Facility: **Palisades** Scenario No.: **ONE** Op-Test No.: **1**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% power. P-8B, Auxiliary Feedwater Pump, is out of service.

Turnover: Shift orders are to alternate operating Service Water pumps and then reduce power to approximately 90% at 6% per hour in preparation for maintenance on Heater Drain Pump P-10A.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	BOP (N)	Alternate Running Service Water Pumps
2	N/A	SRO (R, N) RO (R) BOP (N)	Power de-escalation
3	RP11A	SRO (C, T) BOP (C)	Power Range Detector NI-5 fails low
4	SI04D	RO (C) SRO (T)	T-82D, Safety Injection Tank loss of pressure (leak)
5	ED36B	SRO(C, T)	DC Panel ED-21A 300 amp supply fuse failure (AOP-17)
6	MS03B	ALL (M)	ESDE on 'B' S/G Inside Containment (AOP-2)
7	ED01 ED12A	SRO (C) BOP (C)	Loss of Offsite Power with failure of D/G 1-1 to auto start, (D/G 1-2 is inoperable due to loss of ED-21A)
8	FW17	SRO (C) RO (C)	Loss of Auxiliary Feedwater when P-8A bearing fails (EOP-9.0)

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

- Reset to IC-17 (or similar) 100% power MOL IC.
- Place Right Train CRHVAC in service per SOP-24.
- Ensure FIC-0210A set for 40-gallon dilution on Panel C-02
- AFW Pump P-8B is OOS:
    - Use **FW16B** on PIDFW01 to trip P-8B
    - Override **CV-0522B-G** (green light for P-8B) to OFF
    - Place HS-05422B to CLOSE
    - Hang Caution Tag on P-8B handswitch
    - Ensure EOOS indicates P-8B is out of service
- Ensure SW Pumps P-7A and P-7C inservice
- INSERT **MF ED12A** (PIDED08) D/G 1-1 fail to auto start
- Create Event Trigger 5: Event: Reg Group 1 Rod 21 less than 110”

Event #	Remote or Trigger #	Instructions
1		No actions required.
2		No actions required.
3	**REMOTE 1**	**RP11A** (PIDRPNI3) Loss of NI 5 Power Range Detector (fails low)
4	**REMOTE 2**	**SI04D** (PIDSI04) T-82D, Safety Injection Tank loss of pressure
5	**REMOTE 3**	**ED36B** (PIDED03) ED-21A 300 amp fuse failure
6	**REMOTE 4**	**MS03B** (PIDMS01) ‘A’ S/G Main Steam Line Break Inside Containment; Severity value = 3%, 10 minute ramp
7	**TRIGGER 5**	**ED01** (PIDED13) Loss of Offsite Power
8	**TRIGGER 5**	**FW17** (PIDFW01) Motor Driven P-8A Bearing Failure, Severity = 100%, Ramp = 3 minutes

Special instructions:

- ***None.***

Scenario ONE - Turnover Information

The Plant is at 100% power, MOL. P-8B, Auxiliary Feedwater Pump, is out of service for a bearing inspection (LCO 3.7.5.A.1 - 72 hrs.) It is expected to be 4 hours before bearing inspection is completed.

Shift orders are to alternate operating Service Water pumps (Start P-7B and stop P-7C and place it in STDBY): inform CRS to direct BOP to perform this task. Once this is complete, a power reduction to approximately 90% at 6% per hour is ordered in preparation for maintenance on Heater Drain Pump P-10A.

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **1** Page **1** of **1**

Event Description: ***Alternate Running Service Water Pumps***

Time	Position	Applicant's Actions or Behavior
	SRO	Directs alternating running Service Water Pumps.
	BOP	Refers to SOP-15, 7.1.1 and 7.1.2.
Simulator Operator: If *called as Chemistry to recalculate mixing basin discharge flow volume, inform CR this is not required if they are alternating SW pumps.* ***When called as NPO for SW Pp. parameters, report discharge valve open, oil levels normal.***		
	BOP	Starts P-7B SW Pump: • Make PA announcement • Check discharge valve, oil levels for P-7B (call to NPO) • Remove P-7B from standby (PLACES handswitch to TRIP) • STARTS P-7B • Check amps less than 92 amps • Check local discharge pressure (call to NPO) • Check packing leakoff not excessive. (call to NPO) • Possible alarm: EK-1138 P-7B basket strainer Hi dp (clears on its own)
Simulator Operator: If asked by NCO, report *PI-1322 indicates 72 psig and stable; packing leakoff is NOT excessive*.		
	BOP	• STOPS P-7C • PUSHES STANDBY pushbutton to place P-7C in standby Note: Chemistry recalculation of mixing basin volume is NOT required.

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

Event Description: ***Lower power to 90%***

Time	Position	Applicant's Actions or Behavior
	SRO	Directs lowering power to 90%.
	RO	INSERTS Group 4 Control Rods to less than 128 inches: • Rod Control Switch MANIPULATED to lower control rods
	BOP	Operates turbine generator on the DEH panel for power de-escalation @ 6% per hour: • ENTERS setter value • SELECTS rate of 6% per hour • PUSHES "GO " pushbutton and observes white light illuminate • Informs CRS/RO that turbine is in "GO"
	RO	Performs periodic borations and/or control rod manipulations to maintain T_{AVE} within 3°F of T_{REF} For Boration: • RESET PMW and BA Controllers if required • SET quantity and batch flow limit on FIC-0201B, BA flow controller • SET quantity and batch flow limit on FIC-0210A, PMW flow controller • START P-56B (preferred) OR P-56A, Boric Acid Pump • OPEN CV-2155, Make Up Stop Valve • PUSH start pushbutton on FIC-0210B • VERIFIES FIC-0210B output signal at zero when boration complete • PUSH start pushbutton on FIC-0210A • MONITORS reactor power and T_{AVE} • VERIFIES FIC-0210A output signal at zero when boration complete • CLOSES CV-2155 For Control Rod manipulations: • Operates Rod Control Switch to INSERT Group 4 Regulating Rods in increments specified by CRS • MONITORS reactor power and T_{AVE}

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

Event Description: ***Lower power to 90%***

Time	Position	Applicant's Actions or Behavior
	RO	May divert CVCS letdown to Clean Waste as VCT level rises: ▪ PLACES CV-2056, Letdown to VCT or Radwaste, in the "TO CLEAN WASTE RCVR TANKS" position ▪ When desired VCT level is achieved, PLACES CV-2056 to the "AUTO" or "TO VOL CNTRL TANK" position (then "AUTO")

After power reduction commenced *OR* at the discretion of the Lead Examiner, Insert Remote 1.

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

Event Description: ***Power Range NI-05 Fails***

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnose failure of Power Range NI-05: Indications: NI-05 Lower and Upper power meters read 0%; HI voltage meter reads 0 volts; Rod Drop tell-tale light illuminated Major Alarms: • EK-0948, Dropped Rod; • EK-06 Rack C Window 3, Channel Deviation Level 1 5%; • EK-06 Rack C Window 4, Channel Deviation Level 2 10%; • EK-06 Rack C Window 7, Dropped Rod; • EK-06 Rack C Window 8, NI Channel Trouble; • EK-06 Rack D Window 2, Loss of Load Trip Channel Bypassed, • EK-06 Rack D Window 3, Nuclear –ΔT Power Deviation/T-Inlet Off Normal/Calculator Trouble Channel 'A'
	BOP	May DEPRESS 'HOLD' on the turbine
	BOP	Performs Operator Actions of EK-06 Rack 'C' Windows 3,4;and 8 If Reactor Power less than 25%: ▪ CHECK Rod positions normal ▪ CHECK detector voltage for NI-05 greater than 650 VDC Follow Up Actions: ▪ REMOVE faulty Power Range Nuclear Instrument from service per SOP-35 ▪ NI detector voltage less than 650 VDC, REMOVE from service per SOP-35
	SRO	May reference or enter AOP-5, "Dropped Rod." AOP-5 does not apply
	SRO	Directs ARP actions: ▪ Directs removal of NI-05 from service ▪ Declares Channel 'A' Flux-Delta T Comparator and ASI alarm function of TMM 'A' Channel inoperable ▪ Directs monitoring and logging the "Power Density" status of the remaining operable TMMs hourly ▪ May call Reactor Engineer to assist in Quadrant Power Tilt and Linear Heat Rate with an NI out of service using Incore Detectors

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

Event Description: ***Power Range NI-05 Fails***

Time	Position	Applicant's Actions or Behavior
	BOP	REMOVES NI-05 from service per SOP-35, Section 7.2.2: For 'A' Channel RPS, BYPASS the following Trip Units per SOP-36: Variable High Power Key # 289 High Power Rate Key # 290 TM/LP Key # 297 Loss of Load Key # 298 ▪ INSERT bypass key above affected RPS Trip Unit ▪ TURN key 90° clockwise ▪ VERIFY the yellow light above the bypass keyswitch is ON ▪ Repeat for other affected channel(s)
	BOP	May RESET Rod Drop 'Telltale" and alarm on Panel C-06: PUSHES Rod Drop "Telltale" pushbutton for Channel 'A'
	BOP	May check the "Power Density" status (OK) of the remaining operable TMMs (not in tripped), (Step G)
	SRO	The following Tech Spec LCOs apply: (THESE ARE MOST IMPORTANT) ▪ 3.3.1, Action: A.1, VHP and TM/LP, 7 days ▪ 3.3.1, Action: B.1, High SUR, Prior to entering MODE 2 from MODE 3 ▪ 3.3.1, Action: C.1, Loss of Load, Prior to increasing power ≥ 17% from MODE 3 (THESE ARE OF LESSER IMPORTANCE) The following ORM, Operating Requirements Manual, items apply: ▪ 3.17.6, Item: 12.1, Flux-Delta T Comparator, Prior to next MODE 1 entry from MODE 2 ▪ 3.17.6, Item: 15, Excore deviation alarm, Once per 12 hours ▪ 3.17.6, Item: 16, ASI alarm, Prior to next MODE 4 entry from MODE 5 ▪ 3.11.2, Excores unable to monitor Linear Heat Rate

After BOP bypasses RPS trip units on 'A' Channel RPS *OR* CRS has briefed loss of NI-05 *OR* at the discretion of the Lead Examiner, INSERT REMOTE #2.

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

Event Description: ***T-82D, Safety Injection Tank loss of pressure***

Time	Position	Applicant's Actions or Behavior
	RO	Diagnose failure of T-82D: Indications: T-82D nitrogen pressure lowering Major alarms: ▪ EK-1334, Safety Inj Tank HI-LO Pressure ▪ EK-1336, Safety Inj Tank LO pressure
Simulator Operator: When T-82D pressure is less than 200 psig AND the crew is pressurizing T-82D, THEN delete malfunction SI04D.		
	RO	Operator actions for EK-1134/1136: ▪ CHECK tank level normal ▪ CHECK CLOSED CV-3051, T-82D Vent Valve ▪ CHECK tank pressure on PPC (EK-1136 only) ▪ Adjusts tank pressure per SOP-3, section 7.5.6 to clear alarm (Follow Up Action) • Open CV-1358, Nitrogen to Containment • Open CV-3050, T-82D Nitrogen Valve • Close CV-3050 when T-82D is at desired pressure
	SRO	Declares Tank inoperable while the pressure switch is actuated The following T.S. LCO applies: • 3.5.1, Action: B.1, enter due to loss of pressure in SIT, 24 hour action statement
After CRS has briefed loss of pressure in T-82D *OR* at the discretion of the Lead Examiner, INSERT REMOTE #3		

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

Event Description: ***Loss of DC Bus ED-21A***

Time	Position	Applicant's Actions or Behavior
	CREW	Diagnose loss of DC Bus ED-21A: Control Power Available lights lost on Panel C-04 for Bus 1D Lights off on Control Panels for Bus 1D 2400V loads (running components will still indicate amps): P-8C AFW Pump P-52B CCW Pump P-7A and P-7C SW Pumps P-67A LPSI Pump P-66A HPSI Pump P-54A Containment Spray Pump 'B' CRHVAC ventilation valves go to "Emergency' position V-26B, 'B' CRHVAC Air Filter Fan running Major alarm: EK-0524, Load Shedding/Safeguards Bus Control CKT Undervoltage EK-0558, D/G 1-2 Start Signal Blocked
	SRO	Enters AOP-17, "Loss of 125V DC Panel(s)" and directs actions from AOP-17
	BOP	Operator actions from EK-0524: ▪ CHECK Bus 1D "Control Power Available' on Panel C-04 ▪ May CHECK breakers on ED-21A CLOSED ▪ REFER to AOP-17

Simulator Operator: If contacted by Control Room as NPO to verify breakers closed on ED-21A, wait a few minutes, REPORT back: that the breakers are closed.

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

Event Description: ***Loss of DC Bus ED-21A***

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFIES (from CRS direction) operating: ▪ V-96 'B' CRHVAC Supply Fan ▪ V-26B, Air Filter Unit Fan
	BOP	VERIFIES (from CRS direction) the following: ▪ FIC-1712 local indication, V-26B discharge flow ▪ DPIC-1660 local indication greater than 0.18 inches H_2O
Simulator Floor Instructor: • **REPLACE DPIC-1660 Placard with one showing indication at ~0.22 inches of H_2O** • **REPLACE DPIC-1659 Placard with one showing indication at zero** **Simulator Operator: If contacted by Control Room to check 'B' CRHVAC parameters, REPORT back: ▪ FIC-1712 local flow indication reads 3200 CFM**		
	SRO	May contact Electrical Maintenance to check out DC Bus ED-21A
	SRO	May review equipment lost from ED-21A failure with crew
Simulator Operator: If contacted by Control Room as Elect. Maint. To check out, wait a few minutes, REPORT back: blown fuse and the bus will have to be tagged out so that it can be meggered		
	SRO	Determines that the following Tech Spec LCO Actions apply: ▪ 3.8.9, Action: C.1, DC distribution, 8 hours ▪ 3.8.1, Action: B.1 AND B-2 AND B-3.1 or B-3.2 AND B.4, D/G power (Completes an Off-site source check within one-hour, various): may use LCO 3.0.6 support-supported rule to defer these Actions ▪ 3.3.8, Action: A.1, Alternate Shutdown System Functions 30 days: may use LCO 3.0.6 support-supported rule to defer this Action ▪ 3.7.5, Action: B.1, less than two AFW Pumps operable, 6 hours to MODE 3, 30 hours to MODE 4: can **NOT** use LCO 3.0.6 since P-8A was initially inoperable
After CRS has briefed loss of ED-21A *OR* at the discretion of the Lead Examiner, INSERT REMOTE #4		

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

Event Description: ***ESDE Inside Containment***

Time	Position	Applicant's Actions or Behavior
	BOP/RO	Informs the SRO that indications of excessive load exist: • EK-1148, Fire System Panel C-47, C-47A/B or C-49 Off Normal • EK-1343, Containment Air Cooler VHX-1 Dry Pan HI Level • EK-1345, Containment Air Cooler VHX-3 Dry Pan HI Level • EK-1362, Containment Pressure Off Normal • Reactor power rising • 'B' S/G Compartment Humidity rising • T_{AVE} lowering
	SRO	Enters AOP-2, “Excessive Load” • Determines that unisolable load rise exceeds 1% change in NI or Delta-T Power (may wait for HB Power Steady to also be above 1%) • Directs a reactor trip.
	RO	TRIPS reactor by depressing reactor trip pushbutton at Panel C-02
	SRO/BOP	May direct NPO to check for source of steam release.
	RO/BOP	Perform EOP-1.0 immediate actions

Simulator Operator: If contacted by Control Room as NPO to check on steam leak, wait a few minutes and REPLY back: there are no Steam Generator relief valves blowing by or leaking on SIRWT roof area.

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **1** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	BOP	Informs SRO that S/G pressures < 800 psia, CONTINGENCY ACTION: • MSIVs, CV-0510 and CV- 0501, CLOSED by taking one HS to CLOSE and then back to OPEN (may auto close on CHP)
	BOP	Informs SRO that offsite power has been lost and that D/G 1-1 did not auto start, CONTINGENCY ACTION: D/G 1-1 started from Panel C-04 handswitch (D/G will start) **(CRITICAL TASK PL-000 056 05 01: The failures considered for this recovery action are failure of breakers 152-105, 152-106, 152-202 or 152-203 to mechanically open, failure of breakers 152-107 or 152-213 to mechanically close or failures associated with any of the breaker control circuits. The operators must identify the cause of the failure, open or close (as necessary) the failed breaker or electrically disable the permissive logic. Action must be performed prior to starting EOP-1.0 verbal verifications.)**
	SRO	Commences EOP-1.0 verbal verifications
	RO	Reactivity Control: **YES** • Reactor power lowering • Negative SUR • Maximum of one control rod not inserted

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **2** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	BOP	Main Turbine Generator criteria: **YES** • Main Turbine tripped • Generator disconnected from grid
	BOP	Feedwater criteria: • PLACES Main FWP Controllers to 'MANUAL' and RAMPS to minimum speed **NO** – MSIVs closed, Main Feed Pumps tripped • PLACES Main FW Controllers to 'MANUAL,' Main FRV and B/Ps CLOSED **YES**
	BOP	Main Vital Auxiliaries-Electric: • Buses 1C and 1D energized: **NO** (Bus 1D not energized, D/G 1-1 would not start, Bus 1C being supplied by D/G 1-1) • Bus 1E energized: **NO** • Bus 1A and 1B energized: **NO** • EY-01 energized: **YES** • Six DC Buses energized: **NO (ED-21A de-energized)** • 3 of 4 Preferred AC Buses energized: **YES**
	RO	PCS Inventory Control: • PZR level 20% - 85% and trending toward 42% - 57%: **YES/NO** (depends on conditions) Applicable Contingency: Verify max Charging and min Letdown • PCS 25°F subcooled: **YES** (by CETs)
	RO	PCS Pressure Control: **NO** • PZR pressure 1650 to 2185 psia and trending toward 2010 to 2100 psia Contingencies: o Manually operates PZR heaters and spray; heaters will be off due to low PZR level, spray valves closed. o When PCS pressure is < 1605 psia, verify safety injection initiated, EK-1342 in alarm and all available HPSI and LPSI pumps in service and valves open o At 1300 psia, NONE: PCPs already off due to loss of power

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **3** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	RO	Core Heat Removal: • At least one PCP operating: **NO** • Verify Loop ΔT less than 10°F: **NO** • Verify PCS at least 25°F subcooled: **YES** (by CETs)
	BOP	Informs SRO that P-8A AFW Pump has tripped and cannot be started and that all AFW flow has been lost (if not already reported.)

	BOP	PCS Heat Removal:
		• Verify at least one S/G has; level 5% - 70%; Feedwater available: **NO (since P-8A is tripped)**
		• Verify both S/Gs intact (no indication of ESDE or SGTR) **NO**
		  ○ Contingency: secure FW to 'B' S/G
		• Verify T_{AVE} 525°F - 540°F: **YES/NO**
		  ○ Contingency: Ensures Turbine Bypass Valve and Atmospheric Steam Dump Valves are closed
		• Verify BOTH S/G pressures 800 psia – 970 psia: **NO**
		  ○ Contingencies: momentarily places either control switch to CLOSE and then back to OPEN)
		  ○ Ensures Turbine Bypass Valve and Atmospheric Steam Dump Valves are closed

	RO	Containment Isolation: **NO**
		• Containment pressure > 0.85 psig Applicable Contingency Actions: When Containment pressure > 4.0 psig perform all of the following per EOP-1.0 immediate actions (attached):
		  ○ ENSURE EK-1126 (CIS Initiated) OR PUSH High Radiation Pushbuttons on Panel C-13
		  ○ ENSURE CLOSED: Both MSIVs (MO-0510 and MO-0501); Main FRVs; Main FRV Bypasses; CCW Isolation Valves
		  ○ ENSURE EK-1342 (Safety INJ Initiated) OR PUSH left and right Injection Initiate pushbuttons on Panel EC-13

	BOP	Containment Isolation: • Verify Containment Area Monitor alarms clear: **YES/NO** (Depends on timing: All four in alarm, <u>not</u> corroborated with High Range Gamma Monitors) • Verify Condenser Off Gas Monitor alarm clear: **YES** • Verify Main Steam Line Monitor alarms clear: **YES**

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **4** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Time	Time
	RO	Containment Atmosphere: **NO** • Containment temperature > 125°F • Containment Pressure > 0.85 psig CONTINGENCY: ○ ENSURE OPERATING ALL available Containment Air Cooler 'A' Fans and ensure all CAC Hi Capacity outlet valves are open per EOP-1.0 immediate actions (attached): ○ At 4 psig: • ENSURE OPEN Containment Spray Valves CV-3001 and CV-3002 • ENSURE OPERATING Containment Spray Pumps P-54B an P-54C
	RO	Vital Auxiliaries – Water: **NO** • At least two SW Pumps operating: **NO (only P-7B is operating)** • BOTH Critical SW Headers in operation with pressure > 42 psig • At least one CCW Pump operating
	RO	Vital Auxiliaries – Air: **YES/NO** (depends on when compressor is started) • Instrument Air Pressure > 85 psig CONTINGENCY ACTION: ○ Start available Instrument Air Compressors (C-2A or C-2C)
	BOP	Verifies SIRWT level > 25%
	BOP	PLACES LEFT train CRHVAC in emergency mode: • STARTS V-26A Air Filter Unit Fan • ENSURES OFF: V-94, Purge Fan; V-47, Switchgear Exhaust Fan • May follow up with SOP-24 verification
	BOP	Report that neither Condensate Pump nor Cooling Tower Pump is operating due to loss of power. CONTINGENCY: • CLOSE MSIVs, CV-0510 and CV-0501 (already completed)
	SRO	MAY direct isolating AFW to 'B' S/G
	BOP	When directed, isolates AFW to 'B' S/G: • SELECTS 'MANUAL' on FIC-0727, P-8A/B flow to S/G 'B' • SELECTS 'MANUAL' on FIC-0736A, P-8C flow to S/G 'B' • RAISES flow output to 100% on each controller ('RED' signal indicator to the full right position)

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **5** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	SRO	• Performs Event Diagnostic Flow Chart per EOP-1.0, Attachment 1 ○ Diagnoses EOP-9.0, “Functional Recovery Procedure.” • Performs EOP-9.0 strategy brief • Establishes PCS pressure and temperature bands with RO
	SRO	Directs closing CV-1064 and CV-1065, CWRT vent valves
	BOP	CLOSES CV-1064 and CV-1065 (already closed due to Containment Isolation)
	SRO	Directs performance of EOP Supplement 5, Checklist for Safeguards Equipment Following SIAS
	BOP	Completes EOP Supplement 5
	SRO	Directs placing a Hydrogen Monitor in service in accident mode
	BOP	Places left train H_2 monitor in service in accident mode (back of Panel C-11A): • PLACES HS-2419 to ACCI • PLACES HS-2417 to OPEN and RELEASES • PLACES HS-2413A, HS-2413B, HS-2415A, and HS-2415B, to OPEN • PLACES HS-2427L to 'ANALYZE' position
	SRO	Directs SE to perform EOP-9.0 SFSCs

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **6** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	SRO	Determines success paths for each safety function: • Reactivity: RC-3 • Maintenance of Vital Auxiliaries-Electric: DC-1, AC-2 • PCS Inventory: IC-2 • PCS Pressure: PC-3 • **PCS/Core Heat Removal: HR-2 (challenged)** • Containment Isolation: CI-1 • Containment Atmosphere: CA-3 • Maintenance of Vital Auxiliaries-Air: MVAW-1, MVAA-1
	SRO	Directs actions from HR-2: • Perform EOP Supplement 4, SI flow verification (SE action) • May secure Emergency Boration • Commence a cooldown of 'A' S/G using ADVs • Verify natural circulation exists • Isolate 'B' S/G • Initiate action to restore AFW by either restoring P-8B to service or restoring power to ED-21A (AOP-17)
	SRO	Directs steaming unaffected 'A' S/G to within 50 psi of 'B' S/G
	RO	Begins steaming 'A' S/G: • HIC-0780A, Steam Dump Controller, 'MANUAL' pushbutton PUSHED • 'Slidebar' taken to the OPEN position • MONITORS S/G pressures and cooldown rate on PPC

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **7** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	SRO	May directs use of PZR Auxiliary Spray to lower PCS pressure
	RO	Refers to EOP Supplement 37, PZR Pressure Control Using Auxiliary Spray: • ENSURE CV-1057 and CV-1059 switches in CLOSE • ENSURE at least one charging pump in operation • ENSURE OPEN HS-2111, Charging Line Stop • ENSURE CLOSED MO-3072, Charging Pump Discharge to Train 2 • OPERATE HS-2117, Aux. Spray CV-2117 keyswitch as desired
	SRO	Directs placing handswitches for Letdown Orifice Stop Valves to close
	RO	PLACES handswitches to CLOSE: • HS-2003 (CV-2003) • HS-2004 (CV-2004) • HS-2005 (CV-2005)
	SRO	Directs isolating ‘B’ S/G per EOP Supplement 18, ‘B’ S/G ESDE Isolation Checklist

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **8** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	BOP	Isolates 'B' S/G per EOP Supplement 18 (attached) Isolation from inside the Control Room: **(CRITICAL TASK PL-000 209 05 01: The MSLB analysis assumes operators terminate auxiliary feedwater flow within thirty minutes. Isolating the affected steam generator limits the addition of energy that is added into containment for which containment spray and containment air cooling have to cope, and to a lesser extent prevents the accident from exceeding the flood plain analysis. The time frame for isolating the affected steam generator is reasonable. Operators have steps in both EOP-1.0, Standard Post Trip Actions, and EOP-6.0, Main Steam Line Break to isolate auxiliary feedwater to the most affected steam generator. The only things that might prevent operators from meeting this time requirement are problems with the automatic actuation of SIAS/CIAS or small steam leaks that make determining the most affected steam generator difficult. Since the MSLB is a large steam leak and the analysis doesn't include an active failure on SIAS or CIAS it is likely that operators would isolate water to the affected steam generator well within 30 minutes.)** ○ ENSURE CLOSED BOTH MSIVs (already completed) ○ ENSURE CLOSED MO-0501, 'B' S/G MSIV Bypass Valve. ○ CLOSE CV-0703, 'B' S/G Main Feed Reg Valve. • CLOSE CV-0744, 'B' S/G Main Feed Reg Block Valve ○ CLOSE CV-0734, 'B' S/G Bypass Feed Reg Valve. ○ CLOSE S/G E-50B Blowdown Valves: CV-0768, CV-0770, and CV-0738 (may be performed in EOP supplement 6) ○ CLOSE S/G E-50B Auxiliary Feedwater Flow control Valves CV-0736, CV-0736A, CV-0727 • DIRECTS Auxiliary Operator to isolate 'B' S/G per EOP Supplement 18

SIMULATOR OPERATOR: When requested for isolation of 'B' S/G use Remotes on PIDMS01:

Manual isolation valves: SG10 and SG12 to CLOSE

Air Supply isolations: MS18 and MS19 to CLOSE

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **6/7/8** Page **9** of **9**

Event Description: ***ESDE/LOOP//Failure of D/G 1-1 to auto start/ Loss of AFW***

Time	Position	Applicant's Actions or Behavior
	SRO	Directs expedited return to service of AFW Pump P-8B.
SIMULATOR OPERATOR: If requested, report that P-8B can be ready to be returned to service in 10 minutes. When requested for restoration of P-8B perform the following: **Delete override for P-8B green light (CV-0522B-G)** **Delete Malfunction FW16B** **Report to Control Room and request permission to remove Caution Tag, then remove Caution Tag and report that P-8B is ready for operation.**		
	SRO	Directs start of P-8B.
	RO	Starts P-8B **(CRITICAL TASK PL-061 102 01 01: (This operator action is required should automatic AFW flow control provide insufficient flow to the steam generators to makeup for decay heat boiloff. Should AFW level be on a declining trend, operators must restore AFW flow to start level restoration prior to dry-out of unaffected S/G.)** • May use SOP-12 section 7.2.2 (steps 7.2.2.g through 7.2.2.i OR EOP Supplement 19 sections 4.0 and 5.0 ○ VERIFY CLOSED the associated Auxiliary Feedwater flow control valves for the 'A' S/G ○ OPEN CV-0522B ○ CONTROL flow to 'A' S/G by throttling the associated AFW flow control valve
TERMINATE Scenario when 'B' S/G has been isolated per EOP Supplement 18 AND a source of feedwater is established to the 'A' S/G *OR* at the discretion of the Lead Examiner.		

Facility: **Palisades** Scenario No.: **TWO** Op-Test No.: **1**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 25% power. P-8A, Auxiliary Feedwater Pump is out of service for pump seal replacement.

Turnover: A startup from a forced outage is in progress. GCL-5.1, Power Escalation in MODE 1, has been completed through Step 3.1. Shift orders are to rotate Instrument Air Compressors and then resume the power escalation to full power at 6% per hour.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	BOP (N)	Rotate Instrument Air Compressors
2	N/A	SRO (R, N) RO (R) BOP (N)	Power Escalation
3	CH06B	SRO (I, T) BOP (I)	Loss of 'B' Control Room HVAC Train
4	ED08B	SRO (I, T) RO (I) BOP (I)	Loss of EY-20, Preferred AC Bus (AOP-13)
5	RC03	SRO (C, T) RO (C)	PCS Leak (requires Reactor trip) (AOP-23)
6	FW03B	BOP (C)	Failure of P-8B, Steam Driven AFW Pump, to auto start
7	MS06B MS15B RC04	ALL (M)	RV-0711, Main Steam Relief, partially opens (time delay initiation from time of trip). PCS Leak increases. (EOP-9.0)
8	SI09B	RO (C)	Failure of P-66B, HPSI Pump, to Auto start

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

- Reset to IC 14 and swap in-service Main Feedwater Pump: (**IC150 for ILT2014**)
  - Place P-1A Main Feedwater Pump in service
  - Secure P-1B Main Feedwater Pump.
  - Change status to MV-FW0707 OPEN and MV-FW0705 CLOSED on PID FW03 using remotes and also ensure placards on Panel C-01 reflect status
- Ensure FIC-0210A set for 40-gallon dilution on Panel C-02
- Ensure C-2C, Instrument Air Compressor is in service and C-2A and C-2B in Auto
- Place Right Train CRHVAC in service per SOP-24.
- AFW Pump P-8A is OOS:
  - Use FW16A on PIDFW01 to trip P-8A
  - Override P-8A-G (green light for P-8A) to OFF
  - Override P-8A-W (white light for P-8A) to OFF
  - Place P-8A Auto/Manual handswitch to MANUAL
  - Hang Caution Tag on P-8A handswitch
  - Ensure EOOS indicates P-8A is out of service
- INSERT MF FW03B (PIDFW01) Failure of AFW Pump P-8B to auto start
- INSERT MF SI09B (PIDSI02) Failure to AUTO start P-66B, Safety Injection Pump
- Create Event Trigger 4: Event: 0, Action: imf RC03 20 (raises PCS leak to 20 gpm)
- Create Event Trigger 5: Event: Reg Group 1 Rod 21 less than 110”

Event #	Remote or Trigger #	Instructions
1/2		No actions required.
3	**REMOTE 1**	**CH06B** (PIDCH06) Loss of ‘B’ CRHVAC train
4	**REMOTE 2**	**ED08B** (PIDED02) Loss of Preferred AC Bus NO.2 (EY-20)
5	**REMOTE 3**	**RC03** (PIDRC01) PCS Leak, Severity = 6 (6 gpm). [Simulator Operator will insert Remote 4 after Crew determines Tech Spec implications]
5	**TRIGGER 5**	Action: imf RC04 15 *[PCS leak rises by 150 gpm when reactor trips]*
6		ACTIVE AT SETUP – No actions required.
7	**TRIGGER 5**	**MS06B** (PIDMS01) Safety Relief Valve RV-0711 Leak, Severity = 100, Time Delay = 5 minutes **MS15B** (PIDMS01) ‘B’ S/G Steam Line Break Outside Cont, Severity = 2, Time Delay = 5 minutes
8		ACTIVE AT SETUP – No actions required.

Special instructions:

- Provide a marked up copy of GCL 5.1 completed through step 2.13.f.

Scenario TWO - Turnover Information

The Plant is at approximately 25% power MOL following a startup from a forced outage. The Turbine Drain Valves are closed per SOP-8. A Chemistry hold has just been lifted with S/G chemistry within specifications. P-8A, Auxiliary Feedwater Pump, is out of service for pump packing replacement (LCO 3.7.5.A.1 - 72 hrs.) Shift orders are to alternate running Instrument Air Compressors by placing C-2B in service, and C-2A and C-2C in AUTO, per SOP-19, section 7.2.8: inform CRS to direct BOP to perform this task. Then, resume the power escalation to full power at 6% per hour.

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **1** Page **1** of **1**

Event Description: ***Alternate Instrument Air Compressors***

Time	Position	Applicant's Actions or Behavior
	SRO BOP	Refers to SOP-19, section 7.2.8
	BOP	STARTS C-2B per SOP-19 section 7.2.2: • PLACE Compressor Switch in HAND position • VERIFY the UNLOAD light is de-energized • IF the compressor UNLOAD light is energized, THEN DEPRESS C-2B, Instrument Air Compressor's Load/Unload button o VERIFY the UNLOAD light is extinguished
Simulator Operator: Role play as NPO and follow along in procedure when RO is performing SOP-19 section 7.2.2: **For Step 7.2.2.c: C-2B UNLOAD light is deenergized and C-2B is loading.**		
	BOP	PLACES C-2C in OFF per SOP-19 section 7.2.4. • IF time allows, THEN PERFORM the following: o WHEN PIA-1210, Instrument Air Header Pressure Ind Alarm, reaches peak air header pressure, THEN after at least 10 seconds PLACE Compressor Switch to OFF
	BOP	PLACES C-2C in AUTO per SOP-19 section 7.2.7. • IF C-2C is being taken from HAND to AUTO, THEN PERFORM the following: o WHEN PIA-1210, Instrument Air Header Pressure Ind Alarm, reaches peak air header pressure, THEN after at least 10 seconds PLACE C-2C Control Switch to OFF • PLACE C-2C Control Switch to AUTO
Simulator Operator: Role play as NPO and follow along in procedure when RO is performing SOP-19 section 7.2.7 as needed: no responses expected.		

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

Event Description: ***Power Escalation***

Time	Position	Applicant's Actions or Behavior
	SRO	Enters/continues and directs the actions of GOP-5.
	BOP	Operates turbine generator on the DEH panel for power escalation @ 6% per hour: • Places DEH Speed Loop to OUT • ENTERS setter value • SELECTS rate of 6% per hour • After coordinating with RO, PUSHES "GO " pushbutton and observes white light illuminate • Informs CRS/RO that turbine is in "GO"
	RO	Performs periodic dilutions and/or control rod manipulations to maintain T_{AVE} within 3°F of T_{REF} per SOP-2A Attachment 12 For Dilution: • RESET PMW Controller if not already RESET • SET quantity and batch flow limit on FIC-0210A, PMW flow controller • OPEN CV-2155, Make Up Stop Valve • PUSH start pushbutton on FIC-0210A • MONITORS reactor power and T_{AVE} • VERIFIES FIC-0210A output signal at zero when dilution complete • CLOSES CV-2155 For Control Rod manipulations: • Operates Rod Control Switch to WITHDRAW Group 4 Regulating Rods in increments specified by CRS • MONITORS reactor power and T_{AVE}
Simulator Operator: IF asked, role play as Reactor Engineering and report that surveillance MT-10, is completed.		
	RO	May divert CVCS letdown to Clean Waste as VCT level rises: • PLACES CV-2056, Letdown to VCT or Radwaste, in the "TO CLEAN WASTE RCVR TANKS" position • When desired VCT level is achieved, PLACES CV-2056 to the "AUTO" or "TO VOL CNTRL TANK" position (then "AUTO")
After power has been raised 1%-2% *OR* at the discretion of the Lead Examiner, INSERT REMOTE #1. ALSO ENSURE THAT DPIC-1659 AND 1660 PLACARDS (showing low pressure) ARE HUNG ON BACK OF PANEL C-11A.		

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

Event Description: ***Loss of operating CRHVAC train***

Time	Position	Applicant's Actions or Behavior
Simulator Instructor: When Event 3 is initiated, place placards on the back of C-11A showing DPIC-1659/1660 indicating '0' inches H_2O		
	BOP	Diagnose loss of 'B' Train CRHVAC: • V-96, Air Handling Unit Fan, stops running • Noticeable lowering of background sound • EK-0249, Control Room LOW Pressure DPIC-1659/1660
	BOP	Operator actions from EK-0249: • VERIFIES CR HVAC not operating per SOP-24, Ventilation and Air Conditioning System • START opposite CR HVAC train in service per SOP-24
Simulator Operator: Role play as NPO and support as requested, no problems are noted in CR HVAC other than V-96 is not operating.		
	SRO	DIRECTS BOP to place 'A' Train CR HVAC in service per SOP-24 in Normal Mode. May direct Turbine placed in HOLD.
	BOP	IF placing CR HVAC to 'A' Train in service per SOP-24 section 7.7.1 in NORMAL: • ENSURE Control Switch for VC-11 in AUTO • ENSURE Control Switch for V-26A, Air Filter Unit Fan, in AUTO • ENSURE Control Switch for V-95, Air Handling Unit Fan, PLACED to ON • PLACE Control Switch for V-96 in OFF/RESET (per ARP) • CHECK indications for train ('A') being placed in service: o All Dampers in correct position (OPEN/MODULATING)
Simulator Instructor: When CRHVAC is restored, post placards on the back of C-11A showing DPIC-1659/1660 indicating > 0.125 inches H_2O		

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

Event Description: ***Loss of operating CRHVAC train***

Time	Position	Applicant's Actions or Behavior
	BOP	IF placing CR HVAC to 'A' Train inservice per SOP-24 section 7.7.2 in EMERGENCY: • PLACE Control Switch for V-26A, Air Filter Unit Fan, in ON • ENSURE Control Switch for V-95, Air Handling Unit Fan, PLACED to ON • PLACE Control Switch for V-96 to OFF/RESET (per ARP) • PLACE Control Switch for VC-10 to AUTO • ENSURE Control Switch for VC-11 in AUTO • CHECK indications for train being stopped: • Notes that Train 'B' Dampers reposition to CLOSED: o Outside Air Damper, D-8 o Modulating Damper, D-9 o Recirc Damper, D-10 o Discharge Damper, D-11 • CHECK indications for train ('A') being placed in service: o All Dampers in correct position (OPEN/MODULATING)
Simulator Instructor: When CRHVAC is restored, post placards on the back of C-11A showing DPIC-1659/1660 indicating > 0.125 inches H_2O		
CRS Evaluator: If CRHVAC was placed in EMERGENCY, then ask CRS follow-up question for his reason for using that mode instead of Normal Mode.		
	SRO	Refer to Technical Specifications and determine the following required actions due to inoperable 'B' CRHVAC train: • LCO 3.7.10.A.1 (7-day action) • LCO 3.7.11.A.1 (30-day action)
After SRO has briefed CRHVAC event ***OR* at the discretion of the Lead Examiner, INSERT REMOTE #2**		

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

Event Description: ***Loss of Preferred Bus EY-20***

Time	Position	Applicant's Actions or Behavior
	SRO/RO/BOP	Diagnose loss of Preferred AC Bus EY-20: • 'B' RPS channel parameters all in 'trip' (red lights illuminated); • PIP Control Rod indications read -188.0 • T_{AVE} temperature reads minimum • 'B' channel PZR Pressure Controller power loss • 'B' PZR Level Controller power loss Major Alarms: • EK-0545, Preferred AC Bus NO.2 Trouble • EK-0154, FW Pump P1B LO Suction Flow or LO Disch Press • EK-0764, Pressurizer Level Ch 'B' LO-LO • EK-0754, Pressurizer Pressure Off Normal HI-LO • EK-0918, PIP Trouble; EK-1145, Sequencer Trouble • EK-1378, Contmt Iso Safety INJ Right Side Cont CKT UV
	SRO	May order Turbine placed in HOLD
	BOP	May DEPRESS 'HOLD' on the turbine if directed
	RO	May stop dilution/VCT diversion
	SRO	• ENTERS AOP-13, Loss of Preferred AC Bus EY-20 • DIRECTS BOP to have NPO CLOSE MV-FW734, Feed Pump P-1B Recirc Valve (isolates CV-0710)
	BOP	• Contacts NPO to CLOSE MV-FW734, Feed Pump P-1B Recirc Valve (isolates CV-0710)
Simulator Operator – If requested by Control Room as NPO to close MV-FW734, wait approx. 6 minutes , use FW62 (PIDFW03) with a one-minute RAMP, then report back MV-FW734 is closed.		

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

Event Description: ***Loss of Preferred Bus EY-20***

Time	Position	Applicant's Actions or Behavior
	SRO	Direct the RO to place: • Pressurizer Level Control System (PLCS) to channel 'A' • Pressurizer Pressure Control System (PPCS) to channel 'A' • PLCS to 'CASCADE' • PPCS to 'AUTO' And then: • Refer to SOP-1A, Primary Coolant System to ensure all steps are completed referencing the procedure **Directing RO to swap controllers and then reference the SOP *OR* following step by step guidance in SOP *are both acceptable***
	RO	PLACES Avg Temp Display Switch to LOOP 1 position
	RO	TRANSFERS PPCS and PLCS to CHANNEL 'A' • PLACES HS 1/LRC-0101, Pressurizer Level Control Switch to the 'A' position • PLACES HS 1/LIC-0101, Heater Control Selector Switch to the 'A' position • PLACES HS 1/PRC-0101, Pressurizer Pressure Control Selector Switch to the 'A' position
	RO	PLACES PLCS in 'CASCADE" per SOP-1A Section 7.2.1: • ADJUST blue pointer to match red pointer on LIC-0101B • DEPRESS the 'AUTO' pushbutton on LIC-0101A • DEPRESS the 'CASCADE' pushbutton on LIC-0101A
	RO	PLACES PPCS in 'AUTO" per SOP-1A Section 7.2.2: • ADJUST blue pointer to match red pointer • DEPRESS the 'AUTO' pushbutton on PIC-0101A
	BOP	Performs Operator Actions for EK-0545, Preferred AC Bus NO.2 Trouble: • Refer to AOP-13 • Contacts NPO to go to investigate loss of AC Bus EY-20

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

Event Description: ***Loss of Preferred Bus EY-20***

Time	Position	Applicant's Actions or Behavior
Simulator Operator – When contacted by Control Room as NPO to investigate, wait approx. 4 minutes, then contact the Control Room and STATE: *the Inverter DC input breaker is closed and the AC output breaker is tripped*		
	SRO	Directs bypassing all Channel 'B' RPS trips per SOP-36
	RO/BOP	Verify alarms are due to loss of EY-20 and actions are completed.
	BOP	BYPASS 'B' Channel RPS trips per SOP-36: • INSERT bypass key above affected RPS Trip Unit • TURN key 90° clockwise (note: yellow light will not light due to loss of EY-20) • Repeat for remaining trips
	SRO	May direct BOP to close 2400V breaker 152-211 per AOP-13 or SOP-30, Station Power to restore power to PZR Heaters from 'D' Bus
	BOP	If directed, CLOSES 152-211 to restore PZR Heaters from 'D' Bus (SOP-30 steps shown): • ENSURE all Pressurizer Heater controls OFF for Xfmr 16 • VERIFY Pressurizer level greater than 36% • VERIFY Charging Motor white light lit above 152-211 handswitch • CLOSE 152-211, Bus 1D to XFMR 16 • VERIFY Charging Motor light for Breaker 152-211, Xfmr 16 Feeder, lights within 10 seconds after closure • ENSURE CLOSED 480 V group supply breakers (lights on heater controls for Xfmr 16) • OPERATE Proportional Heater Group switch and Backup Heater Group switches when directed by Shift Manager

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

Event Description: ***Loss of Preferred Bus EY-20***

Time	Position	Applicant's Actions or Behavior
	SRO	The following Tech Spec LCOs apply: • 3.4.1, Action A.1, PZR pressure, (2-hour action): applied IF pressure exceeded 2100 psia during transient • 3.8.9, Action: B.1, Preferred AC Bus, (8-hour action) • 3.8.7, Action: A.1, Inverter, (24-hour action) • 3.8.1, Action: B.1, One D/G (DBA/NSD sequencer), (1-hour action) (may invoke LCO 3.0.6 - support/supported system) • 3.7.5, Action A.1, and B.1, (6 hours to MODE 3) (can NOT invoke LCO 3.0.6 for supported systems since P-8A was already Inoperable) • 3.3.1, Action A.1, RPS Trip Units, (7-day action) (may invoke LCO 3.0.6 - support/supported system) NOTE: SRO may not reference Tech Specs until after AOP-13 attachment 1 is reviewed with the crew. Refers to ORM 3.17.6 for instrumentation per AOP-13 Attachment 1
	SRO	May review AOP-13, attachment 2 with the Crew.
	SRO	May exit AOP-13

After SRO has briefed loss of EY-20 *OR* 'B' Channel RPS is bypassed *OR* at the discretion of the Lead Examiner (may want to wait until PZR Level has stabilized) INSERT REMOTE #3:

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

Event Description: ***PCS Leak requiring a Plant Shutdown***

Time	Position	Applicant's Actions or Behavior

	SRO
	RO
	BOP
		Diagnoses PCS leak:
		• Indications from PPC:
		  ○ Containment Gas Radiation Monitor rising
		  ○ Containment Sump level rising
		  ○ Containment Sump fill rate rising
		  ○ Charging line flow rising
		• P-55A Charging Pump speed rising
		• P-55B Charging Pump Start (may occur)
		• EK-0734, Charging PP Seal Cooling LO Press (if P-55B starts)

	SRO	Enters AOP-23, “Primary Coolant Leak:” • Directs PCS Leak Rate calculation by AOP-23 or DWO-1, (PPC Page 550) • Reviews reactor trip criteria
	RO/BOP	PERFORMS PCS Leak Rate calculation, approximately 6 gpm leak
	SRO	Directs closing: • CV-1064 and CV-1065, CWRT Vent Valves • CV-1910 and CV-1911, PCS Sample Valves
	RO	Isolate Letdown per AOP-24 Attachment 12.
	BOP	• CLOSES CV-1064 and CV-1065, CWRT Vent Valves • CLOSES CV-1910 and CV-1911, PCS Sample Valves
	SRO	Determine the following Tech Spec LCO applies: • 3.4.13, Action: A.1, PCS leakage > 1 gpm unidentified, (4-hour action)
Simulator Operator – When Crew determines Tech Spec implications AND Letdown is isolated, then INSERT REMOTE #4 to raise PCS leakrate to 20 gpm.		

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

Event Description: ***PCS Leak requiring a Plant Shutdown***

Time	Position	Applicant's Actions or Behavior
	RO BOP SRO	Determines reactor trip criteria have been exceeded (unidentified PCS leakage > 10 gpm)
	SRO	Directs reactor trip (unidentified PCS leakage > 10 gpm)
	RO	PUSHES reactor trip pushbutton on Panel C-02
	RO/BOP	Perform EOP-1.0 immediate actions

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **1** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	BOP	• When Auxiliary Feedwater Actuation occurs, DIAGNOSES that AFW Pump P-8B did not auto start and P-8C did not start due to loss of EY-20 • Contingency Actions: PERFORM the following: START P-8B by taking HS-0522B to OPEN **(CRITICAL TASK PL-061 102 01: This operator action is required should automatic AFW flow control provide insufficient flow to the S/Gs to makeup for decay heat boiloff. Operators must start an AFW pump to maintain level. Task should be completed prior to exiting EOP-1.0.)** Note: If BOP attempts to start P-8C it will trip due to loss of EY-20.
	RO	• When Safety Injection actuation occurs, DIAGNOSES that Right Train SI did not actuate and that P-66B HPSI Pump did not start • Contingency Action: PZR Pressures less than 1605 psia, THEN PERFORM the following per EOP-1.0 immediate actions (attached): ○ Informs CRS that that P-66B HPSI Pump did not start ○ START P-66B HPSI Pump ○ START P-66A, HPSI Pump and P-67A, LPSI Pump OPEN Right Train HPSI and LPSI Loop Injection Valves **(CRITICAL TASK PL-000 433 05 01) - This action is to manually initiate HPSI following a SGTR or Small LOCA should failure of the safety injection actuation signal occur. Action should be completed prior to exiting EOP-1.0. Task met when P-66B is started OR P-66A/P-67A started and loop injection valves open.)**
	SRO	Commences EOP-1.0 verbal verifications
	RO	Reactivity Control: • Reactor power lowering **YES** • Negative SUR **YES** • Maximum of one control rod not inserted **YES**

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **2** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	BOP	Main Turbine Generator criteria: • Main Turbine tripped **YES** • Generator disconnected from grid **YES**
	BOP	Feedwater criteria: • Main FWP Controllers in 'MANUAL' at minimum speed: **YES** (however, the MSIVs are closed) • Main FRV and B/Ps CLOSED: **YES**
	BOP	Vital Auxiliaries-Electric: • Buses 1C and 1D energized: **YES** • Bus 1E energized: **NO** (if SIS present) • Bus 1A and 1B energized: **YES** • EY-01 energized: **YES** • Six DC Buses energized: **YES** • 3 of 4 Preferred AC Buses energized: **YES** (however EY-20 de-energized)
	RO	PCS Inventory Control: • PZR level 20% - 85% and trending toward 42% - 57%, **YES/NO** (depends on timing), IF NO, due to PZR Level < 20%. • Contingency Action: ○ All available Charging Pumps in service and Orifice Stop Valves Closed • PCS 25°F subcooled **YES**

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **3** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	RO	PCS Pressure Control: • PZR pressure 1650 – 2185 psia and trending toward 2010 – 2100 psia **NO** • Contingency Action: o Ensure Spray Valves are closed o Ensure all available heaters are energized (all heaters will be de-energized due to PZR level < 36% o At <1605 psia: INITIATE Right Train SI and START P-66B HPSI Pump o If PCS pressure is < 1300 psia, stops 'A' and 'D' PCPs o Informs CRS when PCS subcooling is below 25°F (CRS will note for Emergency Plan) o At < minimum pressure for PCP operations, trip remaining PCPs
	RO	Core Heat Removal: • At least one PCP operating **YES** • Verify Loop ΔT less than 10°F **YES** • Verify PCS at least 25°F subcooled **YES**
	BOP	PCS Heat Removal: • Verify at least one S/G has level between 5% to 70% with Feedwater available to maintain S/G level **YES** • Verify both S/Gs intact (no indication of ESDE or SGTR) **NO** o Secure FW to 'B' S/G • Verify T_{AVE} between 525°F and 540°F **YES/NO** (depends on timing) If T_{AVE} is less than 525°F: o ENSURE FW flow is NOT excessive o RESTORE T_{AVE} between 525°F and 540°F using Turbine Bypass Valve (preferred) or Atmospheric Steam Dump Valves • Verify BOTH S/G pressures between 800 psia and 970 psia **YES/NO** (depends on timing) If <800 psia: o ENSURE Turbine Bypass Valve is closed o ENSURE Atmospheric Steam Dump Valves are closed o CLOSE BOTH MSIVs: CV-0510 ('A'S/G) and CV-0501 ('B' S/G): places one handswitch to CLOSE momentarily and back to OPEN If <500 psia, ENSURE CLOSED the following valves: o BOTH MSIVs, CV-0510 ('A' S/G) and CV-0501 ('B' S/G) o CV-0703, 'B' S/G Main Feed Reg Valve o CV-0734, 'B' S/G Bypass Feed Reg Valve

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **4** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	RO	Containment Isolation: • Containment pressure < 0.85 psig **YES/NO** (depends on Timing) No Applicable Contingency Actions (< 4 psig)
	BOP	Containment Isolation: **YES** • Verify Containment Area Monitor alarms clear **YES** • Verify Condenser Off Gas Monitor alarm clear **YES** • Verify Main Steam Line Monitor alarms clear **YES**, but no power due to loss of EY-20
Simulator Operator – If directed to check for steam leaks, report that steam is coming from ADV/Relief stack area and also in CCW Room upper level: cannot tell exact source (i.e. ADV or Relief).		
	RO	Containment Atmosphere: • Containment temperature < 125°F **YES** • Containment Pressure < 0.85 psig **YES/NO** (depends on timing) No Applicable Contingency Actions (< 4 psig)
	RO	Vital Auxiliaries – Water: • Verify at least two Service Water Pumps operating **YES** • Verify BOTH Critical SW Header Pressures greater than 42 psig **YES** • Verify at least one CCW Pump operating **YES**
	RO	Vital Auxiliaries – Air: • Instrument Air header pressure greater than 85 psig **YES**

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **5** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	BOP	Verifies SIRWT level > 25%
	BOP	PLACES LEFT train CRHVAC in emergency mode: • STARTS V-26A, Air Filter Unit Fan • ENSURES OFF: V-94, Purge Fan; V-47, Switchgear Exhaust Fan • May follow-up with SOP-24 verification
	BOP	Verifies BOTH of the following: • At least one Condensate Pump operating • At least one Cooling Tower Pump operating
	SRO	May direct tripping both MFW Pumps (due to no SW and MSIVs closed)
	SRO	Directs isolating AFW to 'B' S/G per EOP-1.0 immediate actions (attached)
	BOP	ISOLATES AFW to 'B' S/G (may have been performed during verbal verifications): • SELECTS 'MANUAL' on FIC-0727, P-8A/B flow to S/G 'B' • SELECTS 'MANUAL' on FIC-0736A, P-8C flow to S/G 'B' (will not have power due to the loss of EY-20, NPO may be called to close CV-0736A – will be closed) • RAISES output to 100% on each controller (full right position)
	SRO	• Performs Event Diagnostic Flow Chart per EOP-1.0, Attachment 1 ○ Diagnoses EOP-9.0, Functional Recovery Procedure • Performs EOP-9.0 strategy brief • Establishes PCS pressure and temperature bands with RO

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **6** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	SRO	Directs closing CV-1064 and CV-1065, CWRT vent valves (may be performed previously in AOP-23)
	BOP	CLOSES CV-1064 and CV-1065 (may be performed previously in AOP-23)
	SRO	Directs performance of EOP Supplement 5, Checklist for Safeguards Equipment Following SIAS
	BOP	Completes EOP Supplement 5 (repositions components as needed)
	SRO	Directs placing a Hydrogen Monitor in service in accident mode
	BOP	PLACES left train H_2 monitor in service in accident mode (back of Panel C-11A) per SOP-38: • PLACES HS-2419 in ACCI position • PLACES HS-2417 to OPEN and RELEASES • PLACES HS-2413A, HS-2413B, HS-2415A, and HS-2415B, to OPEN • PLACES HS-2427L to “ANALYZE’ position

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **7** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	SRO	May direct throttling of Safety Injection
	RO	If directed, throttles Safety Injection: • Throttling HPSI Loop Injection Valves on left train • Secure HPSI Pump P-66B as necessary • Throttle right train HPSI Loops Injection Valves as necessary
	SRO	Directs SE to perform EOP-9.0 SFSC
	SRO	Determines success paths for each safety function: • Reactivity: RC-3 • Maintenance of Vital Auxiliaries-Electric: DC-1, AC-1 • PCS Inventory: IC-2 • PCS Pressure: PC-3 • **PCS/Core Heat Removal: HR-2 Challenged** • Containment Isolation: CI-1 • Containment Atmosphere: CA-1 or CA-2 (depends on conditions) • Maintenance of Vital Auxiliaries-Air: MVAW-1, MVAA-1
	SRO	Directs closing Letdown Orifice stop valves, CV-2003/2004/2005
	RO	Places handswitches for CV-2003/2004/2005 to the closed position
	SRO	May direct closing CV-2001 and CV-2009 Letdown Isolation Valves
	RO	If directed, CLOSES CV-2001 and CV-2009

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **8** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	SRO	May direct closing CV-2083 and CV-2099, PCP Controlled Bleedoff Valves
	RO	If directed, CLOSES CV-2083 and CV-2099
	SRO	May direct restoring Bus 1E
	BOP	If directed, restore Bus 1E by closing breaker 152-302 per SOP-30
	SRO	Directs PCS cooldown using ADVs
	RO	Begins PCS cooldown of PCS using the Atmospheric Steam Dump Valves: • HIC-0780A, Steam Dump Valve Controller, PLACED in 'MANUAL' • Manual Signal Lever used to OPEN ADVs for PCS cooldown • Lowers pressure using PIC-0101A to stay within EOP Supplement 1
	SRO	Directs isolation on 'B' S/G per EOP Supplement 18

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **9** of **9**

Event Description: ***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***

Time	Position	Applicant's Actions or Behavior
	BOP	Isolates 'B' S/G per EOP Supplement 18 (attached) Isolation from inside the Control Room: **(CRITICAL TASK PL-000 209 05 01: Isolating the affected steam generator prevents excessive cooldown of the Core and PCS and thereby lessens the potential for a Pressurized Thermal Shock Event that can threaten Reactor Vessel integrity. Operators would isolate water to the affected steam generator well within 30 minutes.)** ○ CLOSE both MSIVs, CV-0510 and CV-0501 (performed previously) ○ ENSURE CLOSED MO-0501, 'B' S/G MSIV Bypass Valve ○ CLOSE CV-0703, 'B' S/G Main Feed Reg Valve (performed previously) • CLOSE CV-0744, 'B' S/G Main Feed Block Valve ○ CLOSE CV-0734, 'B' S/G Bypass Feed Reg Valve • CLOSE S/G E-50B Blowdown Valves: CV-0768, CV-0770, and CV-0738 ○ CLOSE S/G E-50B AFW flow control valves; CV-0736, CV-0736A, CV-0727 (performed previously) • Directs NPO to perform Supplement 18 outside the control room

Simulator Operator: When instructed by BOP to isolate 'B' S/G outside the Control Room per Supplement 18, then perform the following:
MS18 (PIDMS01) Main Steam Dump Manual Valve CA-0779, value = CLOSED
MS19 (PIDMS01) Main Steam Dump Manual Valve CA-0780, value = CLOSED
SG10 (PIDMS01) Manual Throttle Vlv MS-102 for CV-0779, value = 0
SG12 (PIDMS01) Manual Throttle Vlv MS-104 for CV-0780, value = 0

TERMINATE Scenario when 'B' S/G has been isolated per EOP Supplement 18 *OR* at the discretion of the Lead Examiner.

Facility: **Palisades** Scenario No.: **THREE** Op-Test No.: **1**

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 60% power.

Turnover: Shift orders are to continue power ascension.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	SRO (R, N) RO (R) BOP (N)	Power escalation
2	P-40A-1	SRO (C, T) BOP (C)	P-40A, Dilution Water Pump, trip/breaker failed
3	RX05B	SRO (I) RO (I)	Channel 'B' Pressurizer Pressure Controller failure (AOP-28)
4	N/A	SRO (T)	T-10A Diesel Fuel Oil Inventory Low
5	RC12A RC16A	SRO (C) RO (C)	PCP P-50A failed lower seal PCP P-50A High Vibration (requires pump trip) (AOP-29)
6	RC04	ALL (M)	LOCA (when reactor manually tripped)
7	TC02	BOP (I)	Failure of Turbine to auto trip
8	CH05A CH05B	RO (I)	CHP Channels Auto Initiate Failure

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

Scenario THREE - Simulator Operator Instructions

- Reset to IC-15 (**IC151 for ILT2014**)
- Ensure FIC-0210A set for 40-gallon dilution on Panel C-02
- INSERT MF TC02 (PIDTC03) Failure of Turbine to trip on Reactor Trip
- INSERT MFs CH05A and CH05B (PIDCH01) Failure of CHP channel to AUTO initiate
- Create Event Trigger 4: Event: AN:K09(3) {this is Alert alarm for PCP Vibration}

Create Event Trigger 5:

Event: ZDI2P(123) {this is P-50A HS to TRIP position}

Action: ior LTVR-0901-08 (0 00:00) 0.55 15:00

- Create Event Trigger 6: Event: rdsr(13)<100

Event #	Remote or Trigger #	Instructions
1		No actions required.
2	**REMOTE 1**	**P-40A-1** (DWS P-40A Selector Stop) to ON (= trips P-40A) **P-40A-W** (P-40A white light) to OFF **P-40A-G** (P-40A green light) to OFF
3	**REMOTE 2**	**RX05B** (PIDRX01) Channel 'B' PZR Pressure Controller failure
4		No actions required (Simulator Operator phone call: see end of Event #3)
5	**REMOTE 3**	**RC12A** (PIDRC03) Lower Seal Failure on P-50A **RC16A** (PIDRC03) HI Vibration on PCP P-50A, Time Delay = 9 minutes
	TRIGGER 4	**LTVR-0901-08** (PNL C-11) P-50A Upper Thrust Bearing Temperature Final Value = 0.75, 7 minute ramp *[Trigger #5 will activate when P-50A is secured]*
6	**TRIGGER 6**	**RC04** (PIDRC01) Severity = 100 (1000 gpm LOCA)
7		ACTIVE AT SETUP – No actions required.
8		ACTIVE AT SETUP – No actions required.

Special instructions:

Provide a marked up copy of GCL 5.1 completed through step 4.3

Scenario THREE - Turnover Information

The plant is at 60% power, MOL after a short forced outage. Power ascension was in progress when an engineering hold was implemented to monitor the performance of both Main Feedwater Pumps. The engineering hold is no longer required and both Main Feedwater Pumps have been deemed acceptable for 100% power operation.

Shift orders are to resume power ascension at 6% per hour. At 80% power, the rate of power ascension will be adjusted to 4% per hour.

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **1** Page **1** of **1**

Event Description: ***Power Ascension***

Time	Position	Applicant's Actions or Behavior
	SRO	Enters/continues and directs the actions of GOP-5.
	BOP	Operates turbine generator on the DEH panel for power escalation @ 6% per hour: • ENTERS setter value • SELECTS rate of 6% per hour • PUSHES "GO " pushbutton and observes white light illuminate • Informs CRS/RO that turbine is in "GO"
SIMULATOR OPERATOR: If asked or told to perform GOP-5 trending, respond that it is in progress.		
	RO	Performs periodic dilutions and/or control rod manipulations to maintain T_{AVE} within 3°F of T_{REF} per SOP-2A Attachment 12 For Dilution: • RESET PMW Controller if not already RESET • SET quantity and batch flow limit on FIC-0210A, PMW flow controller • OPEN CV-2155, Make Up Stop Valve • PUSH start pushbutton on FIC-0210A • MONITORS reactor power and T_{AVE} • VERIFIES FIC-0210A output signal at zero when dilution complete • CLOSES CV-2155 For Control Rod manipulations: • Operates Rod Control Switch to WITHDRAW Group 4 Regulating Rods in increments specified by CRS • MONITORS reactor power and T_{AVE}
	RO	May divert CVCS letdown to Clean Waste as VCT level rises: • PLACES CV-2056, Letdown to VCT or Radwaste, in the "TO CLEAN WASTE RCVR TANKS" position • When desired VCT level is achieved, PLACES CV-2056 to the "AUTO" or "TO VOL CNTRL TANK" position (then "AUTO")
After power has been raised 1%-2% *OR* at the discretion of the Lead Examiner, INSERT REMOTE #1		

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

Event Description: ***Dilution Water Pump P-40A Trip***

Time	Position	Applicant's Actions or Behavior
	BOP SRO	Diagnoses Dilution Water Pump P-40A trip: • P-40A red light OFF, green light OFF, white light OFF • P-40A amps are ZERO • Notes 'A' Cooling Tower level lowering • EK-3518, Dilution Wtr Pump P-40A Trip (ARP-24)
	BOP	THROTTLE OPEN MO-5305 (Cooling Tower Pp. P-39A discharge) to maintain cooling tower basin level.
	BOP	Supply both Water Boxes from P-40B per SOP-14, section 7.3.5: • ENSURE CLOSED MO-5313, P-40A/B Disch to E-30A Makeup/Fill • ENSURE CLOSED MO-5315, P-40A/B Disch to E-30A Makeup/Fill • SLOWLY OPEN MV-CW735, Dilution Water Pumps P-40A/B Disch Xconn (call to NPO) • SIMULTANEOUSLY THROTTLE OPEN MO-5315, P-40A/B Disch to E-30A Makeup/Fill, for a total of 15-20 seconds AND THROTTLE CLOSED MO-5316, P-40A/B Disch to E-30B Makeup/Fill • CONTACT chemistry to obtain Cooling Tower samples
SIMULATOR OPERATOR: If directed to open MV-CW735, use CW19 (PIDCW02), value = 100		
	SRO	May order Main Turbine placed in HOLD.
	BOP	DEPRESS HOLD on Main Turbine if directed.
	SRO	Notify Chemistry or RMC concerning degraded dilution capability.
	SRO	Notify NPO and Work Week Mgr to investigate P-40A and breaker.
SIMULATOR OPERATOR: Call CRS as NPO and inform that P-40A breaker 152-102 has no control power light and there is a smell of burnt insulation from breaker. **SIMULATOR OPERATOR: When asked, inform CRS that P-40B discharge pressure is 11 psig.**		
	SRO	Determines that LCO 3.4.9.B.1, 72 hours to restore to OPERABLE status, applies for P-40A breaker 152-102 being inoperable.
NOTE: After CRS has determined LCO *OR* at the discretion of the Lead Examiner, INSERT REMOTE #2.		

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

Event Description: ***Failure of 'B' Channel PZR Pressure Controller***

Time	Position	Applicant's Actions or Behavior
	RO	Diagnoses failure of 'B' PZR Pressure Controller: Indications: PIC-0101B, 'B' Channel PZR Pressure Controller reads 2500 psia; Signal output on PIC-0101B in 'full Spray' position; PZR Spray CV's 1057/1059 show full open; PZR pressure lowering on PI-0104 and PIC-0101A Major Alarm EK-0754, Pressurizer Pressure OFF Normal HI-LO:
	RO	Performs Operator Actions for EK-0754: ▪ Notifies CRS to refer to AOP-28
	SRO	Enters AOP-28, Pressurizer Pressure Control Malfunctions Directs subsequent actions to be taken
	SRO	May direct RO to perform: ▪ PIC-0101B to the 'M' position ▪ Control PZR pressure using Slide Bar ▪ Direct a pressure band in which to maintain pressure ▪ Swap to PIC-0101A per SOP-1A OR ▪ Placing HS 1/PRC-0101 to the 'A' Channel position And then ▪ Refer to SOP-1A, Primary Coolant System, to ensure all steps are completed referencing the procedure **Directing RO to swap controllers and then reference the SOP *OR* following step by step guidance in SOP *are both acceptable***

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

Event Description: ***Failure of 'B' Channel PZR Pressure Controller***

Time	Position	Applicant's Actions or Behavior
	RO	Per SRO direction performs: ▪ PLACES PIC-0101B to the 'M' position ▪ Control PZR pressure using Slide Bar ▪ Swap to PIC-0101A per SOP-1A OR ▪ PLACES HS 1/PRC-0101 to the 'A' Channel position And then ▪ Refers to SOP-1A, Primary Coolant System, to ensure all steps are completed referencing the procedure **(CRITICAL TASK PL-000 423 04 01: This action is to manually alternate PZR pressure control channels should failure of the in-service channel occur (OR operate failed channel in Manual). Action should be completed prior to an automatic reactor trip.)**
	RO	PLACES PPCS in 'AUTO" per SOP-1A Section 7.2.2: ▪ ADJUST blue pointer to match red pointer ▪ DEPRESS the 'AUTO' pushbutton on PIC-0101A
	SRO	The following Tech Spec LCO may apply: ▪ 3.4.1, Action: A.1, PZR pressure < 2010 psia, 2 hours
	SRO	May exit AOP-28, may direct BOP to check instruments on back of C-12.

After the SRO has briefed the loss of the 'B' Channel Pressurizer Pressure Controller OR at the discretion of the Lead Examiner, make phone call to CRS as I&C technician and report the following:

a. During calibration of T-10A fuel oil tank level transmitter for LIA-1400, we did a dipstick check of T-10A.

b. The dipstick check results are that T-10A actual level is 86" which means we will need to recalibrate LIA-1400 since it is reading inaccurately.

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

Event Description: ***T-10A Diesel Fuel Oil Inventory Low***

Time	Position	Applicant's Actions or Behavior
	SRO	Receives phone call from I&C that T-10A dipstick reading is 84.5".
	SRO BOP	Verifies that LIA-1400 in the Control Room is incorrectly indicating adequate T-10A inventory.
	SRO	Refers to SOP-22, Attachment 3 and determines that based on a dipstick reading of 84.5", there is inadequate fuel oil inventory in T-10A (~30,000 gallons).
	SRO	Refers to Tech. Spec. 3.8.3 and determines that LCO 3.8.3.A applies. Must restore fuel oil inventory within 48 hours.
	SRO	May direct T-10A fill from T-926.

At the discretion of the Lead Examiner, INSERT REMOTE #3

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

Event Description: ***PCP P-50A Lower Seal Failure/High Vibration***

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Responds to P-50A alarm: • EK-0949, “PRI COOLANT PUMP P-50A SEAL PRESS OFF NORMAL”
	RO	Reviews seal pressure readings on PR-0130A (Panel C-12)
	SRO/RO	RESPONDS to alarms for P-50A using AOP-29, “Primary Coolant Pump Abnormal Conditions.” • Monitor affected PCP Seal Flow Recorder • Monitor affected PCP Seal Pressure Recorder AND COMPARE to Attachment 1, "PCP Seal Staging Schematic" • VERIFY the following: o Controlled Bleedoff flow is available o Only one seal stage has failed o Pressure breakdown device not plugged
	SRO	Determines continued operation is allowed with one failed PCP seal.

EXAMINER NOTE: Malfunction for PCP High vibration has a 9 minute time-delay from start of this event and also needs time to cause any alarms.

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

Event Description: ***PCP P-50A Lower Seal Failure/High Vibration***

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Diagnoses P-50A high vibration: Vibration Monitor VIA-131A readings on Panel C-02 above normal, in ALERT or DANGER Alarms EK-0913, Pri Coolant Pump Vib Alert/Mon Trouble and/or EK-0914, Pri Coolant Pump Vibration Danger P-50A upper thrust bearing temperature on Panel C-11, TIA-0138A, trending upward
	RO	RESPONDS to alarms for P-50A using AOP-29, “Primary Coolant Pump Abnormal Conditions.” DETERMINES that reactor trip is required (based on rate of rise and other corroborating indications) and that PCP should be stopped.
	SRO	Directs tripping reactor and then securing P-50A
	RO	DEPRESSES CO-2 Panel Reactor Trip Pushbutton
	RO	TRIPS P-50A using switch on Panel C-02 ENSURES associated AC or DC lift pump automatically starts
	BOP/RO	PERFORM EOP-1.0 immediate actions

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **1** of **7**

Event Description: ***EOP-1.0 actions/EOP-4.0 (LOCA)***

Time	Position	Applicant's Actions or Behavior
	BOP	Informs the CRS that the Turbine did not trip, CONTINGENCY ACTION: PERFORM the following: • CLOSE both MSIVs: CV-0510 ('A'S/G) and CV-0501 ('B' S/G): places one handswitch to CLOSE momentarily and back to OPEN **(CRITICAL TASK PL-000 007 05 01: This action is to manually close the MSIVs due to the failure of the Turbine to trip. Action prevents excessive cooldown of the Core and PCS and thereby lessens the potential for a Pressurized Thermal Shock Event that can threaten Reactor Vessel integrity and should be performed prior to starting verbal verifications of EOP-1.0.)**
	SRO	Commences EOP-1.0 verbal verifications
	RO	Reactivity Control: **YES** • Reactor power lowering • Negative SUR • Maximum of one control rod not inserted
	BOP	Main Turbine Generator criteria: **YES** • Main Turbine tripped (Contingency taken to close MSIV) • Generator disconnected from grid
	BOP	Feedwater criteria: • PLACES Main FWP Controllers to 'MANUAL' and RAMPS to minimum speed **NO** – MSIVs closed • PLACES Main FW Controllers to 'MANUAL,' Main FRV and B/Ps CLOSED **YES**

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **2** of **7**

Event Description: ***EOP-1.0 actions/EOP-4.0 (LOCA)***

Time	Position	Applicant's Actions or Behavior
	BOP	Vital Auxiliaries-Electric: • Buses 1C and 1D energized: **YES** • Bus 1E energized: **YES/NO (depends on SIAS status)** • Bus 1A and 1B energized: **YES** • EY-01 energized: **YES** • Six DC Buses energized: **YES** • 3 of 4 Preferred AC Buses energized: **YES**

	RO	PCS Inventory Control:
		• PZR level 20% - 85% and trending toward 42% - 57% **NO**
		Applicable Contingency Actions:
		  • Ensure all orifice stop valves are closed
		  • Ensure all available charging pumps are operating
		• PCS 25°F subcooled **YES/NO** (depends on timing)

	RO	PCS Pressure Control:
		• PZR pressure 1650 – 2185 psia and trending toward 2010 – 2100 psia **NO**
		Applicable Contingency Actions:
		  • Ensure Spray Valves are closed
		  • Ensure all available heaters are energized (all heaters will be de-energized due to PZR level < 36%
		  • Ensure all available HPSI (P-66A/B) and LPSI Pumps (P-67A/B) operating with associated loop injection valves (12 total) open

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **3** of **7**

Event Description: ***EOP-1.0 actions/EOP-4.0 (LOCA)***

Time	Position	Applicant's Actions or Behavior
	RO	Core Heat Removal: May SECURE ALL PCPs due to loss of CCW for cooling • At least one PCP operating: **YES or NO** (depends on timing) • Verify Loop ΔT less than 10°F: **YES** • Verify PCS at least 25°F subcooled: **YES/NO** (depends on timing) ○ Informs CRS when PCS subcooling is below 25°F (CRS will note for Emergency Plan)
	BOP	PCS Heat Removal: • Verify at least one S/G has; level 5% - 70%; Feedwater available: **YES** • Verify both S/Gs intact (no indication of ESDE or SGTR) **YES** • Verify T_{AVE} 525°F - 540°F: **YES** • Verify BOTH S/G pressures 800 psia – 970 psia: **YES**
	RO	Containment Isolation: **NO** • Containment pressure > 0.85 psig Applicable Contingency Actions (will occur later- see Page 16) When Containment pressure > 4.0 psig perform all of the following per EOP-1.0 immediate actions (attached): • ENSURE EK-1126 (CIS Initiated) OR PUSH High Radiation Pushbuttons on Panel C-13 • ENSURE CLOSED: Both MSIVs (MO-0510 and MO-0501); Main FRVs; Main FRV Bypasses; CCW Isolation Valves • ENSURE EK-1342 (Safety INJ Initiated) OR PUSH left and right Injection Initiate pushbuttons on Panel C-13
	BOP	Containment Isolation: • Verify Containment Area Monitor alarms clear: **YES/NO** (Depends on timing: All four in alarm, not corroborated with High Range Gamma Monitors) Applicable Contingency Actions (will occur later- see Page 16) • Verify Condenser Off Gas Monitor alarm clear: **YES** • Verify Main Steam Line Monitor alarms clear: **YES**

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **4** of **7**

Event Description: ***EOP-1.0 actions/EOP-4.0 (LOCA)***

Time	Position	Applicant's Actions or Behavior

	RO	Containment Atmosphere: **NO**
		• Containment temperature > 125°F
		• Containment Pressure > 0.85 psig Applicable Contingency Actions (may occur in EOP-4.0):
		  • ENSURE OPERATING ALL available Containment Air Cooler 'A' Fans and ensure all CAC Hi Capacity outlet valves are open per EOP-1.0 immediate actions (attached):
		  • At 4 psig (will occur later: see Page 16)

	RO	Vital Auxiliaries – Water: **YES** • Verify at least two SW Pumps operating • Verify BOTH Critical SW Headers in operation with pressure > 42 psig • Verify at least one CCW Pump operating
	RO	Vital Auxiliaries – Air: **YES** • Instrument Air Pressure > 85 psig
	SRO	• Directs performance of EOP Supplement 6, Checklist For Containment Isolation and CCW Restoration • Directs performance of EOP Supplement 5, Checklist for Safeguards Equipment Following SIAS
	BOP	PERFORMS EOP Supplement 5 and Supplement 6
	BOP	Verifies SIRWT level > 25%
	BOP	PLACES left train CRHVAC in emergency mode: • STARTS V-26A Air Filter Unit Fan (will auto start if CHP has occurred) • ENSURES OFF: V-94, Purge Fan; V-47, Switchgear Exhaust Fan • May follow-up with SOP-24 verification

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **5** of **7**

Event Description: ***EOP-1.0 actions/EOP-4.0 (LOCA)***

Time	Position	Applicant's Actions or Behavior
	BOP	Verify BOTH of the following: • At least one Condensate Pump operating • At least one Cooling Tower Pump operating
	BOP	TRIPS both Main Feed Pump Turbines due to MSIVs being closed.
	SRO	▪ Performs Event Diagnostic Flow Chart per EOP-1.0, Attachment 1 • Diagnoses EOP-4.0, Loss of Coolant Event • Performs EOP-4.0 strategy brief • Establishes PCS pressure and temperature bands with RO • Directs cooldown of PCS using ADVs
	SRO	Directs SE to perform Safety Function Status checks for EOP-4.0
	SRO	Directs performance of EOP Supplement 4, Pre-RAS Minimum HPSI Injection Flow
	BOP/SE	PERFORMS EOP Supplement 4

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **6** of **7**

Event Description: ***EOP-1.0 actions/EOP-4.0 (LOCA)***

Time	Position	Applicant's Actions or Behavior
	SRO	Directs placing handswitches for Letdown Orifice Stop Valves to close
	RO	PLACES handswitches to CLOSE: • HS-2003 (CV-2003) • HS-2004 (CV-2004) • HS-2005 (CV-2005)
	SRO	Directs closing CV-1064 and CV-1065, CWRT vent valves
	SRO	Directs closing CV-2001 and CV-2009, Letdown Stop valves
	SRO	Directs closing CV-1910 and CV-1911, PCS Sample Isolation valves
	BOP	CLOSES CV-1064 and CV-1065 CLOSES CV-2001 and CV-2009 CLOSES CV-1910 and CV-1911
	RO	WHEN Containment pressure exceeds 4 psig, THEN takes applicable Contingency action: • ENSURE EK-1126 (CIS Initiated) OR PUSH High Radiation Pushbuttons on Panel C-13 • ENSURE CLOSED: Both MSIVs (MO-0510 and MO-0501); Main FRVs; Main FRV Bypasses; CCW Isolation Valves **(CRITICAL TASK PL-000 443 05 01: This action is to manually initiate Containment Isolation should failure of the automatic actuation signal occur. This action should be completed prior to Containment pressure exceeding 5 psig.)** • ENSURE EK-1342 (Safety INJ Initiated) OR PUSH left and right Injection Initiate pushbuttons on Panel C-13 • ENSURE OPEN Containment Spray Valves CV-3001 and CV-3002 • ENSURE OPERATING all Containment Spray Pumps, P-54A/B/C

Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **7** of **7**

Event Description: ***EOP-1.0 actions/EOP-4.0 (LOCA)***

Time	Position	Applicant's Actions or Behavior
	SRO	Directs placing a Hydrogen Monitor in service
	BOP	Places left train H_2 monitor in service in accident mode (back of Panel C-11A): • PLACES HS-2419 in ACCI position • PLACES HS-2417 to OPEN and RELEASES • PLACES HS-2413A, HS-2413B, HS-2415A, and HS-2415B, to OPEN • Energizes H2 Recorder, AR-2401, by: PLACING to 'ON' Power Switch and PLACES to 'ON' Chart Drive Switch • PLACES HS-2427L to 'ANALYZE' position • REMOVES pen caps from chart pens
	SRO	Verifies all available charging pumps operating
	SRO	Evaluates securing/reducing Containment Spray flow per EOP-4.0 Step 16
	BOP	SECURES either P-54B OR P-54C

TERMINATE Scenario after first Containment Spray Pump is stopped per EOP-4.0 Step 16.a *OR* at the discretion of the Lead Examiner.