

Scenario Outline

ES-D-1

Simulation Facility Oyster Creek	Scenario No.	SRO #1	Op Test No.
Examiners _____	Operators _____		CRS
_____	_____		PRO
_____	_____		URO
Scenario Summary	<p>The scenario begins with the reactor at 80% power with the 'A' Isolation Condenser and the 'A' CRD Pump out of service. The crew will begin by swapping the RBCCW Pumps. APRM 4 will then fail upscale requiring the crew to evaluate Tech Specs, bypass the APRM, and reset the half scram. The 'A' Feedwater Pump trips requiring the crew to reduce power to maintain reactor level. A loss of power to Bus 1B will result in the crew manually scrambling due to a loss of all feedwater. The diesel generator will auto start and restore power to Bus 1D, but the 1B CRD pump will fail to restart due to a logic malfunction. The 1B CRD pump can be manually restarted. The 'B' Isolation Condenser fails to initiate requiring EMRVs to be used to control Reactor pressure. The 'A' EMRV fails to reclose following manual actuation. This causes a loss of RPV level, which will result in the need to Emergency Depressurize.</p>		
Initial Condition	80% power		
Turnover:	See Attached "Shift Turnover" Sheet		

Event No.	Malfunction No.	Event Type*	Event Description
1		N SRO BOP	Swap Reactor Water Closed Cooling Water (RBCCW) Pumps
2	MAL NIS 20D	I SRO RO	APRM 4 Fails Upscale (Tech Spec)
3	MAL CFW 6A	C SRO RO BOP	'A' Feedwater Pump Trips
4		R SRO RO BOP	Power Reduction to Control Level
5	MAL EDS 1B	M SRO RO BOP	Loss of Power to 4160V Bus 1B – Results in Plant Scram
6	CLF BKR CRD1	I SRO RO BOP	'B' CRD Pump Fails to Auto Restart due to a Logic Malfunction on Power Restoration
7	CLF ICS10, opt 6 V-14-35	C SRO RO BOP	'B' Isolation Condenser fails to initiate due to a Valve Failure [Initiation signal on low level]
8	MAL NSS 24A	C SRO RO BOP	'A' EMRV Fails to Reclose After Manual Actuation

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit At 80% Power

INOPERABLE EQUIPMENT/LCOs:

- 'A' Isolation Condenser (IC) has been out of service for two days
- 'A' CRD Pump tripped four hours ago

SCHEDULED EVOLUTIONS:

- Place 1-1 RBCCW pump in service and secure 1-2 RBCCW pump due to excessive leakage around pump shaft. Perform when turnover complete.

SURVEILLANCES DUE THIS SHIFT:

- None

ACTIVE CLEARANCES:

- 'A' IC
- 'A' CRD pump

GENERAL INFORMATION:

- Place 1-1 RBCCW pump in service and secure the 1-2 RBCCW pump IAW Operating Procedure 309.2, Reactor Building Closed Cooling Water System, Section 15.0

Operator Actions

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Event Description: Swap Reactor Water Closed Cooling Water (RBCCW) Pumps

Cause: Excessive leakage around pump shaft

Automatic Actions: None

Effects: None

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Direct that RBCCW pumps be swapped IAW Operating Procedure 309.2, Reactor Building Closed Cooling Water System, Section 15.0
	BOP	IAW 309.2, step 15.3.1; <ul style="list-style-type: none">• Direct an Equipment Operator to vent the pump casing for 1-1 RBCCW pump using V-5-511.• Start 1-1 RBCCW pump on 13R, verify the pump ON light is energized and pump achieves proper discharge pressure.• Stop 1-2 RBCCW pump.• Direct an Equipment Operator to verify proper operation of 1-2 RBCCW pump

Operator Actions

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Op Test No.: Scenario No.: SRO #1 Event No.: 2 Page 2 of 8

Event Description: APRM 4 Fails Upscale (Tech Spec)

Cause: Instrument failure causes upscale response

Automatic Actions: RPS System 1 half scram

Effects: Operator action required to bypass APRM and reset the half scram

Time Position Applicant's Actions Or Behavior

- RO
- Recognize condition by reporting alarms;
 - G-1-c: SCRAM CONTACTOR OPEN
 - G-1-f: APRM HI-HI/INOP
 - G-3-f: APRM HI
 - G-1-d: CHANNEL I

IAW Response to Alarm Procedures (RAPs); confirm automatic action and indications including RPS system 1 scram lights out on 4F and APRM 4 indications on 4F.

Based on alarms and indications, reports RPS system 1 half scram due to APRM 4 failing upscale.

- SRO
- Refers to Standing Order 21, Allowable Bypass Configuration for APRM/LPRM System
 - Requests Work Management assistance and/or may direct the I&C technician to investigate the problem
 - Evaluate TS 3.1, Protective Instrumentation, to ensure that it permits the APRM to be bypassed
 - Directs APRM 4 to be bypassed and the half scram to be reset

- CT RO
- Bypasses APRM 4 by placing the joystick in bypass.
 - Resets half scram

Operator Actions

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Op Test No.: Scenario No.: SRO #1 Event No.: 3 Page 3 of 8

Event Description: 'A' Feedwater Pump Trips

Cause: Motor malfunction causes overload trip

Automatic Actions: Pump trip alarms

Effects: Reactor water level decrease. Requires operator action to reduce reactor power

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	BOP	Recognize condition by reporting alarms; <ul style="list-style-type: none">• J-1-d: FEED PUMP TRIP A• J-2-d: FEED PUMP OL A IAW RAPs; confirm automatic actions and indications including Feed pump amps, discharge pressure, flow, etc.
	SRO RO	Coordinate on power reduction, for details see Event 4
	BOP	Direct Equipment Operator to investigate feed pump and its breaker

Operator Actions

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Op Test No.: Scenario No.: SRO #1

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Event Description: Power Reduction to Control Level

Cause: Response to Feedwater pump trip

Automatic Actions: none

Effects: Reactor power, steam flow and feed flow decrease. Operator action reduces required feedwater flow

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Direct reduction of Reactor power, using recirculation flow, to within the capacity of the remaining feed pumps (approximately 70% power) IAW 3200-ABN-2000.17, Feedwater System Flow Control Failure
	RO	IAW ABN 17 <ul style="list-style-type: none">• Reduce recirculation flow by dialing down on the Master Recirc Controller as required to control Reactor level.• Monitor Reactor parameters
	BOP	Monitor Feedwater pumps and flow

Operator Actions

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Op Test No.: **Scenario No. SRO #1** **Event No.: 5** **Page 5 of 8**

Event Description: Loss of Power to 4160V Bus 1B – Results in Plant Scram

Cause: Bus fault causes loss of power to 4160V loads

Automatic Actions: Loss of all operating feedwater pumps

Effects: Lowering reactor level leads to reactor scram

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	BOP	Recognize condition by reporting alarms <ul style="list-style-type: none"> • T-1-c: MN BRKR 1B TRIP IAW RAPs, confirm automatic actions and indications including 1B breaker status, bus voltage and equipment without power
	SRO	<ul style="list-style-type: none"> • Recognize loss of feedwater to reactor • Direct manual scram of reactor in accordance with ABN 01, Reactor Scram • Implement Emergency Operating Procedures (EOPs)
	RO BOP	IAW ABN 01 <ul style="list-style-type: none"> • Depress both manual scram pushbuttons on panel 4F • Place the Reactor mode switch to SHUTDOWN
	BOP RO	Perform the following actions when directed <ul style="list-style-type: none"> • Verify that the reactor is shutdown by: <ul style="list-style-type: none"> • Verify that all control rods are fully inserted • Insert SRM and IRM detectors • Verify that reactor power is dropping • Confirm that the Main Turbine is tripped
	SRO BOP RO	Recognize entry into EOP 3200.01A, RPV Control – No ATWS due to reactor level below 138 inches.
	SRO	Direct actions IAW the EOP
	BOP RO	Perform EOP actions as directed by the SRO.

Operator Actions

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Op Test No.: **Scenario No.:** SRO #1 **Event No.:** 6 **Page 6 of 8**

Event Description: 'B' CRD Pump Fails to Auto Restart due to a Logic Malfunction on Power Restoration

Cause: Breaker malfunction prevents auto restart of CRD pump

Automatic Actions: none

Effects: Requires operator action to restart CRD pump

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	BOP	Recognizes EDG 2 closure on to Bus 1D
CT	RO	<ul style="list-style-type: none">• Recognize failure of 'B' CRD pump to automatically restart when EDG 2 supplies power to Bus 1D• Manually restart 'B' CRD pump
	SRO	Directs follow-up actions on re-powering of Bus 1D and Unit Substations (USS)

Operator Actions

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Op Test No.:

Scenario No.: SRO #1

Event No.: 7

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Event Description: 'B' Isolation Condenser (IC) fails to initiate due to a Valve Failure

Cause: Valve malfunction prevents auto initiation of IC

Automatic Actions: none

Effects: Requires operator action to control reactor pressure

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	BOP	Recognizes failure of 'B' IC to initiate Report the failure to the SRO
	SRO	Directs pressure control using the EMRVs IAW the EOPs
	RO	Monitor and report Reactor plant parameters

Operator Actions

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Op Test No.: Scenario No.: SRO #1 Event No.: 8 Page 8 of 8

Event Description: 'A' EMRV Fails to Reclose After Manual Actuation

Cause: Electronics malfunction causes failure of EMRV to reclose

Automatic Actions: none

Effects: Requires operator action to mitigate inventory loss

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Directs pressure control using EMRVs
	BOP	Manually opens EMRVs to control pressure Recognizes 'A' EMRV fails to reset when placed back into AUTO
	RO	Monitors and report Reactor plant parameters including the loss of Reactor level
	SRO	Direct ADS Timer Switches to be placed in Bypass when level cannot be maintained above 61 inches
	BOP	Place the ADS Timer Switches in Bypass when directed
	SRO BOP	Confirm the start of at least 2 core spray subsystems
	SRO	<ul style="list-style-type: none"> Directs Emergency Depressurization IAW EOP 3200.04A, Emergency Depressurization – No ATWS, when reactor level reaches 0 inches Direct the Reactor Overfill Protection System (ROPS) to be bypassed Direct that level be controlled with Core Spray when it begins injecting during depressurization.
	RO	Bypass ROPS when directed
CT	BOP	Open all EMRVs when directed
CT	BOP	Control level with Core Spray after injection begins during depressurization

TERMINATION CRITERIA: Once ED is performed and reactor is depressurizing, or at the discretion of the lead evaluator, the scenario may be terminated

POST SCENARIO EMERGENCY CLASSIFICATION: ALERT: when Rx level is less than 61" TAF for greater than 5 minutes or SITE AREA EMERGENCY: when Rx level is less than 0" TAF for greater than 5 minutes

Scenario Outline

ES-D-1

Simulation Facility Oyster Creek **Scenario No.** _____ **SRO #2** _____ **Op Test No.** _____

Examiners _____ **Operators** _____ CRS
 _____ _____ PRO
 _____ _____ URO

Scenario Summary The scenario begins with the reactor at 90% power with 4 recirc pumps operating. One recirc pump has been secured due to emergent maintenance. The crew will begin by raising MVAR loading on the main generator. The crew will remove a recirc pump from service due to MG set malfunctions requiring the crew to reduce power to comply with pump and system limitations. A loss of power to a vital bus will occur requiring the crew to restore vital loads. This will require a Tech Spec evaluation. A steam leak in the drywell will result in the crew manually scrambling due to an increase in drywell pressure. Auto and manual scram functions will be disabled, but Alternate Rod Insertion will insert the rods. Drywell pressure will increase requiring Drywell Sprays using the Containment Spray system. The drywell spray valve fails to automatically realign and must be operated manually to permit sprays to function.

Initial Condition 90% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*	Event Description
1		N SRO BOP	Raise MVAR Loading on the Main Generator
2		C SRO RO BOP	Recirc MG Set Malfunctions requiring Recirc Pump Shutdown
3		R SRO RO BOP	Reduce Power during Recirc Pump Shutdown
4	MAL EDS3E	C SRO RO BOP	Loss of Power to the Vital Bus (Tech Spec)
5	MAL NSS 17A, .03/180s, .1/900s MAL NSS 4C, 1/180s	M SRO RO BOP	Steam Leak in the Drywell
6	MAL RPS 5 & 6	I SRO RO	Failure of the Auto and Manual Scram Logic
7	CLF VLV CNS8, opt 6	C SRO BOP	Containment Spray Valve fails to realign automatically when sprays are required

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit At 90% Power with 4 Recirculating pumps operating

INOPERABLE EQUIPMENT/LCOs:

- 'D' Recirc Pump is out of service for a MG Set brush replacement.

SCHEDULED EVOLUTIONS:

- Raise Main Generator MVAR loading by 20 MVAR

SURVEILLANCES DUE THIS SHIFT:

- None

ACTIVE CLEARANCES:

- 'D' Recirc Pump MG Set

GENERAL INFORMATION:

- The Power System Director (PSD) has requested that Oyster Creek pick up an additional 20 MVAR. The PSD has been informed that this will be completed after shift turnover.

Operator Actions

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Op Test No.: Scenario No.: SRO #2 Event No.: 1 Page 1 of 7

Event Description: Raise MVAR Loading on the Main Generator

Cause: Request by Grid operator, part of turnover

Automatic Actions: none

Effects: minor change to secondary plant indications

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Direct reactive loading be raised by 20 MVAR on the Main Generator IAW procedure 336.1, 24KV Main Generator electrical system.
	BOP	IAW 336.1, section 3.3; <ul style="list-style-type: none">• Increase reactive load by 20 MVARs using the Amplidyne Adjust rheostat.• Adjust Exciter Field Rheostat Control (70M) as needed to maintain a slight BUCK setting

Operator Actions

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Op Test No.: Scenario No.: SRO #2 Event No.: 2 Page 2 of 7

Event Description: Recirc MG Set Malfunctions requiring Recirc Pump Shutdown

Cause: System engineer requests an immediate shutdown of the 'A' Recirc Pump based on his observation of excessive arcing and sparking at the MG Set.

Automatic Actions: none

Effects: Pump dP & flow and MG motor amps decrease when the Operator secures the Recirc pump.

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	<ul style="list-style-type: none">• Direct shutdown of Recirc pump by tripping the Recirc MG set breaker• Execute 3200-ABN-200.02, Recirculation Pump Trip.
	RO	Place Recirc MG set breaker to OPEN IAW ABN 02; <ul style="list-style-type: none">• confirm discharge bypass valve OPEN and CLOSE discharge valve
	BOP	<ul style="list-style-type: none">• Monitor Reactor plant parameters.• Verify proper feedwater system response to the power transient.
	SRO RO	Coordinate power reduction to maintain appropriate Hz on running pumps. See Event 3 for details.

Operator Actions

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Op Test No.:

Scenario No.: SRO #2

Event No.: 3

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Event Description: Reduce Power following Recirc Pump Shutdown

Cause: Response to Recirc pump trip

Automatic Actions: none

Effects: Reactor power, steam flow and feed flow decrease. Operator action required to maintain the Recirc pumps within Hz limits

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Direct reduction of Reactor power to restore proper Recirc Hz by reducing Recirc flow IAW procedure 301.2, Reactor Recirculation system
	RO	IAW 301.2; <ul style="list-style-type: none">• Reduce power with Recirc flow to maintain Recirc pump speed at 30 Hz or less• Make notifications for unplanned power reduction
	BOP	<ul style="list-style-type: none">• Assist RO with procedure and manipulations• Monitor Reactor plant parameters during the power change.• Adjust reactor pressure as required with the EPR IAW 202.1, Power Operations

Operator Actions

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Op Test No.: Scenario No.: SRO #2 Event No.: 4 Page 4 of 7

Event Description: Loss of Power to the Vital Bus (Tech Spec)

Cause: Breaker malfunction causes loss of power to vital bus

Automatic Actions: Loss of power to vital loads

Effects: Loss of equipment powered by the vital bus. Operator action is required to restore loads and re-power RPS.

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	BOP	Recognize condition by reporting alarms; <ul style="list-style-type: none">• U-3-c: 1B2 MN BRKR TRIP• T-7-d: FDR TO 460V 1B2 TRIP IAW RAPs; confirm automatic actions and indications including 1B2 breaker status, bus voltage and lost equipment Confirm 1-1 RBCCW pump is running
	RO	<ul style="list-style-type: none">• Confirm that the 'A' CRD pump is running
	SRO	<ul style="list-style-type: none">• Direct the implementation of 3200-ABN-2000.48, Loss of Unit Substation 1B2• Notify Work Management• Review TS 3.7, Auxiliary Electrical Power<ul style="list-style-type: none">• The reactor must be placed in cold shutdown within 30 hours IAW TS 3.7.B and 3.0.A
	BOP	IAW ABN 48; <ul style="list-style-type: none">• Confirm Reactor Building HVAC is shutdown• Confirm SGTS is running
	RO	<ul style="list-style-type: none">• Monitor Reactor plant parameters• Review ABN 48 attachments for 1B2 loads that may require compensatory measures

Operator Actions

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Op Test No.: Scenario No. SRO #2 Event No.: 5 Page 5 of 7

Event Description: Steam Leak in the Drywell

Cause: Reactor coolant pipe leak

Automatic Actions: none

Effects: Containment pressure and temperature increase due to the steam leak. Operator action is required to mitigate the steam leak.

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	RO BOP	Recognize condition by reporting; <ul style="list-style-type: none">• Unidentified leak-rate change• Containment pressure and temperature change• C-3-f; DW PRESS HI/LO
	SRO	<ul style="list-style-type: none">• Reference RAP C-3-f, DW PRESS HI/LO• Direct venting of Containment IAW procedure 312.11, Section 4.3, Nitrogen System and Containment Atmosphere Control.• Direct monitoring of Containment and investigate potential in-leakage paths using 2000-OPS-3024.09, Drywell Cooling System Diagnostic procedure
	BOP	Vent Containment IAW procedure 312.11 <ul style="list-style-type: none">• Vent the drywell via the Torus by opening Torus vent valves V-28-47 and V-28-18 on panel 11F. OR• Vent the drywell via the drywell by opening drywell vent valves V-23-21 and V-23-22 on panel 12XR.
	RO BOP	Identify the cause of the high drywell pressure condition as directed.

Operator Actions

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Op Test No.: Scenario No.: SRO #2 Event No.: 6 Page 6 of 7

Event Description: Failure of the Auto and Manual Scram Logic

Cause: Electronics malfunction prevents auto and manual scrams

Automatic Actions: Failure to scram

Effects: Operator action is required to initiate Alternate Rod Insertion

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Prior to reaching 3 psig DW pressure, direct a manual scram of the reactor IAW ABN 01, Reactor Scram.
	RO	IAW ABN 01 <ul style="list-style-type: none">• Depress both manual scram pushbuttons on 4F• Place Reactor mode switch to SHUTDOWN• Report the failure to scram condition
	SRO	<ul style="list-style-type: none">• Enter and execute EOP 3200.01B RPV Control – With ATWS• Direct the initiation of Alternate Rod Injection (ARI)• Direct implementation of 3200-ABN-2000.01, Reactor Scram• Direct control of Reactor pressure and level
CT	BOP RO	<ul style="list-style-type: none">• Initiate ARI when directed• Control Reactor level as directed• Control Reactor pressure as directed• Perform remaining scram actions when directed
	SRO BOP RO	Recognize and report that the Control Rods are inserting (due to ARI).

Operator Actions

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Op Test No.: Scenario No.: SRO #2 Event No.: 7 Page 7 of 7

Event Description: Containment Spray Valve fails to realign automatically when sprays are required

Cause: Breaker malfunction prevents valve movement

Automatic Actions: none

Effects: System configuration does not automatically realign. Operator action required to manually open valve

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
CT	SRO	Enter and execute EOP 3200.02, Primary Containment Control when Drywell Pressure exceeds 3 psig. <ul style="list-style-type: none">• Direct lineup of Containment Spray in the Drywell Spray Mode per Support Procedure 29, Initiation of the Containment Spray System for Drywell Sprays
CT	BOP	IAW SP-29; <ul style="list-style-type: none">• Lineup Containment Spray in the Drywell Spray mode• Report failure of V-21-11, DW Spray Discharge Valve, to open• Direct Equipment operator to manually open V-21-11• Spray Drywell when V-21-11 is open and conditions for spraying Drywell are met
	RO	Control Reactor Level and Pressure as Directed

TERMINATION CRITERIA: Once Drywell spray has been initiated and Drywell pressure is being controlled between 4 – 12 psig, or at the discretion of the lead evaluator, the scenario may be terminated

POST SCENARIO EMERGENCY CLASSIFICATION: ALERT: a scram signal received and power remains greater than 2%

Scenario Outline

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Simulation Facility Oyster Creek Scenario No. SRO #3 Op Test No.

Examiners _____ Operators _____ CRS
 _____ PRO
 _____ URO

Scenario Summary The scenario begins with the reactor at 100% power with the 'A' Isolation Condenser out of service. Following turnover, the crew will swap Main Air Ejectors. A SLC Tank Hi/Lo Temperature alarm will be received. Investigation will show that actual SLC tank temperatures are low due to a failed heater control circuit and a Tech Spec evaluation will be required. A small Main Condenser vacuum leak requires a power reduction and investigation of the vacuum leak. A RWCU leak will occur in the Reactor Building requiring entry into the Primary Containment Control EOP. A RWCU valve will fail preventing the isolation of the leak. Reactor Building Ventilation will fail to automatically isolate requiring manual action to stop the radioactive release. Emergency Depressurization will be required to mitigate the primary leak into the Reactor Building.

Initial Condition 100% power
Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*	Event Description
1		N SRO RO BOP	Swap Main Steam Air Ejectors
2	OVR SLC ANN SLC3 CLF PSW SLC5 to trip	I SRO RO BOP	SLC Tank Low Temperature due to Failed Heater Control Circuit (Tech Spec)
3	MAL CFW17A .1 or .4/60s	C SRO RO BOP	Main Condenser Vacuum Leak
4		R SRO RO BOP	Lower Power to Control Vacuum
5	MAL RCU13 3% 600s	M SRO RO BOP	Reactor Water Clean-Up Leak into the Reactor Building [HELB]
6	V-16-1&14	C SRO RO BOP	Reactor Water Clean-Up Isolation Valve Failure
7	MAL RMS 6M, 6N	I SRO RO BOP	Reactor Building Ventilation Fails to Automatically Isolate

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit at 100% Power

INOPERABLE EQUIPMENT/LCOs:

- 'A' Isolation Condenser (IC)

SCHEDULED EVOLUTIONS:

- Swap Main Steam Air Ejectors for Maintenance

SURVEILLANCES DUE THIS SHIFT:

- None

ACTIVE CLEARANCES:

- 'A' IC

GENERAL INFORMATION:

- After Shift Turnover, swap SJAE elements IAW Operating Procedure 325, Air Extraction and Off Gas System. Directed by station management to place 1A2 SJAE element in service and remove 1A1 SJAE element from service

Operator Actions

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Event Description: Swap Main Steam Air Ejectors

Cause: none

Automatic Actions: none

Effects: No effect. Operator action required to change air ejector elements

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Direct that SJAE elements be swapped IAW Operating Procedure 325, Air Extraction and Off Gas System, Step 7.3.10
	BOP	IAW 325, step 7.3.10; <ul style="list-style-type: none">• Open the steam and air valves for element 1A2• Close the steam and air valves for element 1A1 Monitor Main Condenser Vacuum
	RO	Monitor Reactor plant parameters

Operator Actions

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Op Test No.: Scenario No.: SRO #3 Event No.: 2 Page 2 of 7

Event Description: SLC Tank Low Temperature due to Failed Heater Control Circuit (Tech Spec)

Cause: Heater Control Circuit malfunction

Automatic Actions: none

Effects: none

Time Position Applicant's Actions Or Behavior

- RO
- Recognize condition by reporting alarms; G-8-b: TANK TEMP HI/LO
 - IAW RAPs; confirm local indications including tank temperature, tank level, heater status and heater breaker status; contact equipment operator to verify locally.

- NOTE
- When requested, the crew will be told that:
- The SLC Weight Percent is 18%
 - SLC Tank Temperature is 75°F
 - SLC Level of 2000 gallons
 - Red ground lights are lit

- SRO
- Evaluate compliance with TS 3.2, Reactivity Control
- With a Weight Percent of 18%, the temperature needs to be maintained above ~83°F IAW TS Figure 3.2.2
 - IAW TS 3.2.C.3.d, temperature must be restored to the required band or be in the shutdown condition within 24 hours
 - (May state that Boron Concentration is within the acceptable band, but this is not required)

Requests Work Management assistance, may direct I&C technician to investigate problem

- BOP
- Coordinate troubleshooting to restore the SLC Tank Heater.

Operator Actions

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Op Test No.: **Scenario No.:** SRO #3 **Event No.:** 3 **Page** 3 of 7

Event Description: Main Condenser Vacuum Leak

Cause: Excessive condenser in-leakage

Automatic Actions: none

Effects: Condenser vacuum decrease. Operator action is required to mitigate the vacuum loss.

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	BOP	Recognize condition by observing indications or reporting alarms <ul style="list-style-type: none">• Condenser vacuum decrease• MWe decrease• Q-3-c: COND VAC LO 25 INCHES IAW SDRP or RAPs; confirm automatic action and indications including condenser vacuum at panels 5F/6F.
	SRO	Direct mitigation of condenser vacuum loss IAW 2000-ABN-3200.14, Loss of Condenser Vacuum. <ul style="list-style-type: none">• Direct a power reduction as necessary to maintain vacuum greater than 22 inches• Direct Diagnosis of the cause of the vacuum loss in accordance with ABN 14
	SRO RO	Coordinate for power reduction, for details see Event 4
	BOP	Investigate the cause of the vacuum loss as directed by the SRO <ul style="list-style-type: none">• Circulating Water Pumps• SJAEs• Gland Seal System• Gland Seal Exhauster• SJAE Drain Pump
	NOTE	Lowering reactor power will stabilize vacuum.

Operator Actions

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Op Test No.: Scenario No.: SRO #3 Event No.: 4 Page 4 of 7

Event Description: Lower Power to Control Vacuum

Cause: Response to vacuum loss

Automatic Actions: none

Effects: Reactor power, steam flow and feed flow decrease. Operator action required to lower reactor power

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	SRO	Direct reduction of Reactor power, using recirculation flow, as necessary to control condenser vacuum IAW 3200-ABN-2000.14, Loss of Condenser Vacuum
	RO	IAW ABN 14 <ul style="list-style-type: none">• Reduce reactor power with recirculation flow as required• Monitor Reactor parameters
	SRO BOP RO	Monitor condenser vacuum, report when vacuum stops lowering
	RO	Discontinue the power reduction when vacuum stops dropping
	NOTE	Lowering reactor power will stabilize vacuum.

Operator Actions

ES-D-2

Op Test No.:

Scenario No. SRO #3

Event No.: 5

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Event Description: Reactor Water Clean-Up (RWCU) Leak into the Reactor Building

Cause: RWCU pipe leak

Automatic Actions: RWCU auto isolation

Effects: Operator action required

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
RO BOP		Recognize condition by observing indications or reporting alarms <ul style="list-style-type: none">• Increase in unidentified leak rate• Increase in containment parameters• D-1-d/ D-2-d: RWCU HELB IAW RAPS; confirm automatic actions and indications including RWCU system status, area temperatures, area radiation levels
	SRO	Enter and execute EOP 3200.11, Secondary Containment Control <ul style="list-style-type: none">• Direct the RWCU system isolation be verified
RO BOP		<ul style="list-style-type: none">• Recognize that RWCU is not fully isolated.• Attempt to isolate the RWCU system and report the failure of the isolation valves. See Event 6 for details.

Operator Actions

ES-D-2

Op Test No.: Scenario No.: SRO #3 Event No.: 6 Page 6 of 7

Event Description: Reactor Water Clean-Up Isolation Valve Failure

Cause: Breaker malfunction prevents auto valve closure

Automatic Actions: none

Effects: Incomplete RWCU system isolation. Operator action required mitigate unisolable leak

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	RO BOP	Identify failure of RWCU system to fully isolate
	SRO	<ul style="list-style-type: none">• Determine that a primary system is discharging into the secondary containment.• Before exceeding Max Safe temperatures, enter EOP 3200.01A, RPV Control – No ATWS, and shutdown the plant.
	BOP	Record and/or report area temperature and radiation indications
CT	RO	When directed to scram <ul style="list-style-type: none">• Depress both manual scram pushbuttons on 4F• Place Reactor mode switch to SHUTDOWN
CT	SRO	Directs Emergency Depressurization IAW EOP 3200.04A, Emergency Depressurization – No ATWS <ul style="list-style-type: none">• Direct bypassing Reactor Overfill Protection System (ROPS)• Direct manually opening all EMRVs
	RO	Bypass ROPS
	BOP	Opens all EMRVs
	RO	Control reactor level during the depressurization

Operator Actions

ES-D-2

Op Test No.:

Scenario No.: SRO#3 Event No.: 7

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Event Description: Reactor Building Ventilation Fails to Automatically Isolate

Cause: Electronics malfunction prevents isolation

Automatic Actions: SGTS fails to auto start

Effects: Operator action required to secure RB HVAC

<u>Time</u>	<u>Position</u>	<u>Applicant's Actions Or Behavior</u>
	BOP	<ul style="list-style-type: none">• Determines failure of Reactor Building HVAC to isolate when required• Reports observations to SRO
	SRO	<ul style="list-style-type: none">• Directs shutdown of RB HVAC• Directs start of SGTS
	BOP	<ul style="list-style-type: none">• Secures RB HVAC• Starts SGTS
	RO	<ul style="list-style-type: none">• Reports Secondary Containment conditions

TERMINATION CRITERIA: Once ED is performed and reactor is depressurizing, or at the discretion of the lead evaluator, the scenario may be terminated

POST SCENARIO EMERGENCY CLASSIFICATION: ALERT: primary containment isolation required and isolation valves malfunction causing unisolated release path or confirmed leak-rate exceeds 50 gpm from reactor coolant system