	<b>Facility:</b>	Perry	Scenario No.: 2	2 - 75%	Op-Test No.: 2009-0	1
<b>Examiners:</b>			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.

<u>Turnover:</u> 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	М	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
------	----------	---------------------------------

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		
	ВОР	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.		
	ВОР	Performs increased monitoring or shuts down RHR B Pump		

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**Event Description: Main Generator Voltage Regulator Failure** 

Position	Applicant's Actions or Behavior
1	
Driver	Upon Lead examiner direction and while BOP Operator is placing RHR B in Pool Cooling, initiate Trigger 5, Main Generator Auto Voltage Regulator Failure
ATC	Respond to alarms on P680-09 B3 and D4, GENERATOR FIELD OVER VOLTAGE and AUTO VOLTAGE REGULATOR TRIP per ARIs
	Place Auto-Manual Voltage Regulator Selector switch in Manual
Driver	Report Perry Grid HI VOLTAGE alarm. Restore to Schedule voltage
	Adjust Bus 1 Voltage to 349 KV, S42-R011
NRC	BUS 1 volts should be around 351 KV, prior to adjusting; grid voltage alarm @ 350.1 Kv
	Driver

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**Event Description: Power increase** 

Time	Position	Applicant's Actions or Behavior			
Driver	Driver	After ATC adjusts power with 'A' FCV insert Trigger 8, to fail A & B FCVs			
	ATC	Raise Reactor Power by opening Recirculation Flow Control Valves			
		Monitor Reactor Power			
		Maintain RFPT deviations near zero			
		Maintain Loop Flows balanced			
		Maintain Turbine Load Set 120 Mwe above turbine load			
NRC	NRC	With FCV failure in, A FCV will open and B FCV will not move			
	ATC	Respond to increasing Reactor Power, report A FCV opening			
		Attempt to stop power increase by closing FCV A			
		ONI-C51 Immediate Action - Arms and Depresses FCV A HPU Shutdown pushbutton			
		Report FCV movement has stopped			
NRC	NRC	Depending on response time of Operator CV AMP in Control and Steam Bypass Valve Open alarms may come in			
	ATC	If CV AMP in Control or Steam Bypass open alarms are in, raises Load Set to close Bypass Valves			
	SRO	Enter ONI-C51 Unplanned Power Change			

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**Event Description: ONI-C51 Unplanned Power Change** 

Time	Position	Applicant's Actions or Behavior
	SRO	Direct ATC to monitor for Power oscillations
		Answer NO to, "Is power in either Immediate Exit Region or Controlled Entry/Immediate Exit region?"
		Direct Reactor Engineer to perform ONI-SPI-G4
		Answers YES to, "Has an Unplanned Power Increase Occurred?"
		Direct ATC to Lower Power with FCV B
	ATC	Attempt to lower Power with FCV; Reports B FCV will not move
	SRO	Direct ATC to lower Power by use of Cram Rods to the Power level pre transient
	ATC	Insert Cram Rods Step 55 Gang 50 Rods 30-07, 06-31, 54-31, 30-55, to position 00
	SRO	Answer YES to, "Is Recirc Flow Mismatch greater than 10.4 Mlbm/hr?"
		Direct BOP to Record Loop Parameters per ONI-SPI-G2
		Answer NO to, "Is Recirc Flow Mismatch within limits?"
		Flow Mismatch is not with in limits Tech Spec 3.4.1 Condition A - 2 Hours
		Should also direct FCV B to be locked up, since it will not move.
	ATC	Arm and Depress FCV B pushbutton to prevent inadvertent movement of FCV B for positive reactivity control

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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:  • 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:  • RECIRC PUMP A BRKR 5A  • RECIRC PUMP A BRKR 5A  Perform crew update with the following information:  • "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> <li>Trip the main turbine</li> <li>Verify Main Stop valves, Control valves and CIVs are shut</li> <li>Verify Gen BRKRs S-610-PY-TIE and S-611-PY-TIE are open</li> <li>Verify Gen Field Breaker open</li> <li>Insert Nuclear Instruments, SRMs &amp; IRMs</li> </ul>
		VERIFY HST LVL CV MANUAL CONTROL, N21-S19, IN OFF.  STABLIZE reactor water level.  • Feedwater (REFER TO REACTOR SCRAM FEEDWATER HARDCARD)  • RCIC  • HPCS  STABLIZE reactor pressure:
		STABLIZE reactor pressure:  a) Turbine / Turbine Bypass valves (REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD)  b) SRVs  • Evacuate Containment  • REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD  • Evaluate placing RCIC in pressure Control Mode
	ВОР	Recognize HPCS Pump fails to start at Level 2 then Start HPCS Pump
	ВОР	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** 

/D*	D	A . P
Time	Position	Applicant's Actions or Behavior
	SRO	Enter EOP-1 RPV Control at Level 2
		Direct ATC to stabilize Reactor Pressure and Level
		Level Leg - Assign BOP to verify Isolations and Actuations for Level 2 & Level 3
	ВОР	Perform Isolations and Actuation verification for Level 2 & 3 as time permits
	SRO	Direct level band (ATC) (per flow chart, any level band between 130-215"). (Critical Task 4)
	ATC	Control Reactor Level in assigned band with HPCS by cycling 1E22-F004 HPCS Injection Valve (Critical Task 4)
	SRO	<b>Pressure Leg</b> - Direct a Reactor Pressure band of 600 to 1000 psig on Main Turbine Bypass Valves
	ATC	Maintain pressure band with bypass valves and pressure control hardcard

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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)  • 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:  • 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** 

	1	
Time	Position	Applicant's Actions or Behavior
	Crew	Report degrading Containment Temperature and Pressure
	SRO	Enter EOP-2 Containment Control when Containment Temperature is 96°F
		Proceed through Containment Temperature HOLD step and Direct BOP to Operate all Containment Cooling Fans and Restore Containment Cooling per EOP-SPI 2.2
	ВОР	Start the two non running Containment Cooling Fans
		Perform EOP-SPI 2.2
		At H13-P871 Bay C Terminal Strip AA Terminal 9 remove and insulate wire P500717G
		At H13-P872 Bay C Terminal Strip AA Terminal 10 remove and insulate wire P500917G
		At H13-P872 Bay C Terminal Strip AA Terminal 14 remove and insulate wire P501017G
		AT 1H13-P800 Open P50-F060, P50-F150 and P50-F140
		Direct an NLO to Start a P50 Chiller locally
		<u> </u>

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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** 

	T	1
Time	Position	Applicant's Actions or Behavior
	SRO	Direct Terminate and Prevent of low pressure injection systems not required for adequate core cooling per EOP-SPI 5.2 Vessel Flood Prevention
	ВОР	Terminate and prevent LPCS - Close LPCS Injection Valve 1E21-F005, LPCI A & C - Close LPCI A and C Injection Valves 1E12-F042A and 1E12-F042C
NRC	NRC	IF RHR B was allowed to remain in Pool Cooling and it has not been started in Containment Spray yet, it will realign for LPCI injection and with the minimum flow valve failed it will not be protected. BOP Operator was assigned to monitor RHR B Flow, Opens 1E12-F024B to place back in Pool Cooling and provide minimum flow

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

Time	Position	Applicant's Actions or Behavior
	SRO	Prior to exceeding PSP (3.6 psig), with a Containment Pressure of 3.0 psig and MSIVs Open
		Direct ATC to Anticipate ED and Open All Bypass Valves
	ATC	Opens Seven Bypass Valves
	ATC/BOP	After Emergency Depressurization, the SPDS display will not indicate wide range reactor vessel water level. Wide range indication will be available on panel indicators.

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**Event Description: Contingent Emergency Depressurization EOP 4-2** 

Time	Position	Applicant's Actions or Behavior
Time	<u> </u>	
	SRO	Prior to exceeding PSP (3.6 psig) (Critical Task 3)
		Enter EOP-4-2 Emergency Depressurization when Containment Pressure is less than PSP
		Answer YES to "Is Reactor Shutdown?"
		Answer Yes to is Drywell Pressure above 1.68 psig
		Direct Terminate and Prevent of low pressure injection systems not required for adequate core cooling per EOP-SPI 5.2 Vessel Flood Prevention
	ВОР	Terminate and prevent LPCS - Close LPCS Injection Valve 1E21-F005, LPCI A & C - Close LPCI A and C Injection Valves 1E12-F042A and 1E12-F042C
	SRO	Direct Operator to Open 8 ADS Valves
	ATC/BOP	Opens 8 ADS Valves (Critical Task 3)
	ATC/BOP	After Emergency Depressurization, the SPDS display will not indicate wide range reactor vessel water level. Wide range indication will be available on panel indicators.

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**Event Description: Scenario Termination Criteria** 

Time	Dogitio	Applicant?s Actions on Debourion
Time	Position	Applicant's Actions or Behavior
		The reactor has been emergency depressurized prior to exceeding PSP OR Containment Spray was initiated preventing PSP from being exceeded.
		Reactor Level is being maintained greater than 100" with HPCS
		3. All Control Rods are Inserted
		Cooldown rate was maintained less than 100 degrees in an hour as long as ED or Anticipate ED was not utilized.

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**Event Description: Critical Task 1** 

Time	Position	Applicant's Actions or Behavior		
Time	rosition	Applicant's Actions of Benavior		
		Prevent from exceeding a 100 degree per hour cool down of the Reactor prior to Emergency Depressurization being required.		
		1. Safety Significance:		
		Precludes degradation of a fission product barrier		
		2. Cues:		
		Procedural compliance		
		3. Measured by:		
		Observation – Reactor Pressure Maintained above 450 psig		
		4. Feedback:		
		RPV pressure increasing		
		MSIVs Closed if required		

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**Event Description: Critical Task 2\*** 

	T	
Time	Position	Applicant's Actions or Behavior
		With Containment pressure exceeding the Containment Spray Initiation Limit (CSIL), and prior to reaching the Pressure Suppression Pressure, initiate Containment Spray.
		Safety Significance:     Precludes degradation of a fission product barrier.
		2. Cues: Containment pressure increase. Procedural compliance.
		<ul> <li>3. Measured by:     Observation - When above the CSIL, Containment Spray is manually initiated prior to reaching the Pressure Suppression Pressure.</li> <li>4. Feedback:     Containment pressure.</li> </ul>
		"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\*** 

	T	
Time	Position	Applicant's Actions or Behavior
		When Containment Pressure cannot be maintained below the PSP limit, US determines that Emergency Depressurization is required and RO initiates Emergency Depressurization as directed by US.  1. Safety Significance:     Precludes failure of containment 2. Cues:     Procedural compliance     High Containment Pressure 3. Measured by:     Observation - US determines (indicated by announcement or observable transition to EOP-04-2) that Emergency Depressurization is required before Containment pressure exceeds the PSP limit.      AND     Observation - RO opens at least 5 SRV's during performance of Emergency Depressurization actions.  4. Feedback:     RPV pressure decreasing SRV open status indications
		* NOTE: Must do Critical Task 2 <u>OR</u> Critical Task 3

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**Event Description: Critical Task 4** 

	1	
Time	Position	Applicant's Actions or Behavior
		Prior to Reactor Level lowering to Top of Active Fuel, crew restores HPCS to control Reactor Level.  1. Safety Significance:     Maintain adequate core cooling by submergence 2. Cues:
		Procedural compliance Reactor Level trend.  3. Measured by: Observation - Reactor Level maintained greater than ZERO inches.
		4. Feedback: Reactor level trend HPCS Injection rate

Facility:	Perry	Scenario No.: 4 - 3% Op-Tes	t No.: 2009-01
<b>Examiners:</b>		Operate	ors:

**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.

<u>Turnover:</u> 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 ½ 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)	* (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** 

Time	Position	Applicant's Actions or Behavior	
Driver	Driver	Reset Simulator to IC-147	
Driver	Driver	Load Schedule NRC_03.sch & NRC_Info.sch	
Driver	Driver	Place yellow switch caps on RFBP 'B' and NCC Pump 'C'	
Driver	Driver	Reactor Engineer recommends gang withdrawal	
Driver	Driver	Withdraw Gang 32 Rods 10-27, 26-51, 50-35 and 34-11 to 48	
	SRO	Direct RO to start a third Circulating Water Pump	
	SRO	IOI-2 step 4.7.1 Direct RO to withdraw rods until all APRM Downscale indicating lights are off and to perform IRM/APRM Overlap per step 4.7.17	
	ATC	Withdraw Rods per US direction, Should withdraw gang 33 and start to withdraw 38.	
		Selects Correct Rod or Gang.  Gang 33 Rods are 26-11, 10-35, 34-51, and 50-27.  Gang 38 Rods are 18-19, 18-43, 42-43 and 42-19.	
		Withdraw Rods from position 12 to position 48	
		Monitor Reactor Power on IRM / APRM and Bypass Valve position	
		When Rods are at Position 48 perform a coupling check	

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**Event Description: Place Circulating Water Pump C in service** 

Time	Position	Applicant's Actions or Behavior			
	ВОР	Start the third Circulating Water Pump per SOI-N41 Sect 4.3			
		4.3 Starting The Third Circulating Water Pump			
		NOTE			
		When adjusting pump discharge pressures, computer points N71BA035, N71BA036 and N71BA037 may be used in place of meters 1N71-R012A, B and C.			
		4.3.1 VERIFY the following are closed at Cooling Tower Flow Distribution Panel, 1H51-P273:			
		<ul> <li>HOT WATER INLET MOV #5 1N71-F345</li> <li>HOT WATER INLET MOV #10 1N71-F634</li> </ul>			
		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.			
		4.3.3 VERIFY the following valves are open for all condenser trains:			
		<ul> <li>LP CNDR INLET VLV 1N71-F030D</li> <li>HP CNDR OUTLET VLV 1N71-F140D</li> </ul>			
		4.3.4 THROTTLE the CIRW PUMP DISCH VALVE of both inservice pumps to maintain the following: 1N71-F020A, 1N71-F020B, 1N71-F020C			
		<ul> <li>CIRC WATER PUMP DISCH PRESS between 36 and 48 psig, but as close as possible to 36 psig.</li> <li>CIRC WATER PUMP AMPS less than 260.</li> </ul>			
		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			
		4.3.9 THROTTLE the CIRW PUMP DISCH VALVE on each running pump to maintain the following on all 3 pumps:			
		<ul> <li>CIRC WATER PUMP DISCH PRESS between 36 and 48 psig, but as close as possible to 36 psig.</li> <li>CIRC WATER PUMP AMPS less than 260.</li> </ul>			
		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	<ul> <li>7.25.2 RAISE CRDH drive differential pressure in 50 psid increments UNTIL</li> <li>rod motion is possible</li> <li>500 psid is reached</li> <li>(by throttling closed on C11-F003 Drive Pressure Control Valve)</li> </ul>
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	<ul> <li>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:</li> <li>The rod is at the withdrawal limit</li> <li>Rod movement is suspended</li> <li>The US/SO determine the elevated pressure is no longer needed</li> <li>Another Control Rod is to be selected</li> </ul>

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

Time	Position	Applicant's Actions or Behavior
	SRO	ONI-C11-1, Inability to Move Control Rods
		3.1 MAINTAIN plant parameters as steady as possible.
		4.12 IF a withdrawn rod is suspected to be stuck, THEN PERFORM the following:
		4.12.2 DECLARE the control rod inoperable. (rod 18-19)
		4.12.3 CONFIRM the stuck control rod does NOT occupy a location adjacent to:
		<ul><li>Another control rod that is "slow".</li><li>Another withdrawn stuck control rod</li></ul>
		4.12.3 REFER TO the following:
		T.S. 3.1.3, Control Rod Operability T.S. 3.1.4, Control Rod Scram Times
	SRO	T.S. 3.1.3, Control Rod Operability Condition A1 –Immediately; Condition A2 –2 hrs; Condition A3 –N/A Condition A4 – working
NRC	NRC	Condition A if control rod reinsertion is attempted or control rod is declared stuck.  Condition C if control rod is not declared stuck or reinsertion is not attempted
Driver	Driver	As Reactor Engineer, will perform SVI (A4) within 72 hours
	SRO	Direct disarming of rod 18-19 (A2)

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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
	ВОР	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-S1in RPS Bus A Alternate Source on P640.
	SRO	<ul> <li>4.1.8 REFER TO the following Technical Specifications:</li> <li>3.3.1.1, Reactor Protection System Instrumentation</li> <li>3.3.1.3 Oscillation Power Range Monitor (OPRM) Instrumentation</li> <li>3.3.6.1, Primary Containment and Drywell Isolation Instrumentation</li> <li>3.3.2.1, Control Rod Block Instrumentation</li> <li>3.4.7, RCS Leakage Detection Instrumentation</li> <li>ORM 6.2.1, APRM Control Rod Block Instrumentation</li> <li>ORM 6.2.2, Source Range Monitors Control Rod Block Instrumentation</li> <li>ORM 6.2.3, Intermediate Range Monitors Control Rod Block Instrumentation</li> <li>ORM 6.2.4, Scram Discharge Volume Control Rod Block Instrumentation</li> <li>ORM 6.2.5, Reactor Coolant System Recirculation Flow Control Rod Block Instrumentation</li> <li>ORM 6.3.1, Reactor Coolant System Chemistry</li> </ul>
		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> <li>The conditions which caused the full or half scram have cleared.</li> <li>There is reasonable assurance that another scram signal will NOT be generated.</li> </ul>
		7.4.4 MOMENTARILY DEPRESS the appropriate RPS division pushbuttons on P680:
		<ul> <li>SCRAM RESET CH A. 1C71-S5A,</li> <li>SCRAM RESET CH C. 1C71-S5C</li> </ul>
		7.4.7 VERIFY the following SCRAM DISCH VOL DRAIN VALVE lights are on at 1H13-P680:
		<ul> <li>INSTR VOLUME VENT VLV OPEN</li> <li>INSTR VOLUME DRAIN VLV OPEN</li> </ul>

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

Time	Position	Applicant's Actions or Behavior
	ВОР	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
	ВОР	<ul> <li>4.1.13 REFER TO IOI-18 and RESTORE the following isolations as appropriate.</li> <li>BALANCE OF THE PLANT ISOLATION (L2 /1.68#) RESTORATION</li> </ul>
		4.1.16 If required then OPEN the MSL DRM & MSIV BYP OTBD ISOL B21F019
	ВОР	IOI-18 Actions
		Perform Attachment 32 - BALANCE OF THE PLANT ISOLATION (LEVEL 2 / 1.68#)
		<ul> <li>1.0 CONFIRM the following alarms reset:</li> <li>BOP ISOL DW PRESS HIGH H13-P601-19A-A6</li> <li>BOP ISOL RX LEVEL LO L2 H13-P601-19A-B6</li> </ul>
		<ul> <li>2.0 MOMENTARILY DEPRESS the following:</li> <li>MSL &amp; NS4 OTBD ISOL SEAL IN RESET. B21H-S32</li> <li>MSL &amp; NS4 INBD ISOL SEAL IN RESET. B21H-S33</li> <li>4.0 IF restoring an outboard isolation (Division 1), THEN PERFORM the following:</li> </ul>
		<ul> <li>4.1 VERIFY the following open:</li> <li>SA SUPPLY HDR CNTMT ISOL. P51-F150</li> <li>CTS SUPPLY HDR CNTMT ISOL. P11-F060</li> </ul>

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

Time	Position	Applicant's Actions or Behavior
		4.2 AT 1H13-P881, VERIFY the following are open:
		<ul> <li>PERS AL EL 603 OTBD ALRM ISOL P53-F070</li> <li>PERS AL EL 692 OTBD ALRM ISOL P53-F075</li> <li>PERS AL EL 692 SUPP AIR OTBD ISOL P52-F170</li> <li>PERS AL EL 603 SUPP AIR OTBD ISOL P52-F160</li> <li>DW EQUIP DRAIN OTBD DW ISOL G61-F035</li> <li>DW FLOOR DRAIN OTBD DW ISOL G61-F155</li> <li>CNTMT EQUIP DRAIN OTBD ISOL G61-F180</li> <li>CNTMT FLOOR DRAIN OTBD ISOL G61-F170</li> <li>RWCU BACKWASH OUT OTBD ISOL G50-F277</li> <li>MIXED BED WTR CNTMT SUPPLY ISOL P22-F010</li> <li>DW CO2 SUPPLY OTBD ISOL P54-F395</li> <li>4.3 VERIFY the valves closed:</li> <li>PERS AL EL 603 INNER DR AEGTS ISOL P53-F035</li> </ul>
		PERS AL EL 692 INNER DR AEGTS ISOL P53-F045
		<ul> <li>4.4 IF the Containment Airborne Radiation Monitor was in service, THEN VERIFY the following valves open:</li> <li>CNTMT RAD MON OTBD SUCT ISOL D17-F081A</li> <li>CNTMT RAD MON OTBD DISCH ISOL D17-F089A</li> </ul>
		<ul> <li>4.5 IF the Drywell Airborne Radiation Monitor was in service, THEN VERIFY the following valves open:</li> <li>DW RAD MON OTBD SUCT ISOL D17-F071A</li> <li>DW RAD MON OTBD DISCH ISOL D17-F079A</li> </ul>
		<ul> <li>5.0 IF Containment Vessel Chilled Water was in service, PERFORM the following:</li> <li>5.1 AT H13-P800, VERIFY the following valves open:</li> <li>CVCW OTBD SUPP ISOL VALVE P50-F060</li> <li>CVCW OTBD RETURN MOV ISOL VALVE P50-F150</li> <li>CVCW INBD RETURN MOV ISOL VALVE P50-F140</li> </ul>
		5.2 REFER to SOI-P50 and SHIFT chillers.
		Direct an NLO to start a P50 chiller per SOI-P50 and SHIFT chillers.
		<ul> <li>6.0 TAKE the following to closed at 1H13-P800:</li> <li>DW VAL RLF MOV ISOL VALVE M16-F010A</li> <li>DW VAL RLF MOV ISOL VALVE M16-F010B</li> </ul>
		<ul> <li>7.0 VERIFY the following are open at 1H13-P800:</li> <li>CNTMT VAC RLF MOV ISOL VALVE M17-F015</li> <li>CNTMT VAC RLF MOV ISOL VALVE M17-F025</li> <li>CNTMT VAC RLF MOV ISOL VALVE M17-F035</li> <li>CNTMT VAC RLF MOV ISOL VALVE M17-F045</li> </ul>

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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
	ВОР	Attempts to close RHR C Suppression Pool Suction Valve 1E12-F105
		Observe/report 1E12-F105 lost indication
NRC	NRC	1E12-F105 looses 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** 

Time	Position	Applicant's Actions or Behavior
	SRO	Enter EOP-2 Containment Control at less than 17.8' in the Suppression Pool
		Proceeds down Suppression Pool Level Control Leg Directs BOP to initiate SPMU per EOP-SPI 3.2 SPMU INITIATION
	ВОР	Initiates SPMU Makeup per EOP-SPI 3.2
		AT H13-P869, PLACE SUPR POOL MAKEUP A FULL FLW TEST PERM keylock switch in TEST. G43-S13
		AT H13-P868, PLACE SUPR POOL MAKEUP B FULL FLW TEST PERM keylock switch in TEST. G43-S12
		ARM AND DEPRESS the following pushbuttons:
		<ul> <li>SUPR PL MAKE-UP A MANUAL INITIATION G43-S5</li> <li>SUPR PL MAKE-UP A MANUAL INITIATION G43-S7</li> </ul>
		CONFIRM the following valves are OPEN:
		<ul> <li>SUPR PL MAKE-UP A FIRST SHUTOFF G43-F030A</li> <li>SUPR PL MAKE-UP A SECOND SHUTOFF G43-F040A</li> <li>SUPR PL MAKE-UP B FIRST SHUTOFF G43-F030B</li> <li>SUPR PL MAKE-UP B SECOND SHUTOFF G43-F040B</li> </ul>
		VERIFY CLOSED CNTMT POOLS SUPP ISOL G41-F100
	SRO	After SPMU is initiated, when Suppression Pool Level is approaching Less than 17.8'.  Answer NO to "Can Suppression Pool Level be maintained above 17.8'?"
		Consider further actions to maintain Pool Level
		Should decide at this point that Pool Level CANNOT be maintained greater than 14.25' and transition to Emergency Depressurization (ED) (Critical Task 3)
		Transition to EOP-1 RPV Control, EOP-1A Level and Power Control and then to EOP-4-2 Emergency Depressurization. (Critical Task 3)

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

CDO	
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
	<ul> <li>Verify the following actions completed:</li> <li>Mode Switch Locked in Shutdown.</li> <li>RPS Initiated if all control rods are not fully inserted.</li> <li>ARI Initiated if RPS failed to Scram the reactor.</li> </ul>
	If Reactor Recirc Pumps are running in fast speed: Then simultaneously take the following to XFER:  RECIRC PUMP A BRKR 5A  RECIRC PUMP A BRKR 5A
	Perform crew update with the following information:  • "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
	<ul> <li>When generator load less than 90 MWe, then perform the following:</li> <li>Trip the main turbine</li> <li>Verify Main Stop valves, Control valves and CIVs are shut</li> <li>Verify Gen BRKRs S-610-PY-TIE and S-611-PY-TIE are open</li> <li>Verify Gen Field Breaker open</li> </ul>
	Insert Nuclear Instruments,  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
	ATC

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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> <li>Evacuate Containment</li> <li>REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD</li> <li>Evaluate placing RCIC in pressure Control Mode</li> </ul>
	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)  • INBD MSIVs, 1B21-F022A-D  • OTBD MSIVs, 1B21-F028A-D

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

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	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
		<ul> <li>OPERATE the following valves:</li> <li>MSIV BYP VLV For MST Line Warm Up, 1B21-F020</li> <li>INBD MSIV Before Seat Warmup Drain, 1B21-F021</li> </ul>
	SRO	Direct Control Rod Insertion per EOP-SPI 1.1 to 1.7 (Critical Task 1)
	ATC	Insert Control Rods per EOP-SPI 1.3 (Critical Task 1)
		2.0 VERIFY CRD HYDRAULICS FLOW CONTROL is in MANUAL. 1C11-R600 ADJUST CRD HYDRAULICS FLOW CONTROL output to 100
		3.0 CLOSE CRD DRIVE PRESS CONTROL VALVE. 1C11-F003
		5.0 WHEN any CRD Pump is running, THEN INSERT all control rods to position 00 concurrently with the remainder of this procedure as follows:
		5.1 DEPRESS AND HOLD the IN TIMER SKIP pushbutton
		5.2 SELECT the desired Control Rod
		<ul> <li>6.0 VERIFY the following keylock switches in BYPASS</li> <li>AT H13-P629, LO POWER SET PT DIV 1 BYPASS C11A-S4</li> <li>AT H13-P618, LO POWER SET PT DIV 2 BYPASS C11A-S3</li> </ul>

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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
	ВОР	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	<ul> <li>Terminate and Prevent Feedwater (Critical Task 4)</li> <li>Verify closed Heater 6A and 6B Bypass Valve 1N27-F135</li> <li>Close Heater 6A FDW Outlet Valve 1N27-F130A</li> <li>Close Heater 6A FDW Outlet Valve 1N27-F130A</li> <li>Verify Low Flow Controller is Manual and the Low Flow Control Valve is Closed 1N27-F175</li> </ul>
	ВОР	<ul> <li>Terminate HPCS</li> <li>HOLD HPCS Injection Valve 1E22-F004 in CLOSE</li> <li>ARMS and DEPRESSES HPCS Manual Initiation pushbutton E22-S2</li> </ul>
NRC	NRC	Control Switch for valve is Failed, BOP will need to take Pump Control Switch to STOP
	ВОР	Operator to stop HPCS pump

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

Time	Position	Applicant's Actions on Pohovion
Time	Position	Applicant's Actions or Behavior
	BOP/ATC	Terminate and Prevent Low Pressure ECCS (Critical Task 4)
		Verify LOCA Bypass is in BYPASS for BUS XH11 and XH12
		HOLD LPCS Injection Valve 1E21F005 and LPCI A Injection Valve 1E12-F042A in CLOSE
		ARM and DEPRESS LPCS and LPCI A Manual Initiation pushbutton E21A-S9
		Verify Closed 1E12-F042A, 1E21-F005, 1E12-F053A, and 1E12-F023
		HOLD LPCI B Injection Valve 1E12-F042B and LPCI C Injection Valve 1E12-F042C in CLOSE.
		ARM and DEPRESS LPCI B and LPCI C Manual Initiation pushbutton E12A-S21
		Verify Closed 1E12-F042B, 1E12-F053B, and 1E12-F042C
NRC	NRC	Auto Start of ECC A pump Failed, BOP will need to take Pump Control Switch to START
	SRO	May direct RHR C override to OFF
	ATC/BOP	Report Terminate and Prevent is Complete

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**Event Description: EOP-4-2 Emergency Depressurization** 

Time	Position	Applicant's Actions or Behavior				
	SRO	Enter EOP-4-2 Emergency Depressurization (Critical Task 3)				
		Answers NO to "Is Reactor Shutdown?"				
	SRO	Direct BOP Operator to Open 8 ADS Valves				
	ВОР	Open 8 ADS Valves (Critical Task 3)				
	BOP/ATC	After Emergency Depressurization, the SPDS display will not indicate wide range reactor vessel water level. Wide range indication will be available on panel indicators.				
	<u> </u>					

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**Event Description: EOP-1A Level Power Control** 

Time	Position	Applicant's Actions or Behavior
	SRO	Enter EOP-1A at T in the Level Leg
		Direct Operator to Restore and Maintain Level in Directed Level Band when Reactor Pressure is less than the MSCP Pressure of 140 psig ( <b>Critical Task 5</b> )
	ATC/BOP	Restore Reactor Level to directed band (178 to 219") after Reactor Pressure is less than MSCP of 140 psig ( <b>Critical Task 5</b> )
		<ol> <li>To restore level using feedwater - preferred:</li> <li>Verify MFP in OFF</li> <li>Verify FDW Pumps Bypass Valve is open, N27-F200</li> <li>Slowly throttle Low Flow Controller in manual, 1N27-F175</li> <li>If additional injection is required, then throttle Heater 6A and 6B FDW Bypass Valve, 1N27-F135</li> </ol>
		To restore level using RHR: (per EOP-SPI 6.1 RHR A INJECTION & EOP-SPI 6.2 RHR B INJECTION)  1. Restore level using RHR A or B outside the shroud: 2. IF directed to inject outside the shroud, THEN Perform the following: 3. Throttle Shutdown Cooling A/B to FDW Shutoff to the desired flowrate. E12-F053A/B
NRC	NRC	If shutdown under all conditions is declared, Critical Task 5 is not required.

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**Event Description: Scenario Termination Criteria** 

Time	Position	Applicant's Actions or Behavior		
		1. Control Rods are being inserted		
		2. Emergency Depressurized has been performed		
		3. Feedwater or RHR is being used to maintain RPV level		

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	1	
Time	Position	Applicant's Actions or Behavior
		With a reactor scram required and the reactor not shutdown, initiate action to reduce power by inserting control rods.
		<ol> <li>Safety Significance:         Shutting down reactor can preclude failure of containment or equipment necessary for the safe shutdown of the plant.</li> <li>Cues:         Procedural compliance.</li> <li>Measured by:         Control Rod insertion commenced in accordance with Section 1.0 of EOP-</li> </ol>
		SPIs. 4. Feedback: Reactor Power trend. Control Rod indications.

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	1	
Time	Position	Applicant's Actions or Behavior
		With reactor scram required and the reactor not shutdown, to prevent an uncontrolled RPV depressurization and subsequent power excursion, inhibit ADS.
		<ol> <li>Safety Significance:         Precludes core damage due to an uncontrolled reactivity addition.</li> <li>Cues:         Procedural compliance.</li> <li>Measured by:         ADS logic inhibited prior to an automatic initiation unless all required injection systems are Terminated and Prevented.</li> <li>Feedback:         RPV pressure trend.         RPV level trend.</li> </ol>
		ADS "ADS OUT OF SERVICE" annunciator status.

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	<u> </u>	
Time	Position	Applicant's Actions or Behavior
		When Suppression Pool level cannot be maintained above 14.25 feet the US determines that Emergency Depressurization is required, RO initiates Emergency Depressurization as directed by US.  1. Safety Significance:     Precludes failure of Containment. 2. Cues:     Procedural compliance.     Suppression Pool level trend. 3. Measured by:     Observation - US determines (indicated by announcement or observable transition to EOP-04-2) that Emergency Depressurization is required prior to or at a Suppression Pool level of 14.25 feet.     AND     Observation - RO opens at least 5 SRV's during performance of Emergency Depressurization actions.  4. Feedback:     RPV pressure trend.     Suppression Pool temperature trend.     SRV status indication.

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Time	Position	Applicant's Actions or Behavior
		During an ATWS, when conditions with Emergency Depressurization required, Terminate and Prevent RPV injection from ECCS and Feedwater until reactor pressure is below the MSCP as directed by US.
		Safety Significance:     Prevention of fuel damage due to uncontrolled feeding.     Cues:
		Procedural compliance.  3. Measured by:
		Observation - No ECCS injection prior to being less than the MSCP.  AND Observation - Feedwater terminated and prevented until less than the MSCP.  4. Feedback:
		Reactor power trend, power spikes, reactor short period alarms.  Injection system flow rates into RPV.
		This Critical Task is N/A if all rods are in.

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	T	
Time	Position	Applicant's Actions or Behavior
		With RPV pressure <mscp, (-25")="" -="" -25".="" 1.="" 2.="" 3.="" 4.="" above="" adequate="" and="" are="" as="" by="" by:="" commenced="" compliance.="" control="" controlled="" cooling="" core="" cues:="" directed="" equal="" excursions.="" feedback:="" flow="" greater="" increase="" indication.="" injection="" into="" large="" less="" level="" maintain="" maintained="" maintaining="" measured="" minimized,="" mscp,="" mscrwl="" not="" observation="" of="" or="" possibility="" power="" preclude="" pressure="" procedural="" rate="" restore="" restored="" rpv="" rpv.<="" safety="" significance:="" slowly="" spikes="" such="" system="" th="" than="" that="" to="" trend.="" until="" us.=""></mscp,>
		This Critical Task is N/A if all rods are in.

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	T		
Time	Position	Applicant's Actions or Behavior	
_		The Decision to Emergency Depressurize must be based on Suppression Pool Level. A misinterpretation of EOP-3 Secondary Containment Control and performing Emergency Depressurization based on exceeding Two Max Safes would be inappropriate	
		1. Safety Significance:	
		Emergency Depressurization based on NO Primary System Discharging	
		2. Cues:	
		Procedural misinterpretation	
		3. Measured by:	
		Early Decision to ED	
		Suppression Pool Level greater than 17.8'	
		4. Feedback:	
		Enters EOP-1 RPV Control from Secondary Containment EOP-3	
		Enters EOP-4-2 Emergency Depressurization from Secondary Containment EOP-3 HOLD step.	

Facility: Perry	Scenario No.: 5 - 100%	Op-Test No.: 2009-01	
Examiners:		Operators:	
-			<del></del>
-			

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.

<u>Turnover:</u> 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 ≤ 90%
2		N (BOP)	Shift Stator Water Cooling Pumps A→ B and test pickup feature.
3	cb01_1n21c000 1c	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
		ВОР	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
------	----------	---------------------------------

Driver	Driver	Reset Simulator to IC-146
Driver	Driver	Load Schedule NRC_100_Second_R1.sch & NRC_Info.sch
Driver	Per Driver Install 'Protected Train' barriers for HPCS, MFP & Bus L10	
	SRO	Direct Power Reduction to 90% for Surveillances, IOI-3 Attachment 3 Power Maneuvering
	ATC	Lower Reactor Recirculation flow until power is 90%
		Monitor Reactor Power
		Maintain RFPT deviations near zero
		Maintain Loop Flows balanced
		Maintain Turbine Load Set 120 Mwe above turbine load

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**Event Description: Shift Stator Water Cooling Pumps** 

Time Position Applicant's Actions or Behavi		Applicant's Actions or Behavior
	SRO Direct BOP to shift Stator Water Cooling Pumps from 'A' to 'B' and test p	
	ВОР	Shift Stator Water Cooling Pumps from 'A' to 'B' per SOI-N43 Section 7.3
		7.3.1 - PLACE the oncoming STATOR COOLING PUMP in ON. (B)
		7.3.2 - PLACE the offgoing STATOR COOLING PUMP in OFF. (A)
		7.3.3 - PLACE the standby STATOR COOLING PUMP control switch in STBY. (A)
		7.3.4 - IF desired to check the standby STATOR COOLING PUMP pickup feature, THEN PERFORM the following: (A)
NRC	NRC	Stator Water Cooling Pump is started locally by NLO
Driver	Driver	Insert Remote Function <b>EG07</b> when directed by BOP Operator, and return to Normal when directed
	ВОР	7.3.4.a through 7.3.4.c are in the field.
		7.3.4.d - PLACE the offgoing STATOR COOLING PUMP control switch in OFF.
		7.3.4.e - PLACE the standby STATOR COOLING PUMP control switch in STBY.
Driver	Driver	Acknowledge Local Alarms

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**Event Description: Hotwell Pump 'C' in trip** 

Time	Position	Applicant's Actions or Behavior
1 11116	1 02111011	Applicant 8 Actions of Denavior
Driver	Driver	Upon Lead examiner direction, initiate Trigger 12 Hotwell Pump 'C' trip
	ATC	Report trip of Hotwell Pump 'C' Receives Annunciator H13-P680-2A C-5 May receive annunciators H13-P870-8A A-3 & D-3 based on time to start a HW pump
	ATC	Start Hotwell Pump 'A' verify Hot Surge Tank Level stabilizes
Driver	Driver	If sent to investigate breaker, found overcurrent relays trip targets showing
NRC	NRC	Depending on how long the ATC takes to start the Standby Hotwell Pump, Both RFPT Seal Injection Pumps may trip and then both will restart on Hotwell Pump Start.
	ВОР	Discovers Two Seal Injection Pumps operating
		Place a Seal Injection Pump in Off
		Waits 5 seconds return the Pump to Standby

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

Time	Position	Applicant's Actions or Behavior
Driver	Driver	Upon Lead examiner direction Initiate Trigger 3 and as Field Supervisor, Report LH-2-A Trouble Alarm in Unit 2 Control Room
	ВОР	Inform Unit Supervisor that EH11 (Div 1) and EH13 (Div 3) are being supplied by LH-2-A
Driver	Driver	When LH-2-A trips report LH-2-A Lockout Alarm
	ATC	Report Power, Pressure, & Level are stable
	SRO	Enter ONI-R22-1 Loss of Essential 4.16KV Bus
		<ul> <li>4.1 REFER TO the following instructions concurrently with this instruction:</li> <li>ONI-C11-1, Inability to Move Control Rods</li> <li>ONI-P43, Loss of Nuclear Closed Cooling.</li> </ul>
		4.2 REFER TO IOI-18, Plant Emergency Instruction And Isolation Restoration AND RESTORE the following isolations as appropriate:  • BALANCE OF THE PLANT ISOLATION (L2 /1.68#) RESTORATION
		4.5 An EH Bus is de-energized  The Diesel Generator failed to start Interbus Transformer LH-1-A is available LH-1-A is the preferred option to restore power to the bus quickly. THEN PERFORM the following: 4.5.1.a - VERIFY the ALTN PREFERRED SOURCE BRKR is open. EH1115 4.5.1.b - CLOSE the PREFERRED SOURCE BRKR. EH1114
		Direct BOP Operator to Perform ONI-R22-1 Step 4.5

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

Time	Position	Applicant's Actions or Behavior
	ВОР	Report failure of HPCS ESW Pump to start, loss of indication on Discharge Valve 1P45-F140
Driver	Driver	If NLO is directed to check MCC EF1C12-H for 1P45F140 – found blown mainline fuses If NLO is directed to check valve locally – can not de-clutch valve handwheel
	ВОР	Place Division 3 DG in Pull-to-Lock
NRC	NRC	If Div 3 DG control switch taken through STOP too quickly when going to pull-to-lock, DG will not stop. Will need to shutdown DG locally or take control switch back to STOP.
NRC	NRC	May place Div 1 DG in pull-to-lock. (not required)
	ВОР	Restore EH11 - verify EH1115 is Open and Close EH1114
	SRO	Establish Restoration priorities: CRD Recovery is 1st - have 20 minutes from second accumulator fault. 2nd priority would be to recover one NCC Pump, and 3rd would be IOI-18 restoration
	SRO	Tech Specs: HPCS and RCIC are Inoperable - 3.5.1 Conditions A, B, C, & H→ 3.0.3 until EH11 is reenergized.  Two DGs are Inoperable - 3.8.1 Condition A, B, & D.
		Control Rod Scram Accumulators - 3.1.5 Condition A & B, 20 minutes to restore CRD after second accumulator fault or Mode Switch to Shutdown.
Driver	Driver	If the CREW goes to place the MODE Switch in SHUTDOWN, then initiate Trigger 7 Loss of Feedwater

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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)
		<ul> <li>4.2 - In Mode 1 or 2.</li> <li>At least 2 CRD accumulators inoperable.</li> <li>At least one inoperable accumulator is associated with a withdrawn control rod Reactor pressure ≥ 600 psig</li> <li>CRD PRESSURE CHARGING WATER indicating &lt; 1600 psig.</li> <li>THEN within 20 minutes PLACE the REACTOR MODE SWITCH in SHUTDOWN.</li> </ul>
	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 inservice 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

Time	Position	Applicant's Actions or Behavior
	SRO	Enter ONI-P43, Loss of Nuclear Closed Cooling
		4.1 - IF only ONE NCC pump is running, THEN REFER TO SOI-P43 and START the standby NCC pump. Directs (BOP) to perform.
	ВОР	Perform Startup of Standby NCC Pump 'A' per SOI-P43 Section 4.2 Additional NCC Pump Startup
Driver	Driver	When directed: 4.2.1 - THROTTLE the oncoming NCC Pump Disch valve P43-F513A 10% open using Remote Function SW014
	ВОР	4.2.2 - TAKE the oncoming NCC PUMP control switch on Common Long Response Control Panel H13-P970 to START. P43-C001A
Driver	Driver	When directed: 4.2.3 OPEN the oncoming NCC Pump Disch. P43-F513A using Remote Function SW014
	ВОР	4.2.4 - VERIFY NCC HDR PRESSURE on P970 stabilizes between 94 – 123 psig. P43-R221

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**Event Description: IOI-18, BOP Restoration** 

Time	Position	Applicant's Actions or Behavior
	ВОР	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
		<ul> <li>2.0 MOMENTARILY DEPRESS the following:</li> <li>• MSL &amp; NS4 OTBD ISOL SEAL IN RESET. B21H-S32</li> <li>• MSL &amp; NS4 INBD ISOL SEAL IN RESET. B21H-S33</li> </ul>
		<ul> <li>4.0 IF restoring an outboard isolation (Division 1), THEN PERFORM the following:</li> <li>4.1 VERIFY the following open:</li> <li>• SA SUPPLY HDR CNTMT ISOL. P51-F150</li> <li>• CTS SUPPLY HDR CNTMT ISOL. P11-F060</li> </ul>
		<ul> <li>4.2 AT 1H13-P881, VERIFY the following are open: <ul> <li>PERS AL EL 603 OTBD ALRM ISOL P53-F070</li> <li>PERS AL EL 692 OTBD ALRM ISOL P53-F075</li> <li>PERS AL EL 692 SUPP AIR OTBD ISOL P52-F170</li> <li>PERS AL EL 603 SUPP AIR OTBD ISOL P52-F160</li> <li>DW EQUIP DRAIN OTBD DW ISOL G61-F035</li> <li>DW FLOOR DRAIN OTBD DW ISOL G61-F155</li> <li>CNTMT EQUIP DRAIN OTBD ISOL G61-F170</li> <li>RWCU BACKWASH OUT OTBD ISOL G50-F277</li> <li>MIXED BED WTR CNTMT SUPPLY ISOL P22-F010</li> <li>DW CO2 SUPPLY OTBD ISOL P54-F395</li> </ul> </li> </ul>
		<ul> <li>4.3 VERIFY the valves closed:</li> <li>• PERS AL EL 603 INNER DR AEGTS ISOL P53-F035</li> <li>• PERS AL EL 692 INNER DR AEGTS ISOL P53-F045</li> </ul>
		<ul> <li>4.4 IF the Containment Airborne Radiation Monitor was in service, THEN VERIFY the following valves open:         <ul> <li>CNTMT RAD MON OTBD SUCT ISOL D17-F081A</li> <li>CNTMT RAD MON OTBD DISCH ISOL D17-F089A</li> </ul> </li> </ul>
		<ul> <li>4.5 IF the Drywell Airborne Radiation Monitor was in service, THEN VERIFY the following valves open:</li> <li>• DW RAD MON OTBD SUCT ISOL D17-F071A</li> <li>• DW RAD MON OTBD DISCH ISOL D17-F079A</li> </ul>

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**Event Description: IOI-18, BOP Restoration** 

Time	Position	Applicant's Actions or Behavior
	ВОР	<ul> <li>5.0 IF Containment Vessel Chilled Water was in service, PERFORM the following:</li> <li>5.1 AT H13-P800, VERIFY the following valves open: <ul> <li>CVCW OTBD SUPP ISOL VALVE P50-F060</li> <li>CVCW OTBD RETURN MOV ISOL VALVE P50-F150</li> <li>CVCW INBD RETURN MOV ISOL VALVE P50-F140</li> </ul> </li> <li>5.2 REFER to SOI-P50 and SHIFT chillers.</li> </ul>
		Direct an NLO to start a P50 chiller per SOI-P50 and SHIFT chillers.
Driver	Driver	When RO requests, start a P50 chiller using Remote Functions SWO95 –97 for CW pump start, SWO98 – 100 for start permissive, & SWO101-103 for chiller start
	ВОР	<ul> <li>6.0 TAKE the following to close at 1H13-P800:</li> <li>DW VAL RLF MOV ISOL VALVE M16-F010A</li> <li>DW VAL RLF MOV ISOL VALVE M16-F010B</li> </ul>
		<ul> <li>7.0 VERIFY the following are open at 1H13-P800:</li> <li>• CNTMT VAC RLF MOV ISOL VALVE M17-F015</li> <li>• CNTMT VAC RLF MOV ISOL VALVE M17-F025</li> <li>• CNTMT VAC RLF MOV ISOL VALVE M17-F035</li> <li>• CNTMT VAC RLF MOV ISOL VALVE M17-F045</li> </ul>

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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
		<ul> <li>Verify the following actions completed:</li> <li>Mode Switch Locked in Shutdown.</li> <li>RPS Initiated if all control rods are not fully inserted.</li> <li>ARI Initiated if RPS failed to Scram the reactor.</li> </ul>
		If Reactor Recirc Pumps are running in fast speed: Then simultaneously take the following to XFER:  RECIRC PUMP A BRKR 5A  RECIRC PUMP A BRKR 5A
		Perform crew update with the following information:  "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,  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, SRMs & IRMs
		VERIFY HST LVL CV MANUAL CONTROL, N21-S19, IN OFF.

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**Event Description: Loss of Feed and Reactor Scram** 

Time	Position	Applicant's Actions or Behavior
		STABLIZE reactor water level.  • Feedwater (REFER TO REACTOR SCRAM FEEDWATER HARDCARD)  • RCIC (not available)  • HPCS
		STABLIZE reactor pressure:  a) Turbine / Turbine Bypass valves (REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD)  b) SRVs  • Evacuate Containment  • REFER TO REACTOR SCRAM PRESSURE CONTROL HARDCARD  • Evaluate placing RCIC in pressure Control Mode

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**Event Description: EOP-1 RPV Control** 

Time	Position	Applicant's Actions or Behavior
	SRO	Enter EOP-1 RPV Control at Level 2
		Direct ATC to stabilize Reactor Pressure and Level
		Level Leg - Assigns BOP Isolations and Actuations for Level 2 & Level 3
	ВОР	Perform Isolations and Actuations for Level 3 & Level 2 as time permits
	ATC	Report no High Pressure injection systems, Motor Feed Pump, RCIC and HPCS are not available
	SRO	Answer NO to, "Can Reactor Level be restored and maintained above 130"?"
		Direct EOP-SPI 4.1 CRD ALTERNATE INJECTION and EOP-SPI 4.5 SLC DEMIN WATER ALTERNATE INJECTION
	ATC/BOP	Perform EOP-SPI 4.1 and 4.5
	SRO	Wait in Hold Step to answer "Can Reactor Level can be restored and maintained above 16.5?"
		<b>Pressure Leg</b> - Direct a Reactor Pressure band of 800 to 1000 psig on Main Turbine Bypass Valves
	ATC	Control Reactor Pressure in designated band.
		If Pressure begins to lower uses Pressure Control Hard Card to maintain Reactor Pressure

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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 only 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
		<ul> <li>CLOSE at least one of the following: (Notify the Unit Supervisor)</li> <li>INBD MSIVs, 1B21-F022A-D</li> <li>OTBD MSIVs, 1B21-F028A-D</li> </ul>
		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:  • 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
	ВОР	Start H2 Igniters by placing switches in ON
	ВОР	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
	ВОР	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** 

Time	Position	Applicant's Actions or Pohovior
Time	Position	Applicant's Actions or Behavior
	SRO	Enter EOP-4-2 Emergency Depressurization when RPV Level is less then Zero inches and above minus 25 inches. (Critical Task 2)
		Answers YES to "Is Reactor Shutdown?"
		Direct Operator to Open 8 ADS Valves
	ATC/BOP	Open 8 ADS Valves (Critical Task 2)
	ATC/BOP	Control Injection rate once injection systems start to inject, RFBPs at about 270 psig and RHRs about 230 psig and LPCS about 450 psig (Critical Task 3)

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**Event Description: EOP-2 Containment Control** 

Time	Position	Applicant's Actions or Behavior
	Crew	After Emergency Depressurization three Containment Control Entry conditions should be reported. Suppression Pool Temperature, Suppression Pool Level and Drywell Temperature
	SRO	Enter EOP-2 Containment Control
		For Drywell Temperature above 145°F, Direct all available Drywell Cooling Fans started and EOP-SPI 2.1
	BOP	Start all available Drywell Cooling Fans
		Perform EOP-SPI 2.1
		Places NCC LOCA Bypass switch in Bypass P43-BS2, Opens P43-F215 and P43-F400
		Places NCC LOCA Bypass switch in Bypass P43-BS1, Opens P43-F355, F410, F140 and F055
	SRO	For High Suppression Pool Temperature, transitions RHR B from Level Control to Pool Cooling when confident in LPCS, RHR C, and RFBPs ability to maintain RPV level
	BOP	If Directed places RHR B in Suppression Pool Cooling
		Close 1E12-F042B LPCI Injection Valve
		Close 1E12-F048B RHR HX Bypass Valve
		Throttle Closed 1E12-F003B RHR HX Outlet Valve
		Open 1E12-F024B RHR Test Valve to SUPR Pool.

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**Event Description: Scenario Termination Criteria** 

T:	Do sitt	Amplicantly Actions on Debagger
Time	Position	Applicant's Actions or Behavior
		The reactor has been emergency depressurized after zero inches and before minus 25 inches.
		2. Reactor Level is being maintained greater than 100"
		3. All Control Rods are Inserted

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Position	Applicant's Actions or Behavior
	To prevent an uncontrolled RPV depressurization and subsequent loss of Reactor Vessel inventory, inhibit ADS.
	Safety Significance:     Precludes core damage due to loss of inventory.
	2. Cues: Procedural compliance.
	3. Measured by: ADS logic inhibited prior to an automatic initiation
	4. Feedback: RPV pressure trend. RPV level trend. ADS "ADS OUT OF SERVICE" annunciator status.
	Position

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	T	
Time	Position	Applicant's Actions or Behavior
		With an injection system(s) operating and the reactor shutdown and at pressure, after RPV water level drops to 0 inches, initiate Emergency Depressurization before RPV level lowers to -25 inches.
		Safety Significance:     Maintain adequate core cooling, prevent degradation of fission product barrier.
		2. Cues: Procedural compliance. Water level trend.
		3. Measured by: Observation - At least 5 SRV's must be opened before RPV level lowers to - 25 inches.
		4. Feedback: RPV pressure trend. SRV status indications.

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Time	Position	Applicant's Actions or Behavior
		With RPV pressure below the Shutoff Head of the available Low Pressure system(s), operate available Low Pressure system(s) to restore RPV water level above T.A.F. (0 inches) and maintain below 255" (main steam lines).
		Safety Significance:     Maintaining adequate core cooling.
		Cues:     Procedural compliance.     Pressure below low pressure ECCS system(s) shutoff head.
		3. Measured by: Operator manually starts <u>or</u> initiates at least one low pressure ECCS system and injects into the RPV to restore water level above 0 inches.
		4. Feedback: Reactor water level trend. Reactor pressure trend.

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	T	
Time	Position	Applicant's Actions or Behavior
		Within 20 minutes of 2 <sup>nd</sup> accumulator fault following CRD pump trip, perform CRD PUMP TRIP RECOVERY - to start either CRD A or B Pump <u>or</u> crew places REACTOR MODE SWITCH in SHUTDOWN.
		Safety Significance:     Prevent violation of facility license condition (T.S. 3.1.5).
		2. Cues: Procedural compliance. HCU accumulator alarms.
		3. Measured by: Within 20 minutes of 2nd accumulator fault following CRD pump trip, the crew will start either CRD A or B Pump OR
		With all of the following present, 2 accumulators INOP, RPV pressure > 600 psig, CRD charging pressure < 1520 psig, and 20 minutes elapsed, crew immediately places the REACTOR MODE SWITCH in SHUTDOWN.
		4. Feedback: Reactor Power trend. Control Rod indication