Facility: **PALISADES** Scenario No.: **ONE** Op-Test No.: **___1____**
Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: 87% power. P-66B HPSI Pp. is out of service for seal cooler inspection.

Turnover: Turbine Valve Testing was completed successfully. Shift orders are to reduce Main Generator VAR loading to 50 megavars OUT, and then commence a power escalation to full power at 3% per hour.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	SRO (N) BOP (N)	Adjust MVAR loading on Main Generator
2	N/A	SRO (R) RO (R) BOP (N)	Commence power escalation at 3% per hour
3	CV06	SRO (I) RO (I)	Letdown pressure control fails LOW
4	RX14A	SRO (I) BOP (I)	FT-0701 (Main Feed flow) fails higher than current value. 'A' S/G level lowers
5	N/A	SRO (C)	Low lube oil temperature on EDG 1-1
6	MS06B	ALL (C)	Main Steam Code Safety partial lifting. Requires de-rate; severity is then raise to require plant trip
7	RP19/20	RO (I) BOP (I)	Reactor fails to auto trip. Will not manually trip from C-02 or C-06. Requires operation of CRD clutch toggle switches
8	RC04	ALL (M)	LOCA (350 gpm) inside containment (initiates at time of trip)
9	SI09A	RO (C)	P-66A HPSI Pump fails to auto start

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

Scenario 1 - Simulator Operator Instructions

- Reset to IC-16 (or similar) 87% power MOL IC.
- P-66B is OOS for seal cooler inspection. (Place caution tag on hand switch).
    - Insert REM SI24 (PIDSI02) to RACKOUT
- INSERT MF RP19 (PIDRPNI3) Reactor fails to auto trip.
- INSERT MF RP20 (PIDRPNI3) Reactor fails to manual trip.
- INSERT SI09A (PIDSI02) P-66A fails to auto start.
- ADJUST PCS Activity on PPC to 2.85 E-1 µci/ml.
- ADJUST Off-Gas reading on PPC to 3.1 CFM.
- RAISE Main Generator MVARS to ~120 MVARS OUT using AC Adjuster switch 390 AC/CS.

Remote	Type	Instructions
1	**MF**	**CV06** (PIDCV03) Loss of Letdown Press. Control LOW
2	**MF**	**RX14A** (PIDRX02) Severity = 90%. FT-0701 fails (feed flow).
3	**MF**	**MS06B** (PIDMS01) Severity = 100, no ramp. Code Safety RV-0711 leak.
4	**MF**	**MS15B** (PIDMS01) Severity = 3, no ramp. Code Safety going full open.
5	**MF**	**RC04** (PIDRC01) Severity = 35, ramp = 5 minutes. 350 gpm LOCA Create event trigger 5: Event: rdsr(1).lt.100.0 Action: leave blank
6	**MF**	**ANN-K-05-51** ON – D/G 1-1 Trouble Alarm

Special instructions:

- Provide a marked up copy of GOP-5 completed up to and including step 4.5.

Scenario 1 - Turnover Information

The plant is at 87% power, following successful completion of Main Turbine Valve Testing. P-66B, HPSI Pump, is tagged out of service for seal cooler inspection. Boron is 721 ppm. MECS has ordered Main Generator VAR loading reduced to 50 megavars OUT. Shift orders are to commence power escalation to full power at 3 % per hour.

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

Event Description: ***Adjust MVAR loading on Main Generator***

Time	Position	Applicant's Actions or Behavior
	BOP	Adjusts Main Generator voltage regulator (390AC/CS) in the lower direction to lower MVARs out on panel C-01 to 50
	RO/CRS	Peer checks BOP
	BOP	Informs MECS that MVARs out have been lowered to 50

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

Event Description: ***Raise Power Following Turbine Valve Test***

Time	Position	Applicant's Actions or Behavior
	BOP	Operates turbine generator controls on the DEH panel for power escalation @ 3% per hour: Enters setter value Selects rate of 3% per hour Pushes GO and observes white light energize Informs CRS/RO that turbine is in "GO"
	SRO	Makes PA announcement that power escalation is in progress and to minimize communication with control room
	RO	Performs periodic dilutions and/or control rod manipulations to maintain T_{AVE} matched with T_{REF} For dilution: Set quantity and batch flow limit on FIC-0210A OPEN CV-2155, Dilution stop valve Push START on FIC-0210A Verifies FIC-0210A output signal at zero when dilution complete Closes CV-2155 Monitors reactor power and T_{AVE} For control rods: Withdrawals group 4 rods in increments as specified by CRS Monitors reactor power and T_{AVE}
	RO	May divert as VCT level rises: Selects CV-2056, Letdown to VCT or Radwaste, in the "TO CLEAN WASTE RCVR TANKS" position When desired VCT level is reached, operator selects CV-2056 in the "TO VOL CNTRL TANK" position
Do not enter next malfunction while a dilution is in progress or while diverting.		

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

Event Description: ***Loss of Letdown Pressure Control - Low***

Time	Position	Applicant's Actions or Behavior
	RO	Diagnose failure of Letdown Pressure controller (PIC-0202): ● Selected Letdown Pressure Control valve fails CLOSED ● EK-0704, Letdown Ht Ex Tube Inlet Hi-Lo Press, alarms ● EK-0702, Relief Valve 2006 Disch Hi Temp, alarms
	RO	Performs actions of ARP-4 windows 2 and 4: Determines charging and letdown flows are NOT matched on C-02 Determines PIC-0202, Low Pressure Letdown Pressure Controller, NOT controlling at 460 psig Selects MANUAL on PIC-0202 and manually adjusts selected backpressure CV to control letdown pressure at ~460 psig
	BOP	May go to HOLD on turbine generator controls
	SRO	Gives control band of approximately 400 – 470 psig for intermediate letdown pressure control
	SRO	If RV-2006 does not reseat, refers to ONP-23.1 for PCS Leak due to RV-2006. Initiate troubleshooting and repair. May quantify amount of water added to quench tank
	SRO	May refer to EI-Plan, UE for SU5
	SRO/RO	Diagnose RV-2006 reseats by noting downward trend on TIA-0202 and Quench Tank parameters on panel C-02
	SRO	May direct performance of a PCS leak rate calculation
	SRO	Refer to Tech. Spec. 3.4.13 for PCS Leakage: ● Determines a 4 hour completion time for reducing leakage to within limits.

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

Event Description: ***Main Feedwater Flow Failure - High***

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnoses failure of Feedwater Flow Transmitter FT-0701 high • LIC-0701 demand goes low • Recorder FI-0701 feed flow goes high • SG 'A' level lowers • EK-0962, STEAM GEN E-50A LO LEVEL, alarm may annunciate Informs CRS of failure of Feedwater Flow instrument for 'A' S/G
	SRO	Enters ONP-3, Loss of Feedwater
	BOP	Performs immediate actions of ONP-3, Loss of Feedwater: Takes manual control of FRV-0701 using LIC-0701 Slowly raises S/G level using manual control of FRV-0701 to restore level
	SRO	Directs actions of ONP-3 Reviews reactor trip criteria (< 30% S/G level)
	SRO	Establishes control band for 'A' S/G Level with BOP operator
	BOP	May go to HOLD on turbine if not already in HOLD from previous event
	SRO	Contact maintenance to initiate troubleshooting and repairs

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

Event Description: ***Low lube oil temperature on EDG 1-1.***

Time	Position	Applicant's Actions or Behavior
	BOP	Receives alarm EK-0551 "Diesel Generator 1-1 Trouble" • Reviews ARP-3 actions • Dispatches AO to investigate cause of alarm • Reports alarm to CRS
SIM OP: When asked to investigate, report that alarm is "Low Lube Oil Temperature" reading 89°F and "Pre-lube Pump Failure" for D/G 1-1. Pre-lube pump is not running. **SIM OP: When AO answers alarm at local alarm panel for D/G 1-1, delete malfunction for D/G 1-1 Trouble Alarm** **SIM OP: If asked to check breaker 52-116 or 52-116A/D, report that they are closed.** **SIM OP: If asked to check MV-CA10189 (Air supply to SW cooling CV) report that it is open.**		
	BOP	Reports to CRS that D/G 1-1 lube oil temperature is 89°F
	CRS	Declares D/G 1-1 inoperable per SOP-22 step 4.2.a Enters TS 3.8.1.B for one D/G inoperable, 1 hour action to perform off-site source checks (SR 3.8.1.1)

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

Event Description: ***Main Steam Line Code Safety Lift***

Time	Position	Applicant's Actions or Behavior
	SRO BOP RO	Diagnose Main Steam safety lift: • Rising steam flow • Lowering T_{AVE} • Lowering PZR Pressure • Rising Power (NI and Heat Balance) • Containment parameters (i.e., not affected) • Diagnoses < 1% power rise
	SRO	Enters and directs the actions of ONP-9, Excessive Load Reviews trip criteria: > 1% change in power OR if plant conditions require a > 30% rate of power reduction
	SRO	Directs a power reduction at ≤ 30% per hour in accordance with GOP-8, Plant Shutdown to MODE 2 or MODE 3 ≥ 525 °F
	BOP	Sets up turbine generator controls for power reduction: Enters setter value Selects rate of 30% per hour Pushes GO and observes white light energize Informs CRS/RO that turbine is in "GO".
	SRO/BOP	Directs Auxiliary Operator to inspect steam dump area. Auxiliary Operator reports that it appears steam is leaking from a code safety but cannot tell which S/G
SIM OP: When asked to inspect Steam Dump area for steam leak, report that the steam leak is from a S/G code safety but you cannot tell from which S/G.		
SIM OP: As soon as turbine is in GO, raise steam leak severity by inserting next malfunction (MS15B). This will simulate the code safety fully opening.		
	SRO BOP RO	Diagnoses > 1% power rise
	SRO	Directs reactor trip and performance of EOP-1.0, Standard Post Trip Actions

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

Event Description: ***Reactor Fails to Auto Trip and from Panel C-02/C-06 and P-66A fails to start***

Time	Position	Applicant's Actions or Behavior
	RO	Diagnoses failure of RX trip on C-02 panel
	BOP	Attempts to trip RX from C-06, diagnoses failure of reactor trip on C-06
	RO/BOP	De-energizes individual CRD clutches using toggle switches on back of C-06 (may use breaker 42-1 and 42-2 in cable spreading room)
SIM OP: If directed to open breakers 42-1 and 42-2, use RP35 and RP36 on PIDRPNI3		
	BOP/RO	Trips turbine when pressurize pressure starts to lower (at CRS discretion)
	RO	Answers YES to the following for EOP-1.0 verbal verifications of immediate actions: • Reactivity control • Core heat removal • Containment isolation (may not be later in scenario) • Containment atmosphere (may not be later in scenario) • Main. Vital Auxiliaries – Water • Main. Vital Auxiliaries - Air

	RO	Answers NO to the following for EOP-1.0 verbal verifications of immediate actions: • PCS Inventory Control – PZR level is off-scale low o contingency - verifies CVCS operating to restore PZR level, i.e., charging pumps running and orifice stop valves closed • PCS Pressure control – PZR pressure < 1650 psia o contingency – manually operates PZR heaters and spray, heaters will be off due to low PZR level, spray valves closed o contingency – when PCS pressure is < 1605 psia, verify safety injection initiated: ▪ Verify EK-1342 in alarm ▪ Verify all available HPSI and LPSI pumps in service ▪ Diagnoses P-66A is not running, informs SRO and starts P-66A ▪ If PCS pressure is < 1300 psia, stop 'A' and 'D' PCPs. If PCS pressure is < minimum for pump operation, secure all PCPs
	BOP	Answers YES to the following for EOP-1.0 verbal verifications of immediate actions: • Main Turbine Generator acceptance criteria • Both MFPs in manual at minimum speed with both feed regulating and bypass valves closed • Containment Isolation
	BOP	Answers NO to the following for EOP-1.0 verbal verifications of immediate actions • Vital Auxiliaries – Electric – 1E bus is de-energized due to Safety Injection actuation (depending on timing of SIS) o No contingency • PCS Heat Removal – Tave < 525°F and S/G pressures < 800# o Contingency Tave – Verify feed flow not excessive, Turbine bypass valve and Atmospheric steam dump valves closed o Contingency S/G pressure – Ensure TBV and ADVs are closed, close both MSIVs (S/Gs < 800 psia)
	BOP	May isolate AFW to 'B' S/G by: Selecting manual on FIC-0727 and 0736A Raising output of controller to 100%

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

Event Description: ***LOCA***

Time	Position	Applicant's Actions or Behavior
	SRO	Performs Event Diagnostic Flow Chart per EOP-1.0, attachment 1 Diagnoses EOP-9.0 entry Performs EOP-9.0 strategy brief Establishes PCS pressure and temperature bands with RO Directs SE to perform safety function status checks
	BOP	Places left train CRHVAC in emergency: Starts CRHVAC Emergency Fan V-26A Ensures Purge Fan, V-94, and Switchgear Exhaust Fan, V-47 are secured
	BOP	Closes CV-1064 and CV-1065, Clean Waster Receiver Tank Vent Valves, on panel C-13 Places CRHVAC in emergency mode by starting V-26A or V-26B, Emergency Fan on Panel C-11A Performs EOP supplement 5, safety injection checklist (1 exception – P-66B, otherwise, SAT) Closes L/D Isolation Valves CV-2001and CV-2009 on panel C-02 Places left train H_2 monitor in service in accident mode on back of panel C-11A: Places HS-2419 in ACCI position Places HS-2417 to OPEN Places sample solenoid valves to the OPEN position Energizes H_2 monitor recorder AR-2401 Places HS-2427L in ANALYZE
	BOP	Performs EOP Supplement 18 to isolate ‘B’ S/G inside control room: Closes MSIVs and 'B' S/G MSIV Bypass valve on panel C-01 Closes 'B' FRV, CV-0703, on panel C-01 Closes 'B' FRV Block valve, CV-0744, on panle C-01 Closes CV-0727, CV-0736, CV-0736A, AFW to 'B' S/G (if not performed earlier), on panel C-01 Closes 'B' S/G Blowdown Valves CV-0768, CV-0770, CV-0738, on panel C-13 Directs AO to perform EOP Supplement 18 to isolate ‘B’ S/G from outside control room

SIM OP: use MS18/MS19, SG10/SG12 on PIDMS01 to isolate 'B' S/G

	RO	Establishes PCS pressure and temperature bands with SRO
	SRO	Determines EOP-9.0 success paths: • RC-3 • MVAE-DC-1 • HR-2 • MVAE-AC-1 • IC-2 • PC-3 • CI-1 • CA-2 • MVAW-1 • MVAA-1 Determines that Heat Removal (HR) is jeopardized due to LOCA
	SRO	Directs ‘A’ S/G steamed to within 50 psi of ‘B’ S/G using ADVs
	RO	Steams 'A' S/G to within 50 psi of 'B' S/G by: Selecting manual on HIC-0780A Adjusts signal on controller to achieve desired ADV position Monitors S/G pressures and cooldown rate Restores 'A' S/G level to 60 - 70 %
	SRO RO	Verifies natural circulation: Core ΔT < 50 °F Loop THS and TCS constant or lowering Average of qualified CETs at least 25 °F subcooled Difference between Loop TH and average qualified CETs is ≤15 °F
	SRO BOP	Performs EOP supplement 4 to verify HPSI flow within specifications
	SRO	Determines safety injection throttling criteria met: PCS is at least 25 °F subcooled for non degraded containment PCS is above minimum subcooling curve of EOP supplement 1 for degraded containment PZR level > 20% (40%) for degraded containment One S/G is available for heat removal Reactor vessel level > 102" Reactivity control safety function criteria met

	BOP/RO	Throttles Safety Injection by: Throttling closed HPSI Pump P-66A loop injection valves, MO-3062, MO-3064, MO-3066, MO-3068 on panel C-03
Emergency Classification Level – Alert (FA1)		
Terminate scenario when SI throttling criteria are met or at examiner discretion		

Facility: **PALISADES** Scenario No.: **TWO** Op-Test No.: **___1____**
Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: 25% power. P-7C, Service Water Pump is out of service for bearing inspection.

Turnover: A power escalation was on hold for Chemistry. Shift orders are to continue the power escalation at 8% per hour.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	SRO (R) RO (R) BOP (N)	Continue power escalation at 8% per hour.
2	V-6A-1	SRO (C) RO (C)	Main Exhaust Fan V-6A trips.
3	ED08C	SRO (I) BOP (C)	Loss of Preferred AC Bus Y-30.
4	SG01B	SRO (C) RO (C) BOP (C)	'B' Steam Gen. Tube Leak at 0.25 gpm (requires controlled shutdown). Leak then rises to require reactor trip. ($\geq$ 0.4 gpm requires reactor trip.)
5	ED56	SRO (C) BOP (C)	Safety bus 1D de-energizes. EDG 1-2 auto starts but requires manual breaker closure.
6	SG01B	ALL (M)	SGTR on 'B' S/G
7	SW10A	RO (C) SRO (C)	P-7A fails to restart via NSD sequencer
8	RC16B	SRO (C) RO (C)	P-50B PCP high vibration requires pump trip.

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

Scenario 2 - Simulator Operator Instructions

- Reset to IC-14 (IC-94)
- Ensure V-6A is in service and V-6B is not in standby
- INSERT SW16 (PIDSW03) to RACKOUT to remove SW Pump P-7C from service
- INSERT ED11B (PIDED08) to prevent auto closure of D/G 1-2 output breaker.
- INSERT SW10A (PIDSW03) to prevent P-7A from auto starting
- Hang a caution tag on P-7C Handswitch

REMOTE	Type	Instructions
1	**OR**	**V-6A-1 OPEN** Trips V-6A breaker
2	**MF**	**ED08C** on PIDED02 Causes a loss of Preferred AC Bus Y-30
3	**MF**	**SG01B** on PIDSG01 Severity 0.025. Causes a S/G Tube Leak on 'B' S/G.
4	**MF**	Setup Event Trigger: **4** Event: 0 Action: imf sg01b 0.15 This raises the severity of the tube leak to 1.5 gpm
N/A	**OR**	**TIA-0136B** with a 5 minute ramp, 5 minute delay, severity 0.9 (P-50B hi temp) Setup Event Trigger: **5** Event: rdsr(1).lt.100.0 Action: none (leave empty)
N/A	**MF**	**RC16B** with a 5 minute delay (P-50B high vibe) Setup Event Trigger: **6** Event: rdsr(1).lt.100.0 Action: none (leave empty)
N/A	**MF**	Setup Event Trigger: **7** Event: rdsr(1).lt.100.0 Action: imf sg01b 24.0 This raises severity of tube leak to 240 gpm
N/A	**REM**	**ED56** to RACKOUT with 1 minute time delay, loss of Bus 1D Setup Event Trigger: **8** Event: rdsr(1).lt.100.0 Action: none (leave empty)
N/A	**---**	Setup Event Trigger: **9** Event: zdi5p(960) Action: dmf ED11B Deletes 1-2 D/G breaker failure to close malfunction

Special Instructions:

- Provide marked up GOP-5 completed up to and including Att. 1, Step 3.1.

Scenario 2 - Turnover Information

A power escalation was on hold for chemistry reasons. Chemistry has now authorized exceeding 30% power. The plant is at 25% power. PCS boron is 1007 ppm. Core burnup is 7000 MWD.

P-7C is out of service for bearing replacement. 56 hours are left on the 72 hour action statement, LCO 3.7.8.A.

Shift orders are to continue the power escalation at 8% per hour. AOs have been briefed on P-1B startup. P-1A is in service. P-10A Heater Drain Pp. is warming.

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

Event Description: ***Power Escalation***

Time	Position	Applicant's Actions or Behavior
	BOP	Operates turbine generator controls on the DEH panel for power escalation @ 8% per hour: Enters setter value Selects rate of 8 % per hour Pushes GO and observes white light energize Informs CRS/RO that turbine is in "GO"
	SRO	Makes PA announcement that power escalation is in progress and to minimize communication with control room
	RO	Performs periodic dilutions and/or control rod manipulations to maintain T_{AVE} matched with T_{REF} For dilution: Set quantity and batch flow limit on FIC-0210A OPEN CV-2155, Dilution stop valve Push START on FIC-0210A Verifies FIC-0210A output signal at zero when dilution complete Closes CV-2155 Monitors reactor power and T_{AVE} For control rods: Withdrawals group 4 rods in increments as specified by CRS Monitors reactor power and T_{AVE}
	RO	May divert as VCT level rises: Selects CV-2056, Letdown to VCT or Radwaste, in the "TO CLEAN WASTE RCVR TANKS" position When desired VCT level is reached, operator selects CV-2056 in the "TO VOL CNTRL TANK" position
Do not enter next malfunction while a dilution is in progress or while diverting.		

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

Event Description: ***Main Exhaust Fan V-6A trips.***

Time	Position	Applicant's Actions or Behavior
	RO	Diagnoses that V-6A has tripped: EK-1127, V-6 A/B trip, annunciates. Green light on, red light off for V-6A on C-13
	RO	Manually starts V-6B (time delay for dampers to open) Uses 52-1111CS on C-13 EK-1122, Exhaust Plenum Hi Pressure will annunciate when V-6B is started. Operates CS-52-215 to CLOSE (closes idle damper CV-1816). This prevents short cycling thru idle fan)
	BOP	May go to HOLD on turbine
	RO	Positions V-6A H/S, 52-1225CS, to TRIP on C-13 to clear alarm
	SRO	Initiates troubleshooting efforts for V-6A

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

Event Description: ***Loss of Preferred AC Bus Y-30***

Time	Position	Applicant's Actions or Behavior
	ALL	Note multiple alarms. Enter transient alarm response
	BOP	May go to HOLD on Main Turbine
	SRO	Enters ONP-24.3, Loss of Y-30 Reviews with crew equipment affected
	BOP	Dispatches AO to check Y-30 inverter input/output breakers, and local alarms Dispatches Electricians to check for fault on preferred AC bus
	SRO	Orders all RPS trips bypassed for 'C' channel RPS
	BOP	Bypasses all RPS 'C' channel trips on panel C-06 per SOP-36: Obtains correct key for corresponding trip channel Inserts key into switch above affected RPS trip unit Turns key 90° clockwise Verifies yellow light is lit above keyswitch Repeats for each RPS trip channel
	SRO	Briefs crew on the following: If a valid SIS signal is received, left channel ESS equipment must be started manually per EOP Supplement 5 If a valid CHP signal is received, P-54B and P-54C must be started manually
	SRO	Determines that multiple Tech. Specs. apply: * Tech. Spec. 3.8.7, 3.8.9 - 8 hr. LCO on Y-30 - 24 hr. action on the associated inverter * Tech. Spec. 3.8.1 - D/G 1-1 is inoperable due to associated sequencer - 1 hr. action * Tech. Spec. 3.8.9 - 8 hr. action for one Preferred AC Bus inoperable (will exit when placed on the bypass regulator)

	SRO	Receives the following report from AO on Y-30 Inverter #3 local indications: * AC Output Brkr. is CLOSED * DC Input Brkr. is OPEN * It appears that a worker slipped and inadvertently caused the DC Input Breaker to open
	SRO/BOP	Determines that AO/electricians report is indicative of NO fault on Y-30. Determines from discussions with AO/electricians that it is acceptable to re-energize Y-30
	SRO	Directs placing Y-30 on the Bypass Regulator
	BOP	Refers to SOP-30, 7.6.2. c through h for re-energizing from the Bypass Regulator
SIM OP: Use ED48 on PIDED02 to CLOSE bypass regulator and then delete malfunction ED08C.		
	SRO/BOP	May also dispatch AO to reset 42-1 and AFAS
SIM OP: For 42-1 use RP35 to RESET on PIDRPN13. For AFAS, use FW43 to RESET on PIDFW01.		

Op-Test No.: **1** Scenario No.: **2** Event No.: **4/6** Page 1 of 5

Event Description: ***'B' Steam Generator Tube Leak/Rupture/Plant Trip***

Time	Position	Applicant's Actions or Behavior
	SRO BOP RO	Diagnoses Steam Generator Tube Leak on 'B' 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 ('B' S/G) • RIA-0707, Steam Generator Blowdown Monitor • RIA-2325/2326, Stack Gas Effluent Monitors • RIA-2327, High Range Noble Gas Monitor
	SRO RO	Uses ONP-23.2, Att.1 and/or Att.2 or PPC Page 540 to determine leak rate. Determines leak rate is ~ 0.25 gpm. May also use DWO-1 method (15 min)
	SRO	'B' S/G tube leak is identified and quantified, determines that plant shutdown per GOP-8 must occur (Mode 3 within 6 hours). Action level 3
	SRO	Determines that Tech. Spec. 3.4.13.B applies - 6 hours to MODE 3, 36 hours to MODE 5. (> 150 gpd)
	SRO	Have HP determine dose rates on C-42 cation columns Have HP perform surveys per EOP Supplement 14
SIM OP: Inform control room that cation surveys for 'B' S/G indicate a higher than normal dose rate.		

	BOP/RO	Isolates S/G Blowdowns by closing the following valves on panel C-13: CV-0704, Blowdowns to mixing basin CV-0739, 'A' S/G Surface B/D CV-0767, 'A' S/G Bottom B/D CV-0771, 'A' S/G Bottom B/D CV-0738, 'B' S/G Surface B/D CV-0768, 'B' S/G Bottom B/D CV-0770, 'B' S/G Bottom B/D
	SRO BOP	May raise RIA-0631, Condenser off-gas monitor, setpoint on back of panel C-01
	BOP	Operates turbine generator controls on the DEH panel for shutdown: Enters setter value Selects rate of ≤ 30% per hour Pushes GO and observes white light energize Informs CRS/RO that turbine is in "GO"
SIM OP: Once plant de-rate commences, raise severity of leak to 1.5 gpm using remote 4		
	ALL	Diagnose that leak rate has risen to above 0.4 gpm. Requires reactor trip
	SRO	Direct Reactor Trip
Plant Trip		
	RO	Answers YES to the following for EOP-1.0 verbal verifications of immediate actions: • Reactivity control • Core heat removal • Containment isolation • Containment atmosphere • Main. Vital Auxiliaries – Water • Main. Vital Auxiliaries - Air

	RO	Answers NO to the following for EOP-1.0 verbal verifications of immediate actions: • PCS Inventory Control – PZR level is off-scale low o contingency - verifies CVCS operating to restore PZR level, i.e., charging pumps running and orifice stop valves closed • PCS Pressure control – PZR pressure < 1650 psia o contingency – manually operates PZR heaters and spray, heaters will be off due to low PZR level, spray valves closed o contingency – when PCS pressure is < 1605 psia, verify safety injection initiated: ▪ Verify EK-1342 in alarm ▪ Verify all available HPSI and LPSI pumps in service ▪ If PCS pressure is < 1300 psia, stop 'D' PCP. If PCS pressure is < minimum for pump operation, secure all PCPs
	BOP	Answers YES to the following for EOP-1.0 verbal verifications of immediate actions: • Main Turbine Generator acceptance criteria • Both MFPs in manual at minimum speed with both feed regulating and bypass valves closed
	BOP	Answers NO to the following for EOP-1.0 verbal verifications of immediate actions • Vital Auxiliaries – Electric o 1E bus is de-energized due to Safety Injection actuation (this may be a 'YES' depending on timing of SIS) No contingency o 1D bus de-energized. Contingency to manually close D/G 1-2 output breaker • PCS Heat Removal – Tave < 525°F and S/G pressures < 800# o Contingency Tave – Verify feed flow not excessive, Turbine bypass valve and Atmospheric steam dump valves closed o Contingency S/G pressure – Ensure TBV and ADVs are closed, close both MSIVs (S/Gs < 800 psia) • Containment Isolation - Condenser Off-Gas monitor in alarm o No contingency
	BOP	May start AFW Pump P-8A manually using start switch on panel C-01 Verifies 165 gpm to 'A' S/G (and 'B' S/G if not isolated) on FIC-0727 and 0749
	SRO	Performs EOP-1.0, attachment 1, Event Diagnostic Flow Chart Diagnoses a SGTR and enters EOP-5.0, Steam Generator Tube Rupture Recovery
	ALL	Diagnose 'B' S/G as affected

	BOP	Isolates AFW to 'B' S/G by: Selecting manual on FIC-0727 and 0736A Raising output of controller to 100%
	RO	Commences a cooldown of the PCS: Selects manual on HIC-0780A Adjusts signal on controller to achieve desired ADV position Monitors S/G pressures and cooldown rate Controls 'A' S/G level 60 - 70 %
	BOP	Perform SIS checklist, EOP Supplement 5 (SAT with exception P-7C)
	SRO/RO	Establish PCS temperature and pressure control bands
	RO	May manually start Charging Pump P-55B because it will not automatically start on SIS due to loss of 1D bus earlier in scenario (anti-pump feature): Places control switch on panel C-12 in MANUAL Starts P-55B using control switch on panel C-02
	BOP/RO	Closes Letdown orifice isolation valves: Places control switches for CV-2003, CV-2004, CV-2005, to CLOSE on panel C-02
	BOP	Places left train CRHVAC in emergency: Starts CRHVAC Emergency Fan V-26A Ensures Purge Fan, V-94, and Switchgear Exhaust Fan, V-47 are secured
	SRO	Direct chemistry to sample S/G for lithium and activity
	SRO	Direct EOP supplement 4, HPSI flow verification, completed
	SRO	When lowest hot leg temperature is < 524 °F, orders 'B' S/G isolated per EOP supplement 13

	BOP	Performs EOP Supplement 13 to isolate ‘B’ S/G inside control room: If removing heat using the TBV, ensures MO-0510, 'A' S/G MSIV Bypass valve is open Closes MSIVs and 'B' S/G MSIV Bypass valve on panel C-01 Closes 'B' FRV, CV-0703, on panel C-01 Closes 'B' FRV Block valve, CV-0744, on panle C-01 Closes CV-0727, CV-0736, CV-0736A, AFW to 'B' S/G (if not performed earlier), on panel C-01 Closes 'B' S/G Blowdown Valves CV-0768, CV-0770, CV-0738, on panel C-13 Directs AO to perform EOP Supplement 13 to isolate ‘B’ S/G from outside control room
SIM OP: Use MS18/MS19 and SG10/SG12 on PIDMS01 to isolate ‘B’ S/G		
EI Classification – FA1 Alert		
Terminate Scenario when S/G is isolated or at examiner discretion		

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

Event Description: ***Safety Bus 1D De-energizes; D/G 1-2 Output Breaker Requires Manual Closing/P-7A Fails to restart on NSD sequencer/***

Time	Position	Applicant's Actions or Behavior
	BOP RO	Diagnoses that Bus 1D is de-energized RO may diagnose loss of Bus 1D due to MOV lights for HPSI/LPSI injection and loss of P-7A or P-7C with attendant header press low alarm
	BOP	Manually closes D/G 1-2 output breaker
	RO	Diagnoses that P-7A did not restart on NSD Sequencer: EK-1163 - Critical SW Header 'B' Lo Pressure EK-1164 - Critical SW Header 'A' Lo Pressure EK-1165 - Non-Critical SW Header Lo Pressure SW Critical Header Pressures approximately 30 psig P-7A Amps are zero P-7A Green Light ON, Red Light OFF Informs CRS
	SRO	Directs P-7A, SW Pump, manually started May enter ONP-6.1 (already in EOP-1.0)
	RO	Manually starts P-7A using handswitch on panel C-08 All SW Header Lo pressure alarms clear and pressures return to approximately 70 psig

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

Event Description: ***P-50B PCP High Vibration***

Time	Position	Applicant's Actions or Behavior
	RO	Diagnoses P-50B high vibration: Vibration Monitor VIA-131B readings on panel C-02 above normal, in ALERT on DANGER Alarms EK-0913, Pri Coolant Pump Vibe Alert/Mon Trouble and/or EK-0914, Pri Coolant Pump Vibration Danger P-50B upper guide bearing temperature on panel C-12, TIA-0136B, trending upward
	SRO	Directs P-50B tripped
	RO	Trips P-50B using switch on panel C-02 Ensures associated AC or DC lift pump automatically starts