

Facility: **Perry** Scenario No.: **2 - 75%** Op-Test No.: **2009-01**

Examiners: _____ Operators: _____

Initial Conditions: Reactor Power 72%. MOL Pull Sheets, Rods @ Step 55 at Position 48.
Power ascension is in progress. IOI-3 Step 4.5.35.
'B' CRD pump & 'C' CBP in secured status.
Green Risk.
Suppression Pool Temperature 90°F due to leaking SRVs.
ESW B and ECC B are running.

Turnover: When requested by Reactor Engineering, raise Rx Power to 75% with Recirculation Flow and then complete Step 56 of MOL Pull Sheets.
Place RHR 'B' in Suppression Pool Cooling to lower Suppression Pool Temperature.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Place RHR 'B' in Suppression Pool Cooling (BOP).
2	mv05/mv08_ 1e12f064b	C (BOP)	1E12F0064B fails to Auto close then fails when full closed.
		SRO	Tech Spec 3.5.1 for RHR B, 3.6.1.3 for 1E12F064B (if position unknown)
3	EG05	C (ATC)	Main generator voltage regulator failure in auto.
4	TH23A/ TH23B	C (ATC)	Reactor Recirc FCVs start to open after flow adjustment. Arms and Depresses HPU shutdown pushbuttons to lock FCVs.
		SRO	Enters ONI-C51 Unplanned Change in Reactor Power. Tech Spec 3.4.1 Loop Flows
		R (ATC)	Inserts Cram Rods
5	pt01_ 1c34- n04a/b/c	M	Loss of Feedwater, EOP-1 RPV Control
		C (BOP)	HPCS fails to Auto Start. Start with Control Switch
6	RD16	M	SDV rupture, EOP-2 Containment Control
		C (BOP)	Containment Spray 'A' will not initiate, transition to Containment Spray 'B' or Emergency Depressurize

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

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Event Description: Place RHR B in Suppression Pool Cooling

Time	Position	Applicant's Actions or Behavior
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Driver	Driver	Reset Simulator to IC-149
Driver	Driver	Load Schedule NRC_75.sch & NRC_Info.sch
	SRO	Direct BOP to place RHR B in Suppression Pool Cooling
	BOP	Place RHR B in Pool Cooling per SOI-E12 Section 4.4
		4.4.2 Notify HP that a Suppression Pool evolution will be conducted 4.2.6 Close RHR B HX Bypass 1E12-F048B (Holds switch in CLOSE 8-10 seconds after receiving closed indication per OAI-0201- OPERATIONS GENERAL INSTRUCTIONS AND OPERATING PRACTICES) 4.2.7 Throttle RHR B HX Outlet Valve 1E12-F003B closed 18 to 20 seconds 4.2.8 Start RHR Pump B 1E12-C002B 4.2.10 Open RHR B Test Valve to SUPR Pool 1E12-F024B 4.2.11 Verify RHR Pump B Minimum Flow Valve 1E12-F064B closes when flow is greater than 1650 gpm
NRC	NRC	Minimum Flow Valve will not close in Auto, Operator Closes and when it is full closed it will lose power
	BOP	Report Failure of 1E12-F064B
Driver	Driver	If sent to EF1D07-CC for E12F064B, no obvious problems
		Throttle RHR B HX Outlet Valve 1E12-F003B to obtain 7100 to 7300 gpm
	SRO	Tech Spec for 1E12-F064B: 3.5.1 Condition A - 7 days 3.6.1.7 Condition A - 7 Days 3.6.2.3 Condition A - 7 Days 3.3.5.1 Conditions A - Immediately & Condition E - 1 hr 3.6.1.3 Condition A - if BOP reports unknown condition of 1E12-F064B 3.4.9 (PLCO) 3.6.3.3 Condition A - if declares RHR B INOP)
	SRO	Assign BOP increased monitoring of RHR B to ensure it does not Operate at less than 1650 gpm for greater than 8 seconds or may direct RHR B be Shutdown.
	BOP	Performs increased monitoring or shuts down RHR B Pump

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Event Description: Main Generator Voltage Regulator Failure

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Event Description: Power increase

[illegible]

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Event Description: ONI-C51 Unplanned Power Change

[illegible]

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Event Description: Loss of High Pressure Reactor Feedwater Pumps

Time	Position	Applicant's Actions or Behavior
Driver	Driver	Upon Lead examiner direction, initiate Trigger 3 for a loss of feedwater due to narrow instruments failing high (loss of a DFWCS power supply)
	ATC	Report Trip of Feed Pumps and places the Mode Switch in Shutdown
		Perform SCRAM Hardcard actions
		Verify the following actions completed: <ul style="list-style-type: none"> • Mode Switch Locked in Shutdown. • RPS Initiated if all control rods are not fully inserted. • ARI Initiated if RPS failed to Scram the reactor.
		If Reactor Recirc Pumps are running in fast speed: Then simultaneously take the following to XFER: <ul style="list-style-type: none"> • RECIRC PUMP A BRKR 5A • RECIRC PUMP A BRKR 5A
		Perform crew update with the following information: <ul style="list-style-type: none"> • “The Mode Switch is locked in shutdown” • “All Control Rods are inserted” • Reactor Power is _____ • Reactor Pressure is _____ • Reactor Level is _____
		When generator load less than 90 MWe, <ul style="list-style-type: none"> • Trip the main turbine • Verify Main Stop valves, Control valves and CIVs are shut • Verify Gen BRKR S-610-PY-TIE and S-611-PY-TIE are open • Verify Gen Field Breaker open
		Insert Nuclear Instruments, SRMs & IRMs
		VERIFY HST LVL CV MANUAL CONTROL, N21-S19, IN OFF.
		STABLIZE reactor water level. <ul style="list-style-type: none"> • Feedwater (REFER TO REACTOR SCRAM FEEDWATER HARDCARD) • RCIC • HPCS
		STABLIZE reactor pressure: <ol style="list-style-type: none"> Turbine / Turbine Bypass valves (REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD) SRVs <ul style="list-style-type: none"> • Evacuate Containment • REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD • Evaluate placing RCIC in pressure Control Mode
	BOP	Recognize HPCS Pump fails to start at Level 2 then Start HPCS Pump
	BOP	Recognize 1E51-F045 lost Power. Dispatch NLO to ED1A09-J
Driver	Driver	If sent to ED1A09-J, found both mainline fuses blown

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Event Description: EOP-1 RPV Control

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Event Description: Pressure Control Hardcard Actions – if required

Time	Position	Applicant's Actions or Behavior
	ATC	IF Reactor Pressure is lowering with pressure control on the Turbine Bypass Valves, THEN PERFORM the following:
		VERIFY Turbine Bypass Valves properly adjusted
		IF RCIC turbine is running AND NOT needed for level control, THEN TRIP RCIC turbine.
		RECORD the as found positions and VERIFY the following valves closed.
		LATCH controller 1N22-R235, Main Turb Stop Valves Before Seat DRN Valve controller, by taking to 100% then to 0% to close the 1N22-F340A-D
		IF RFPTs are not being used for level control, THEN CLOSE MST To RFPT A & B Supply Valve, 1N11-F100
		MSL Low Point DRN Shutoff, 1B21-F015
		Shutoff Vlv Before Seat Norm DRN, 1N22-F450
		Shutoff Vlv Before Seat Warmup DRN, 1N22-F455
		INBD MSIV Before Seat Normal Drain, 1B21-F033
		INBD MSIV Before Seat Warmup Drain, 1B21-F021
		MSIV BYP VLV For MST Line Warm Up, 1B21-F020
		CLOSE at least one of the following: (Notify the Unit Supervisor) <ul style="list-style-type: none"> • INBD MSIVs, 1B21-F022A-D • OTBD MSIVs, 1B21-F028A-D
		IF RPV pressure is raising AND the MSIVs are closed, THEN PERFORM the following to control RPV Pressure:
		VERIFY OPEN MSL DRN & MSIV BYP OTBD ISOL, 1B21-F019
		VERIFY OPEN MSL DRN & MSIV BYP INBD ISOL, 1B21-F016
		OPERATE the following valves: <ul style="list-style-type: none"> • MSIV BYP VLV For MST Line Warm Up, 1B21-F020 • INBD MSIV Before Seat Warmup Drain, 1B21-F021
	SRO	Direct MSIVs Closed prior to exceeding a Cooldown rate of 100°F, pressure of 450 to 500 psig. (Critical Task 1)
	ATC	Close MSIVs if directed (Critical Task 1)

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Event Description: EOP-2 Containment Control, Containment Temperature

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Event Description: EOP-2 Containment Control, Containment Pressure

Time	Position	Applicant's Actions or Behavior
	SRO	Proceed through Containment Pressure Hold step when Containment pressure exceeds 0.5 psig
		Before Containment Pressure Exceeds PSP determine Containment Spray is required. (Critical Task 2)
		In the If While Executing step, verify Containment Spray is required and Containment Pressure is above the Containment Spray Initiation Limit (CSIL); Direct an Operator to Initiate Containment Spray per EOP-SPI 3.1 (Critical Task 2)
	BOP/ATC	Perform EOP-SPI 3.1 for Containment Spray Loop A
		At 1H13-P629 Place CNTMT Spray A HI DW PRESS Bypass switch in Bypass E12A-S75
		Confirm Containment Pressure above CSIL
		Arm and Depress CNTMT Spray A Manual Initiation button E12A-S63A
NRC	NRC	Switch for Containment Spray A is failed. Containment Spray A will not initiate. Status of RHR B: If still available will initiate for Containment Spray B, If it is not available SRO will decide to Anticipate ED or to ED prior to exceeding PSP.
	BOP/ATC	Perform EOP-SPI 3.1 for Containment Spray Loop B (Critical Task 2)
		At 1H13-P618 Place CNTMT Spray B HI DW PRESS Bypass switch in Bypass E12A-S76
		Confirm Containment Pressure above CSIL
		Arm and Depress CNTMT Spray B Manual Initiation button E12A-S63B
		Verify RHR B Pump Running
		Verify Containment Spray Valves 1E12-F537B and 1E12-F028B Open
	BOP/ATC	Terminate Containment Sprays prior to a Containment Pressure of 0 psig
		Take LPCI B Injection Valve Control Switch to Close 1E12-F042B
		Place CNTMT Spray B Manual Initiation button E12A-S63B in Disarm
		Depress CNTMT Spray B Seal In Reset E12A-S64B
		Close Containment Spray Valves 1E12-F537B and 1E12-F028B

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Event Description: EOP-2 Containment Control, Drywell Pressure

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Event Description: Contingent Anticipate ED (if RHR B was not used for Containment Spray)[illegible]

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Event Description: Contingent Emergency Depressurization EOP 4-2

[illegible]

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Event Description: Scenario Termination Criteria

[illegible]

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Event Description: Critical Task 1

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Event Description: Critical Task 2*

Time	Position	Applicant's Actions or Behavior
		<p>With Containment pressure exceeding the Containment Spray Initiation Limit (CSIL), and prior to reaching the Pressure Suppression Pressure, initiate Containment Spray.</p> <ol style="list-style-type: none"> 1. Safety Significance: Precludes degradation of a fission product barrier. 2. Cues: Containment pressure increase. Procedural compliance. 3. Measured by: Observation - When above the CSIL, Containment Spray is manually initiated prior to reaching the Pressure Suppression Pressure. 4. Feedback: Containment pressure. "CONTAINMENT SPRAY START SIGNAL RECEIVED" annunciator status. Containment Spray flowrate.
		* NOTE: Must do Critical Task 2 <u>OR</u> Critical Task 3

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Event Description: Critical Task 3*

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Event Description: Critical Task 4

[illegible]

Facility: Perry **Scenario No.:** 4 - 3% **Op-Test No.:** 2009-01

Examiners: _____ **Operators:** _____

Initial Conditions: Reactor Power 3%, MOL Pull Sheets, Rods @ Step 30 Gang 33 at Position 12.
 Power ascension in progress.
 IOI-2 Hot Startup Section 4.7.
 RFBP 'B' and NCC Pump 'C' are Out of Service.
 APRM 'A' is bypassed for I&C SVI-C51-T0027A.
 Reactor Engineer is available in the Control Room.

Turnover: Continue Power Ascension per IOI-2 Hot Startup. Place Circulating Water Pump 'C' in service per SOI-N71 Circulating Water System. Hot Water Inlet MOVs 5 and 10 are closed and the fill and vent is complete on condenser train 'D'

Event No.	Malf. No.	Event Type*	Event Description
1		R (ATC)	Pull Control Rods per IOI-2 for Transfer to Run
2		N (BOP)	Place Circulating Water Pump C in service
3	rd01r1819	C (ATC)	Control Rod 18-19 Stuck at Position 12, will move to position 20
		SRO	Tech Spec 3.1.3 for Stuck Withdrawn Control Rod
4	RP01A	C (Crew)	RPS Bus A EPA Failure, Loss of RPS Bus A
		C (BOP)	Transfer RPS A to Alternate, Reset NS4 Isolation and recovery
		SRO	ONI-C71-2 Loss of RPS Bus, Tech Spec 3.3.1.3, 3.3.6.1, and 3.3.2.1.
5	NM02G	I (ATC)	IRM 'G' Fails upscale, Bypass IRM 'G', Range IRMs and Reset 1/2 Scram
		SRO	Tech Spec 3.3.1.1(IRM G)
6	PC04	M	Suppression Pool Leak, EOP-3 Secondary Containment Control and EOP-2 Containment Control Emergency Depressurize EOP-4-2, on lowering Pool Level
7	ZD1E22F0004	C (BOP)	HPCS Injection valve fails open. Override HPCS Pump to off
8	cb04_1p42c0001a	C (BOP)	ECC 'A' pump fails to auto start – manually start ECC pump
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

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Event Description: Pull Control Rods per IOI-2 for Transfer to RUN

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Event Description: Place Circulating Water Pump C in service

Time	Position	Applicant's Actions or Behavior
	BOP	Start the third Circulating Water Pump per SOI-N41 Sect 4.3
		<p>4.3 Starting The Third Circulating Water Pump</p> <p>NOTE</p> <p>When adjusting pump discharge pressures, computer points N71BA035, N71BA036 and N71BA037 may be used in place of meters 1N71-R012A, B and C.</p> <p>4.3.1 VERIFY the following are closed at Cooling Tower Flow Distribution Panel, 1H51-P273:</p> <ul style="list-style-type: none"> • HOT WATER INLET MOV #5 1N71-F345 • HOT WATER INLET MOV #10 1N71-F634
		4.3.2 IF WHILE aligning condenser trains the oncoming condenser train inlet and outlet valves are both closed, THEN REFER TO Section 7.13, Filling and Returning an Isolated Main Condenser Section to Service, and RESTORE the Condenser train.
		<p>4.3.3 VERIFY the following valves are open for all condenser trains:</p> <ul style="list-style-type: none"> • LP CNDR INLET VLV 1N71-F030D • HP CNDR OUTLET VLV 1N71-F140D
		<p>4.3.4 THROTTLE the CIRW PUMP DISCH VALVE of both inservice pumps to maintain the following: 1N71-F020A, 1N71-F020B, 1N71-F020C</p> <ul style="list-style-type: none"> • CIRC WATER PUMP DISCH PRESS between 36 and 48 psig, but as close as possible to 36 psig. • CIRC WATER PUMP AMPS less than 260.
		4.3.5 WHILE observing the requirements of the following step, TAKE the third CIRW PUMP to START on 1H13-P870. 1N71-C001C
		4.3.6 IF the oncoming discharge valve does NOT begin opening within 7 seconds, THEN IMMEDIATELY TAKE the oncoming CIRW PUMP to STOP.
		4.3.7 VERIFY the third CIRW PUMP DISCH VALVE opens. 1N71-F020C
		4.3.8 CONFIRM that CIRC WATER PUMP DISCH PRESS has stabilized. 1N71-R012C
		<p>4.3.9 THROTTLE the CIRW PUMP DISCH VALVE on each running pump to maintain the following on all 3 pumps:</p> <ul style="list-style-type: none"> • CIRC WATER PUMP DISCH PRESS between 36 and 48 psig, but as close as possible to 36 psig. • CIRC WATER PUMP AMPS less than 260.
		4.3.10 DIRECT Chemistry to align the Circulating Water Chemical Treatment System for the current Circulating Water System lineup in accordance with SOI-P83A.

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Event Description: Control Rod 18-19 Stuck at position 12

Time	Position	Applicant's Actions or Behavior
	ATC	Report Control Rod 18-19 will not move with normal drive pressure
Driver	Driver	If asked for history, this rod needs 400 # to move
	SRO	Direct use of Alternate Control Methods
	ATC	Perform SOI-C11(RCIS) Section 7.25
		7.25 Alternate Control Method Rod Initially at a Position Other Than “00”
Driver	Driver	Inform SRO as the Reactor Engineer that Rod 18-19 does not have a settle condition.
	ATC	7.25.2 RAISE CRDH drive differential pressure in 50 psid increments UNTIL <ul style="list-style-type: none"> • rod motion is possible • 500 psid is reached (by throttling closed on C11-F003 Drive Pressure Control Valve)
Driver	Driver	Once Drive water pressure is raise modify stuck rod failure (malfunction RD01R1819) to position 20.
	ATC	Withdraw Rod to 20; once again raise drive water pressure.
NRC	NRC	ROD will not move
	ATC	7.25.3 IF the rod is immovable at 500 psid, THEN REFER TO ONI-C11-1, Inability to Move Control Rods.
	SRO	Enter ONI-C11-1
	ATC	7.25.5 IF NOT moving control rods in accordance with Tech Spec 3.10.6, THEN RETURN Drive Water Pressure to normal WHEN any one of the following condition is met: <ul style="list-style-type: none"> • The rod is at the withdrawal limit • Rod movement is suspended • The US/SO determine the elevated pressure is no longer needed • Another Control Rod is to be selected

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Event Description: ONI-C11-1 -- Control Rod 18-19 Stuck at position 20

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Event Description: Loss of RPS Bus A

Time	Position	Applicant's Actions or Behavior
Driver	Driver	Upon Lead examiner direction initiate Trigger 10, Loss of RPS Bus A
	ATC/BOP	Report Loss of RPS Bus A
	SRO	Enter ONI-C71-2, Loss of One RPS Bus
Driver	Driver	If sent to investigate RPS, found EPA A tripped – undervoltage is indicated – MG is coasting down
		Direct BOP to select alternate source A – ALT A
	BOP	RPS A bus is de-energized MG SET TRANSFER switch is in NORM RPS Bus A GEN ALT AVAIL light on THEN PLACE the MG SET TRANSFER switch 1C71-S1 in RPS Bus A Alternate Source on P640.
	SRO	4.1.8 REFER TO the following Technical Specifications: <ul style="list-style-type: none"> • 3.3.1.1, Reactor Protection System Instrumentation • 3.3.1.3 Oscillation Power Range Monitor (OPRM) Instrumentation • 3.3.6.1, Primary Containment and Drywell Isolation Instrumentation • 3.3.2.1, Control Rod Block Instrumentation • 3.4.7, RCS Leakage Detection Instrumentation • ORM 6.2.1, APRM Control Rod Block Instrumentation • ORM 6.2.2, Source Range Monitors Control Rod Block Instrumentation • ORM 6.2.3, Intermediate Range Monitors Control Rod Block Instrumentation • ORM 6.2.4, Scram Discharge Volume Control Rod Block Instrumentation • ORM 6.2.5, Reactor Coolant System Recirculation Flow Control Rod Block Instrumentation • ORM 6.3.1, Reactor Coolant System Chemistry
		Direct ATC to Reset ½ scram
		Technical Specification 3.3.1.1 for IRM G - Condition A (potential LCO) no actions ORM 6.2.3 for IRM G – no action
		ORM 6.3.1.5 – 4 hour sample

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Event Description: Bypass IRM G and Reset ½ Scram

Time	Position	Applicant's Actions or Behavior
NRC	NRC	IRM G failed upscale upon RPS bus re-energization. All IRMs on Div 1 side will have upscale alarms upon bus re-energization until IRMs are ranged up.
	ATC	Ranges up on all Division 1 IRMs to clear trips
	ATC	Observe/Report IRM G failed upscale
	SRO	Direct ATC to Bypass IRM G per SOI-C51
	ATC	Bypass IRM G per SOI-C51(IRM) Sect 7.4
		7.4.1 VERIFY that a valid IRM upscale trip does NOT exist on IRM to be bypassed
		7.4.2 PLACE the NEUTRON MONITOR BYPASS switch, for the IRM Channel being bypassed, in the BYPASS position. 1C51A-S6 CH G
		7.4.2 PLACE the NEUTRON MONITOR BYPASS switch, for the IRM Channel being bypassed, in the BYPASS position. 1C51A-S6 CH G
		7.4.4 CONFIRM the BYPASSED IRM light on applicable Startup Range Rad Mon Panel comes on. CH G
Driver	Driver	Inform when asked that back panel Bypass Light is lit
NRC	NRC	Must bypass IRM G before resetting RPS
	ATC	Reset RPS per SOI-C71 Sect 7.4
		7.4.1 VERIFY the following: <ul style="list-style-type: none"> The conditions which caused the full or half scram have cleared. There is reasonable assurance that another scram signal will NOT be generated.
		7.4.4 MOMENTARILY DEPRESS the appropriate RPS division pushbuttons on P680: <ul style="list-style-type: none"> SCRAM RESET CH A. 1C71-S5A, SCRAM RESET CH C. 1C71-S5C
		7.4.7 VERIFY the following SCRAM DISCH VOL DRAIN VALVE lights are on at 1H13-P680: <ul style="list-style-type: none"> INSTR VOLUME VENT VLV OPEN INSTR VOLUME DRAIN VLV OPEN

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Event Description: ONI-C71-2 Actions and IOI-18

Time	Position	Applicant's Actions or Behavior
	BOP	ONI-C71-2 Actions
		4.1.10 VERIFY all SRV control switches on P601 are in AUTO 4.1.11 VERIFY all SRV control switches on P631 are in AUTO 4.1.12 VERIFY GROSS/FAIL TRIP/LATCH lights are reset at the following panels: • 1H13-P692, • 1H13-P693, • 1H13-P691, • 1H13-P694
Driver	Driver	When asked the above light are reset
	BOP	4.1.13 REFER TO IOI-18 and RESTORE the following isolations as appropriate. • BALANCE OF THE PLANT ISOLATION (L2 /1.68#) RESTORATION
		4.1.16 If required then OPEN the MSL DRM & MSIV BYP OTBD ISOL B21F019
	BOP	IOI-18 Actions
		Perform Attachment 32 - BALANCE OF THE PLANT ISOLATION (LEVEL 2 / 1.68#)
		1.0 CONFIRM the following alarms reset: • BOP ISOL DW PRESS HIGH H13-P601-19A-A6 • BOP ISOL RX LEVEL LO L2 H13-P601-19A-B6
		2.0 MOMENTARILY DEPRESS the following: • MSL & NS4 OTBD ISOL SEAL IN RESET. B21H-S32 • MSL & NS4 INBD ISOL SEAL IN RESET. B21H-S33
		4.0 IF restoring an outboard isolation (Division 1), THEN PERFORM the following: 4.1 VERIFY the following open: • SA SUPPLY HDR CNTMT ISOL. P51-F150 • CTS SUPPLY HDR CNTMT ISOL. P11-F060

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Event Description: ONI-C71-2 Actions and IOI-18

Time	Position	Applicant's Actions or Behavior
		<p>4.2 AT 1H13-P881, VERIFY the following are open:</p> <ul style="list-style-type: none"> • PERS AL EL 603 OTBD ALRM ISOL P53-F070 • PERS AL EL 692 OTBD ALRM ISOL P53-F075 • PERS AL EL 692 SUPP AIR OTBD ISOL P52-F170 • PERS AL EL 603 SUPP AIR OTBD ISOL P52-F160 • DW EQUIP DRAIN OTBD DW ISOL G61-F035 • DW FLOOR DRAIN OTBD DW ISOL G61-F155 • CNTMT EQUIP DRAIN OTBD ISOL G61-F080 • CNTMT FLOOR DRAIN OTBD ISOL G61-F170 • RWCU BACKWASH OUT OTBD ISOL G50-F277 • MIXED BED WTR CNTMT SUPPLY ISOL P22-F010 • DW CO2 SUPPLY OTBD ISOL P54-F395
		<p>4.3 VERIFY the valves closed:</p> <ul style="list-style-type: none"> • PERS AL EL 603 INNER DR AEGTS ISOL P53-F035 • PERS AL EL 692 INNER DR AEGTS ISOL P53-F045
		<p>4.4 IF the Containment Airborne Radiation Monitor was in service, THEN VERIFY the following valves open:</p> <ul style="list-style-type: none"> • CNTMT RAD MON OTBD SUCT ISOL D17-F081A • CNTMT RAD MON OTBD DISCH ISOL D17-F089A
		<p>4.5 IF the Drywell Airborne Radiation Monitor was in service, THEN VERIFY the following valves open:</p> <ul style="list-style-type: none"> • DW RAD MON OTBD SUCT ISOL D17-F071A • DW RAD MON OTBD DISCH ISOL D17-F079A
		<p>5.0 IF Containment Vessel Chilled Water was in service, PERFORM the following:</p> <p>5.1 AT H13-P800, VERIFY the following valves open:</p> <ul style="list-style-type: none"> • CVCW OTBD SUPP ISOL VALVE P50-F060 • CVCW OTBD RETURN MOV ISOL VALVE P50-F150 • CVCW INBD RETURN MOV ISOL VALVE P50-F140
		5.2 REFER to SOI-P50 and SHIFT chillers.
		Direct an NLO to start a P50 chiller per SOI-P50 and SHIFT chillers.
		<p>6.0 TAKE the following to closed at 1H13-P800:</p> <ul style="list-style-type: none"> • DW VAL RLF MOV ISOL VALVE M16-F010A • DW VAL RLF MOV ISOL VALVE M16-F010B
		<p>7.0 VERIFY the following are open at 1H13-P800:</p> <ul style="list-style-type: none"> • CNTMT VAC RLF MOV ISOL VALVE M17-F015 • CNTMT VAC RLF MOV ISOL VALVE M17-F025 • CNTMT VAC RLF MOV ISOL VALVE M17-F035 • CNTMT VAC RLF MOV ISOL VALVE M17-F045

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Event Description: EOP-3 Secondary Containment Control - Suppression Pool Leak

Time	Position	Applicant's Actions or Behavior
Driver	Driver	Upon Lead examiner direction initiate Trigger 2, Suppression Pool Leak
	Crew	Receive/Acknowledge alarm H13-P601-18-D3 RHR C PUMP ROOM SUMP LEVEL HI
		Dispatch NLO to investigate
		Respond to Sump Room Alarm and Suppression Pool Level Alarms
Driver	Driver	Report a large leak in RHR C Pump Room, door is severely damaged and can not be closed
	SRO	Enter EOP-3 Secondary Containment Control on RHR C Sump Room Alarm. Entry Condition met for Area Water Level, Proceeds through HOLD step
NRC	NRC	No Primary system is discharging to area
	SRO	Answers NO to “Is any Primary System discharging into the affected area?”
		Wait in Hold Box for two (2) MAX SAFEs to shutdown Reactor (Critical Task 6)
NRC	NRC	May Shutdown Reactor Before Max Safe is reached
Driver	Driver	4 minutes after leak start, report water is over the grating in RHR C Room
NRC	NRC	Water Over Grating is a MAX SAFE Condition
	SRO	Direct BOP to Isolate RHR C Suppression Pool Suction Valve 1E12-F105 per ARI
	BOP	Attempts to close RHR C Suppression Pool Suction Valve 1E12-F105
		Observe/report 1E12-F105 lost indication
NRC	NRC	1E12-F105 loses power when taken to CLOSE
Driver	Driver	If NLO sent to investigate, EF1D07-HH for 1E12-F105 has burnt control power transformer
NRC	NRC	May ask for 18” orange mark submergence in Aux Bldg 568’, but this is not a ‘primary’ system.

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Event Description: EOP-2 Containment Control - Suppression Pool Level

[illegible]

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Scenario No.: 4 – 3%

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Event Description: ONI-C71-1 Reactor Scram (ATWS)

Time	Position	Applicant's Actions or Behavior
	SRO	Direct Reactor Scram
		Enter ONI-C71-1 REACTOR SCRAM, but power < 4% - no EOP entry
	ATC	Scram the Reactor by taking the Mode Switch to SHUTDOWN and complete scram hard card actions
		Verify the following actions completed: <ul style="list-style-type: none"> • Mode Switch Locked in Shutdown. • RPS Initiated if all control rods are not fully inserted. • ARI Initiated if RPS failed to Scram the reactor.
		If Reactor Recirc Pumps are running in fast speed: Then simultaneously take the following to XFER: <ul style="list-style-type: none"> • RECIRC PUMP A BRKR 5A • RECIRC PUMP A BRKR 5A
		Perform crew update with the following information: <ul style="list-style-type: none"> • “The Mode Switch is locked in shutdown” • RPS was initiated (report failure) • ARI was initiated (report failure) • “All Control Rods are not inserted” • Reactor Power is _____ • Reactor Pressure is _____ • Reactor Level is _____
		When generator load less than 90 MWe, then perform the following: <ul style="list-style-type: none"> • Trip the main turbine • Verify Main Stop valves, Control valves and CIVs are shut • Verify Gen BRKRs S-610-PY-TIE and S-611-PY-TIE are open • Verify Gen Field Breaker open
		Insert Nuclear Instruments, <ul style="list-style-type: none"> • SRMs • IRMs • Place recorders in IRM (leave A or E in APRM)
		VERIFY HST LVL CV MANUAL CONTROL, N21-S19, IN OFF
		STABLIZE reactor water level. a) Feedwater (REFER TO REACTOR SCRAM FEEDWATER HARDCARD) b) RCIC c) HPCS

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Event Description: ONI-C71-1 Reactor Scram (ATWS)

Time	Position	Applicant's Actions or Behavior
		STABLIZE reactor pressure: a) Turbine / Turbine Bypass valves (REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD) b) SRVs <ul style="list-style-type: none"> • Evacuate Containment • REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD • Evaluate placing RCIC in pressure Control Mode
	SRO	Direct a reactor water level band of 178 to 219 inches per ONI-C71-1
	ATC	Level Control should remain in Automatic with the Motor Feed Pump
	SRO	Direct a Pressure Band of 800 to 1000 psig
	ATC/BOP	Maintain pressure band with bypass valves and Pressure Control Hardcard
		IF Reactor Pressure is lowering with pressure control on the Turbine Bypass Valves, THEN PERFORM the following:
		VERIFY Turbine Bypass Valves properly adjusted.
		IF RCIC turbine is running AND NOT needed for level control, THEN TRIP RCIC turbine.
		RECORD the as found positions and VERIFY the following valves closed.
		LATCH controller 1N22-R235, Main Turb Stop Valves Before Seat DRN Valve controller, by taking to 100% then to 0% to close the 1N22-F340A-D
		IF RFPTs are not being used for level control, THEN CLOSE MST To RFPT A & B Supply Valve, 1N11-F100
		MSL Low Point DRN Shutoff, 1B21-F015
		Shutoff Vlv Before Seat Norm DRN, 1N22-F450
		Shutoff Vlv Before Seat Warmup DRN, 1N22-F455
		INBD MSIV Before Seat Normal Drain, 1B21-F033
		INBD MSIV Before Seat Warmup Drain, 1B21-F021
		MSIV BYP VLV For MST Line Warm Up, 1B21-F020
		CLOSE at least one of the following: (Notify the Unit Supervisor) <ul style="list-style-type: none"> • INBD MSIVs, 1B21-F022A-D • OTBD MSIVs, 1B21-F028A-D

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Event Description: ONI-C71-1 Reactor Scram (ATWS)

[illegible]

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Event Description: EOP-1A Level Power Control (Level Leg)

Time	Position	Applicant's Actions or Behavior
	SRO	Enter EOP-1 RPV Control as directed by EOP-2 and transition to EOP-1A
		Enter EOP-1A Level Power Control (Level Leg)
		Direct Inhibit ADS (Critical Task 2)
	ATC/BOP	Inhibit ADS - Places ADS Inhibit switches in INHIBIT (Critical Task 2)
	SRO	Direct MSIV and ECCS interlocks per EOP-SPI 2.3
	BOP	As time permits, perform EOP-SPI 2.3
	SRO	Direct Terminate and Prevent ECCS Injection per EOP-SPI 5.1 and Feedwater for Depressurization per EOP-SPI 5.3 and wait in HOLD step until complete (Critical Task 4)
	ATC/BOP	Terminate and Prevent Feedwater (Critical Task 4) <ul style="list-style-type: none"> • Verify closed Heater 6A and 6B Bypass Valve 1N27-F135 • Close Heater 6A FDW Outlet Valve 1N27-F130A • Close Heater 6A FDW Outlet Valve 1N27-F130A • Verify Low Flow Controller is Manual and the Low Flow Control Valve is Closed 1N27-F175
	BOP	Terminate HPCS <ul style="list-style-type: none"> • HOLD HPCS Injection Valve 1E22-F004 in CLOSE • ARMS and DEPRESSES HPCS Manual Initiation pushbutton E22-S2
NRC	NRC	Control Switch for valve is Failed, BOP will need to take Pump Control Switch to STOP
	BOP	Operator to stop HPCS pump

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Event Description: EOP-1A Level Power Control (Level Leg)

[illegible]

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Event Description: EOP-4-2 Emergency Depressurization

[illegible]

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Event Description: EOP-1A Level Power Control

[illegible]

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Event Description: Scenario Termination Criteria

[illegible]

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Event Description: Critical Task 1

[illegible]

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Event Description: Critical Task 2

[illegible]

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Event Description: Critical Task 3

[illegible]

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Event Description: Critical Task 4

[illegible]

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Event Description: Critical Task 5

[illegible]

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Event Description: Critical Task 6

[illegible]

Facility: Perry Scenario No.: 5 - 100% Op-Test No.: 2009-01

Examiners: _____ **Operators:** _____

Initial Conditions: Reactor Power 100%. MOL Pull Sheets, Rods @ Step 57 at Position 6.
 IOI-3 Step 4.5 is complete.
 RCIC outage is in progress. Day 7 of 14 day LCO.
 Yellow Risk.
 Protected systems: HPCS and Div 3 DG, MFP, L10.

Turnover: Shift Stator Water Cooling Pumps and test pickup feature. NLO has been briefed and is on station. Lower Power to 90% to support surveillance testing.

Event No.	Malf. No.	Event Type*	Event Description
1		R (ATC)	Power reduction to $\leq 90\%$
2		N (BOP)	Shift Stator Water Cooling Pumps A \rightarrow B and test pickup feature.
3	cb01_1n21c0001c	C (ATC)	Hotwell Pump 'C' trips, ATC starts Hotwell Pump 'A'
4	tf01_2r11s0003	C (Crew)	Loss of LH-2-A Interbus Transformer, Loss of Div 1 Bus
		SRO	ONI-R22-1, ONI-C11-1, ONI-P43. Tech Spec 3.5.1 and 3.5.3 HPCS and RCIC, 3.5.1 for RHR A and LPCS. 3.8.1 for Two DGs, 3.1.5 for Loss of CRD.
		ATC	Recover CRD Pump 'A' or 'B' within 20 minutes
	mv06_1p45f0140	C (BOP)	ESW 'C' Discharge Valve fails, Place Div 3 DG in Pull-to-Lock. Loss of Div 3 Bus
		BOP	Restores Div 1 Bus, closes in Preferred Source Breaker
5	Loss of Feed	M	No high pressure injection EOP-1 RPV Control Emergency Depressurize EOP-4-2, on lowering Reactor Level

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

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Event Description: Lower Power to 90%

Time	Position	Applicant's Actions or Behavior
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[illegible]

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Event Description: Hotwell Pump 'C' in trip

[illegible]

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Event Description: LH-2-A Interbus Transformer Lockout, Loss of Division 1 and Division 3 Buses

[illegible]

Op-Test No.: 2009-01

Scenario No.: 5 – 100%

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Event Description: ONI-C11-1 and CRD Pump Trip recovery

Time	Position	Applicant's Actions or Behavior
	SRO	Enter ONI-C11-1 Inability to Move Control Rods
		4.1 - IF a CRD Pump is NOT operating, THEN REFER TO SOI-C11 (CRDH) and PERFORM CRD Pump Trip Recovery. Direct ATC to perform (Critical task 4)
		4.2 - In Mode 1 or 2. At least 2 CRD accumulators inoperable. At least one inoperable accumulator is associated with a withdrawn control rod Reactor pressure \geq 600 psig CRD PRESSURE CHARGING WATER indicating < 1600 psig. THEN within 20 minutes PLACE the REACTOR MODE SWITCH in SHUTDOWN.
	ATC	Perform CRD PUMP TRIP RECOVERY - will start either CRD A or B Pump per SOI-C11(CRDH) section 7.6 (Critical task 4)
		7.6 CRD Pump Trip Recovery 7.6.2 - TAKE the tripped CRD PUMP to STOP. 1C11-C001A
		7.6.3 - TAKE the oncoming CRD AUX OIL PUMP to START
		7.6.4 - CONFIRM the CRD PUMP TRIP OIL PRESS LOW alarm clears.
		7.6.5 - PLACE the CRD HYDRAULICS FLOW CONTROL in Manual. 1C11-R600
		7.6.6 - LOWER the CRD HYDRAULICS FLOW CONTROL output UNTIL the in-service CRD FLOW CONTROL VALVE is closed
		7.6.7 - TAKE the oncoming CRD PUMP to START. 1C11-C001A, 1C11-C001B
		7.6.8 - SLOWLY THROTTLE the in service CRD FLOW CONTROL VALVE UNTIL flow is restored on the CRD HYDRAULICS FLOW CONTROL.
		7.6.9 - PLACE the CRD HYDRAULICS FLOW CONTROL in AUTO. 1C11-R600
		7.6.10 - IF the tripped CRD Pump will NOT be re-started, THEN PERFORM the following:
		7.6.10.a - TAKE the tripped CRD PUMP to STOP. 1C11-C001A
		7.6.10.b - TAKE the CRD AUX OIL PUMP to STOP. 1C11-C002A
Driver	Driver	When a CRD Pump is started remove accumulator faults
Driver	Driver	If the CREW goes to put the MODE Switch in Shutdown, initiate the Loss of Feedwater Trigger 7

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Event Description: ONI-P43 and CRD Start of Standby NCC pump

[illegible]

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Event Description: IOI-18, BOP Restoration

Time	Position	Applicant's Actions or Behavior
	BOP	4.1.13 - REFER TO IOI-18 and RESTORE the following isolations as appropriate. • BALANCE OF THE PLANT ISOLATION (L2 /1.68#) RESTORATION.
		Attachment 32 - BALANCE OF THE PLANT ISOLATION (LEVEL 2 / 1.68#)
		1.0 CONFIRM the following alarms reset: • BOP ISOL DW PRESS HIGH H13-P601-19A-A6 • BOP ISOL RX LEVEL LO L2 H13-P601-19A-B6
		2.0 MOMENTARILY DEPRESS the following: • MSL & NS4 OTBD ISOL SEAL IN RESET. B21H-S32 • MSL & NS4 INBD ISOL SEAL IN RESET. B21H-S33
		4.0 IF restoring an outboard isolation (Division 1), THEN PERFORM the following: 4.1 VERIFY the following open: • SA SUPPLY HDR CNTMT ISOL. P51-F150 • CTS SUPPLY HDR CNTMT ISOL. P11-F060
		4.2 AT 1H13-P881, VERIFY the following are open: • PERS AL EL 603 OTBD ALRM ISOL P53-F070 • PERS AL EL 692 OTBD ALRM ISOL P53-F075 • PERS AL EL 692 SUPP AIR OTBD ISOL P52-F170 • PERS AL EL 603 SUPP AIR OTBD ISOL P52-F160 • DW EQUIP DRAIN OTBD DW ISOL G61-F035 • DW FLOOR DRAIN OTBD DW ISOL G61-F155 • CNTMT EQUIP DRAIN OTBD ISOL G61-F080 • CNTMT FLOOR DRAIN OTBD ISOL G61-F170 • RWCU BACKWASH OUT OTBD ISOL G50-F277 • MIXED BED WTR CNTMT SUPPLY ISOL P22-F010 • DW CO2 SUPPLY OTBD ISOL P54-F395
		4.3 VERIFY the valves closed: • PERS AL EL 603 INNER DR AEGTS ISOL P53-F035 • PERS AL EL 692 INNER DR AEGTS ISOL P53-F045
		4.4 IF the Containment Airborne Radiation Monitor was in service, THEN VERIFY the following valves open: • CNTMT RAD MON OTBD SUCT ISOL D17-F081A • CNTMT RAD MON OTBD DISCH ISOL D17-F089A
		4.5 IF the Drywell Airborne Radiation Monitor was in service, THEN VERIFY the following valves open: • DW RAD MON OTBD SUCT ISOL D17-F071A • DW RAD MON OTBD DISCH ISOL D17-F079A

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Event Description: IOI-18, BOP Restoration

[illegible]

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Event Description: Loss of Feed and Reactor Scram

Time	Position	Applicant's Actions or Behavior
Driver	Driver	Upon Lead examiner direction, initiate Trigger 7 Loss of Feed
	ATC	Report Computer Trouble alarms on digital feedwater system
	ATC	Report Turbine Speed or Feed Rate degrading
	ATC	May attempt to control with Manual Dial, will not work
NRC	NRC	Loss of Power to RFPT Speed Control runs back RFPT speed to zero with no trip of Pump
	ATC/SRO	Scram the Reactor – NOTE: RPS auto scram fails, ARI shuts down the Rx on Level 2.
	ATC	Perform SCRAM Hardcard actions
		Verify the following actions completed: <ul style="list-style-type: none"> • Mode Switch Locked in Shutdown. • RPS Initiated if all control rods are not fully inserted. • ARI Initiated if RPS failed to Scram the reactor.
		If Reactor Recirc Pumps are running in fast speed: Then simultaneously take the following to XFER: <ul style="list-style-type: none"> • RECIRC PUMP A BRKR 5A • RECIRC PUMP A BRKR 5A
		Perform crew update with the following information: <ul style="list-style-type: none"> • “The Mode Switch is locked in shutdown” • “All Control Rods are inserted” • Reactor Power is _____ • Reactor Pressure is _____ • Reactor Level is _____
		When generator load less than 90 MWe, <ul style="list-style-type: none"> • Trip the main turbine • Verify Main Stop valves, Control valves and CIVs are shut • Verify Gen BRKR S-610-PY-TIE and S-611-PY-TIE are open • Verify Gen Field Breaker open
		Insert Nuclear Instruments, SRMs & IRMs
		VERIFY HST LVL CV MANUAL CONTROL, N21-S19, IN OFF.

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Event Description: Loss of Feed and Reactor Scram

[illegible]

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Event Description: EOP-1 RPV Control – Alternate Level Control Systems

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Perform EOP-SPI 4.1 CRD Alternate Injection
		PLACE BUS XH11 LOCA BYPASS keylock switch in BYPASS
		PLACE BUS XH12 LOCA BYPASS keylock switch in BYPASS
		AT H13-P970, VERIFY <u>only</u> one NCC Pump is running
		VERIFY CRD HYDRAULICS FLOW CONTROL is in MANUAL. 1C11-R600
		ADJUST CRD HYDRAULICS FLOW CONTROL output to 100 to maximize flow.
		OPEN CRD DRIVE PRESS CONTROL VALVE. C11-F003
		START the second CRD Pump as follows
		Direct an NLO to bypass the suction filters and to place an additional drive water filter in service
Driver	Driver	Bypass CRD Pump Filters using Remote Function RD37
		START CRD AUX OIL PUMP
		VERIFY blue PERM light is energized
		START CRD PUMP
		Direct the NLO to close the Minimum Flow Valves for CRD Pump A and B
	ATC/BOP	Perform EOP-SPI 4.5 SLC Demin Alternate Injection
		COMMENCE injection into the RPV as follows
		VERIFY the following pumps are running:
		SLC PUMP A and SLC PUMP B

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Event Description: Pressure Control Hardcard Actions – if required

Time	Position	Applicant's Actions or Behavior
	ATC	Maintain pressure band with bypass valves and pressure control hardcard
		IF Reactor Pressure is lowering with pressure control on the Turbine Bypass Valves, THEN PERFORM the following:
		VERIFY Turbine Bypass Valves properly adjusted.
		IF RCIC turbine is running AND NOT needed for level control, THEN TRIP RCIC turbine.
		RECORD the as found positions and VERIFY the following valves closed.
		LATCH controller 1N22-R235, Main Turb Stop Valves Before Seat DRN Valve controller, by taking to 100% then to 0% to close the 1N22-F340A-D
		IF RFPTs are not being used for level control, THEN CLOSE MST To RFPT A & B Supply Valve, 1N11-F100
		MSL Low Point DRN Shutoff, 1B21-F015
		Shutoff Vlv Before Seat Norm DRN, 1N22-F450
		Shutoff Vlv Before Seat Warmup DRN, 1N22-F455
		INBD MSIV Before Seat Normal Drain, 1B21-F033
		INBD MSIV Before Seat Warmup Drain, 1B21-F021
		MSIV BYP VLV For MST Line Warm Up, 1B21-F020
		CLOSE at least one of the following: (Notify the Unit Supervisor) <ul style="list-style-type: none"> • INBD MSIVs, 1B21-F022A-D • OTBD MSIVs, 1B21-F028A-D
		IF RPV pressure is raising AND the MSIVs are closed, THEN PERFORM the following to control RPV Pressure:
		VERIFY OPEN MSL DRN & MSIV BYP OTBD ISOL, 1B21-F019
		VERIFY OPEN MSL DRN & MSIV BYP INBD ISOL, 1B21-F016
		OPERATE the following valves: <ul style="list-style-type: none"> • MSIV BYP VLV For MST Line Warm Up, 1B21-F020 • INBD MSIV Before Seat Warmup Drain, 1B21-F021

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Event Description: EOP-1 RPV Control – Level less than 16.5”

Time	Position	Applicant's Actions or Behavior
	SRO	Answer NO to, “Can Reactor Level be restored and maintained above 16.5?”
		Direct Operator to Inhibit ADS (Critical Task 1)
	ATC/BOP	Inhibits ADS, Places ADS A and B Inhibit switches in Inhibit (Critical Task 1)
	SRO	Direct BOP to start H2 Igniters and start H2 Analyzers
	BOP	Start H2 Igniters by placing switches in ON
	BOP	Start H2 Analyzers
		Start ESW Pumps A and B
		Starts ECC Pumps A and B
		Opens Comb Gas H2 ANAL Sample Valves
		Places Mode & Function Selector switch in Sample
		Places System Function switch in ON
		Directs an NLO to complete H2 Analyzer Startup in the field
	SRO	Direct the Operators to align two or more injection systems: RFBP, LPCS, RHR B, and RHR C are available.
	ATC	Align RFBP for Injection – Open 1N27-F200
	BOP	Align/verify LPCS, RHR B and C for Injection
	SRO	Answers YES to “Can two or more systems be lined up?”
	SRO	Wait for Reactor Level to lower to ZERO inches. (Critical Task 2)
	SRO	At Level One, MSIVs close, direct ATC to maintain 800 to 1000 psig pressure band with SRVs
	ATC	Use SRVs to maintain directed Pressure band

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Event Description: EOP-4-2 Emergency Depressurization

[illegible]

Op-Test No.: 2009-01

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Event Description: Scenario Termination Criteria

[illegible]

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Event Description: Critical Task 2

[illegible]

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Event Description: Critical Task 3

[illegible]

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Event Description: Critical Task 4

[illegible]