

Scenario Outline

Facility: Pilgrim Scenario No.: 1 Op-Test No.: 1
 Examiners: _____ Operators: _____

 Initial Conditions: 100% RCIC OOS, 'A' APRM Bypassed

 Turnover: Reduce reactor power to 50% in prep for backwash, shift TBCCW pumps for maintenance to perform vibration tests.

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	N-BOP	Shift TBCCW pumps for maintenance vibration test
2	N/A	R-RO	Reduce reactor power for thermal backwash
3	I/O	C-RO	'A' Recirc scoop tube lockup
4	CW03	I-BOP	TBCCW pump trip with failure to auto-start of other pump
5	FW23	C-RO	FWLC transmitter fails high
6	MS01/ FW01	M-ALL	Steam line break inside containment with all reactor feed pumps tripping on the scram
7	HP04	C-BOP	HPCI flow controller fails downscale

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

Operator Actions

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Event Description: Shift TBCCW Pumps for Maintenance Vibration Test

Time	Position	Applicant's Actions or Behavior
	CRS	Direct Starting 'B' TBCCW pump and securing 'A' TBCCW pump IAW PNPS 2.2.31 section 7.6.
	BOP	Start 'B' TBCCW pump. Verify proper indications, TBCCW system pressure between 50 and 60 psig.
	BOP	Secure 'A' TBCCW pump. Monitor/verify proper system response.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 1 </u> Event No.: <u> 2 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: Reduce Power for Thermal Backwash Using Recirc		
Time	Position	Applicant's Actions or Behavior
	CRS	Brief/Direct power reduction. IAW PNPS 2.1.14 section 7.3.
	CRS	Inform I&C standby to adjust AGAFs to less than or equal to 0.975.
	RO	Perform channel check PBDS IAW PNPS 2.1.5.
	RO	At Panel 904, use the Recirc. Pump speed controllers to lower core flow to 40Mlbm/hr.
	BOP	Verify SPEED LOAD CHANGER position 100 percent.
	RO	Plot position on power to flow map.
	RO	Monitor power, pressure and level.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 1 </u> Event No.: <u> 3 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: 'A' Recirc Scoop Tube Lockup		
Time	Position	Applicant's Actions or Behavior
	RO	Acknowledges /announces 'A' recirc tube lockup alarms. Verifies by RED A" Recirc pump lockup light lit on 904.
	CRS	Directs entry into 2.4.19.
	CRS	Direct assessment of power to flow conditions.
	RO	Plot power and flow on power to flow map.
	RO	Monitor PBDS recorders for oscillations (no oscillations noted).
	RO	Ensures loop flows balanced IAW PNPS 2.1.5.
	RO	Determine cause to be loss of signal based on speed signal indication.
	CRS	Notify I&C to investigate and repair.
	CRS	Request licensed operator standby for manual operation of scoop tube positioner.
	CRS	Verify pump speeds within Tech Spec limits 3.6.F (within 10% above 80% power).
	CRS	Identifies need to trip Recirc pump in event of SCRAM.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 1 </u> Event No.: <u> 4 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: TBCCW Pump Trip with Failure of Standby Pump to Auto-Start		
Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledge/Announce Annunciator –trip of 'B' TBCCW pump.
	BOP	Manually start 'A' TBCCW pump.
	CRS	Direct entry into PNPS 2.4.41.
	CRS	Identify 60 second delay to feed pump trip/loss of feed.
	BOP	Monitor /verify proper system response.
	CRS	Inform EM/maintenance to investigate and repair.
	BOP	Reset Acknowledge Reset GEN MONITOR TROUBLE alarm using KAYE computer.

Operator Actions

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

Event Description: 'B' FWLC Level Instrument Fails High

Time	Position	Applicant's Actions or Behavior
	RO	Recognize/announce annunciators <ul style="list-style-type: none"> • RX FEED PUMP HI WTR LEVEL TRIP, • REACTOR WTR LEVEL HI, • RX FEED PUMP HI WTR LEVEL CHAN UPSCL in alarm
	RO/BOP	Refer to ARP.
	RO	Check FWLC range level indication and Narrow Range Level indication on C905.
	RO	Determine that channel 'B' of the FWLC range has failed upscale and is currently selected.
	RO	Select channel 'A' on the REACTOR LEVEL SELECTOR switch on C905.
	RO	Acknowledge and announce that REACTOR WTR LEVEL HI alarm has cleared.
	CRS	Direct entry into PNPS 2.4.49.
	CRS	Direct I&C to investigate and correct cause of alarm.
	CRS	Refer to Tech. Specs. Table 3.2.F.
	CRS	Enter 30 day active LCO for failure of one FWLC level instrument.

Operator Actions

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

Event Description: Steam Line Break Inside Containment – All Reactor Feed Pumps Trip on the Scram

Time	Position	Applicant's Actions or Behavior
	ALL	Identify Drywell pressure increasing
	CRS	Direct SCRAM when drywell pressure approaches 2.2 psig
	CRS	Directs entry into EOP 1 and EOP 3
	RO	Place mode switch in shutdown and enter PNPS 2.1.6.
	RO	Verify and announce the status of APRM downscals.
	RO	Verify all control rods are fully inserted.
	RO	Insert IRM and SRM detectors, select two SRMs for recording, and place selector switch for APRM/IRM to "IRM".
	RO	Verify or manually place reactor recirc pumps at minimum speed.
	BOP	Restore and maintain RPV water level between +20 inches and +40 inches. Identify/announce no RFPs operating
	CRS	Direct alternate level control using HPCI/ CRD (see Event 7)
	BOP	Starts HPCI for level control to maintain level +20 - +40 inches

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 1 </u> Event No.: <u> 6 </u> Page <u> 2 </u> of <u> 3 </u>		
Event Description: Steam Line Break Inside Containment		
Time	Position	Applicant's Actions or Behavior
	CRS	Direct RPV pressure be maintained within 900 -1040 psig using Bypass valves.
	BOP	Adjusts Bypass valves.
	CRS	Directs maximizing Drywell cooling when Drywell temperature cannot be maintained below 150 degrees.
	BOP	Maximize drywell cooling IAW PNPS 5.3.35.
	CRS	Directs Torus sprays placed in service prior to Torus bottom pressure exceeding 16 psig.
	BOP	Places Torus Spray in service IAW PNPS 5.3.35.
	CRS	Directs Hydrogen monitoring system placed in service.
	CRS	Directs ADS be placed in inhibit when/if RPV level drops below – 45 inches. NOTE: CRITICAL TASK
	BOP	Places ADS inhibit switch in INHIBIT when/if directed.
	CRS	Directs Drywell Spray initiated if/when Torus bottom pressure exceeds 16 psig. NOTE: CRITICAL TASK
	CRS	Directs Drywell Spray initiated before Drywell temperature exceeds 280 degrees.

Operator Actions

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

Event Description: Steam Line Break Inside Containment

Time	Position	Applicant's Actions or Behavior
	CRS	Determines primary containment parameters are being maintained and directs focus on EOP 1.
	CRS	Directs RPV cooldown be established not to exceed 100 degrees per hour.
	BOP	Establishes cooldown using HPCI/ Bypass valves.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 1 </u> Event No.: <u> 7 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: HPCI Flow Controller Fails Downscale		
Time	Position	Applicant's Actions or Behavior
	BOP	Recognize/announce failure of HPCI flow controller.
	CRS	Direct taking HPCI to manual control.
	BOP	Place HPCI controller in manual. Use HPCI to maintain reactor water level above TAF. NOTE: CRITICAL TASK
	CRS	Direct I&C to troubleshoot HPCI controller.
		The scenario will be terminated at the direction of the Chief Examiner after the plant has been stabilized and drywell spray is in service. Expected EAL is 3.4.1.2.

Notes: Scenario 1

1. Shift TBCCW pumps for maintenance vibes (2.2.31, Section 7.6).
2. Reduce reactor power for thermal backwash. Per power maneuver plan 2.1.14 reduce flow to 40 Mlbm/hr then consult reactor engineering.
3. 'A' Recirc scoop tube lockup, after Reactivity manipulation, 2.4.19 while still adjusting Recirc. (A pump) B pump will trip from LPCI loop select. Check power/flow map dispatch operator locally, notify EM, licensed operator standing by locally. Follow action per 2.1.6 after scram to trip Recirc pump.
4. 'A' TBCCW pump trips with fail to auto-start of other pump. 2.4.41 Manually start 'B' TBCCW pump, 60 second delay Feed pump trip if not started. C-100 gen monitor trouble must reset on Kaye investigate cause.
5. FWLC transmitter fails high (**selected**). Actual level drops, Operator must select other channel immediately or SCRAM will occur on low level. 2.4.49 place FRV in manual if this is done will SCRAM on low level. (No procedural guidance for selecting other channel). **Tech Spec entry 3.2.F**
6. Steam line break inside containment all reactor feed pumps trip on the scram (10 % with 20 minute ramp) prior to SCRAM after SCRAM then 100 percent for 10 minutes. Maximize Drywell cooling. Benchmark and SCRAM brief based on drywell press. SCRAM 2.1.6 Trip A Recirc pump. All RFPs trip on SCRAM.
7. HPCI flow controller fails downscale. Flow controller fails low conditional at 1000 GPM operator must take manual control to raise level.
8. Classify as unusual event/site area based on drywell temperature.

Actions: Pending/ Active

1. IC-14
2. RCIC INOP active
3. A APRM Bypass active
4. A scoop tube lockup pending
5. B TBCCW pump breaker trip pending
6. A TBCCW fail to start (do not put in until after pumps are swapped) C/S trip pending, delete conditional on C/S to start active
7. Steam line break inside DW 10% / 20 min ramp pending.
8. All RFPs breakers trip conditional with Mode switch to shutdown active
9. steam line break 100 % 10 min ramp conditional with M/S to shutdown active
10. HPCI flow controller fail low conditional 1000 gpm active

Critical Tasks: Scenario 1

1. Inhibit ADS if level drops to less than -45 inches (may not)
2. Manually initiate HPC maintain level above TAF
3. Spray Drywell prior to Torus bottom pressure exceeding 16 psig

EOPs ENTERED

1. EOP 1
2. EOP 3

EOP CONTINGENCY

NONE

Operator Actions

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

Event Description: Remove 'C' RFP From Service Tag-Out

Time	Position	Applicant's Actions or Behavior
	CRS	Direct removal of 'C' RFP per PNPS 2.2.96 attachment 16 section 7.3.3.
	BOP	Review PNPS 2.2.96, Attachment 16.
	BOP	<p>Performs steps 3.1[1] through [10]</p> <ul style="list-style-type: none"> • Record pump to be secured (C) • Place RFP TRIP SEQUENCE ENABLE switch in OFF position • Verify total feedwater flow is less than 60 percent • Place 'C' RFP control switch to STOP • Verify Reactor water level is stable • ACK and Reset all expected alarms • Verify 'A' and 'B' RFP motor current is less than 650 amps • Verify Aux lube oil pump for 'C' RFP auto starts • Verify 'C' RFP recirc valve close • Direct 'C' RFP Hydrogen injection valve be closed • Direct control switch SW619 taken to CLOSED
	BOP	Monitor 'C' RFP pump lube oil temperature.
	BOP	<p>When lube oil temperature cooled to 90 -110 degrees:</p> <ul style="list-style-type: none"> • Shutdown 'C' RFP Auxiliary lube oil pump.
	CRS	Direct tag out of 'C' RFP.
	BOP	Hang tag on 'C' RFP control switch.

Operator Actions

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

Event Description: Continue Shutdown

Time	Position	Applicant's Actions or Behavior
	CRS	Directs power reduction to 50 percent power using reverse order of withdrawal sheet IAW PNPS 2.1.14, Section 7.3.
	RO	Reduces power using reverse order of withdrawal sheet.
	RO	Monitors Reactor power plots power/flow on power to flow map.
	RO	If approaching monitored region, verifies both channels of PBDS operable.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 2 </u> Event No.: <u> 3 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: Rod Drift		
Time	Position	Applicant's Actions or Behavior
	RO	Acknowledges/announces rod drifting out when drive in switch released. Acknowledge Annunciator refers to ARP C905L-A3.
	RO	Verifies rod selected, identifies affected rod.
	CRS	Directs entry into PNPS 2.4.11.
	CRS	Determines power cannot be reduced further by Recirc flow.
	CRS	Directs affected rod be fully inserted.
	RO	Inserts affected rod to 00 position
	RO	Identifies rod remains at 00 position and is no longer drifting out.
	CRS	Contacts Reactor engineering to modify Rod Sequence sheet and power maneuvering guidance.
	CRS	Notifies I&C to develop troubleshooting guide IAW PNPS 3.M.1-34.
	CRS	Refers to Tech Spec 3.3.H for verifying BPWS
	CRS	Initiates condition report to document rod drift.

Operator Actions

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

Event Description: 'G' IRM Fails Upscale

Time	Position	Applicant's Actions or Behavior
	RO	Acknowledges/announces 'G' IRM HI HI alarm (refers to ARP).
	CRS	Determines 'G' IRM failed upscale.
	CRS	Direct 'G' IRM placed in BYPASS.
	RO	Places 'G' IRM in BYPASS.
	CRS	Refers to Tech Spec Tables 3.1.1 and 3.2.C.
	CRS	Initiates tracking LCO for Table 3.1.1 IRM scram.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 2 </u> Event No.: <u> 5 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: HPCI Spurious ECCS Actuation		
Time	Position	Applicant's Actions or Behavior
	ALL	Identify unexplained increase in power.
	CRS	Direct entry into PNPS 2.4.13, Unexplained Rapid Increase in Reactor Power.
	ALL	Recognize that HPCI has started.
	CRS	Direct entry into PNPS 2.4.35, "Inadvertent Initiation of Core Standby Cooling Systems".
	CRS/BOP	Inadvertent initiation is verified (Drywell < 2.2 psig/RPV level > -46 inches) on two independent instruments.
	BOP	Depress and hold the HPCI Turbine Trip pushbutton.
	BOP	After the turbine has come to a complete stop, places the Aux. Oil Pump (P-229) control switch to the PULL TO LOCK position.
	BOP	Releases the Turbine Trip push button.
	CRS/RO	Assess operating conditions by plotting power versus core flow on the Pilgrim Power/Flow Map, then perform action required IAW 2.1.14 Section 7.10.
	CRS	References 2.1.14 Section 7.10.
	RO	Monitor PBDS Recorders for any indications of power oscillations. (No indication of oscillations.)
	CRS/BOP	Check process Radiation Monitors for indications of Fuel damage. (No indication of oscillations.)
	CRS/RO	Verify that peak power and pressure did not exceed any limits.
	CRS	Investigate cause of inadvertent initiation by calling I&C.

Operator Actions

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u> 1 </u> Scenario No.: <u> 2 </u> Event No.: <u> 6 </u> Page <u> 1 </u> of <u> 2 </u>		
Event Description: 'B' RFP Trips		
	BOP	Acknowledges/announces trip of 'B' Feed pump.
	CRS	Directs entry into PNPS 2.4.49.
	RO	Acknowledges/announces lowering reactor water level approaching SCRAM setpoint.
	CRS	Directs mode placed in SHUTDOWN perform actions of PNPS 2.1.6.
	RO	Place mode switch in shutdown and enter PNPS 2.1.6.
	RO	Verify and announce the status of APRM downscapes.
	RO	Verify all control rods are fully inserted.
	RO	Insert IRM and SRM detectors, select two SRMs for recording, and place selector switch for APRM/IRM to "IRM".
	RO	Verify or manually place reactor recirc pumps at minimum speed.
	RO	Verify or manually place reactor recirc pumps at minimum speed.
	RO	Maintain reactor water level +20 - +40 inches using feedwater.
	BOP	Restore and maintain RPV water level between +20 inches and +40 inches. Identifies trip of remaining feed pump.

Operator actions

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

Event Description: 'B' RFP Trips

Time	Position	Applicant's Actions or Behavior
	CRS	Directs entry into EOP-1 based on Reactor water level
	CRS	Directs Reactor water level band +20 to +40 inches
	BOP	Announces 'A' RFP tripped on SCRAM
	CRS	Directs starting HPCI/ RCIC alternate method of level control.
	BOP	Starts HPCI/RCIC as needed to maintain water level above TAF. NOTE: CRITICAL TASK

Operator Actions

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

Event Description: LOCA

Time	Position	Applicant's Actions or Behavior
	BOP/RO	Recognize/announce rising drywell parameters.
	CRS	Recognize/announce EOP-03 entry conditions.
	RO/BOP	Report to the CRS when out of current RPV level/pressure band.
	CRS	Establish new pressure bands as the reactor depressurizes due to the leak.
	CRS	When Drywell temperature cannot be maintained < 150°F, directs that Drywell cooling be maximized. Note: Drywell area cooler load shed must be defeated to do this.
	RO/BOP	<ul style="list-style-type: none"> • Maximizes RBCCW on the 'B' loop of RBCCW • Maximizes Drywell cooling
	CRS	When Torus temperature cannot be maintained < 80°F, directs that Torus cooling be maximized.
	BOP	Maximizes RBCCW. Maximizes Torus cooling.
	CRS	Before drywell pressure reaches 16 psig, directs that Torus spray be placed in service using 'A' or 'B' RHR. Directs that Torus Spray secured if Drywell pressure goes below 2.2 psig.
	BOP	Starts Torus Spray using 'A' or 'B' RHR.

Operator actions

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

Event Description: LOCA

Time	Position	Applicant's Actions or Behavior
	CRS	<p>When Drywell pressure exceeds 16 psig:</p> <ul style="list-style-type: none"> • Verifies Drywell temperature and pressure within DSIL (Fig. 5). • Verifies torus water level below 180 inches. • Verifies Recirc pumps shutdown. • Directs that Drywell sprays be placed in service using A/B RHR loops. • Directs that Drywell spray secured if Drywell pressure goes below 2.2 psig.
	BOP	<p>Places drywell sprays in service using A/B RHR loops.</p> <p>NOTE: CRITICAL TASK</p>
	RO	<p>Recognize/announce that HPCI is not keeping up with the leak.</p>
	CRS	<p>Determines water level cannot be maintained above + 12 and establishes a new band between -125 and +45. Directs that CRD be placed in 2 pump operation.</p>
	RO	<p>Directs that the RBO lineup the CRD system for 2 pump operation.</p> <p>IF OPERATOR: If asked to line up the CRD pumps for 2 pump operation, wait 5 minutes and report that the CRD pumps are lined up for two pump operation.</p>
	RO	<p>When the Reactor Building Operator reports that the CRD system is lined up for two pump operation, starts the second CRD pump.</p>

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 2 </u> Event No.: <u> 7 </u> Page <u> 3 </u> of <u> 4 </u>		
Event Description: LOCA		
Time	Position	Applicant's Actions or Behavior
	BOP	Recognizes/announces any/all of the following: <ul style="list-style-type: none"> • RPV water level at or below –46 inches. • 2 minute timer initiated.
	CRS	Directs that the ADS Inhibit keylock switch be taken to the "INHIBIT" position.
	BOP	Places the ADS Inhibit switch in the "INHIBIT" position. NOTE: CRITICAL TASK
	CRS	Orders a cooldown at a rate < 100°F/hr. Note: The RPV should be depressurizing slowly on its own due to the medium break LOCA and the use of HPCI to maintain level.
	BOP	Monitors pressure bands established by the CRS.
	CRS	Determines water level cannot be maintained above –125. Directs that 2 or more Injection Systems, Table C lined up for injection and the pumps started.
	BOP	Lines up for injection and starts all available RHR and Core Spray pumps.
	CRS	If RPV level reaches TAF, determines that Alternate RPV Depressurization is required and enters EOP-17. <ul style="list-style-type: none"> • Determines steam cooling is not required. • Verifies Torus water level is > 50 inches. • Directs that all 4 SRVs opened.

Operator Actions

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

Event Description: LOCA

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Opens all 4 SRVs.</p> <p>NOTE: CRITICAL TASK</p>
	BOP	<p>Verifies that they have opened:</p> <ul style="list-style-type: none"> • Checks the acoustic monitor lights on Panel C171. • Checks SRV tail pipe temperatures on Panel C921.
	CRS	Asks if RPV water level can be determined.
	BOP/RO	Report that RPV water level can be determined.
	CRS	When RPV pressure goes below the shutoff head of the low pressure ECCS directs that RPV level restored and maintained +20 to +40 using the low pressure ECCS pumps.
	BOP	Restores and maintains RPV +20 and +40 using low-pressure ECCS pumps.
		<p>The scenario shall be terminated when RPV level is restored and maintained between +20 and +40 and when directed by the Chief Examiner.</p> <p>Expected EAL is "Alert" 3.4.1.2.</p>

Operator Actions

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

Event Description: LPCI Injection Valve Fails to Open

Time	Position	Applicant's Actions or Behavior
	BOP	Announces no injection flow 'B' loop during RHR 29B being closed.
	CRS	Directs RHR 29 B to be opened.
	BOP	Opens 29B and verifies injection flow.

Notes: Scenario 2

1. Remove 'C' RFP from service tag out immediately to make unavailable
2. Continue shutdown
3. Rod drift 4th rod and last rod in step 66, step 67 complete, drift out when released remove drift when 00 position reached
4. 'G' IRM fails upscale (**Tech Spec entry**) 3.1
5. HPCI spurious ECCS actuation
6. 'B' RFP trips level drops manual SCRAM on level
7. Large break LOCA ramped in 5000 gpm ramped 5 min B loop trip remaining feed pump on scram insert 1000 gpm leak other loop
8. RHR 29-B fails to open

Actions: Scenario 2 Pending/ Active

1. IC-14 ramp down to 60 percent
2. A IRM Bypassed active
3. G IRM downscale pending
4. Rod drift last rod in and 4th rod in step 66 step 67 Delete conditional on rod select light and full in light.
5. HPCI spurious actuation pending
6. B RFP breaker trip pending
7. LOCA 5000 B loop gpm ramp 5 minutes pending
8. C RFP pump breaker trip conditional with mode switch in shutdown
9. LOCA A loop 1000 gpm pending
10. RHR 29B fail to open pending

Critical Tasks: Scenario 2

1. Spray Drywell
2. Manually initiate HPCI
3. Blow down when level less – 150 inches

EOPs ENTERED

1. EOP 1
2. EOP 3
3. EOP 17

EOP CONTINGENCY

Emergency depressurization

Scenario Outline

Facility: <u> Pilgrim </u>	Scenario No.: <u> 3 </u>	Op-Test No.: <u> 1 </u>	
Examiners: _____	Operators: _____		
_____	_____		
_____	_____		
Initial Conditions: <u>20% turbine synchronized to grid, 'A' RBCCW pump out of service.</u>			
Turnover: Starting up following scram MSIV twice weekly surveillance, PNPS 8.7.4.5 needs to be performed on the 'A' Inboard and Outboard MSIVs.			
Event No.	Mal. No.	Event Type*	Event Description
1	N/A	N-BOP	MSIV twice weekly surveillance, PNPS 8.7.4.5 post work testing.
2	N/A	N-RO	Continue reactor startup.
3	I/O	C-RO	CRD FCV controller failure closed.
4	CW05	C-BOP	'B' RBCCW pump trip.
5	FW19	I-RO	FRV lockup.
6	MT03/ TC09	C-BOP	Turbine high vibration. Bypass valves fail closed 30 seconds after turbine trip.
7	IO/RD26 RD16	M-ALL	ATWS.
8	LP02/ LP01	C-RO	SLC pump failure.

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

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 3 </u> Event No.: <u> 1 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: MSIV Twice Weekly Surveillance		
Time	Position	Applicant's Actions or Behavior
	CRS	Brief/direct PNPS 8.7.4.5, "MSIV Twice Weekly Exercise". Logs the performance of the test in the Station Log Book when the test is completed.
	BOP	Reviews precautions and limitations of 8.7.4.5. Reads appropriate Notes and Cautions. Correctly performs steps of the procedure. Verifies Acceptance Criteria met.
	RO	Observes steam flows through the steam lines while the MSIVs are being tested. Announces "MSIV Not Full Open" annunciators and provides verification that the MSIV is open. Verifies the Acceptance Criteria is met.
		IF OPERATOR: When asked as the OSS to sign off the Acceptance Criteria, come in as the OSS and take the completed procedure for review.

Operator Actions

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

Event Description: Continue Raising Power Using Control Rods

Time	Position	Applicant's Actions or Behavior
	CRS	Brief/Direct power increase IAW PNPS 2.1.1 and 2.1.14.
	RO	<ul style="list-style-type: none">• Withdraws control rods in a safe and controlled manner.• Regularly checks APRM channel indications.• Plots power to flow.
	BOP	Serves as peer checker/second verifier during control rod movement.
	RO	Monitors RPV power, pressure and level.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 3 </u> Event No.: <u> 3 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: CRD FCV Controller Failure Closed		
Time	Position	Applicant's Actions or Behavior
	RO	<ul style="list-style-type: none"> Determines no rod movement while attempting to withdraw rods. Identifies CRD flow indication low. Identifies FCV failed closed.
	CRS	Directs entry into PNPS 2.4.11.1, Attachment 4.
	RO	<ul style="list-style-type: none"> Places CRD FLOW CONTROLLER to MANUAL. Control flow at 50 GPM
	RO	Check DRIVE WTR and COOLING WTR DIFF PRESS indicators adjust as needed.
	RO	Adjust DRIVE WTR PCV as necessary.

Operator Actions

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

Event Description: 'B' RBCCW Pump Trips

Time	Position	Applicant's Actions or Behavior
	BOP	Acknowledges/announces trip of 'B' RBCCW pump.
	BOP	Starts 'C' RBCCW pump.
	CRS	Directs entry into PNPS 2.4.42 section 4.4.
	BOP	Monitors/verifies RBCCW system for proper response.
	CRS	Refer to Tech Spec 3.5.B to initiate active LCO for inoperable containment cooling loop.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 3 </u> Event No.: <u> 5 </u> Page <u> 1 </u> of <u> 1 </u> Event Description: 'A' FRV Lockup		
Time	Position	Applicant's Actions or Behavior
	RO	Acknowledge announce 'A' Feed Reg. Valve Control Signal Failure.
	RO	Checks power, pressure, level.
	RO	Announces 'A' Feed Reg. Valve Lockup.
	CRS	Direct 'A' Feed Reg. Valve Placed in Manual.
	RO	Places 'A' Feed Reg. Valve Placed in Manual.
	CRS	Directs entry into PNPS 2.4.49.
	CRS	Notify I&C to investigate and repair.
	CRS	Directs actions for Reactor level control.
		Note: IF operator should call in as I&C and report that the lockup was due to the spurious blowing of a fuse and request permission to replace the fuse. If permission is given, delete malfunction.
	CRS	Direct resetting 'A' FRV.
	RO	Depress and release pushbutton for 'A' FRV Reset on C905.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 3 </u> Event No.: <u> 6 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: Turbine High Vibration Bypass Valve Fail to Open When Turbine Tripped		
Time	Position	Applicant's Actions or Behavior
	BOP	Recognize/announce "Turbine Vibration Hi" alarm. Refers to ARP C2L-A3. Checks Vibration & Eccentricity recorder (VR-3000 on Panel C2).
	CRS/BOP	Enters and executes steps of 2.4.46, "Turbine Bearing Malfunction".
	CRS	Recognizes/announces Step 4.0[1], which establishes vibration limits. Directs the crew to make note of the time which turbine bearing vibration reaches 10 mils. Attempts to reduce vibration levels by directing the RO to reduce Reactor power.
	BOP	In order to reduce Main Turbine vibrations, lowers Speed Load Changer setting.
	BOP	Places Vibration & Eccentricity recorder VR-3000 to fast speed.
	CRS	When turbine vibrations have been at 10 mils for 10 minutes, directs a reactor scram and entry into PNPS 2.1.6, "Reactor Scram" turbine trip.
	CRS	Directs a reactor scram by taking the MODE switch to the "SHUTDOWN" position and the RO to take the actions of 2.1.6. Directs RPV level maintained +20 to +40 inches and RPV pressure 900 - 1050 psig.
		NOTE: Power reduction may result in the stop valve closure scram being bypassed. If so, the plant should be scrammed when reactor pressure starts to increase due to bypass valve failure. If the stop valve closure scram is not bypassed, the reactor should be scrammed prior to turbine trip.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 3 </u> Event No.: <u> 7 </u> Page <u> 1 </u> of <u> 3 </u>		
Event Description: ATWS		
Time	Position	Applicant's Actions or Behavior
	CRS	Enters EOP-01 and immediately transitions to EOP-02 based on all controls rods not at or beyond position 02.
	CRS	Verifies the immediate actions required by EOP-02: <ul style="list-style-type: none"> • Verifies mode switch in "SHUTDOWN". • Verifies both channels of ARI initiated. • Verifies the turbine has tripped. • Recognizes reactor power is above 3%. • Verifies both Recirc. pumps are tripped.
	RO	Performs the following actions: <ul style="list-style-type: none"> • Verifies mode switch in "SHUTDOWN". • Initiates both channels of ARI. • Recognizes the turbine has tripped. • Recognizes reactor power is above 3%. • Trips/verifies tripped both Recirc. pumps.
	CRS	Orders new RPV level and pressure bands: <ul style="list-style-type: none"> • Level -25 to -45 inches. • Pressure 1000 to 1050 psig using SRVs. Orders the RO to enter into PNPS 5.3.23, "Alternate Rod Insertion".
	CRS	Direct initiation of SBLC as required by EOP-02.
	RO	Recognize/report that after starting the 'A' SBLC train, the 'A' pump starts, but the 'A' squib valve fails to fire (see Event 8).

Operator Actions

	Op-Test No.: <u> 1 </u> Scenario No.: <u> 3 </u> Event No.: <u> 7 </u> Page <u> 2 </u> of <u> 3 </u>	
	Event Description: ATWS	
Time	Position	Applicant's Actions or Behavior
	RO	Enters PNPS 5.3 23, "Alternate Rod Insertion". Determines that there is an hydraulic lock and goes to Section 2.3 of the procedure and performs it concurrently with the "General Actions" section of the procedure.
	CRS	When RPV level is determined to be greater than – 25 inches enters the 'Q' Leg of EOP-02 and performs the following steps: <ul style="list-style-type: none"> • Orders stop and prevent all injection into the vessel except from SBLC and CRD.
	RO	Closes/verifies closed the feedwater reg valves and Startup Feed Reg. Valve. NOTE: CRITICAL TASK NOTE: IF THE 'A' FRV IS STILL LOCKED, THE OPERATOR MUST CLOSE THE FEEDWATER HEATER DOWNSTREAM BLOCK VALVES OR TRIP THE RFP'S SINCE THE FRV'S CANNOT BE CLOSED. THE CRITICAL PORTION IS THAT FEED IS SECURED.
	BOP	Places the control switches for the RHR and Core Spray pumps in the PTL position. Trips/verifies stopped the HPCI turbine and places the Aux. Oil pump control switch in the PTL position. Trips the RCIC turbine. NOTE: CRITICAL TASK
	CRS	Asks the crew to report any of the following plant conditions: <ul style="list-style-type: none"> • Rx power <3% (APRM downscals are in). • RPV water level reaches –125 inches TAF.

Operator Actions

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

Event Description: ATWS

Time	Position	Applicant's Actions or Behavior
	RO	<p>Performs the following actions to reset and scram the reactor:</p> <ul style="list-style-type: none"> • Resets and verifies reset the scram using the RPS reset switch. • Places the Air Dump System Test Switch to "ISOLATE". • Waits for/verifies the "SPVAH Pressure Lo" alarm clears. • Places the Air Dump System Test Switch to "NORMAL". • Verifies either SDIV Level Hi or SDIV East Not Drained and SDIV West Not Drained alarms are clear. • Initiates a manual scram. • Verifies and announces all rods in. <p>NOTE: CRITICAL TASK</p> <p>NOTE: EXAMINER WILL CUE THE IF OPERATOR TO ALLOW RPS/ARI TO BE RESET SO THAT RODS CAN BE SCRAMMED.</p>
	CRS	<p>When all rods are in transitions to EOP-01. Orders RPV water level be restored and maintained between +20 and +40 inches. Initiates a cooldown using HPCI or SRVs at less than 100° per hour.</p>
	BOP	<p>Restores and maintains RPV level +20 to +40. Initiates a cooldown at less than 100° per hour.</p>
		<p>The scenario will be terminated at the direction of the Chief Examiner when level has been restored to between +20 and +40 and a cooldown has been initiated.</p> <p>Expected EAL is 2.3.1.3.</p>

Operator Actions

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

Event Description: SBLC Failure

Time	Position	Applicant's Actions or Behavior
	CRS	Direct initiation of SBLC as required by EOP-02 or Operations Policy Statement.
	RO	Start one SBLC system by placing the SLC ACTUATE switch to SYS 'A' or SYS 'B' position on Panel C905.
	RO	Recognize/report that after starting the 'A' SBLC train, the 'A' pump starts but the 'A' Squib valve fails to fire.
	CRS	Direct using other train of SBLC.
	RO	Start the 'B' SBLC train with the SLC ACTUATE switch.
	RO	Recognize/report that after starting the 'B' SBLC the 'B' pump trips but the 'B' Squib valve fires.
	CRS	Direct using other train of SBLC.
	RO	Start the 'A' SBLC train with the SLC ACTUATE switch.
	RO	<p>Recognize/report The 'A' SBLC pump is running injecting through the 'B' Squib valve. Verifies Boron injection based on pump discharge pressure and lowering tank level.</p> <p>NOTE: CRITICAL TASK</p> <p>NOTE: THE OPERATOR MAY CHOOSE TO USE RWCU TO INJECT BORON INSTEAD OF USING 'A' SBLC PUMP VIA 'B' SQUIB VALVE. THE CRITICAL PORTION IS THAT BORON BE EITHER INJECTED WITH SBLC OR ORDERED INJECTED WITH RWCU.</p>

Notes: Scenario 3

1. Continue reactor startup: IAW 2.1.1 using rod pull sheet
2. MSIV twice weekly surveillance, PNPS 8.7.4.5 post work testing: may only have 2-3 valves to test
3. CRD FCV controller failure closed: Initiate after Reactivity manipulation complete, identify call for repairs restore to auto
4. 'B' RBCCW pump trip: enter 2.4.42 A RBCCW tagged out auto start C RBCCW auto start failed, must start manually. Tech Spec addressed active LCO containment cooling 3.5.B.3
5. FRV lockup: 905R G8 2.4.49 place FRV in manual 2.2.82 may want to do at 30% to make sure both FRV in service.
6. Turbine high vibration bypass valve fail to open when turbine tripped:
enter 2.4.46
May use speed load changer to reduce load and stay below turbine trip bypass thus not requiring Scram if so when turbine tripped 30 seconds later bypass valve closes pressure increase requiring Scram. EPIC group display #28 manual trip required 10mils for 10 minutes
7. ATWS: EOP 2 entry Q leg stop and prevent feed -25 inches
8. SLC failure: One pump and one valve inop. must fire both sides to inject depending on sequence may require third switch cycle, must verify flow and level indications to verify injection

Actions: Scenario 3; Pending/ Active

1. IC-9
2. A RBCCW OOS active
3. FRV AUTO signal lockup pending
4. B RBCCW pump trip pending
5. C RBCCW pump C/S trip active
6. C RBCCW trip delete conditional C/S to start active
7. CRD FCV controller fail pending
8. Turbine bearing # 5 high vibs 11 mils 10 min ramp pending delete conditional turbine trip pending
9. Bypass fail to open conditional turb trip 30 second delay active
10. ATWS SDIV level inst failed both active
11. SDIV drn valve stem broken both sides active
12. SDIV 100 % both active
13. SDIV high level inst delete conditional with scram
14. SDIV stem broken delete conditional air dump system test

Critical Tasks: Scenario 3

1. Insert control rods
2. Initiate Standby Liquid
3. Q leg Stop and prevent greater than -25 inches

EOPs ENTERED

1. EOP 1
2. EOP 2

EOP CONTINGENCY

Q leg EOP 2 Alternate level control

Scenario Outline

Facility: <u> Pilgrim </u>	Scenario No.: <u> 4 </u>	Op-Test No.: <u> 1 </u>	
Examiners: _____	Operators: _____		
_____	_____		
_____	_____		
Initial Conditions: <u>100% Power, RHR Pump 'A' Tagged Out for Bearing Replacement</u>			
Turnover: Swap CRD FCV for maintenance, PNPS 2.1.37 in effect, Step 7.2(6) complete, Ops manager consulting REMVEC evaluating power reduction. In day one of seven day LCO for 'A' RHR pump OOS.			
Event No.	Mal. No.	Event Type*	Event Description
1	N/A	N-RO	Swap CRD FCV
2	N/A	R-RO	Reduce power due to report of Coastal storm
3	RP09	C-RO	RPS MG set trip
4	RD05	C-RO	CRD pump trips
5	MS14	C-BOP	SRV fails open
6	IO/ ED06	M-ALL	Degraded grid leading to LOSP
7	RC06/ IO	M-ALL	Steam leak in Secondary Containment in RCIC quad

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

Operator Actions

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

Event Description: Swap CRD FCV

Time	Position	Applicant's Actions or Behavior
	CRS	Brief/Direct changeover of flow control valves.
	RO	Establish communications between Control Room and the master control station.
	RO	At Panel C905, place FIC-340-1, CRD Flow Control, setpoint 0 GPM (controller may be left in automatic).
	RO	Direct NLO to: <ol style="list-style-type: none"> 1) Slowly open 301-40B, Standby Flow Control Valve 'B' Inlet Valve 2) Slowly open 301-41B, Outlet Valve from Standby Flow Control Valve 3) Close 301-41A, Outlet Valve from In-Service Flow Control Valve 4) Close 301-40A, Inlet Valve for the Previously In-Service Flow Control Valve 5) On local valve control panel, swap Selector Switch 3B-S1, for electrical signal to E/P unit, from valve in-service to standby valve position 6) Swap valve 301-29, CRD Air Diversion Valve to Selected Flow Control Valve, from valve in-service position to that of standby valve.
	RO	At Panel C905, slowly raise setpoint of FIC-340-1, CRD flow control, to 50 GPM, observing the flow increase as setpoint increases.
	RO	At Panel C905, check the following ΔP indicators and adjust pressures if needed: <ul style="list-style-type: none"> • Drive water differential pressure. • Cooling water differential pressure.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 4 </u> Event No.: <u> 2 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: Reduce Power Due to Report of Coastal Storm		
Time	Position	Applicant's Actions or Behavior
		Note: Cue the following: Ops manager directs power reduction below 70 percent load line IAW PNPS 2.1.14 section 7.3.
	CRS	Direct power reduction using recirc flow to 40Mlbm/hr.
	RO	Lowers Recirc flow to 40 Mlbm/hr.

Operator Actions

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

Event Description: Trip of 'A' RPS MG Set.

Time	Position	Applicant's Actions or Behavior
	RO	<ul style="list-style-type: none"> • Recognize/announce various annunciators associated with the loss of 'A' RPS bus. • Recognize/announce loss of 'A' RPS bus. • Recognize/announce annunciator "RPS MG Set A Trip" is in alarm. • Refers to ARP C905R-C1.
	CRS	Directs that action be taken per ARP C905R-C1.
	CRS	Direct transfer RPS bus 'B' to Standby Transformer (Panel C511) and reset half-scrum. NOTE: MAY CALL NLO TO THE CONTROL ROOM FOR A BRIEF PRIOR TO PLACING RPS ON BACKUP
	RO	<ul style="list-style-type: none"> • Verify ½ scram RPS Channel 'A'. • Directs TBO transfer 'A' RPS Bus to the standby transformer per 2.2.79. • Resets the ½ scram when A' RPS Bus is on the standby transformer.
	CRS	Direct I&C to determine the cause of the breaker trip and inspect equipment powered from this source for electrical faults.
	CRS	Refers to Tech Specs 3.1 and Table 3.1.1.
	BOP	Resets the Main Steam Line and Air Ejector Offgas Rad monitors.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 4 </u> Event No.: <u> 4 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: 'A' CRD Pump Trips		
Time	Position	Applicant's Actions or Behavior
	RO	Acknowledges/announces trip of 'A' CRD pump.
	CRS	Directs entry into PNPS 2.4.4.
	RO	Checks power, pressure, level. Performs immediate actions of PNPS 2.4.4: <ul style="list-style-type: none"> • Notes pressure greater than 950 psig. • No inoperable accumulator alarms.
	CRS	Directs RO to start standby CRD pump IAW with PNPS 2.4.4
	RO	<ul style="list-style-type: none"> • Transfers FCV to manual and closes. • Starts 'B' CRD pump. • Verifies pump amp and discharge pressure stabilize. • Balances deviation meter. • Transfers CRD controller to AUTO.

Operator actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 4 </u> Event No.: <u> 5 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: 'A' SRV Fails Open		
Time	Position	Applicant's Actions or Behavior
	ALL	Identify/announce 'A' SRV open.
	CRS	Direct entry into PNPS 2.4.29.
	CRS	Direct monitoring of Torus bulk temperature and note time.
	CRS	Direct BOP to attempt cycling of 'A' SRV switch.
	BOP	Cycles 'A' SRV switch identifies 'A' SRV remains open.
	BOP	Directs opening of ADS power supplies: <ul style="list-style-type: none"> • Panel D-4 Bkr #1 opened. • Panel D-5 Bkr #2 opened. NOTE: CRITICAL TASK
	BOP	Verifies 'A' SRV closes: <ul style="list-style-type: none"> • Verifies acoustic monitor indicates 'A' SRV closed.
	BOP	Directs local control of 'A' SRV be taken at ASP and closed.
	BOP	Directs reclosing of ADS power supplies: <ul style="list-style-type: none"> • Panel D-4 Bkr #1 closed. • Panel D-5 Bkr #2 closed.
	CRS	Briefs manual operation of 'A' SRV will be required if blowdown needed.

Operator Actions

Op-Test No.: 1 Scenario No.: 4 Event No.: 6 Page 1 of 3

Event Description: Degraded Grid Leading to LOSP

Time	Position	Applicant's Actions or Behavior
		Note: Cue: REMVEC notifies "can't guarantee SUT voltage will remain above 342 KV if unit trips"
	ALL	Identify/announce degraded voltage condition.
	CRS	Directs entry into PNPS 2.4.144.
	CRS	Directs/brief if voltage drops to 3868 on Bus A5 or A6 initiate SCRAM perform actions of PNPS 2.1.6.
	CRS	Direct Recirc pump scoop tube lock up be initiated.
	RO	Depresses both scoop tube lock up pushbuttons for 'A' and 'B' recirc pumps.
	CRS	Note: Either D/G may be selected first. Direct 'B' EDG started and loaded onto A6 bus.
	BOP	Places 'B' EDG in service IAW PNPS 2.4.144 Section 4.1(2).2a-o.
	ALL	Identify voltage on bus A5 drops to less than 3868 volts.
	CRS	Directs mode switch taken to SHUTDOWN and perform action of PNPS 2.1.6.
	RO	Place mode switch in shutdown and enter PNPS 2.1.6.
	RO	Verify and announce the status of APRM downscapes.
	RO	Verify all control rods are fully inserted.

Operator Actions

Op-Test No.: 1 Scenario No.: 4 Event No.: 6 Page 2 of 3

Event Description: Degraded Grid Leading to LOSP

Time	Position	Applicant's Actions or Behavior
	RO	Insert IRM and SRM detectors, select two SRMs for recording, and place selector switch for APRM/IRM to "IRM".
	RO	Manually trip Reactor Recirc Pumps.
	RO	Verify or manually trip the turbine.
	RO	Maintain reactor water level +20 - +40 inches using feedwater.
	ALL	Identify LOSP when turbine taken offline.
	BOP/RO	Report EOP-01 entry conditions.
	CRS	Enters EOP-1. Verifies: <ul style="list-style-type: none"> • Isolations. • ECCS initiations. • Emergency Diesel Generator initiations.
	CRS	Announces entry into 2.4.16, "Distribution Alignment Electrical Systems Malfunctions". Directs actions be taken per 2.4.16.
	BOP	Using PNPS 2.4.16, "Distribution Alignment Electrical Systems Malfunctions", performs the following steps concurrently: <ul style="list-style-type: none"> • Places the Fast Transfer switches A1-A6 to the "OFF" position. • Performs 5.3.6, Loss of Instrument Air. • Connects Atlas COPCO air compressor. • Verifies SSW system operation IAW 5.3.3 and 2.4.43. • Verifies RBCCW system operation IAW 2.4.42. • Verifies TBCCW system operation IAW 2.4.41.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 4 </u> Event No.: <u> 6 </u> Page <u> 3 </u> of <u> 3 </u>		
Event Description: Degraded Grid Leading to LOSP		
Time	Position	Applicant's Actions or Behavior
	All	Close/verify closed MSIVs.
	CRS	Directs that RPV level be maintained using HPCI and RPV pressure maintained using SRVs.
	RO	Maintain RPV level using HPCI +20 - +40 inches.
	BOP	Maintains RPV pressure using SRVs 900 – 1040 psig.
	CRS	Directs that CRD pump load shed be defeated per PNPS 2.4.4, "Loss of CRD Pumps".
	RO	Using PNPS 2.4.4, "Loss of CRD Pumps" calls I&C and has CRD Pump load shed defeated.
	CRS	Directs that Drywell cooler load shed be defeated per PNPS 2.4.44, "Loss of Drywell Area Coolers".
	RO	Using PNPS 2.4.44, "Loss of Drywell Area Coolers", calls I&C and has Drywell cooler load shed defeated.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 4 </u> Event No.: <u> 7 </u> Page <u> 1 </u> of <u> 2 </u>		
Event Description: Steam Leak Outside Containment RCIC Quad		
Time	Position	Applicant's Actions or Behavior
	BOP	Check/report area temperature alarms in RCIC quad.
	CRS	Enter EOP-04 on high area temperature in RCIC quad.
	CRS	Direct isolation of RCIC when report of steam leak is received.
	CRS	Direct RP to take EOP-04 surveys.
	CRS	Direct starting all area coolers.
	CRS	Before any area temperature exceeds Max Normal Value, enter EOP-04.

Operator actions

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

Event Description: Steam Leak Outside Containment RCIC Quad

Time	Position	Applicant's Actions or Behavior
	ALL	Recognize failure of RCIC to isolate.
	CRS	Direct manual isolation of RCIC.
	BOP	Attempt to manual close MO-1301-16 and MO-1301-17. Report the attempt was unsuccessful.
	CRS	Dispatch Maintenance or NLO's to attempt to close MO-1301-16 and MO-1301-17.
	CRS	When temperature exceeds Max Safe Value in two areas, exit EOP-04 pressure control leg and enter EOP-17.
	BOP	Open all SRV's: NOTE: CRITICAL TASK
		<ul style="list-style-type: none"> • Enter 5.3.24 to supplement depressurization. NOTE: CRITICAL TASK
	BOP	Verify (Acoustic Monitor or Tailpipe Temperature) that all SRV's are open.
	CRS	Exit EOP-17 and re-enter EOP-01 pressure control leg.
		<p>The scenario will be terminated at the direction of the Chief Examiner after the Emergency Depressurization is complete.</p> <p>Expected EAL is 4.2.1.3.</p>

Notes: Scenario 4

1. Swap CRD FCV
2. Reduce power due to report of Coastal storm per power maneuver plan 2.1.14
3. RPS MG set trip 905R C-1 Tech Spec 3.1., 3.11 IAW 2.2.79 direct operator to transfer to standby transformer reset recombiner temp alarm reset rad monitors
4. CRD pump trips 2.4.4 swap pumps reset annunciator
5. SRV fails open; 2.4.29 cycle switch 5 minutes until as scram required dispatch operator locally to open D-4 and D-5 breakers close SRV (**CRITICAL TASK**). tech spec ADS inop valve will operate in safety mode only
6. Degraded grid leading to LOSP 2.4.146 have BOP place a EDG on A-5 or A-6 initiate scoop tube lockup. before second EDG aligned drop voltage below 3860 to require scram. Mode switch to shutdown 2.1.6 direct MSIVs closed no circ water pumps running. EOP 1 entry due to level.
8. Steam Break outside containment RCIC break 10 percent ramped for 15 minutes. Enter EOP 4 on high temperature. A SRV disabled when 2 areas greater than max safe direct Blow down (**CRITICAL TASK**). Must direct local operation of A SRV to have 4 SRVs open(**CRITICALTASK**). consider using survey results to prompt blow down if necessary.
Establish shutdown cooling

Actions: Pending/ Active

1. CRD FCV 41B 100 percent pending
2. CRD FCV 41 A 0 percent pending
3. CRD selector false pending
4. A RHR tagged green light / red light off active
5. Switch pull to lock MCB
6. Knife blade closed false active
7. RPS MG trip true pending
8. Feed from RPS Bus false pending
9. Feed B-10 RPS true pending
10. CRD pump trip true pending
11. SRV 3A fails open true pending
12. Red /green light all SRV false pending
13. 903L A-1 on pending
14. C-156 open pending
15. C-156 delete pending
16. All SRV red/green light delete pending
17. 903L-A-1 delete pending
18. A SRV ASP closed pending
19. Degraded grid Imaginary generator voltage lower pending
20. Imaginary generator volt lower delete conditional as A6 less than 3860 volts
21. Bypass valve cam closed conditional turb trip 30 second delay
22. RCIC steam line break 10 percent over 15 minute ramp pending
23. Group 5 isolation failure active
24. C-156 open pending
25. A SRV ASP pending open

Critical Tasks:Scenario 4

1. Close SRV
2. Blow down when 2 areas greater than max safe
3. Open SRV to blow down with 4 SRVs

EOPs ENTERED

1. EOP 1
2. EOP 4
3. EOP 17

EOP CONTINGENCY

Emergency depressurization

Scenario Outline

Facility: <u> Pilgrim </u>		Scenario No.: <u> Spare </u>		Op-Test No.: <u> 1 </u>	
Examiners: _____			Operators: _____		
_____			_____		
_____			_____		
Initial Conditions: <u>84% power, 'A' EDG tagged out for bearing replacement.</u>					
- <u>Intake screening cleaning is in progress</u>					
Turnover: Continue raising power to 100% following control valve testing, block feedwater correction factor. Currently in day 2 of a 14 day LCO for 'A' EDG OOS.					
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N-BOP	Block feed flow correction factor		
2	N/A	R-RO	Ramp up to 100%		
3	EG04	C-BOP	Voltage regulator failure		
4	RR20	I-RO	'A' Recirc Pump runaway		
5	I/O	C-BOP	RBCCW temperature controller fails high		
6	RR07	C-RO	'A' Recirc MG trip		
7	CW02/ ED06	M-ALL	Loss of Intake Structure, Scram LOSP		
8	I/O	M-ALL	'B' EDG fails – loss of all AC – SBO start		

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

Operator Actions

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

Event Description: Block Feed Flow Correction Factor

Time	Position	Applicant's Actions or Behavior
	CRS	Direct Feedwater Correction Factor Blocked IAW PNPS 2.1.14, Attachment 4.
	BOP	At EPIC computer "Pilgrim Main Menu", access the "Point Data Service Menu".
	BOP	In the "Single Point Change Service Menu" box, select "for display/change".
	BOP	When the computer point is highlighted in blue, eliminate the computer point and return the cursor to the left side of the highlighted area.
	BOP	Type the Feedwater Flow Correction Factor Computer Point "CFWFACUT" and press the enter key of the numbers keypad.
	BOP	Select "Select Point" "Do" box and click the left mouse button.
		The "Point Data Change For CFWFACUT" screen should appear.
	BOP	Position the mouse arrow on the radio point to the right of "Processing:" and click the left mouse button to obtain "On".
	BOP	Position the mouse arrow on the "Apply Changes" "Do" box and click the left mouse button. Observe that the computer point "CFWFACUT" State is "NO" and the Status is "NML".
	BOP	Verifies that the State of point "CFWAPPLD" is "NO".
	BOP	Verify EPIC computer points "CFWFACUT" and "CFWAPPLD" changed.

Operator Actions

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

Event Description: Raise Reactor Power to 100%

Time	Position	Applicant's Actions or Behavior
	CRS	Directs power increase IAW 2.1.14, Section 7.4.
	RO	Raises power using Recirc flow and pull sheets.

Operator Actions

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

Event Description: Voltage Regulator Failure

Time	Position	Applicant's Actions or Behavior
	BOP	Identifies/announces VOLTAGE REGULATURE MALFUNCTION annunciator. Refers to ARP.
	BOP	Verifies voltage regulator shifted to MANUAL.
	BOP	Places VOLTAGE REGULATOR XFER SWITCH in manual.
	BOP	Adjust MANUAL VOLTAGE ADJUSTER. To control reactive load.
	CRS	Notifies I&C/EM to investigate and repair.
	CRS	Notifies REMVEC that voltage regulator is in manual.
	CRS	Determines voltage regulator adjustment will be in manual control for further power changes.

Operator Actions

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

Event Description: 'A' Recirc Pump Runaway

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Recognize/announce increasing reactor power.
	CRS	Refer to PNPS 2.4.13.
	RO/CRS	Determine the cause of the unexplained rapid increase: <ul style="list-style-type: none"> • Reactor Recirculation System Speed or Flow Control System Malfunction, PNPS 2.4.20.
	CRS/RO	Refer to PNPS 2.4.20.
	CRS	Direct initiating scoop lockup of 'B' Recirc pump.
	RO	Initiates 'B' Recirc pump scoop tube lockup.
	CRS	Direct entry into PNPS 2.4.19
	CRS	Direct assessment of power to flow conditions.
	RO	Plot power and flow on power to flow map.
	RO	Monitor PBDS recorders for oscillations (no oscillations noted).
	RO	Ensures loop flows balanced IAW PNPS 2.1.5. (Within 10% above 80% power.)

Operator Actions

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

Event Description: 'A' Recirc Pump Runaway

Time	Position	Applicant's Actions or Behavior
	RO	Determine cause to be loss of signal based on speed signal indication.
	CRS	Notify I&C to investigate and repair.
	CRS	Request licensed operator standby for manual operation of scoop tube positioner.
		NOTE: licensed operator will not be available.
	CRS	Verify pump speeds within Tech Spec limits 3.6.F
	CRS	Determines that if pump speeds cannot be brought within limits within 30 minutes shutdown will be required.
	CRS	Identifies need to trip Recirc pump in event of SCRAM.

Operator Actions

Op-Test No.: <u> 1 </u> Scenario No.: <u> 5 </u> Event No.: <u> 5 </u> Page <u> 1 </u> of <u> 1 </u>		
Event Description: RBCCW Temperature Controller Fails High		
Time	Position	Applicant's Actions or Behavior
	ALL	Identifies Drywell pressure increasing slowly.
	CRS	Directs checking for indications of Drywell leakage.
	ALL	No indications of leakage inside Drywell.
	CRS	Refers to PNPS 2.4.42 Section 4.7 NOTE may refer to. PNPS 5.3.35.
		NOTE: BOP operator should recognize controller malfunction and place in manual control. If not, performance of PNPS 2.4.42 section 4.7 or PNPS 5.3.35 MAXIMIZING DRYWELL COOLING will mitigate instrument malfunction.
	BOP	Places 'B' RBCCW temperature controller in manual and adjust output to control RBCCW temperature approximately 70 degrees <p style="text-align: center;">OR</p> Closes MO-4083 'B' RBCCW heat exchanger bypass <p style="text-align: center;">AND</p> Throttles MO-3806 SSW outlet 'B' RBCCW heat exchanger.

Operator Actions

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

Event Description: 'A' Recirc MG Trip

Time	Position	Applicant's Actions or Behavior
	RO	Recognize announce trip of 'A' Recirc pump.
	CRS	Direct entry into PNPS 2.4.17 section 4.1.
	RO	Close MO-202-5B.
	RO	Estimate total core flow. Determines total core flow to be approximately 32Mlbm/hr
	RO	Determines core flow is within limits: Restricted region entry.
	CRS	Directs rod movement to exit restricted region.
	RO	Opens MO-202-5B after 5 minutes.

Operator Actions

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

Event Description: Intake Structure Fouling ('A' Bay / 'B' Seawater Pump)

Time	Position	Applicant's Actions or Behavior
	BOP	Recognize/announce annunciator "Travelling Screen ΔP Hi" and refers to ARP C1R-C3. Verifies the alarm using the EPIC SW/SSW graphic display. Recognizes that 'A' Seawater bay's level is lowering.
	CRS	Enters PNPS 2.4.154, "Intake Structure Fouling". Directs that screenwash for all travelling screens be placed in service per 2.2.94. Refers to Attachment 1 of 2.2.154.
	BOP	Recognize/announce that 'A' and 'B' Seawater bay level is approaching -10 ft.
	CRS	Directs that 'A' and 'B' Seawater pumps be stopped.
	CRS	Directs SCRAM and entry of PNPS 2.1.6. NOTE: CRITICAL TASK
	CRS	Directs a reactor scram by taking the MODE switch to the "SHUTDOWN" position and the RO to take the actions of 2.1.6. Directs RPV level maintained +20 to +40 inches and
	RO	Place mode switch in shutdown and enter PNPS 2.1.6.
	RO	Verify and announce the status of APRM downscapes.
	RO	Verify all control rods are fully inserted.
	RO	Insert IRM and SRM detectors, select two SRMs for recording, and place selector switch for APRM/IRM to "IRM".
	RO	Verify or manually place reactor recirc pumps at minimum speed.

Operator Actions

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

Event Description: Intake Structure Fouling ('A' Bay / 'B' Seawater Pump)

Time	Position	Applicant's Actions or Behavior
	RO	Insert IRM and SRM detectors, select two SRMs for recording, and place selector switch for APRM/IRM to "IRM".
	RO	Verify or manually place reactor recirc pumps at minimum speed.
	RO	Maintain reactor water level +20 - +40 inches using feedwater.
	BOP	Maintains RPV pressure 900 – 1050 psig using SRVs.
	CRS	Directs MSIVs closed.

Operator Actions

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

Event Description: 'B' EDG Fails – Loss of all AC – SBO Start

Time	Position	Applicant's Actions or Behavior
	ALL	Recognize LOSP.
	CRS	Direct entry into PNPS 2.4.16.
	CRS	Determines type of malfunction.
	ALL	Recognize: <ul style="list-style-type: none"> • Loss of off site power. • 'A' EDG tagged out. • 'B' EDG trips when ties to A6.
	CRS	Determines Station Blackout directs entry into PNPS 5.3.31 and 2.4.146 section 7.1.
	BOP	Starts and loads SBODG from the control room.
	BOP	Verifies breaker A600 open.
	BOP	Verifies 24 KV incoming breaker open.
	BOP	Verifies shutdown XFMR breaker A802 tripped.
	BOP	Check shutdown transformer relay reset.
	BOP	Place BLACKOUT DIESEL GENERATORS START control switch to start.
	BOP	After 30 seconds place BLACKOUT DIESEL GENERATOR breaker A801 to close.

Operator Actions

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

Event Description: 'B' EDG Fails – Loss of all AC – SBO Start

Time	Position	Applicant's Actions or Behavior
	CRS	Direct SBODG placed on A6 bus.
	CRS	Direct RHR pump 'B' and 'D' and 'B' core spray pumps be pulled to locked.
	RO	Place control switches for RHR pumps 'B' and 'D' and 'B' Core Spray pumps pulled to locked.
	BOP	Place breaker A501 to pull to lock position.
	BOP	Depress the 'B' load shed manual initiation pushbuttons for 5 seconds.
	BOP	Close breaker A600.
	BOP	Verify SBODG comes up to rated voltage.
	BOP	Close breaker A601. NOTE: CRITICAL TASK
	CRS	Direct loading A6 as necessary.
	BOP	Monitor SBODG loads as loads started.
		The scenario will be terminated at the direction of the Chief Examiner after the SBO has been placed in service supplying A-5 or A-6. Expected EAL is 6.3.2.1.

Notes: Scenario 5

1. 80-85% power following Turbine Stop Valve testing. Block feed flow correction factor per 2.1.14 section 7.4 step 6 att. 4 section 1
2. Ramp up to 100% using Recirc
3. Voltage regulator failure auto shifts to manual will require manual adjustment during power changes C3R E-3 D-4 A-1 200 vars ok call EM
4. Runaway of 'A' Recirc Pump.
5. Failure of 'B' RBCCW temperature controller high. Will notice drywell pressure increase. Maximize RBCCW cooling either with temp controller or SSW valves, may not notice if SSW valves used but will still mitigate failure.
6. Trip of 'A' Recirc MG. 2.4.17 restricted region entry if high enough in power with flow if not may scram. Be high in power with Recirc
7. Loss of Intake Structure, 2.4.154 at 9 feet reduce power 8 feet trip CW pumps, close MSIVs HPCI pressure control RCIC injecting EOP 1 entry Scram LOSP 2.1.6 actions then LOSP allow BEDG to tie on then fail Delete intake level failure after CW pumps tripped to allow operation of SSW pumps. ensures TBCCW operable
8. 'B' EDG fails – loss of all AC – SBO 2.4.146 tie on in less than 10 minutes 2000 KW continuous 2200 2 hour rating check load prior to starting loads Torus cooling

Actions: Scenario 5 Pending/ Active

1. IC-14:
2. A EDG tagged out,
3. A EDG fail to start active
4. Voltage regulator failure high Pending
5. 'B' RBCCW Temperature Controller, fails high temperature set point 100 % pending
6. 'A' Recirc MG drive breaker trip pending
7. 'A' Recirc Pump runaway
8. LOSP pending
9. 'B' EDG emergency stop switch pending
10. Intake screens D/P 100 percent clogged ramped 10 minutes pending delete 5 min
ramp conditional on circ pumps tripped

Critical Tasks: Scenario 5

1. Start SBO D/G and energize Bus within 10 minutes
- 2.
- 3.

EOPs ENTERED

1. EOP 1
2. EOP 3 possibly based on drywell pressure due to loss of cooling

EOP CONTINGENCY

NONE