks RCP thermal barrier alarms off. • Starts One Charging Pump • Places RCS Makeup Control Switch in STOP • Starts additional charging pumps if needed and offsite power available • Adjusts Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow • Verifies charging pump suction auto transfers to RWST
	RO	Verifies SI can not be terminated.
		EXAMINER NOTE **The scenario is terminated when the crew determines Safety Injection can not be terminated.**

Op-Test No.: 2009-301 Scenario No.: 5 Event No.: 6 Page 7 of 8

Event Description: When the Reactor trips, the RCS leak will get progressively worse. The crew will transition to 3-EOP-E-1 to address the large break LOCA.

Upon receipt of a Safety Injection signal, the 3A RHR pump shaft shears and the 3B RHR pump fails to automatically start. The crew will manually start the 3B RHR pump using 3-EOP-E-0 Attachment 3.

Both trains of Containment Spray fail to actuate. The crew will manually initiate at least one train of Containment Spray using 3-EOP-E-0 Attachment 3.

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 $\geq$ 180°F

   OR

   Containment radiation levels $\geq 1.3 \times 10^5$ 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[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.

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 ≥ 1.3×10^5 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.

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:	761	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	50	RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	100
MWe:	761
Tavg:	574
RCS Pressure:	2250
RCS Boron Conc:	50

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:

Maintain 100% power.

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.

TP-2009-301 Scenario #6 Event Description

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

Initial Conditions: Mode 1 100% power EOL.

Turnover: Equipment OOS: 3B charging pump out of service due to packing leakage. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

Maintain 100% power.

Online risk – green

B train protected both units

Event No.		Event Type	Event Description
1	TVBVLK40=1.0	(C) RO (C) SRO	CVCS relief valve, RV-3-203, fails open, the crew isolates Letdown using the ARP.
2		N (RO/SRO)	The crew establishes Excess Letdown using 3-OP-041.2
3		TS (SRO)	The crew discovers the In Service Test of the C CCW pump failed. The crew declares the C CCW pump INOPERABLE.
4	TFS1ML3L=T	(R)BOP (R)SRO	PT-3-1604 fails causing CV-3-2011 to open bypassing the LP feedwater heaters, the crew responds to reduce power < 100% using the ARP.
5	TFN1P4AH=T	(I) RO (TS,I) SRO	PR Channel N44 Upper Detector fails high, the RO responds using 3-ONOP-59.8 to stop control rod motion by placing rod control to manual.
5a		(C) BOP	The BOP removes the PR Channel N44 Upper Detector from service using 3-ONOP-59.8.
6	TFF1MACH=T	(I)BOP/SRO	3C S/G level transmitter LT-3-498 fails high. The crew controls 3C S/G level manually to maintain plant operation using the ARP and 3-ONOP-49.1.
7	TVFAHDR2 1.000000 5:00 ramp	(M) ALL	A common Main Feed Header break occurs, the crew will respond to the reactor trip using 3-EOP-E-0. When the reactor trips, the main turbine fails to trip automatically, the crew manually trips the main turbine.
8	TFFXCGVA=T, TVFXLGVB=1 & TFFXOGVC=T		During the reactor trip response, the "A" AFW turbine steam admission valve fails to open, the "B" AFW governor develops an oil leak and the "C" AFW turbine trips on overspeed. The crew transitions to 3-FR-H-1 to initiate Feed and Bleed.

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

Turkey Point 2009-301 Scenario #6

Event 1 - CVCS relief valve, RV-3-203, fails open, the crew will isolate letdown using the ARP.

Event 2 – The crew will establish Excess Letdown using 3-OP-041.2

Event 3 –The crew discovers the In Service Test of the C CCW pump failed. The crew declares the C CCW pump INOPERABLE.

Event 4 – PT-3-1604 fails causing CV-3-2011 to open bypassing the LP feedwater heaters, the crew responds to reduce power less than 100% by lowering main turbine load using the ARP.

Event 5 – PR Channel N44 Upper Detector fails high, the RO responds using 3-ONOP-59.8 to stop control rod motion by placing rod control to manual.

Event 5a – The BOP removes the PR Channel N44 Upper Detector from service using 3-ONOP-59.8.

Event 6 – 3C S/G level transmitter LT-3-498 fails high. The crew controls 3C S/G level manually to maintain plant operation using the ARP and 3-ONOP-49.1.

Event 7 – A common Main Feed Header break occurs, the crew will respond to the reactor trip using 3-EOP-E-0. When the reactor trips, the main turbine fails to trip automatically, the crew manually trips the main turbine. **Critical Task**

Event 8 – During the reactor trip response, the "A" AFW turbine steam admission valve fails to open, the "B" AFW governor develops an oil leak and the "C" AFW turbine trips on overspeed. The crew transitions to 3-FR-H-1 to initiate Feed and Bleed. **Critical Task**

Scenario XXV NRC 6 Simulator Operating Instructions

Setup

Restore IC-6 (100% power EOL)

- Open & execute lesson file SRO_XXV_NRC_6.lsn
- Place simulator in run

Trigger lesson step:

- SETUP – 3B Charging pump OOS. Removes 3B charging pump from service. (Actuates TAB1POSM = RACKOUT)
- SETUP - Main Turbine Fails To Trip (actuates TFU10005 T)
- Place clearance info tag on 3B Charging Pump start switch
- Provide shift turnover checklists
- INSERT OTSC for ARP alarm A 5/6. Change to Establish Excess Letdown using 3-OP-041.2, PRESSURIZER OPERATION, Step 5.1.2.7
- Set ERDADS on VPA and at the RCO desk to the Utilities screens.
- Perform Simulator Operator Checklist

Event 1 – CVCS Relief Valve, RV-3-203, Fails Open

Initiated immediately after shift turnover.

CVCS relief valve, RV-3-203, fails open, the crew will isolate letdown using the ARP.

When directed by the lead examiner **trigger lesson step EVENT 1 - RV-3-203, Fails Open** (actuates TVBVLK40=1.0)

Event 2 – Establish Excess Letdown

The crew will establish Excess Letdown using 3-OP-041.2

If directed, respond as HP and Chemistry when notified that normal letdown is secured and excess letdown has been placed in service.

If directed, respond as SNPO and report CCW Excess Letdown flow is 219 gpm.

If directed, respond as SNPO to check for increasing RCDT level (indication of RV-3-304 lifting in excess letdown line). Report RCDT level stable as indicated on Waste Boron Panel.

Event 3 –C CCW Pump Failed In Service test

When directed call 4906, inform the control room that you are the Operations Manager. Engineering has informed Operations that a review of the data for the In Service Test of the C CCW pump reveals the pump has failed the test. Operations management has concurred with the decision from Engineering. Take appropriate administrative measures to remove the C CCW pump from service.

If directed, respond as the FS/ANPO to rackout the 3C CCW pump breaker. Wait 10 minutes and **trigger lesson step EVENT 3 - RACKOUT 3C CCW PUMP BREAKER** (actuates TAK1G04P RACKOUT)

If directed, respond as WCC to prepare a PWO/Clearance.

Event 4 – PT-3-1604 Fails Low

PT-3-1604 fails causing CV-3-2011 to open bypassing the LP feedwater heaters, the crew responds to reduce power less than 100% by lowering main turbine load using the ARP.

When directed by the lead examiner **trigger lesson step EVENT 4 - PS-3-1604 fails Low** (actuates TFS1ML3L=T)

If directed, respond as TO to verify CV-3-1900 closed. Click on Schema→ FEEDWATER HEATING→HIGH PRESS FW HEATERS & RHTR & HTR DRAIN TANKS→report CV-3-1900 position (see far right side of mimic).

If directed, respond as WCC to prepare a PWO/Clearance and notify I&C.

If directed, respond as I&C and acknowledge request to troubleshoot and repair PS-3-1604-1.

Event 5 – PR Channel N44 Upper Detector Fails High

PR Channel N44 Upper Detector fails high, the RO responds using 3-ONOP-59.8 to stop control rod motion by placing rod control to manual. The BOP removes the PR Channel N44 Upper Detector from service using 3-ONOP-59.8.

When directed by the lead examiner **trigger lesson step EVENT 5 - N44 Upper Detector Fails High** (actuates TFN1P4AH=T)

If directed, respond as WCC to prepare a PWO/Clearance and notify I&C.

If directed, respond as I&C and acknowledge request to troubleshoot and repair PR Channel N44.

If directed, respond as Reactor Engineering to calculate QPTR. Reply that an engineer will be called in to perform this calculation.

If directed, respond as SM direct crew to remove PR Channel N44 from service.

Event 6 – LT-3-498 Fails High

3C S/G level transmitter LT-3-498 fails high. The crew controls 3C S/G level manually to maintain plant operation using 3-ONOP-49.1.

When directed by the lead examiner **trigger lesson step EVENT 6 - LT-3-498 Fails High** **(actuates TFF1MACH=T)**

If directed, respond as WCC to prepare a PWO/Clearance and notify I&C.

If directed, respond as I&C and acknowledge request to troubleshoot and repair LT-3-498.

If directed, respond as FS/TO if directed to reset AMSAC. Wait 3 min, then **trigger EVENT 6, Reset AMSAC** (actuates TCL4RST = T). Report when complete.

Event 7 – Main Feed Header Leak

A common Main Feed Header break occurs, the crew will respond to the reactor trip using 3-EOP-E-0. When the reactor trips, the main turbine fails to trip automatically, the crew manually trips the main turbine.

When directed by the lead examiner **trigger lesson step EVENT 7 - FEED HEADER BREAK** **(actuates TVFAHDR2 1.0 5 min ramp)**

When the crew manually trips the main turbine **ensure lesson step EVENT 7 - Manually Trip Main Turbine** (actuates TFU10005=0) is inserted.

If directed, respond as TO/FS the U3 end of the turbine bldg. is inaccessible since a vapor cloud is rapidly filling up the area. The AFW cage is presently inaccessible due to steam in the area. I will enter the area when the steam dissipates.

When directed respond as the FS/SNPO to place PAHMS in service, **trigger lesson step EVENT 7 - ALIGN PAHM FOR** SERVICE **(actuates TAC2V02A=1.0/30 sec delay, TAC2V02B=1.0/1 min delay, TAAAV21=1.0/ 2 min delay, TAAAV22=1.0/3.5 min delay & TACA005=0.0)**. Report completion 10-15 min later.

If directed, respond as Chemistry to sample S/G, monitor DAM-1

If directed, respond as HP to perform surveys.

Event 8 – Loss of AFW

During the reactor trip response, the "A" AFW turbine steam admission valve fails to open, the "B" AFW governor develops an oil leak and the "C" AFW turbine trips on overspeed. The crew transitions to 3-FR-H-1 to initiate Feed and Bleed.

When the Main Turbine has been manually tripped, ensure **lesson step EVENT 8 – Loss of AFW** **(actuates TFFXCGVA=T, TVFXLGVB=1, & TFFXOGVC=T)**

If directed, respond as TO/FS "The AFW cage is presently inaccessible due to steam in the area. I will enter the area when the steam dissipates."

If directed as TO/FS wait 3 minutes and respond "The "A" AFW pump governor valve is shut and cannot be opened. The "B" AFW pump is running at minimum speed and the governor has an oil leak. The "C" AFW pump tripped on overspeed. "The overspeed trip mechanism will not reset due to mechanical binding of the trip linkage.""

If directed as TO/FS wait 3 minutes and respond "The location of the feed line break is on the common feed line downstream of the Main Feed pumps."

If directed as TO/FS wait 3 minutes and respond "The location of the feed line break is on the common feed line downstream of DWDS-3-012."

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 1 Page 1 of 1 Event Description: CVCS relief valve, RV-3-203, fails open, the crew will isolate letdown using the ARP.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 1 - RV-3-203, Fails Open" (actuates TVBVLK40=1.0)		
	RO	Observes A 5/6 CVCS LP LTDN LINE RELIEF HI TEMP
	SRO	Directs response using the ARP
		NOTE *The decision to isolate letdown should be based on unacceptable RV-3-203 leakage and NPS discretion.*
	RO	Verifies alarm by observing temperature is > 150°F on TI-3-141 & decreased letdown flow
	RO	Verifies CV-3-204 OPEN
	RO	Attempts to reseat RV-3-203 as follows: 1. Closes all letdown orifices (may secure a Charging Pump) 2. Checks PCV-3-145 operates properly 3. Checks TI-3-141 NOT increasing 4. Opens the required number of orifices while controlling PCV-3-145 (Most likely will open the 45 GPM orifice)
	RO	Determines that RV-3-203 did NOT reseat by observing TI-3-141 temperature increasing and lower than expected letdown flow
		Performs the following to isolate the RV-3-203 relief valve: 1. Closes all letdown orifices 2. Closes LCV-3-460 3. Minimizes charging flow
		EXAMINER NOTE: Excess letdown will be established in the next event
	CREW	Notifies WCC of failed relief valve RV-3-203.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 2 Page 1 of 1 Event Description: The crew will establish Excess Letdown using 3-OP-041.2.		
Time	Position	Applicant's Actions or Behavior
	SRO	Directs placing excess letdown in service using 3-OP-041.2 step 5.1.2.7
	RO	Places excess letdown in service as follows: Verifies excess letdown HX CCW outlet valve, CV-3-739, is OPEN. Directs SNPO verify CCW flow to excess letdown HX 200-238 gpm Determines Excess Ltdn Isolation Valve, CV-3-387 closed Determines excess letdown divert to WDS valve, CV-3-389, is aligned to the VCT. Slowly opens excess letdown flow controller, HCV-3-137, allowing the excess letdown lines to fill. After > 5 min., closes HCV-3-137 Opens excess letdown isolation valve, CV-3-387 Directs SNPO observe RCDT level for indication of RV-3-304 lifting Slowly opens excess letdown flow controller, HCV-3-137, allowing the heat exchanger to warmup.
		CAUTION *If excess letdown heat exchanger outlet temperature exceeds 195°F, the VCT may have an excessive heatup rate.*
	RO	Monitors excess letdown HX outlet temp on TI-3-139. IF LCV-3-115A, reaches 100% divert position (RED light ON, GREEN light OFF), THEN aligns excess letdown divert to WDS, CV-3-389, to the RCDT (switch to DIVERT).
	CREW	Notifies Chemistry & HP that normal letdown is secured and excess letdown now in service
		EXAMINER NOTE: When Excess letdown has been placed in service proceed to Event 3

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 3 Page 1 of 1 Event Description: The crew discovers the In Service Test of the C CCW pump failed. The crew declares the C CCW pump INOPERABLE.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator tomake the communication to the control room for Event 3.		
	SRO	Recognizes requirement for LCO 3.2.7.a Action a entry.
		EXAMINER NOTE: 3.2.7.a The Component Cooling Water System (CCW) shall be OPERABLE with Three CCW pumps 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 hoursand in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable. APPLICABILITY: MODES 1, 2, 3, and 4. ACTION: 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.
		EXAMINER NOTE: When the SRO has addressed LCO 3.2.7.a Action a entry, proceed to Event 4.

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

Event Description: PT-3-1604 fails causing CV-3-2011 to open bypassing the LP feedwater heaters, the crew responds to reduce power less than 100% by lowering main turbine load using the ARP.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 4 - PS-3-1604 fails Low" (actuates TFS1ML3L=T)		
	BOP	Observes D-7/4 LP HEATER BYPASS OPEN
		CAUTIONS • *Reactor power may increase due to the positive reactivity addition of colder feedwater into the Steam Generators.* • *Reactor power indication may be lower than actual power due to lower Tavg.*
	RO	Observes decrease in Tavg & increase in reactor power due to CV-3-2011 failure
	SRO	Directs BOP to maintain power less than 100% by lowering main turbine load.
	BOP	Maintains power less than 100% by lowering main turbine load.
	SRO	Directs response using the ARP
	BOP	Recognizes/reports CV-3-2011 open and PT-3-1604 failed. Observes no other automatic actions have occurred. Observes SGFP suction pressure > 260 psig. Closes CV-3-2011. Directs TO to verify CV-3-1900 closed. May start the 3C Condensate pump Observes 2 HDPs running as required since turbine load > 450 MWe
		Notifies WCC of PT-3-1604 failure.
		EXAMINER NOTE: When the crew has sufficiently reduced power proceed to Event 4.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 5 Page 1 of 4

Event Description: PR Channel N44 Upper Detector fails high, the RO responds using 3-ONOP-59.8 to stop control rod motion by placing rod control to manual. The BOP removes the PR Channel N44 Upper Detector from service using 3-ONOP-59.8.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 5 - N44 Upper Detector Fails High" (actuates TFN1P4AH=T)		
	RO	Observes the following: • Annunciators B-2/2, 6/1, 6/3, 6/4, 9/2 & G-5/1, 5/2 • N-44 power range channel indication on console fails high • N-44 axial flux indication on console fails high • N-44 upper detector indication on NIS racks fails high
	SRO	Transitions to 3-ONOP-59.8
	SRO	Directs response using 3-ONOP-59.8
	RO	Places ROD MOTION CONTROL SELECTOR to MANUAL
	BOP	Places the DROPPED ROD MODE switch for N-44 in the BYPASS position.
	BOP	Places right rod stop bypass switch to bypass N-44.
		NOTE *If an **Upper Section Deviation** or **Lower Section Deviation** alarm occurs, or if ANNUNCIATORS B-2/2 or B-2/3 annunciate, the actions of 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, need to be performed if power is greater than 50 percent.*
	BOP	Places the UPPER SECTION comparator defeat switch to N-44
	BOP	Places the LOWER SECTION comparator defeat switch to N-44
	BOP	Places right power mismatch bypass switch to bypass N-44.
	BOP	Places the COMPARATOR CHANNEL DEFEAT switch to N-44
	SRO	May direct manual rod withdrawal to restore Tavg within 3°F of Tref as needed using 3-ONOP-028

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 5 Page 2 of 4

Event Description: PR Channel N44 Upper Detector fails high, the RO responds using 3-ONOP-59.8 to stop control rod motion by placing rod control to manual. The BOP removes the PR Channel N44 Upper Detector from service using 3-ONOP-59.8.

Time	Position	Applicant's Actions or Behavior
	RO	Manually withdraws control rods as directed by US to restore Tavg within 3°F of Tref as needed using 3-ONOP-028.
	RO	Places the ROD MOTION CONTROL SELECTOR to AUTO
	BOP	May pull the instrument power fuses from N-44 drawer B
	SRO	Refers to LCO 3.3.1, Table 3.3-1, Functional Unit 2 Action 2 Functional Unit 17 c & 17 d Action 7
		EXAMINER NOTE See next two pages for applicable Tech Specs.
	CREW	Notifies I&C
	SRO	Directs performance of monitoring the Quadrant Power Tilt Ratio using 3-OSP-059.10, DETERMINATION OF QUADRANT POWER TILT RATIO. (Per Tech Spec 4.2.4.2)
		EXAMINER NOTE: When the crew has restored Tave proceed to Event 6.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 5 Page 3 of 4

Event Description: PR Channel N44 Upper Detector fails high, the RO responds using 3-ONOP-59.8 to stop control rod motion by placing rod control to manual. The BOP removes the PR Channel N44 Upper Detector from service using 3-ONOP-59.8.

Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE. APPLICABILITY: As shown in Table 3.3-1. ACTION: As shown in Table 3.3-1.
		FUNCTIONAL UNIT / TOTAL NO. OF CHANNELS / CHANNELS TO TRIP / MINIMUM CHANNELS OPERABLE / APPLICABLE MODES / ACTION 2. Power Range, Neutron Flux a. High Setpoint: 4 / 2 / 3 / 1, 2 / 2 b. Low Setpoint: 4 / 2 / 3 / 1##, 2 / 2
		ACTION 2 –With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied: a. The inoperable channel is placed in the tripped condition within 6 hours, b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1, and c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored per Specification 4.2.4.2.

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

Event Description: PR Channel N44 Upper Detector fails high, the RO responds using 3-ONOP-59.8 to stop control rod motion by placing rod control to manual. The BOP removes the PR Channel N44 Upper Detector from service using 3-ONOP-59.8.

Time	Position	Applicant's Actions or Behavior

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
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

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

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 6 Page 1 of 1 Event Description: 3C S/G level transmitter LT-3-498 fails high. The crew controls 3C S/G level manually to maintain plant operation using 3-ONOP-49.1.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 5 – LT-3-498 Fails High" (actuates TFF1MACH=T)		
	BOP	Observes alarms C-5/3 & 6/3, & D-7/6
	SRO	Directs response using 3-ONOP-049.1.
	SRO	Observes indicator LT-3-498 failing low and compares to adjacent loops and known plant parameters and conditions.
	SRO	Verifies no off-normal conditions exist on the adjacent channels.
	BOP	Manually controls FCV-3-498 and returns S/G level to program using 3-ARP-097.CR
	BOP	When 3C S/G level on program, selects LT-3-498 for FCV-3-478 control & returns FCV-3-478 to AUTO.
	SRO	Refers to LCO 3.3.1, Table 3.3-1, and Table 3.3-2 and determines the minimum channels for S/G level are OPERABLE.
		EXAMINER NOTE When the SRO determines the minimum channels of S/G level are OPERABLE, proceed to Event 7.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 7 Page 1 of 4 Event Description: A common Main Feed Header break occurs, the crew will respond to the reactor trip using 3-EOP-E-0. When the reactor trips, the main turbine fails to trip automatically, the crew manually trips the main turbine.		
Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 6 – FEED HEADER BREAK" **(actuates TVFAHDR2 1.0 5 min ramp)**		
	BOP	Recognizes and reports lowering SG levels and feedwater flows • Annunciators C-5/1 thru 5/3 (SG steam > feed flow) • Annunciators D-6/1 thru 6/3 (SG level deviations) • Indicated feedwater flow < steam flow for all SGs • Slowly dropping level in all SGs
	SRO	Directs a manual trip of the reactor
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	Performs immediate actions of 3-EOP-E-0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing Determines SI not actuated

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 7 Page 2 of 4

Event Description: A common Main Feed Header break occurs, the crew will respond to the reactor trip using 3-EOP-E-0. When the reactor trips, the main turbine fails to trip automatically, the crew manually trips the main turbine.

Time	Position	Applicant's Actions or Behavior
	BOP	Performs immediate actions of 3-EOP-E-0: Manually trips the main turbine. • Turbine stop valves closed • Manually closes MSR steam supply MOVs • Mid & East GCBs open Verifies power to emergency 4kV buses Determines both 3A & 3B 4kV buses energized with 3D 4kV bus energized from 3B 4kV bus
		Crew critical task: manually trip the turbine prior to completing immediate operator actions.
		EXAMINER NOTE: When the BOP manually trips the main turbine the simulator malfunction that disables all AFW will automatically insert.
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	CREW	Monitors 3-EOP-E-0 Foldout page (see page 13 for foldout)
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification.
	BOP	Performs 3-EOP-E-0 Attachment 3 Prompt Action Verification • Places Main Feed pump HS to STOP • Places FWIV MOV-3-1407, 1408 & 1409 HS to CLOSE
	BOP	Directs SNPO to align PAHMS per 3-OP-094

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

Event Description: A common Main Feed Header break occurs, the crew will respond to the reactor trip using 3-EOP-E-0. When the reactor trips, the main turbine fails to trip automatically, the crew manually trips the main turbine.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs RO in performance of 3-EOP-E-0 subsequent actions.
	RO	Checks no AFW Pumps RUNNING May direct the FS/TO investigate C AFWP and attempt to reset the overspeed trip (3-ONOP-075 Att. 4 may be used for guidance).
	RO	Checks proper AFW valve alignment.
	RO	Verifies total AFW flow less than 345 gpm.
	STA	STA observes a RED PATH for Loss of Secondary Heat Sink and recommends entry to 3-FRP-H-1
	SRO	Transitions to 3-FRP-H-1

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

Event Description: A common Main Feed Header break occurs, the crew will respond to the reactor trip using 3-EOP-E-0. When the reactor trips, the main turbine fails to trip automatically, the crew manually trips the main turbine.

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 $\geq$ 180°F

   OR

   Containment radiation levels $\geq 1.3 \times 10^5$ 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[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.

Op-Test No.: 2009-301 Scenario No.: 6 Event No.: 8 Page 1 of 2

Event Description: During the reactor trip response, the "A" AFW turbine steam admission valve fails to open, the "B" AFW governor develops an oil leak and the "C" AFW turbine trips on overspeed. The crew transitions to 3-FR-H-1 to initiate Feed and Bleed.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs 3-FRP-H-1 response
		CAUTIONS • *If total feed flow has been reduced to less than 345 gpm due to procedural requirements and 345 gpm total feed flow is available, then this procedure shall NOT be performed.* • *Feed flow should NOT be reestablished to any faulted S/G if a non-faulted S/G is available.*
	RO	Determines RCS pressure > intact SG pressure Determines RCS Tavg >350°F
		CAUTIONS • *If wide range level in any S/G is less than 22% [narrow range level in all S/Gs less than 32%] and required feedwater flow can NOT be immediately restored or PRZ pressure is greater than or equal to 2335 psig due to loss of secondary heat sink, RCPs should be stopped and Steps 11 through 19 should be initiated immediately for bleed and feed.* • *If CST level decreases to less than 10%, makeup water sources for CST will be necessary to maintain secondary heat sink.*
	RO	Observes SG wide range levels less than 22%
	SRO	Directs immediate transition to steps 11-19 of 3-EOP-FR-H.1.
		CAUTION *Steps 11 through 19 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.*
	RO	Stops all RCP's
	RO	Manually initiates SI & Containment Isolation phase A
	RO	Verifies 2 Unit 3 HHSI pumps running Verifies SI valve amber lights on VPB – ALL BRIGHT

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

Event Description: During the reactor trip response, the "A" AFW turbine steam admission valve fails to open, the "B" AFW governor develops an oil leak and the "C" AFW turbine trips on overspeed. The crew transitions to 3-FR-H-1 to initiate Feed and Bleed.

Time	Position	Applicant's Actions or Behavior
	RO	Verifies PORV block MOVs open and energized
	RO	Opens both PORVs for adequate RCS bleed path.
	BOP	Verifies Instrument Air Containment Isolation, CV-3-2803 – OPEN AND Verifies instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG
	RO	Verifies RCS heat removal adequate by observing both PORV's and both PORV block valves OPEN.
		Crew critical task: Initiate feed and bleed cooling so that the RCS depressurizes sufficiently for HHSI injection flow to occurprior to completing step 16 of 3-EOP-FR-H.1.
		EXAMINER NOTE **The scenario is terminated when the crew verifies RCS Feed & Bleed using of 3-EOP-FR-H.1 step 16.**

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:	6	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. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

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 5.52.2.3

Unit 3 Status

Reactor Operator

Mode:	1
Power:	6
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.

TP-2009-301 Scenario #7 Event Description

Facility:	Turkey Point	Scenario No.:	7 MOD	Op Test No.:	2009-301
Examiners:		Candidates:			US
					RO
					BOP

Initial Conditions: Mode 2, 6% power, MOL. Turbine rolling at 1800 RPM ready to sync generator to grid.

Turnover: Equipment OOS: 3B charging pump. Scheduled return to service in 14 hours. The National Weather Service has issued a severe thunderstorm warning for Miami-Dade County

Immediately after shift turnover place unit on line and increase power using 3-GOP-301 beginning with step 5.52.2.3. Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map. The shift manager has granted permission to perform the evolution.

Event No.		Event Type*	Event Description
1		(N) ALL	Place unit on line using 3-GOP-301 beginning with step 5.52.2.3 Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.
2	TVKD001X = 1.0 / 2 min ramp TFK3B11S = T	(C) SRO/BOP	The 3A TPCW pump bearing fails and the 3B TPCW pump fails to automatically start. The crew responds using 3-ONOP-008 or the ARP and manually starts the 3B TPCW pump.
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). The crew responds using 3-ONOP-049.1 to manually control 3B S/G level and avoid a reactor trip.
4	TFB1LTHV=T	(I) RO/SRO	VCT level transmitter LT-3-115 fails high. The crew responds using the ARP and 3-ONOP-46.4 and places LCV-3-115A, control switch to the VCT Position.
5	TFS1MREH = T TFSVV13A = T	(R) SRO/BOP	PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew will eventually direct local isolation of CV-3-1608.
6	TVUJINF = 0.95 TVUJINFB=0.95 TVUJINFC=0.95 TVUJINFD=0.95		Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds using 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.
7	TFP8SWYD = T TFQ5GAFS = T TFQ6XABF = T TFFXM05 = T K30P11BG = F K30P11BR = F	(M) ALL	The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. Power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

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

Turkey Point 2009-301 Scenario #7

Event 1 - Place unit on line using 3-GOP-301 beginning with step 5.52.2.3 Increase load, place the feed regulating valves in automatic and hold power at 30% for a flux map.

Event 2 – The 3A TPCW pump bearing fails and the 3B TPCW pump fails to automatically start. The crew responds using 3-ONOP-008 or the ARP and manually starts the 3B TPCW pump.

Event 3 - 3B S/G controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). The crew responds using 3-ONOP-049.1 to manually control 3B S/G level and avoid a reactor trip.

Event 4 - VCT level transmitter LT-3-115 fails high. The crew responds using the ARP and 3-ONOP-46.4 and places LCV-3-115A, control switch to the VCT Position.

Event 5 - PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew will eventually direct local isolation of CV-3-1608.

Event 6 - Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds using 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 breaker failure. 3A EDG fails to start and can not be manually started.

Event 7 - The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. **Critical Task**. Seal injection will be isolated to all RCP's **Critical Task**. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Scenario XXV NRC 7 Simulator Operating Instructions

Setup

- Restore to IC 195 (Mode 2 MOL 6% power)
- Open & execute lesson file SRO_XXV_NRC_7.lsn
- Place simulator in run

Trigger lesson step:

- SETUP – 3B Charging pump OOS. Removes 3B charging pump from service.

  (Actuates TAB1POSM = RACKOUT)

- SETUP - 3B TPCWP AUTO START FAIL
- SETUP - 3A EDG START FAIL
- SETUP - 3B EDG BKR 3AB20 Fails to Close
- SETUP - MOV-3-1405 FAILS TO OPEN
- Place simulator in freeze.
- Place clearance info tag on 3B Charging Pump start switch
- Provide shift turnover checklists
- Provide power ascension guidelines
- Provide an in progress copy of 3-GOP-301 complete to step 5.52.3
- Set ERDADS on VPA and at the RCO desk to the Utilities screens.
- Perform Simulator Operator Checklist

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

Event 1 - Place unit on line

Initiated by crew based on shift turnover.

The crew performs 3-GOP-301 beginning at step 5.52.2.3 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.

If directed, respond as SM that auto synchronization is to be used for placing the main generator on line. (Step 5.54 is n/a)

If directed, respond as System and acknowledge Unit 3 to be synchronized and increasing power to 30% (135 MWe). If asked about VARS, request 100 MVAR out at 100% power.

If directed, respond as Chemistry when notified to sample for 15% power change.

If directed, respond as FS/TO to commence purging MSRs using 3-OP-072.1

If directed, respond as FS/TO to complete 3-OP-072 section 5.0, place steam traps in service. After 7-10 min. report complete.

If directed, respond as FS/TO to complete local actions to initiate MSR tube bundle purge using 3-OP-072.1.

If directed, respond as FS/TO to verify GCM filter free of oil & set H2 gas flow at 16. After 2-4 min., report complete.

If directed, respond as FS/TO 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.

If directed, 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.

If directed, respond as FS/TO to check PSS voltmeter inside the voltage regulator cabinet. Report back that meter reads zero volts.

If directed, respond 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.

If directed, respond as Reactor Engineering, request power be held at 30% until flux map complete.

If directed, respond as FS/TO to verify 3-OSP-089 step 7.1.2 completed during turbine startup. Report that this surveillance requirement met satisfactorily.

If directed, respond as FS/TO about status of hydrogen gas dryer. Report that it is in service.

If directed, respond as FS/TO to begin placing MSRs in service using 3-OP-072.1.

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

Event 2 - 3A TPCWP bearing failure

When directed, trigger lesson step EVENT 2 - 3A TPCWP BEARING FAILURE (actuates TVKD001X = 1.0 on 2 min ramp).

The 3A TPCW pump bearing fails and the 3B TPCW pump fails to automatically start. The crew responds using 3-ONOP-008 or the ARP and manually starts the 3B TPCW pump.

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

If directed, respond as FS/TO 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.

If directed, respond as FS/TO 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.

If directed, respond as FS/TO 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.

If directed, respond as FS/TO to check temperature of components cooled by TPCW. After 8-10 min., report all temperatures stable.

If directed, respond as WCC, 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

When directed, trigger lesson step EVENT 3 - FT-3-487 FAILS HIGH (actuates TF1M87H = T).

3B S/G controlling feed flow transmitter FT-3-487 fails high causing 3B FRV (FCV-3-488 to fail closed). The crew responds using 3-ONOP-049.1 to manually control 3B S/G level and avoid a reactor trip.

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

If directed, respond as FS/TO 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 VCT level transmitter LT-3-115 fails high.

When directed, trigger lesson step EVENT 4 LT-3-115 fails high (actuates TFB1LTHV=T)

VCT level transmitter LT-3-115 fails high. The crew responds using the ARP and 3-ONOP-46.4 and places LCV-3-115A, control switch to the VCT Position.

If directed, respond as WCC to generate a work order and contact maintenance.

Event 5 - PT-3-1608 fails high / CV-3-1608 fails open

When directed, trigger lesson step EVENT 5 - PT-3-1608 FAILS HIGH / CV-3-1608 FAILS OPEN (actuates TFS1MREH = T & TFSVV49D=0.1 then TFSVV13A = T 5 sec later).

PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew will eventually direct local isolation of CV-3-1608.

If directed, respond as FS/TO 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

If directed, respond as FS/TO, wait 2-4 min then **trigger lesson step EVENT 5 - 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.

If directed, respond as WCC to get Mechanical assistance in isolating 3C SG ADV.

Event 6 - Exciter air cooler TPCW blockage / Reactor trip

When directed, trigger lesson step EVENT 6 - 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 using 3-ARP-097.CR for annunciator E-9/4. When exciter hot gas temperature reaches 90°C, the crew manually trips the reactor and 3-EOP-E-0 immediate actions are performed.

Events 7 - Loss of all AC power

After the immediate actions of 3-EOP-E-0 are completed, trigger lesson step EVENT 7 - LOSS OF SWITCHYARD (actuates TFP8SWYD = T, K30P11BG = F, K30P11BR = F, TCE2E01T = T & TCE2E07T = T).

The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

If directed, respond as FS/TO to locally trip 3B1 & 3B2 CWP breakers 3AB16 & 3AB18. **Trigger lesson step EVENT 7 - TRIP 3AB16 AND 3AB18** (actuates TCK4CC = F then TCK 4DC = F 1 min later). Report when complete.

If directed, respond as FS/ANPO 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.

When directed by the lead examiner, respond as FS/ANPO to remove the 3B EDG output breaker failure, **trigger lesson step EVENT 7 – REMOVE 3AB20 FAILURE.**

When directed by the lead examiner, respond as FS/ANPO to locally close the 3B EDG output breaker, **trigger lesson step EVENT 7 – Locally close 3AB20** (actuates TCQ5B20C=T). Report when complete.

If directed, respond as FS/SNPO to check which unit CCW is supplying cooling to the U4 HHSIPs. Report that U4 CCW is supplying U4 HHSI pumps.

If directed, respond as FS/SNPO locally open MOV-3-843A or B. After 2-4 min., **trigger either lesson step EVENT 7 - LOCALLY OPEN MOV-843A** (actuates TFMVV01O = T) **or EVENT 7 - LOCALLY OPEN MOV-843B** (actuates TFMVV02O = T). Report when complete.

If directed, respond as FS/SNPO to locally isolate RCP seals by closing 3-297A/B/C, MOV-3-381 & MOV-3-626. **Trigger lesson step EVENT 7 - 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.

If directed, respond as FS/TO open AFSS-3-007 to restore train 2 steam flow to C AFWP. After 1-3 min., **trigger lesson step EVENT 7 - OPEN AFSS-3-007** (actuates TAFF07 = 1.0 on 30 sec ramp). Report when complete.

If directed, respond as FS/TO to deenergize and close MOV-3-1405. After 1-3 min., **trigger lesson step EVENT 7 - DEENERGIZE MOV-1405** (actuates TCF5MA27 = F). Report when complete.

If directed, respond as FS/TO to report the 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.

If directed, respond as U4 RO of 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.

If directed, respond as FS/TO to start a SFP cooling water pump. **Trigger lesson step EVENT 6 - START SFP Cooling Pump** (actuates TCC4CL15 = T) and report when complete

If directed, respond as FS/SNPO 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.: 7 Event No.: 1 Page 1 of 8

Event Description: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs the evolution
	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 1005 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).

Op-Test No.: 2009-301 Scenario No.: 7 Event No.: 1 Page 2 of 8

Event Description: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

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.)

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

Event Description: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

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	8. Slowly adjust the AC regulator control to null the AC-DC regulator mismatch meter.
	BOP	9. Place the Voltage Regulator Control Switch in the ON position.
	BOP	10. Place the Generator Synchronizing East Bus Control in the MANUAL position.
	BOP	11. Adjust the turbine speed using the Generator Governor Speed Changer Control until the synchroscope Indicator is rotating slowly in the FAST direction.
	BOP	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: [Commitment Step 2.3.11 - CAPR] • 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.*

Op-Test No.: 2009-301 Scenario No.: 7 Event No.: 1 Page 4 of 8

Event Description: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

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.*

Op-Test No.: 2009-301 Scenario No.: 7 Event No.: 1 Page 5 of 8

Event Description: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

Time	Position	Applicant's Actions or Behavior
	RO / BOP	5.55 Perform the following to increase turbine load: [Commitment Step 2.3.11 - CAPR] 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. (Reference Attachment 5 for operation of the SDTA controllers.) 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.

Op-Test No.: 2009-301 Scenario No.: 7 Event No.: 1 Page 6 of 8

Event Description: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

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 1005 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 1005 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 1005 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: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

Time	Position	Applicant's Actions or Behavior
	RO	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	5.59 Notify Chemistry Lab that RCS sampling is required by Technical Specification 3.4.8.
	BOP	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.
		Examiner 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: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level contrd to main feed reg valves controlling in automatic.

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	Transfers the steam generator level controls to automatic
		Examiner Note: Surrogate transfers all FRVs to automatic control.
	SUR	5.61.5 Verify that each S/G level is being automatically controlled. 5.61.6 Verify the main feedwater control valves are in AUTO: • FCV-3-478 • FCV-3-488 • FCV-3-498 5.61.7 Verify the FW Bypass Valves are CLOSED: • FCV-3-479 • FCV-3-489 • FCV-3-499

Once feed regulating valves are placed in automatic,direct the facility operator to trigger event 2 - 3A TPCWP BEARING FAILURE.

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Event Description: The 3A TPCW pump bearing fails and the 3B TPCW pump fails to automatically start. The crew responds using 3-ONOP-008 or the ARP and manually starts the 3B TPCW pump.

Time	Position	Applicant's Actions or Behavior
	RO	Observes I-5/1, 5/2 & 5/4 alarms
	SRO	Directs response per 3-ONOP-008 or the ARP
	BOP	May start the 3B and stop the 3A TPCW pump using the ARP
		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 2008-803)* **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.

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Event Description: The 3A TPCW pump bearing fails and the 3B TPCW pump fails to automatically start. The crew responds using 3-ONOP-008 or the ARP and manually starts the 3B TPCW pump.

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-3-4583 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: The 3A TPCW pump bearing fails and the 3B TPCW pump fails to automatically start. The crew responds using 3-ONOP-008 or the ARP and manually starts the 3B TPCW pump.

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 A-R 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 80 deg (R-347 pt 5 or 6), THEN reduce load to 80% power. d. IF Generator Exciter temperature reaches 85 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.

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Event Description: The 3A TPCW pump bearing fails and the 3B TPCW pump fails to automatically start. The crew responds using 3-ONOP-008 or the ARP and manually starts the 3B TPCW pump.

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 8/5, 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). The crew responds using 3-ONOP-049.1 to manually control 3B S/G level and avoid a reactor trip.

Time	Position	Applicant's Actions or Behavior
When the crew has started the 3B TPCW pump, direct the facility operator to trigger event 3 - EVENT 3 - FT-3-487 FAILS HIGH.		
	BOP	Observes 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
	SRO	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	Verify instrument loop failure by comparison to adjacent loops and known plant parameters and conditions.
	BOP	Verify no off-normal conditions exist on the adjacent channels which are to remain in service.

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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). The crew responds using 3-ONOP-049.1 to manually control 3B S/G level and avoid a reactor trip.

Time	Position	Applicant's Actions or Behavior
	BOP	Verify applicable control transfer switches are in the position which eliminates the failed loop.
		Examiner Note: transfers controlling FW flow channel for 3B SG to channel IV. Steam flow may also be transferred.
	BOP	IF a control function was placed in manual control due to the failure, THEN verify the control function is returned to automatic.
	SRO	Refer to Technical Specifications 3/4.3, Instrumentation, AND verify the minimum channels operable.
		Examiner 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	3 stm. gen. level and 2 stm./feed-water flow mismatch in each stm. gen.	1 stm. gen. level coin-cident with 1 stm./feed-water flow mismatch in same stm. gen.	1 stm. gen. level and 2 stm./feed-water flow mismatch in same stm. gen. or 2 stm. gen. level and 1 stm./feedwater flow mismatch in same stm. gen.	1, 2	6
13. Undervoltage--4.16 KV Busses A and B (Above P-7)	2/bus	1/bus on both busses	2/bus	1	12
14. Underfrequency-Trip of Reactor Coolant Pump Breaker(s) Open (Above P-7)	2/bus	1 to trip RCPs***	2/bus	1	11
15. Turbine Trip (Above P-7) a. Autostop Oil Pressure b. Turbine Stop Valve Closure	3 2	2 2	2 2	1 1	12 12

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

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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). The crew responds using 3-ONOP-049.1 to manually control 3B S/G level and avoid a reactor trip.

Time	Position	Applicant's Actions or Behavior
		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 17 of 53) FAILED CHANNEL BISTABLE LIST

F-3-487 Steam Generator B Main Feedwater Flow Ref Dwgs 5610-T-L1, Sh 19; 5610-T-D-17

Max Deviation As Compared to other Channels
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

RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNC-TION	LOGIC AFFECTED
18	BS-3-488B-1	FW to SF Mismatch Logic	S/G B STM-FW FLO DEV FC488B1		P	1/2 channels on 1/3 S/G low level (10%) with 1/2 low feedwater flow (466,000 lb/hr <steam flow) on same S/G
18	BS-3-488B-2	SF > FW Alarm		C 5/2 SG B STEAM > FEED	C	
18	BS-3-488C	FW > SF Alarm		C 4/2 SG B FEED > STEAM	C	

		Note: Determines BS-3-488B1, BS-3-488B2, and BS-3-488C need to be tripped.

When the SRO has determined which bistables to trip, direct the facility operator to trigger event 4 - EVENT 4 - LT-3-115 FAIL HIGH.

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Event Description: VCT level transmitter LT-3-115 fails high. The crew responds using the ARP and 3-ONOP-46.4 and places LCV-3-115A, control switch to the VCT Position.

Time	Position	Applicant's Actions or Behavior
	RO	Observes alarm A 4/6 and LCV-3-115A in the DIVERT position.
	SRO	Directs response using ARP or 3-ONOP-46.4
		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	Verify alarm by comparing VCT level on LI-3-115 (VP-A) with LT112 on ERDADS Chemical & Volume Control System displayor by local indication.
	RO	Places LCV-3-115A control switch to VCT position.
	SRO	Transitions to 3-ONOP-46.4
	SRO	Directs response using 3-ONOP-46.4
	SRO	Check boric acid or primary water makeup flow rates– NORMAL and goes 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	Checks VCT Level Transmitter, LT-3-115, Failed High
		CAUTION ***With no operator action, LT-3-115 failed high will result in loss of suction to the charging pumps.***

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Event Description: VCT level transmitter LT-3-115 fails high. The crew responds using the ARP and 3-ONOP-46.4 and places LCV-3-115A, control switch to the VCT Position.

Time	Position	Applicant's Actions or Behavior
		NOTE *Failure of LT-3-115 high will result in the following:* • *Annunciator Alarm A 4/6 VCT HI/LO LEVEL.* • *Full divert of valve LCV-3-115A to the CVCS holdup tank.* • *No auto makeup.* • *No auto swap over to the RWST.*
	RO	Places LCV-3-115A control switch to VCT position.
	SRO	Goes to step 41
		Notifies failure of LT-3-115 to WCC
Direct the facility operator to triggerEVENT 5 - PT-3-1608 FAILS HIGH / CV-3-1608 FAILS OPEN.		

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Event Description PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew will eventually direct local isolation of CV-3-1608.

Time	Position	Applicant's Actions or Behavior
	BOP	Observes 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 on ERDADS • Steam noise present • 3C SG steam flow indication • Primary plant responses, Tavg indication, reactor power increase
	RO	Observes 4-5% reactor power increase Observes Tavg < Tref
	SRO	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.
	SRO	When informed of CV-3-1608 failure, directs local isolation of CV-3-1608

Op-Test No.: 2009-301 Scenario No.: 7 Event No.: 5 Page 2 of 2 Event Description PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%. The crew will eventually direct local isolation of CV-3-1608.		
Time	Position	Applicant's Actions or Behavior
	BOP	Reduces turbine load to match Tavg = Tref Attempts manual closure of CV-3-1608 & determines CV-3-1608 failed open Directs NSO locally investigate CV-3-1608 Relays report from NSO of steam coming from unit 3 silencer Directs NSO locally close CV-3-1608 isolation valve Relays report from NSO that steam fbw not completely stopped with isolation valve closed. Adjusts turbine load as necessary to match Tavg = Tref
	SRO	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
When the crew has stabilized power, direct the facility operator to trigger EVENT 6 - EXCITER AIR COOLER TPCW BLOCKAGE		

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Event Description: Main generator exciter air coolers TPCW flow is partially blocked resulting in a high air temperature condition. The crew responds using 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 breaker failure. 3A EDG fails to start and can not be manually started.

Time	Position	Applicant's Actions or Behavior
	BOP	Observes alarm E-9/4
	SRO	Directs response using ARP
		CAUTION ***Switchyard voltage should be maintained at or above 233 Kv. Actions may be necessary to maintain Switchyard voltage greater than or equal to 233 Kv.***
		NOTES • *An increasing trend in point 5 or 6 without a corresponding increase in point 7 or 8 (respectively) is indicative of a possible instrument problem.* • *Hot air temperatures need to be maintained less than 90 degrees C, and cold air temperature limitations are required to be followed in order to preclude equipment damage.* • *All voltage changes should be coordinated through System Operations.*
	BOP	Verifies alarm using recorder R-3-347 (VPA) Monitors exciter air temperature closely
	SRO	Determines hot air temp > 90°C & no expectation of fast recovery Directs reactor trip Directs crew perform immediate actions of 3-EOP-E-0.
	RO	Manually trips the reactor

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson stepEVENT 7 – LOSS OF SWITCHYARD		
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	Performs immediate actions of 3-EOP-E-0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing
	BOP	Performs immediate actions of 3-EOP-E-0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSIV's • Mid & East GCBs open Verifies NO power to emergency 4kV buses
	SRO	Transitions to 3-EOP-ECA-0.0

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDGoutput breaker. Seal injection will be isolated to all RCP's. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 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	Performs immediate actions of 3-EOP-ECA-0.0: Verifies reactor trip • Rod bottom lights on & RPIs at zero • Rx trip & bypass bkrs open • Neutron flux decreasing
	BOP	Performs immediate actions of 3-EOP-ECA-0.0: Verifies turbine tripped • Turbine stop valves closed • Manually closes MSIV's • Mid & East GCBs open
	RO	Checks PRZ PORVs – CLOSED
	RO	Closes Letdown isolation valves
	RO	Checks Excess letdown isolation valves – CLOSED
	BOP	Checks all two AFW Pumps RUNNING
	BOP	Establishes total AFW flow of 270 gpm.

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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	Verify 4KV bus stripping using ATT. 1 and 2 (see pages 24 & 25)
	RO	Verify SI - RESET
		EXAMINER NOTE: The SRO will probably choose to implement Attachment 2 for expediency since the 3D 4kv bus is aligned to the 3B 4kv bus. Either attachment is acceptable. See the following two pages for ATTACHMENTS 1 and 2
	SRO	Checks the A and B 4KV buses de-energized and goes to step 6.
	RO	Verifies The A And B 4KV Bus Lockout Relays – RESET
	RO	Directs FS/ANPO to locally reset 3A emergency diesel start failure relay by depressing the alarm reset pushbutton. The relay WILL NOT reset.
		Examiner Note: FS/ANPO reports failure of the 3A EDG turbocharger
	RO	Verifies 3B Emergency Diesel Generator Lockout Relays- RESET
		EXAMINER NOTE: Go to page 26

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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	**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.

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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	**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.

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Sealinjection will be isolated to all RCP's. 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 * 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.
		Examiner Note: The crew will direct the FS/ANPO to locally close the 3B EDG output breaker 3AB20. Do not direct the facility operator to perform this action until the completion of step 13 on page 29.

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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
		Examiner Note: The RO and SRO continue in 3-EOP-ECA-0.0. Steps completed depend on timing of restoration of power to 3B 4KV bus. Once power is restored, the SRO will go to step 32. Scenario details for the step commence on page 35
		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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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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-NOP-030, COMPONENT COOLING WATER SYSTEM 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
		Examiner Note: Determines Pzr level can not be maintained >17%, starts U4 HHSIP when MOV-3-843A/B opened.

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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
		CREW CRITICAL TASK: Isolate RCP seal injection to the RCPs prior to the completion of step 13 of 3-EOP-ECA 0.0.
		Examiner Note: When the crew directs RCP seal isolation, direct the facility operator to trigger EVENT 7 - REMOVE 3AB20 FAILURE.
		Examiner Note: After the facility operator has removed the 3AB20 failure, direct the facility operator to trigger EVENT 7 - LOCALLY CLOSE 3AB20
		CREW CRITICAL TASK: Restore power to the 3B 4kv bus prior to the completion of step 10 of 3-EOP-ECA 0.0.
		Examiner Note: Power should be restored to the 3B 4kv bus, the SRO will go to step 32. Scenario details for the step commence on page 35
	RO	**14** **Check S/G Status** a. Main steam line 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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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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.
		Examiner 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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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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 8%[32%] — a. Maintain maximum AFW flow until narrow range level greater than 8%[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.
	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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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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, **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.* **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.*

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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 a. **WHEN** SI actuated, **THEN** do Steps 28b, 29, 30 and 31. Continue with Step 32 b. Verify SI - RESET
	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 a. Manually stop fans. b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT b. Manually align equipment for Control Room emergency recirculation.

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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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 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. b Check 3A and 3B 4KV buses - AT LEAST ONE ENERGIZED 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) 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-026.3, DC EQUIPMENT AND INVERTER ROOM SUPPLEMENTAL COOLING. 5) Observe CAUTION prior to Step 15 AND 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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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. 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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The crew transitions to 3-EOP-ECA-0.0. MOV-3-1405 will fail to open. The power will be restored to the 3B 4kV bus by locally closing the 3B EDG output breaker. Seal injection will be isolated to all RCP's. Transition is made to 3-EOP-ECA-0.2 due to the effects of the steam leak.

Time	Position	Applicant's Actions or Behavior
	SRO	**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 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.
		Examiner Note: SRO determines Pzr level , 17%, directs transition to 3-EOP-ECA-0.2
		Examiner Note: The scenario is terminated when transition has been made to 3-EOP-ECA-0.2 or earlier, at the discretion of the lead evaluator.