2010 PALISADES NUCLEAR PLANT

INITIAL EXAMINATION

PROPOSED EXAM FILES

PROPOSED SCENARIOS

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 87% power with P-66B HPSI Pump tagged out.

Turnover: P-66B HPSI Pump is tagged out for a coupling alignment and will be restored to operable in 4 hours. Shift orders are to maintain current power level.

Event No.	Malf. No.	Event Type*	Event Description
1	CW01A	SRO (C, T) BOP (C) RO (R)	Cooling Tower Pump P-39A trips (ONP-14) and rapid downpower (ONP-26)
2	EG04 ED142	BOP (C) SRO (C)	Main Generator Voltage Regulator failure with concurrent change in grid voltage
3	RP24A	SRO (I, T) RO (I)	Cold Leg #1 RTD fails high
4	SG01A	SRO (C, T) RO (C)	'A' S/G tube leak that rises to require a reactor trip. (≥ 0.4 gpm requires reactor trip)
5	SG01A	ALL (M)	SGTR on 'A' S/G
6	ED13B	RO (C)	Failure of Right Train SIAS to automatically actuate

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

Scenario ONE - Simulator Operator Instructions

- Reset to IC 16
- Ensure FIC-0210A set for 40-gallon dilution on Panel C-02
- INSERT MF ED13B (PIDSI01)
- Hang Caution Tag on HPSI Pump P-66B (OOS) hand switch
    - RACKOUT breaker for P-66B using SI24 on PIDSI02
    - Ensure EOOS indicates that P-66B is out of service
- Create Event Trigger 5: Event: rdsr(13)<100

Event #	Remote or Trigger #	Instructions
1	**REMOTE 1**	**CW01A** (PIDCW01) C/T Pump P-39A Trip
2	**REMOTE 2**	**EG04** (PIDEG01) Main Gen Auto Volt Regulator Fail **ED142** (PIDED03) Infinite Grid Voltage, Final Value = 380000
3	**REMOTE 3**	**RP24A** (PIDRPNI1) Cold Leg #1 RTD Fail High TE-0112CA, Final Value = 100
4	**REMOTE 4**	**SG01A** (PIDSG01) Severity 0.20, 20-minute ramp. causes a S/G Tube Leak on 'A' S/G.
5	**TRIGGER 5**	Action: imf sg01a 40.0 *[raises severity of tube leak to 400 gpm]*
6		ACTIVE AT SETUP (right train SIAS auto failure)

Special instructions:

None

Scenario ONE - Turnover Information

The Plant is at 87% power. P-66B HPSI Pp. is tagged out for pump coupling alignment and it is estimated that it will be restored to operable in 4 hours (LCO 3.5.2.B.1 - 72 hrs.). Shift orders are to maintain current power level.

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

Event Description: ***P-39A Cooling Tower Pump Trip***

Time	Position	Applicant's Actions or Behavior
	BOP/SRO	Diagnoses that P-39A has tripped: • EK-3522, "CLG TWR PUMP P-39A TRIP" • Possible lowering trend on Main Condenser vacuum.
	SRO	Enters and directs the actions of ONP-14, Loss of Condenser Vacuum and ONP-26, Rapid Downpower. • Reviews trip criteria of ONP-14 • Reviews trip criteria of ONP-26
	SRO/RO/ BOP	Initiate a rapid downpower to <55% at a rate of ≤ 300% per hour, as directed by ONP-14 and as controlled by ONP-26, Rapid Downpower.
	RO	INSERTS Group 4 Control Rods 10 inches: ▪ Rod Control Switch operated to INSERT Group 4 control rods 10 inches
	BOP	Stabilize power at < 55% as specified by SRO. COMMENCE turbine load reduction in Operator Auto using RUNBACK at a rate ≤ 300%/hour, as ordered by the Control Room Supervisor.
	RO	Stabilize power at < 55% as specified by SRO. MAINTAIN T_{AVE} within 5°F of T_{REF} during the rapid power reduction by regulating rod insertion and/or boration. **Note: This will take some time to stabilize; i.e., crew will slow rate of power reduction significantly when vacuum starts to stabilize.**
	SRO	Refers to and implements the following Tech Spec LCOs: • 3.1.6.A, 2-hour action to restore rods above PDIL

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

Event Description: ***P-39A Cooling Tower Pump Trip***

Time	Position	Applicant's Actions or Behavior
	BOP	THROTTLE P-39A Waterbox Inlet per ONP-14 Attachment 1 per SRO direction.
	RO	May balance Group 4 control rods.
	BOP	PLACES one Main FW pp. to MANUAL at minimum speed per SRO direction.

After power has been lowered to 55% *OR* at the discretion of the Lead Examiner, INSERT REMOTE #2

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

Event Description: ***Main Gen Auto Volt Regulator Trip***

Time	Position	Applicant's Actions or Behavior
	BOP SRO	Diagnose Main Gen Auto Voltage Regulator Trip: Indications: • C-01 lights above Voltage Regulator Control Switch are OFF • Terminal Voltage 23.6 kV Major alarms: • EK-0310, Generator Volt Reg Trip • EK-0317, Generator HI Volts/Hertz
SIMULATOR OPERATOR: Make phone call as Transmission System Controller that grid is experiencing severe voltage problems.		
	BOP	Respond per ARP-2 for EK-0310: IF Generator has NOT tripped, THEN CHECK Generator Terminal Voltage normal. IF Generator Terminal Voltage is NOT normal, THEN ADJUST with DC Adjuster by performing the following: VERIFY Regulator Balance Meter indicates approximately zero. PLACE 390CS, Voltage Regulator Control Switch to OFF or TEST position. ADJUST 370DC/CS, Voltage Regulator Manual Control Switch to control Generator Terminal Voltage between 21kV and 23kV.
	SRO	Make notifications to Transmission Systems Coordinator concerning that the Plant is not currently operating in accordance with the GRCP.
At the discretion of the Lead Examiner, INSERT REMOTE #3		

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

Event Description: ***Cold Leg RTD Failure HIGH***

Time	Position	Applicant's Actions or Behavior
	RO	Diagnoses high failure of Loop #1 Tcold signal: Alarms: - EK-0967, Loop 1 LOOP 2 T_{AVE} Deviation - EK-0968, Loop 1 T_{AVE}/T_{REF} Gross Deviation - EK-0759, No PCS Protection Channel A - EK-06 Rack C Window #1, TM/LO Pressure Channel Trip - EK-06 Rack C Window #5, TM/LO Pressure Channel Pre-Trip - EK-06 Rack D Window #3, Nuclear-ΔT Power Deviation T-Inlet Off Normal/Calculator Trouble Channel A - Rising of calculated ΔT Power and TM/LP trip setpoint for Channel 'A' - TI-0112CA Loop 1 Cold Leg Temperature indicates high
	RO	Checks ARP-5 and ARP-21 for alarms present: report to CRS that ONP-13 needs to be referenced. May also reference SOP-1A, attachment 1 for PCS Temperature Instrumentation functions.
	SRO	May enter ONP-13, T_{AVE}/T_{REF} Controller Failure (no actions apply). May check ΔT Power for the PIP Node and the SPI Node/Host Computer on a workstation and compare to actual heat balance power (no actions apply)

Op-Test No.: **1**	Scenario No.: **ONE** Event No.: **3**	Page **2** of **2**
Event Description:	***Cold Leg RTD Failure HIGH***	
Time	Position	Applicant's Actions or Behavior
	SRO	Refers to and implements the following Tech Spec/ORM LCOs: • 3.1.6.C, 15-minute action if rods are moved • 3.3.1.A (Table 3.3.1-1 Items 1 and 9), 7 day action statement • 3.3.8.A (Table 3.3.8-1 item 6), 30 day action statement • ORM 3.17.6 (Item 12.1), Prior to next MODE 1 entry from MODE 2
NOTE: Have Shift Manager surrogate tell CRS to direct BOP operator to relieve ATC operator so they can perform the next task.		
	RO	BYPASS Variable High Power Trip and TM/LP Trip for Channel 'A' per SOP-36 (does not need to be in-hand) 1. INSERT bypass keys (289 & 297) above affected RPS Trip Unit. 2. TURN key 90° clockwise. 3. Verify lit yellow light above bypass keyswitch.
	SRO	Initiates troubleshooting and repairs
After RPS has been bypassed *OR* at the discretion of the Lead Examiner, INSERT REMOTE #4		

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

Event Description: ***'A' Steam Generator Tube Leak***

Time	Position	Applicant's Actions or Behavior
	SRO BOP RO	Diagnoses Steam Generator Tube Leak on 'A' S/G: EK-1364, GASEOUS WASTE MONITORING HI RADIATION alarms Monitors PZR level, pressure Monitors VCT level Charging-Letdown mismatch
	SRO RO BOP	Notes trends on any of the following: • RIA-0631, Condenser Off-Gas Monitor • RIA-2323, Main Steam Gamma Monitor ('B' S/G) • RIA-2324, Main Steam Gamma Monitor ('A' S/G) • RIA-0707, Steam Generator Blowdown Monitor • RIA-2325/2326, Stack Gas Effluent Monitors • RIA-2327, High Range Noble Gas Monitor
	SRO BOP	Uses ONP-23.2, Att.1 and/or Att.2 or PPC Page 540/550 to calculate leak rate. (calculated leak rate may be inaccurate due to changing value over 15-minute ramp.) May also use DWO-1 method (15 min)
Simulator Operator: If asked as Chemistry, PCS Gas Total Isotope activity = 0.6 µCi/cc		
	SRO	Determines that Tech Spec 3.4.13.B applies - 6 hours to MODE 3, 36 hours to MODE 5. (> 150 gpd)
	SRO	Notify HP to determine dose rates on C-42 cation columns Notify HP to perform surveys per EOP Supplement 14 May notify Chemistry to sample S/Gs for lithium and activity
Simulator Operator: Inform control room that cation surveys for 'A' S/G indicate a higher than normal dose rate.		

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

Event Description: ***'A' Steam Generator Tube Leak***

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnose that leak rate is above 0.4 gpm which requires a Reactor trip
	SRO	Directs Reactor Trip
		Plant Trip
	RO	Depresses Reactor Trip pushbutton on Panel C-02
	RO	Announces time of trip and verifies all full length control rods indicate fully inserted

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

Event Description: ***'A' Steam Generator Tube Rupture/Failure of Right Train SIAS***

Time	Position	Applicant's Actions or Behavior
	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 ▪ Generator disconnected from grid
	BOP	Feedwater criteria: **YES**: ▪ PLACES Main FWP Controllers to 'MANUAL' and RAMPS to minimum speed ▪ Main FRV and B/Ps CLOSED
	BOP	Vital Auxiliaries-Electric: ▪ Buses 1C and 1D energized: **YES** ▪ Bus 1E energized: **NO (if SIS present)** ▪ Bus 1A and 1B energized: **YES** ▪ Y-01 energized: **YES** ▪ Six DC Buses energized: **YES** ▪ 3 of 4 Preferred AC Buses energized: **YES**

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **5/6** Page **2** of **5**

Event Description: ***'A' Steam Generator Tube Rupture/Failure of Right Train SIAS***

Time	Position	Applicant's Actions or Behavior
	RO	PCS Inventory Control: **YES OR NO** (Depends on Plant conditions) ▪ PZR level 20% - 85% and trending toward 42% - 57% ▪ PCS 25°F subcooled IF **NO**, would be on PCS being 25°F subcooled (NO CONTINGENCY) or PZR Level < 20% (CONTINGENCY: All available Charging Pumps in service and Orifice Stop Valves Closed)
	RO	PCS Pressure Control: **NO** Contingency – manually operates PZR heaters and spray, heaters will be off due to low PZR level, spray valves closed. 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 Notes Right Train SIAS does not automatically initiate: Pushes Right Train SIAS pushbutton Panel C-13 per EOP-1.0 immediate actions(attached): **(CRITICAL TASK PL-000 433 05 01)** If PCS pressure is < 1300 psia, stop 'A' and 'D' PCPs.
	RO	Core Heat Removal: **YES** ▪ At least one PCP operating ▪ Verify Loop ΔT less than 10°F ▪ Verify PCS at least 25°F subcooled
	BOP	PCS Heat Removal: **YES** ▪ Verify at least ONE S/G level 5% to 70% with Feedwater available (will isolate AFW to 'A' S/G) ▪ Verify T_{AVE} between 525°F and 540°F ▪ Verify BOTH S/G pressures between 800 psia and 970 psia

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **5/6** Page **3** of **5**

Event Description: ***'A' Steam Generator Tube Rupture/Failure of Right Train SIAS***

Time	Position	Applicant's Actions or Behavior
	RO	Containment Isolation: **YES** ▪ Verify containment pressure less than 0.85 psig
	BOP	Containment Isolation: ▪ Containment Area Monitors CLEAR and no unexplained rise: **YES** ▪ Condenser Off Gas Monitor, RIA-0631, CLEAR and no unexplained rise: **NO** ▪ Main Steam Line Monitor and no unexplained rise: **NO**
	RO	Containment Atmosphere: **YES** ▪ Verify temperature less than 125°F ▪ Verify Containment pressure less than 0.85 psig
	RO	Vital Auxiliaries – Water: **YES** ▪ Verify at least two Service Water Pumps operating ▪ Verify BOTH Critical SW Header Pressures greater than 42 psig ▪ Verify at least one CCW Pump operating
	RO	Vital Auxiliaries – Air: **YES** ▪ Instrument Air header pressure greater than 85 psig
	BOP	Verifies BOTH of the following: ▪ At least one Condensate Pump operating ▪ At least one Cooling Tower Pump operating
	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

Op-Test No.: **1** Scenario No.: **ONE** Event No.: **5/6** Page **4** of **5**

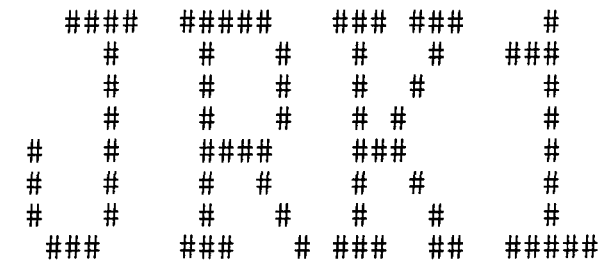
Event Description: ***'A' Steam Generator Tube Rupture/Failure of Right Train SIAS***

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnose 'A' S/G as affected
	SRO	Directs isolating AFW to 'A' S/G
	BOP	When directed, isolates AFW to 'A' S/G: ▪ SELECTS 'MANUAL' on FIC-0737A ▪ SELECTS 'MANUAL' on FIC-0749 ▪ Raises output to 100% on each controller ('RED' signal indicator to the full right position)
	SRO	Performs EOP-1.0, attachment 1, Event Diagnostic Flow Chart Diagnoses a SGTR and enters EOP-5.0, Steam Generator Tube Rupture Recovery
	SRO	Directs PCS cooldown to below 524°F on Loop Thots via TBV
	RO	Commences a cooldown of the PCS: • SELECTS 'MANUAL' on PIC-0511 • ADJUSTS signal on controller to achieve desired TBV position • Monitors S/G pressures and cooldown rate Controls 'B' S/G level 60 - 70 %
	BOP	Perform SIS checklist, EOP Supplement 5 (SAT)
	SRO/RO	Establish PCS temperature and pressure control bands
	BOP/RO	CLOSES Letdown orifice isolation valves on Panel C-02: PLACES control switches for CV-2003, CV-2004, CV-2005, to CLOSE

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

Event Description: ***'A' Steam Generator Tube Rupture/Failure of Right Train SIAS***

Time	Position	Applicant's Actions or Behavior
	SRO	Direct chemistry to sample S/Gs for lithium and activity (if not previously performed per ONP-23.2)
	SRO	Direct EOP Supplement 4, HPSI flow verification, completed
	SRO	When highest hot leg temperature is < 524°F, orders 'A' S/G isolated per EOP Supplement 12
	BOP	Performs EOP Supplement 12 to isolate 'A' S/G inside control room **(CRITICAL TASK PL-000 209 05 01):** o If removing heat using the TBV, ensures MO-0501, 'B' S/G MSIV Bypass valve is open o CLOSES 'A' S/G MSIV Bypass Valve, MO-0510 (if open for cooldown) • CLOSES MSIVs on Panel C-01 o CLOSES 'A' FRV, CV-0701, on Panel C-01 • CLOSES 'A' FRV Block valve, CV-0742, on Panel C-01 o CLOSES CV-0749, CV-0737, CV-0737A, AFW to 'A' S/G (if not performed earlier), on Panel C-01 o CLOSES 'A' S/G Blowdown Valves CV-0767, CV-0771, CV-0739, on Panel C-13 (if not performed earlier) o Directs AO to perform EOP Supplement 12 to isolate 'A' S/G from outside control room
SIM OP: Use MS20/MS21 and SG09/SG11 on PIDMS01 to isolate 'A' S/G		
SRO: Emergency Classification Level: Alert, FA1, Loss of PCS Boundary due to SGTR that results in ECCS actuation		
Terminate Scenario when S/G is isolated or at examiner discretion		



Job : 44
Date: 5/19/2011
Time: 7:40:09 AM

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

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

Turnover: Shift orders are to alternate running Service Water pumps and then reduce power to approximately 87% at 4% per hour to perform Turbine valve testing on the next shift.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	RO (N)	Alternate Running Service Water Pumps
2	N/A	SRO (N) RO (R) BOP (N)	Power de-escalation
3	RX08B	SRO (I) RO (I)	PZR Level Control Channel downscale demand
4	N/A	SRO (T)	Report of Personnel Airlock condition
5	OVRD	SRO (C, T) BOP (C)	Dilution Water Pump P-40A trip/breaker failed
6	MS03B	ALL (M)	ESDE Inside Containment
7	ED01 ED14A	SRO (C) RO (C)	Loss of Offsite Power with failure of D/G 1-1 to start
8	RD16	RO (C)	Two stuck Control Rods

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

Scenario TWO - Simulator Operator Instructions

- Reset to IC-17 (or similar) 100% power MOL IC.
- Ensure FIC-0210A set for 40-gallon dilution on Panel C-02
- AFW Pump P-8C is OOS:
  - Use FW16C on PIDFW01 to trip P-8C
  - Override P-8C-G (green light for P-8C) to OFF
  - Override P-8C-W (white light for P-8C) to OFF
  - Hang Caution Tag on P-8C handswitch
  - Ensure EOOS indicates P-8C is out of service
- Ensure SW Pumps P-7B and P-7C inservice
- INSERT MF ED14A (PIDED08) D/G 1-1 fail to start
- INSERT MFs RD16-05 and RD16-20 (PIDRD02) Control Rods #5 and #20, Final Value = 5-Stuck
- Create Event Trigger 4: 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**	**RX08B** (PID RX01), PRESSURIZER LEVEL CONTROL CHANNEL DOWNSCALE DEMAND.
4		No actions required (Simulator Operator phone call: see event)
5	**REMOTE 2**	**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
6	**REMOTE 3**	**MS03B** (PIDMS01) 'B' S/G Main Steam Line Break Inside Containment; Severity value = 7%, 10 minute ramp
7	**TRIGGER 4**	**ED01** (PIDED03) Loss of Offsite Power
8		No actions required.

Special instructions:

- ***None.***

Scenario TWO - Turnover Information

The Plant is at 100% power, MOL. P-8C, 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 running Service Water pumps (Start P-7A and stop P-7B and place it in STDBY). Once this is complete, a power reduction to approximately 87% at 4% per hour is ordered to prepare for Turbine valve testing on the next shift.

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

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

Time	Position	Applicant's Actions or Behavior
	RO	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 AO for SW Pp. parameters, report discharge valve open, oil levels normal.***		
	RO	Starts P-7A SW pump. • Make PA announcement. • Check discharge valve, oil levels for P-7A (call to AO). • Remove P-7A from standby (PLACES handswitch to TRIP). • STARTS P-7A. • Check amps less than 92 amps. • Check local discharge pressure (call to AO). • Check packing leakoff not excessive. (call to AO) • Possible alarm: EK-1132 P-7A 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.*		
	RO	STOPS P-7B. Note: Chemistry recalculation of mixing basin volume is NOT required.

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

Event Description: ***Lower power to less than 87%***

Time	Position	Applicant's Actions or Behavior
	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 @ 4% per hour: • ENTERS setter value • SELECTS rate of 4% 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 dilution complete • PUSH start pushbutton on FIC-0210A • VERIFIES FIC-0210A output signal at zero when dilution complete • CLOSES CV-2155 • MONITORS reactor power and T_{AVE} 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.: **TWO** Event No.: **2** Page **2** of **2**

Event Description: ***Lower power to less than 87%***

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 has been lowered 1%-2% *OR* at the discretion of the Lead Examiner, INSERT REMOTE #1

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

Event Description: ***PZR LEVEL CONTROL CHANNEL DOWNSCALE DEMAND***

Time	Position	Applicant's Actions or Behavior
	SRO RO	Diagnoses a failure of the 'B' PZR level control channel: EK-0761, Pressurizer Level HI-LO - alarm due to LIC-0101B failed high EK-0703, Letdown HT EX Tube Outlet HI Temp - alarm due to opening of Letdown Orifice Stop Valves Observes all three Letdown Orifice Stop Valves open. P-55A variable speed pp lowers to minimum speed. LIC-0101B process output at 100%.
	SRO	Directs RO to shift PZR level control to 'A' Channel (LIC-0101A) or place LIC-0101B in MANUAL and control PZR level (manual control will be unsuccessful)
	RO	PLACES LIC-0101A in service by placing selector switch, 1/LRC-0101 in CHANNEL 'A' PLACES Pressurizer Heater Control Channel Selector Switch to CHANNEL 'A'
	SRO	Directs RO to place LIC-0101A in CASCADE per SOP-1A
	SRO	May direct the BOP operator to place the turbine in hold
	RO	Places 'A' Channel PZR Level Controller, LIC-0101A, to CASCADE: ADJUSTS raise/lower pushbutton to match blue pointer to red pointer DEPRESSES 'A' pushbutton ADJUSTS raise/lower pushbutton to adjust blue pointer to approximately 51% level DEPRESSES 'C' pushbutton
	BOP/RO	May check LIC-0101BL on back of C-11 to verify a failed instrument
	SRO	May refer to LCO 3.4.9 (no actions apply)

After PZR level control is reestablished *OR* at the discretion of the Lead Examiner, make phone call to CRS (see next event).

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

Event Description: ***Report of Personnel Airlock Condition***

Time	Position	Applicant's Actions or Behavior
SIMULATOR OPERATOR: Make phone call to CRS: report as Health Physics Supervisor that the door interlock for the Personnel Airlock is broken. This was observed by the personnel on the previous shift (4 hours ago) that made the bi-weekly Containment entry, but was not effectively turned over to the supervisor. HP Supervisor is in the process of initiating a Condition Report.		
	SRO	Receives report from HP Supervisor that door interlock for Personnel Airlock is broken.
	SRO	Refers to Tech. Spec. 3.6.2, and determines required actions: B.1: Verify an operable door is closed within one-hour. B.2: Lock an operable door closed within 24 hours B.3: Verify an operable door is locked closed every 31 days
After CRS has briefed Personnel Airlock condition *OR* at the discretion of the Lead Examiner, INSERT REMOTE #2		

Op-Test No.: **1** Scenario No.: **TWO** Event No.: **5** 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: EK-3518, Dilution Wtr Pump P-40A Trip P-40A red light OFF, green light OFF, white light OFF P-40A amps = zero Notes 'A' Cooling Tower level lowering.
	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. 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 (if not already done).
	BOP	DEPRESS HOLD on Main Turbine (if not already done).
	SRO	Notify Chemistry or RMC concerning degraded dilution capability.
	SRO	Notify AO and Work Week Mgr to investigate P-40A and breaker.
SIMULATOR OPERATOR: Call CRS as AO and inform that P-40A breaker 152-102 has no control power light and there is a smell of burnt insulation from breaker.		
	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 #3.		

Op-Test No.: **1** Scenario No.: **TWO** 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-1344, Containment Air Cooler VHX-2 Dry Pan HI Level EK-1346, Containment Air Cooler VHX-4 Dry Pan HI Level EK-1362, Containment Pressure Off Normal Reactor power rising T_{AVE} lowering
	SRO	Enters ONP-9, "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 AO to check for source of steam release.

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

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

Event Description: ***ESDE Inside Containment/Two Stuck Control Rods/Loss of offsite power/Failure of D/G 1-1 to start***

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 attempted start from Panel C-04 handswitch (does not start)
	RO	Informs SRO that two controls rods are not fully inserted, CONTINGENCY ACTION: ▪ Commences emergency boration. **(CRITICAL TASK PL-000 024 05 01)** STARTS Boric Acid Pump, P-56A OPENS MO-2140, Boric Acid Pump Feed Isolation VERIFIES Charging Flow greater than 33 gpm
	RO	Informs SRO that PCS pressure < 1300 psia, CONTINGENCY ACTION: ▪ NONE (PCPs already stopped due to loss of power)
	SRO	EOP-1.0 verbal verifications
	RO	Reactivity Control: ▪ Reactor power lowering **YES** ▪ negative SUR **YES** ▪ maximum of one control rod not inserted **NO (two rods stuck out)** (Emergency Boration is in progress)

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

Event Description: ***ESDE Inside Containment/Two Stuck Control Rods/Loss of offsite power/Failure of D/G 1-1 to start***

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 ▪ PLACES Main FW Controllers to 'MANUAL,' Main FRV and B/Ps CLOSED **YES**
	BOP	Vital Auxiliaries-Electric: ▪ Buses 1C and 1D energized: **NO** (Bus 1C not energized, D/G 1-1 would not start, Bus 1D being supplied by D/G 1-2) ▪ Bus 1E energized: **NO** ▪ Bus 1A and 1B energized: **NO** ▪ Y-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%: **YES/NO** (depends on conditions) Applicable Contingency: Verifiy max Charging and min Letdown ▪ PCS 25°F subcooled: **YES** (by CETs)
	RO	PCS Pressure Control: **NO** PZR pressure 1650 – 2185 psia and trending toward 2010 – 2100 psia: **NO** - verifies PZR spray valves closed and maximum heaters • At 1605 psia, verifies Safety Inj Initiated alarm EK-1342 and ensures all available HPSI and LPSI pumps operating with the associated loop isolation valves open • At 1300 psia, NONE: PCPs already off due to loss of power

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

Event Description: ***ESDE Inside Containment/Two Stuck Control Rods/Loss of offsite power/Failure of D/G 1-1 to start***

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	PCS Heat Removal: ▪ Verify at least one S/G has; level 5% - 70%; Feedwater available: **YES** ▪ Verify T_{AVE} 525°F - 540°F: **YES/NO** Applicable Contingency Action: Ensures Turbine Bypass Valve and Atmospheric Steam Dump Valves are closed ▪ Verify BOTH S/G pressures 800 psia – 970 psia: **NO** Applicable Contingency Action: Ensure closed both MSIVs, Feed Regulating Valves, and Feed Regulating Bypass Valves
	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.: **TWO** Event No.: **6/7/8** Page **4** of **7**

Event Description: ***ESDE Inside Containment/Two Stuck Control Rods/Loss of offsite power/Failure of D/G 1-1 to start***

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 Pump P-54A
	RO	Vital Auxiliaries – Water: **YES** • At least two SW Pumps 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-2B)
	BOP	PLACES right train CRHVAC in emergency mode: • STARTS V-26B Air Filter Unit Fan • ENSURES OFF: V-94, Purge Fan; V-47, Switchgear Exhaust Fan
	BOP	Report that neither Condensate Pump nor Cooling Tower Pump are 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.: **TWO** Event No.: **6/7/8** Page **5** of **7**

Event Description: ***ESDE Inside Containment/Two Stuck Control Rods/Loss of offsite power/Failure of D/G 1-1 to start***

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, ESDE and two stuck control rods • 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
	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 right train H_2 monitor in service in accident mode (back of Panel C-11A): • PLACES HS-2418 to ACCI • PLACES HS-2416 to OPEN and RELEASES • PLACES HS-2412A, HS-2412B, HS-2414A, and HS-2414B, to OPEN • Energizes H_2 Recorder, AR-2401, by: PLACING to 'ON' Power Switch and PLACES to 'ON' Chart Drive Switch • PLACES HS-2427R to 'ANALYZE' position • REMOVES pen caps from chart pens
	SRO	Directs SE to perform EOP-9.0 SFSCs

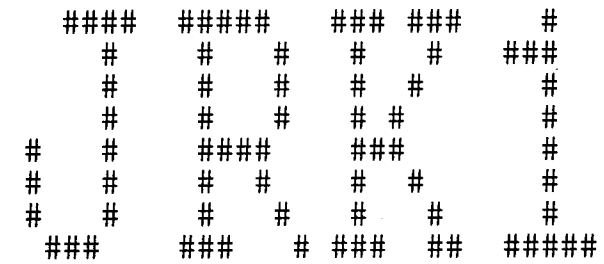
Op-Test No.: **1** Scenario No.: **TWO** Event No.: **6/7/8** Page **6** of **7**

Event Description: ***ESDE Inside Containment/Two Stuck Control Rods/Loss of offsite power/Failure of D/G 1-1 to start***

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
	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.: **TWO** Event No.: **6/7/8**	Page **7** of **7**
Event Description:	***ESDE Inside Containment/Two Stuck Control Rods/Loss of offsite power/Failure of D/G 1-1 to start***	

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
	BOP	Isolates 'B' S/G per Supplement 18: **(CRITICAL TASK PL-000 209 05 01)** ▪ CLOSE CV-0744, 'B' S/G Main Feed Reg Block Valve ▪ CLOSE S/G E-50B Blowdown Valves: CV-0768, CV-0770, and CV-0738 (may be performed in EOP supplement 6) ▪ DIRECTS Auxiliary Operator to isolate 'B' S/G per EOP Supplement 18
SRO: Emergency Classification Level: SA5 AC Power Supplied by one D/G > 15 minutes		
TERMINATE Scenario when 'A' S/G has been isolated per EOP Supplement 17 *OR* at the discretion of the Lead Examiner.		



Job : 47
Date: 5/19/2011
Time: 7:40:28 AM

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 25% power.

Turnover: 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. GCL-5.1, Power Escalation in MODE 1, has been completed through Step 2.13a. Shift orders are to then commence a power escalation to full power at 6% per hour.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	SRO (N) RO (R)	Power escalation
2	RP11A	SRO (C, T) BOP (C)	Power Range Detector NI-5 fails low
3	RX05B	SRO (I) RO (I)	Channel 'B' Pressurizer Pressure Controller failure
4	N/A	SRO (T)	T-10A Diesel Fuel Oil Inventory Low
5	RC16	SRO (C) RO (C)	PCP P-50A High Vibration (requires pump trip)
6	RC04	ALL (M)	LOCA
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-14
- 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 TIA-0138A (0 15:00) 0.55

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

Event #	Remote or Trigger #	Instructions
1		No actions required.
2	**REMOTE 1**	**RP11A** (PIDRPNI3) Loss of NI 5 Power Range Detector (fails low)
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**	**RC16** (PIDRC03) HI Vibration on PCP P-50A
	TRIGGER 4	**TIA-0138A** (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 2.12a.

Scenario THREE - 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. GCL-5.1, Power Escalation in MODE 1, has been completed through Step 2.13a. Shift orders are to commence a power escalation to full power at 6% 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"
	RO	Performs periodic dilutions and/or control rod manipulations to maintain T_{AVE} within 3°F of T_{REF} 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 ▪ VERIFIES FIC-0210A output signal at zero when dilution complete ▪ CLOSES CV-2155 ▪ MONITORS reactor power and T_{AVE} 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 **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 and 4; If Reactor Power less than 25%: ▪ CHECK Rod positions normal Follow Up Actions: • REMOVE faulty Power Range Nuclear Instrument from service per SOP-35
	BOP	Performs Operator Actions of EK-06 Rack 'C' Windows 8: • CHECK detector voltage for NI-08 greater than 650 VDC Follow Up Actions: ▪ NI detector voltage less than 650 VDC, REMOVE from service per SOP-35
	SRO	▪ May reference or enter ONP-5.1, Dropped Rod. ONP-5.1 does not apply ▪ 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.: **THREE** Event No.: **2** 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 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
	BOP	May RESET Rod Drop 'Telltale" and alarm on Panel C-06: PUSHES Rod Drop "Telltale" pushbutton
	BOP	May check the "Power Density" status (OK) of the remaining operable TMMs (not in tripped)
	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.: **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 ONP-18
	SRO	Enters ONP-18, 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 <u>OR</u> ▪ 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 *<u>OR</u>* following step by step guidance in SOP *<u>are both acceptable</u>***

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)**
	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 ONP-18

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 64" 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 64".
	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 64", there is inadequate fuel oil inventory in T-10A.
	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.

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

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

Event Description: ***PCP P-50A High Vibration requiring a Plant trip***

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 on 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 ARP-5. 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 **(CRITICAL TASK PL-343 223 05 01)**
	RO	TRIPS P-50A using switch on Panel C-02 ENSURES associated AC or DC lift pump automatically starts
	BOP/RO	PERFORM immediate actions of EOP-1.0, Standard Post Trip 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)
	SRO	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** ▪ Y-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)
	BOP	PCS Heat Removal: ▪ Verify at least one S/G has; level 5% - 70%; Feedwater available: **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 (may occur in EOP-4.0): 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) ▪ 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: ENSURE OPEN Containment Spray Valves CV-3001 and CV-3002 ENSURE OPERATING all Containment Spray Pumps, P-54A/B/C **(CRITICAL TASK PL-000 433 05 01)**
	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	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

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 (already performed)
	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
	SRO	Directs SE to perform Safety Function Status checks for EOP-4.0
	SRO	Directs check to verify minimum SI flow per 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
	BOP	CLOSES CV-1064 and CV-1065
	SRO	Directs closing CV-2001 and CV-2009, Letdown Stop valves
	BOP	CLOSES CV-2001 and CV-2009
	SRO	Directs closing CV-1910 and CV-1911, PCS Sample Isolation valves
	BOP	CLOSES CV-1910 and CV-1911

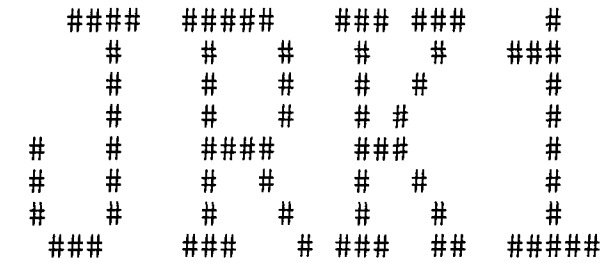
Op-Test No.: **1** Scenario No.: **THREE** Event No.: **6/7/8** Page **7** of **7**

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 H_2 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 (NOT in procedure)
	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

SRO: Emergency Classification Level: Alert, FA1, PCS Leak Rate GREATER THAN available makeup capacity indicated by PCS subcooling LESS THAN 25 degrees F based on average of qualified CETs

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



Job : 49
Date: 5/19/2011
Time: 7:40:39 AM

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

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% power. P-8A, Auxiliary Feedwater Pump is out of service for pump seal replacement.

Turnover: Shift orders to rotate Instrument Air Compressors and then lower power at 4% per hour to 87% to perform Turbine Valve Testing.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	RO (N)	Rotate Instrument Air Compressors
2	N/A	SRO (N) RO (R) BOP (N)	Power de-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 Preferred AC Bus Y-20
5	RC03	SRO (C, T) RO (C)	PCS Leak
6	FW03B	BOP (C)	Failure of Steam Driven AFW Pump P-8B to Auto Start
7	MS06B MS15B	ALL (M)	Main Steam Relief RV-0711 partially open (initiates at time of trip)
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

Scenario Spare - Simulator Operator Instructions

- Reset to IC 17.
- Ensure FIC-0210A set for 40-gallon dilution on Panel C-02
- 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
  - 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 15
- 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 (Y-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 RC03 100 *[PCS leak to 100 gpm when reactor trips]*
6		ACTIVE AT SETUP – No actions required.
7	**TRIGGER 5**	**MS06B** (PIDMS01) Safety Relief Valve RV-0711 Leak, Severity = 100 **MS15B** (PIDMS01) 'B' S/G Steam Line Break Outside Cont, Severity = 2
8		ACTIVE AT SETUP – No actions required.

Special instructions:

- NONE

Scenario Spare - Turnover Information

The Plant is at 100% power with P-8A Auxiliary Feedwater Pump is out of service for pump seal 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. Then, shift orders are to lower power at 4% per hour to less than 87% to perform Turbine Valve testing.

Op-Test No.: **1**	Scenario No.: **SPARE**	Event No.: **1**	Page **1** of **1**
Event Description:	***Alternate Instrument Air Compressors***		

Time	Position	Applicant's Actions or Behavior
	SRO RO	Refers to SOP-19, section 7.2.8
	RO	STARTS C-2B per SOP-19 section 7.2.2: PLACE Compressor Switch in HAND position. 1. VERIFY the UNLOAD light is de-energized. 2. IF the compressor UNLOAD light is energized, THEN DEPRESS C-2B, Instrument Air Compressor's Load/Unload button. (a) VERIFY the UNLOAD light is extinguished.
Simulator Operator: Role play as AO 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.**		
	RO	PLACES C-2A in OFF per SOP-19 section 7.2.4. IF time allows, THEN PERFORM the following: 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.
	RO	PLACES C-2A in AUTO per SOP-19 section 7.2.5. IF C-2A is being taken from HAND to AUTO, THEN PERFORM the following: WHEN PIA-1210, Instrument Air Header Pressure Ind Alarm, reaches peak air header pressure, THEN after at least 10 seconds PLACE C-2A Control Switch to OFF. PLACE C-2A Control Switch to AUTO.
Simulator Operator: Role play as AO and follow along in procedure when RO is performing SOP-19 section 7.2.5: **For Step 7.2.5.c1: CL-20.1 is complete.** **For Step 7.2.5.c2: All sub-steps are satisfied.**		

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

Event Description: ***Lower power to less than 87%***

Time	Position	Applicant's Actions or Behavior
	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 at 4% per hour: ▪ ENTERS setter value ▪ SELECTS rate of 4% 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 dilution complete ▪ PUSH start pushbutton on FIC-0210A ▪ VERIFIES FIC-0210A output signal at zero when dilution complete ▪ CLOSES CV-2155 ▪ MONITORS reactor power and T_{AVE} For Control Rod manipulations: ▪ INSERTS Group 4 Regulating Rods in increments specified by CRS ▪ MONITORS reactor power and T_{AVE}

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

Event Description: ***Lower power to less than 87%***

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 has been lowered 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-33.

Op-Test No.: **1** Scenario No.: **SPARE** 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 4 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: Indications: V-96, Air Handling Unit Fan, stops running; noticeable lowering of back-round sound Major alarm: EK-0249, Control Room LOW Pressure DPIC-1659/1660
	BOP	Operator actions from EK-0249: ▪ CHECK CR HVAC not operating per SOP-24, Ventilation and Air Conditioning System ▪ START opposite CR HVAC train in service per SOP-24
	SRO	Directs BOP to Place 'A' Train CR HVAC in service per SOP-24
	BOP	IF placing CR HVAC to 'A' Train inservice per SOP-24 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 • 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.: **SPARE** 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 in EMERGENCY: • PLACE Control Switch for V-26B, 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 AUTO • 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		
	SRO	Refer to Technical Specifications and determine the following required actions due to inoperable 'B' CRHVAC train: ▪ LCO 3.7.10.A.1 (72-hour action) ▪ LCO 3.7.11.A.1 (72-hour action)
After SRO has briefed CRHVAC event *OR* at the discretion of the Lead Examiner, INSERT REMOTE #3		

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

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

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Diagnose loss of Preferred AC Bus Y-20: Indications: 'B' RPS channel parameters all in 'trip' (red lights illuminated); PIP Control Rod indications read -188.0 T_{AVE} temperature reads 515.0°F '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
	BOP	May DEPRESS 'HOLD' on the turbine
	SRO	Enters ONP-24.2, Loss of Preferred AC Bus Y-20 Directs Subsequent Actions to be taken
	BOP	Contacts AO to CLOSE MV-FW734, Feed Pump P-1B Recirc Valve (isolates CV-0710)
Simulator Operator – When contacted by Control Room as AO to close MV-FW734, wait approx. 4 minutes, use FW62 (PIDFW03), then report back MV-FW734 is closed.		
	SRO	May direct RO to place: • Pressurizer Level Control System (PLCS), Pressurizer Pressure Control System (PPCS) to the 'A' position • PLCS in 'CASCADE' • PPCS in '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***

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

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

Time	Position	Applicant's Actions or Behavior
	RO	PLACES Avg Temp Display Switch to LOOP 1 position
	RO	PLACES HS 1/LRC-0101, Pressurizer Level Control Switch to the 'A' position
	RO	PLACES HS 1/LIC-0101, Heater Control Selector Switch to the 'A' position
	RO	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 ONP-24.2 ▪ Contacts AO to go to investigate loss of AC Bus Y-20 ▪ BYPASS all RPS 'B' trip units per SOP-36, Reactor Protective System and Anticipated Transient Without Scram (ATWS) System

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

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

Time	Position	Applicant's Actions or Behavior
Simulator Operator – When contacted by Control Room as AO 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
	BOP	No Operator Actions required for EK-0154, FW Pump P1B LO Suction
	BOP	BYPASS 'B' Channel RPS trips per SOP-36: • INSERT bypass key above affected RPS Trip Unit (all) • TURN key 90° clockwise (note: yellow light will not light due to loss of Y-20)
	RO	No Operator Actions required for EK-0545 (PZR level), EK-0754 (PZR Press), EK-1378 (Cont and SI CNTRL CKT UV), EK-1145 (SEQ Trouble), EK-0918 (PIP)
	SRO	May direct BOP to close 2400V breaker 152-211 per SOP-30, Station Power to restore power to PZR Heaters from 'D' Bus
	BOP	CLOSES 152-211 per SOP-30: Pressurizer Heater controls OFF for Xfmr 16. Pressurizer level greater than 36%. 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.: **SPARE** Event No.: **4** Page **4** of **4**

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

Time	Position	Applicant's Actions or Behavior
	SRO	The following Tech Spec LCOs apply: • 3.8.9, Action: B.1, Preferred AC Bus, 8 hours • 3.8.7, Action: A.1, Inverter, 24 hours • 3.8.1, Action: B.1, One D/G (DBA/NSD sequencer), 1 hour (Attachment 1)(may invoke LCO 3.0.6) • 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 days (may invoke LCO 3.0.6)
	SRO	May exit ONP-24.2

After SRO has briefed loss of Y-20 *OR* 'B' Channel RPS is bypassed *OR* at the discretion of the Lead Examiner INSERT REMOTE #3:

Op-Test No.: **1** Scenario No.: **SPARE** 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	Diagnose PCS leak: Indications from PPC: Containment Sump level rising Containment Sump fill rate rising Charging line flow rising P-55B Charging Pump Start (may occur) Major alarms: EK-0734, Charging PP Seal Cooling LO Press (may occur)
	SRO	Enters ONP-23.1, Primary Coolant Leak: • Directs actions of ONP-23.1 • Reviews reactor trip criteria
	SRO	Directs PCS Leak Rate calculation by ONP-23.1 or DWO-1
	RO/BOP	PERFORMS PCS Leak Rate calculation
	SRO	Directs closing: • CV-1064 and CV-1065, CWRT Vent Valves • CV-1910 and CV-1911, PCS Sample Valves
	RO	• 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 hours
Simulator Operator – When Crew determines Tech Spec implications, then INSERT REMOTE #4 to raise PCS leakrate to 15 gpm.		

Op-Test No.: **1**	Scenario No.: **SPARE**	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) **(CRITICAL TASK PL-343 223 05 01)**
	RO	PUSHES reactor trip pushbutton on Panel C-02

Op-Test No.: **1**	Scenario No.: **SPARE**	Event No.: **6/7/8**	Page **1** of **7**
Event Description:	***EOP-1.0/EOP-9.0, SBLOCA and Main Steam Safety Valve Leak***		

Time	Position	Applicant's Actions or Behavior
	BOP	Informs the CRS that the AFW Pump P-8B did not auto start, CONTINGENCY ACTION: PERFORM the following: • START P-8B by taking HS-0522B to OPEN
	RO	Informs CRS that that Right Train SI did not actuate, CONTINGENCY ACTION: PZR Pressures less than 1605 psia, THEN PERFORM the following per EOP-1.0 immediate actions (attached): • MAY PUSH right INJECTION INITIATE pushbutton on Panel C-13: PB-2 (WON'T WORK due to loss of Y20) **THEN** **P-66A, HPSI Pump and P-67A, LPSI Pump STARTED from handswitches,** **Right Train HPSI and LPSI Loop Injection Valves OPENED using handswitches (CRITICAL TASK PL-000 433 05 01)**
	RO	Informs CRS that 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): ENSURE ALL available HPSI pumps operating: START P-66B HPSI Pump
		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.: **SPARE** Event No.: **6/7/8** Page **2** of **7**

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: **YES** ▪ Main Turbine tripped ▪ Generator disconnected from grid
	BOP	Feedwater criteria: ▪ Main FWP Controllers in 'MANUAL' at minimum speed: **NO** REPORT that 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** ▪ Y-01 energized: **YES** ▪ Six DC Buses energized: **YES** ▪ 3 of 4 Preferred AC Buses energized: **YES**
	RO	PCS Inventory Control: **YES OR NO** (Depends on Plant conditions) ▪ PZR level 20% - 85% and trending toward 42% - 57% ▪ PCS 25°F subcooled IF **NO**, would be on PCS being < 25°F subcooled (NO CONTINGENCY) or PZR Level < 20% (CONTINGENCY: All available Charging Pumps in service and Orifice Stop Valves Closed)
	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% At <1605 psia: INITIATE Right Train SI and START P-66B HPSI Pump At <1300 psia, Trip two PCPS (P-50A and P-50D)

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

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

Time	Position	Applicant's Actions or Behavior
	RO	Core Heat Removal: **YES** ▪ At least one PCP operating ▪ Verify Loop ΔT less than 10°F ▪ Verify PCS at least 25°F subcooled
	BOP	PCS Heat Removal: **YES OR NO** (Depends on Plant conditions) ▪ Verify at least ONE S/G level 5% to 70% with Feedwater available ▪ Verify T_{AVE} between 525°F and 540°F ▪ Verify BOTH S/G pressures between 800 psia and 970 psia IF **NO**, then at least 165 gpm AFW flow to 'A' S/G; may secure AFW flow to 'B' S/G; Turbine Bypass Valve and ADVs are closed.
	RO	Containment Isolation: **YES** ▪ Containment pressure > 0.85 psig
	BOP	Containment Isolation: **YES** ▪ Verify Containment Area Monitor alarms clear ▪ Verify Condenser Off Gas Monitor alarm clear ▪ Verify Main Steam Line Monitor alarms clear

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

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

Time	Position	Applicant's Actions or Behavior
	RO	Containment Atmosphere: **YES** ▪ Containment temperature > 125°F ▪ Containment Pressure > 0.85 psig
	RO	Vital Auxiliaries – Water: **YES** ▪ Verify at least two Service Water Pumps operating ▪ Verify BOTH Critical SW Header Pressures greater than 42 psig ▪ Verify at least one CCW Pump operating
	RO	Vital Auxiliaries – Air: **YES** ▪ Instrument Air header pressure greater than 85 psig

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

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

Time	Position	Applicant's Actions or Behavior
	BOP	Verifies BOTH of the following: • At least one Condensate Pump operating • At least one Cooling Tower Pump operating
	BOP	PLACES Left train CRHVAC in emergency mode: (if not already in emergency mode) • STARTS V-26A, Air Filter Unit Fan • ENSURES OFF: V-94, Purge Fan; V-47, Switchgear Exhaust Fan
	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	If directed to isolate 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' (will not have power due to the loss of Y-20, AO may be called to close CV-0736A) • Raises output to 100% on each controller ('RED' indicator 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
	SRO	Directs closing CV-1064 and CV-1065, CWRT vent valves (may be performed previously in ONP-23.1)
	BOP	CLOSES CV-1064 and CV-1065 (may be performed previously in ONP-23.1)
	SRO	Directs performance of EOP Supplement 5, Checklist for Safeguards Equipment Following SIAS
	BOP	Completes EOP Supplement 5 (repositions components as needed)

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

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

Time	Position	Applicant's Actions or Behavior
	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 • Energizes H_2 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	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-2 • 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	CLOSES CV-2001 and CV-2009

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

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	CLOSES CV-2083 and CV-2099
	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
	SRO	Ensures MSIVs and MSIV Bypass Valves are closed
	SRO	Directs isolation on 'B' S/G per EOP Supplement 18
	BOP	Isolates 'B' S/G per EOP Supplement 18 (attached) Isolation from inside the Control Room: o CLOSE both MSIVs, CV-0510 and CV-0501 (performed previously) o ENSURE CLOSED MO-0501, 'B' S/G MSIV Bypass Valve. o CLOSE CV-0703, 'B' S/G Main Feed Reg Valve (performed previously) • CLOSE CV-0744, 'B' S/G Main Feed Block Valve o CLOSE CV-0734, 'B' S/G Bypass Feed Reg Valve. • CLOSE S/G E-50B Blowdown Valves: CV-0768, CV-0770, and CV-0738 o CLOSE S/G E-50B AFW flow control valves; CV-0736, CV-0736A, CV-0727 (performed previously)

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

SRO: Emergency Classification Level: Unusual Event, SU5.1, Unidentified PCS Leakage > 10 gpm

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