Simulation Facility Peach Bottom **Scenario No.** #1 **Op Test No.**

Examiners _____ **Operators** _____ CRS

_____ _____ PRO

_____ _____ URO

Scenario Summary

The scenario begins with the reactor at 4% power during a reactor startup. During the turnover, the crew is directed to swap RBCCW pumps for inspection of a noisy bearing on the 'B' RBCCW pump. Following the swap of RBCCW, the crew is to continue with the reactor startup pulling control rods in accordance with the approved startup sequence. A loss of power to System 1 End of Cycle Recirc Pump Trip Logic will require investigation and the application of Tech Specs.

After the Tech Spec determination, a high Standby Liquid Control Tank temperature alarm will be received. An investigation will determine that the tank heater had stuck on and the crew should take action to open the breaker for the heater. A review of Tech Specs will result in the SBLC system being considered inoperable due to the loss of NPSH to the pumps.

Once the Tech Spec interpretation is complete, a recirc leak develops in the drywell requiring entry into OT-101, High Drywell Pressure. The crew will take actions for the rising drywell pressure and will manually scram the reactor and enter T-101, RPV Control. During the scram, five rods will fail to insert resulting in an ATWS.

Attempts to spray the drywell will fail due to a drywell spray logic failure and the crew will need to perform a T-112, Emergency Blowdown when drywell temperature cannot be maintained below 281 degrees F. With several rods stuck out, the crew will need to terminate and prevent injection in accordance with T-240 prior to the emergency depressurization. The scenario may be terminated when the RPV depressurization is performed.

Initial Condition IC-121, 4% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1		N	ATC BOP SRO	Swap of RBCCW pumps.
2		R	ATC BOP SRO	Power Ascension with Control Rods.
3	Override	I	ATC BOP SRO	Loss of Power to System 1 End of Cycle -Recirc Pump Trip (EOC-RPT) Logic (Tech Spec).
4	Override	C	ATC BOP SRO	Standby Liquid Control Tank High Temperature (Tech Spec).
5	RRS20	M	ATC BOP SRO	Recirculation System leak in the drywell.
6	Preinserted CRM02XXXX	C	ATC BOP SRO	Five Rods stick full out during the scram.
7	Preinserted Override	I	ATC BOP SRO	DW Spray Valve Logic Failure prevents Drywell Sprays.

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit 2 is starting up at 4% rated power.
- The Drywell is still deinerted due to required inspections.

INOPERABLE EQUIPMENT/LCOs:

None

SCHEDULED EVOLUTIONS:

- Swap RBCCW Pumps, placing the 'A' RBCCW Pump in service and shutting down the 'B' RBCCW Pump
- Continue the reactor startup using GP-2 beginning with Step 6.50 and Rod Sequence Step 15.

SURVEILLANCES DUE THIS SHIFT:

None

ACTIVE CLEARANCES:

None

GENERAL INFORMATION:

Predictive Maintenance reports a noisy bearing on the 'B' RBCCW pump motor and has requested a swap to the 'A' RBCCW pump to permit installing instrumentation on the 'B' pump. When the crew has the shift, perform SO 35.6.A-2, Placing the Standby Reactor Building Closed Cooling Water System Pump in Service. When the pump swap is complete, notify the Work Control Supervisor, and they will send in the Clearance.

After the pump swap the crew is expected to resume power ascension. GP-2 is complete through Step 6.2.47, begin with Step 6.2.48. A Reactivity Briefing was already completed and you are ready to begin withdrawing rods at the beginning of Sequence Step 15 with Control Rod 18-35.

Op Test No.: Scenario No.: # 1 Event No.: 1 Page 1 of 10

Event Description: Swap of RBCCW pumps.

Cause: None

Automatic Actions: None

Effects: None

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct the PRO to perform SO 35.6.A-2 "Placing the Standby Reactor Building Closed Cooling Water System Pump in Service" to place the 'A' RBCCW pump in service and shutdown the 'B' RBCCW pump.
	PRO	Perform SO 35.6.A-2 "Placing the Standby Reactor Building Closed Cooling Water System Pump in Service." - Review SO procedure, including prerequisites and precautions. - Contact the Equipment Operator (EO) to perform SO 35.6.A-2 Step 4.1 to verify alignment, oil level, and vent the 'A' TBCCW pump to verify it ready for start. - PRO starts the 'A' TBCCW pump and informs the EO. - PRO stops the 'B' TBCCW pump and places it in AUTO (may choose to leave the pump in OFF due to impending maintenance). - If directed by shift management, the PRO directs the EO to perform the RBCCW routine inspection. - PRO informs the CRS of the pump swap and contacts the WCS.
	URO	Monitor plant parameters. Peer check and assist as requested.

Event Description: Power Ascension with Control Rods

Time	Position	Applicant's Actions Or Behavior
	CRS	Directs the URO to commence rod withdrawal in accordance with the Startup REMA and the Startup Sequence beginning with Rod Sequence step 15, Rod 18-35.
	URO	Commence rod withdrawal beginning with Sequence Step 15, Rod 18-35. Coordinate with the 2nd Verifier communicating: • Rod Selected • Switch Selection and direction of motion • Target Rod Position. Withdraw control rods by selecting the rod on the matrix and then using the Single Notch Withdrawal switch to withdraw control rods.
	PRO	Monitor balance of plant conditions during rod withdrawal.
	NOTE	Scenario will continue when the evaluators are satisfied with their observation of the reactivity manipulation.

Op Test No.: Scenario No.: # 1 Event No.: 3 Page 3 of 10

Event Description: **Loss of Power to System 1 EOC-RPT Logic**

Cause: Failure of the DC power supply (20D23) switch

Effects: Cause a loss of the trip circuitry that would result in a trip under EOC-RPT conditions. Requires tech spec actions to be taken in accordance with TS 3.3.4.2.

Time	Position	Applicant's Actions Or Behavior
	URO/PRO	Recognize by reporting SYSTEM I EOC-RPT LOGIC PWR FAIL/TEST (214 D-3) Annunciator is alarming.
		Recognize by reporting that the 'A' and 'B' System 1 EOC-RPT Breakers have lost their normally lit red light indication.
		Enter and execute the Alarm Response Card (ARC) for 214 D-3.
	CRS	Enter and execute the Alarm Response Card (ARC) for 214 D-3.
		Direct troubleshooting of the issue.
		Review Tech Spec 3.3.4.2, determine that with a loss of power to the System 1 trip breakers, power must be maintained <29.5% RTP until the problem is corrected. (If the plant was already at a higher power level, then the system would have needed to be restored in 72 hours, or reduced power to < 29.5% within 4 hours.)
	URO	If directed, contact the Work Week Manager/Outage Control Center (or others) to assist in troubleshooting the loss of power to System 1 EOC-RPT Breakers.
	PRO	If directed, coordinate EOs to investigate the loss of power to the System 1 EOC-RPT Breakers.

Event Description: SBLC Tank High Temperature.

Cause: Heater switch failed leaving heater energized after it should have shutdown.

Effects: With tank temperature >120°F, SBLC must be considered INOP.

Time	Position	Applicant's Actions Or Behavior
	URO/PRO	Recognize by reporting STANDBY LIQUID OR PIPE HI-LO TEMP (211 J-3) annunciator is alarming.
	URO	Enter and execute ARC 211 J-3 • Dispatch an operator to check tank temperature locally. • Report tank temperature to CRS. • Direct operator to verify that the heater is NOT on and the control switch is in auto.
	PRO	Determine the power supply to the SBLC Tank Heater and report it to the CRS.
	CRS	Direct that the Tank Heater be deenergized. Reference Tech Spec 3.1.7 and recognize that with 123°F tank temperature, SBLC must be considered INOP. Tech Spec 3.1.7, Condition C applies requiring temperature to be restored in 8 hours.
	PRO	Direct the EO to deenergize the tank heater using switch #52-3604 on E-124-R-C.
	URO/PRO	Recognize by reporting that the tank heater is off when STANDBY LIQUID TANK HEATER POWER OFF (211 J-4) annunciator is received.

Event Description: Small Recirc Rupture

Cause: Small Recirc Rupture results in Drywell temperature and pressure rising but not fully depressurizing the RPV.

Automatic Actions: "Drywell Hi-Lo Press" alarms (210 F-2, 225 A-4)
High Drywell Pressure Scram Signal, Isolations, Diesel and HPCI auto starts.

Effects: Rising drywell pressure indicated. Manual scram at 1.2 psig or auto scram at 2 psig with isolations, HPCI and diesel starts.

Time	Position	Applicant's Actions Or Behavior
	URO/PRO	Recognize Drywell High Pressure alarms • Recognize that Drywell pressure is going up and announce entry into OT-101 for High Drywell Pressure. • Trend the Drywell Pressure Increase
	CRS	Enter/direct actions in accordance with OT-101, High Drywell Pressure: • Verify that Drywell Inerting is not in progress • Direct placing additional drywell cooling in service. • Directs actions to monitor components e.g., RRP seals. • Directs crew to isolate and restore systems IAW OT-101 to stop the source of the leak. OT-101 systems include: RWCU, HPCI and RCIC.
	URO/PRO	Perform OT-101 actions as directed: • Monitor drywell pressure and plant parameters. • If directed, verify that inerting is not in progress. • If directed, place additional drywell cooling in service. • Monitor components for abnormal indications as directed by the CRS. • Isolate plant systems to include RWCU, HPCI, RCIC as directed by the CRS IAW OT-101.
	CRS	Directs a GP-4 Manual Scram when drywell pressure reaches 1.2 psig.

Event Description: Small Recirc Rupture (Continued)

Time	Position	Applicant's Actions Or Behavior
	URO	Performs GP-4 Manual Scram actions: • Places the Mode Switch to Shutdown. • Verify Rods inserting • Manually control the Reactor Feed Water System to control Reactor Level ♦ Pressing Emergency Stop for the 'C' RFP ♦ Shut MO-2149C, the 'C' RFP discharge valve ♦ Open MO-8090 the Startup Level Controller isolation • Verify APRMs are downscale and report to the CRS. • Verify all control rods inserted and report to the CRS.
	PRO	Performs scram actions • Verify all isolations. • Restore Instrument Nitrogen to the DW when directed by the CRS.
	URO PRO CRS	Recognize by reporting entry into T-102, Primary Containment Control when Drywell Pressure exceeds 2 psig.

Event Description: Five Rods stick full out during the scram.

Cause: Rods are mechanically stuck in the full out position.

Effects: ATWS actions must be completed for the stuck control rods. This will require injection to be terminated and prevented prior to completing a RPV Blowdown.

Time	Position	Applicant's Actions Or Behavior
CT	URO	Recognize by reporting that NOT all control rods inserted on the scram.
	CRS	Direct that the control rods be manually inserted using T-220, Driving Control Rods during a scram. (T-216, Control Rod Insertion by Manual Scram or Individual Scram Test Switches, OR T-246, Maximizing CRD Flow to the Reactor Vessel, OR T-215, Control Rod Insertion by Withdrawal Line Venting are also appropriate but T-220 is typically directed first because it is the most expedient method to insert a few control rods that failed to scram.)
	URO	Attempt insertion of the control rods by the method specified by the CRS. For T-220: • Place the CRD Flow Control in MANUAL and open the Flow Control Valve Fully OR Direct an Operator to close HV-2-3-56, the Charging Wtr Hdr Blk Vv to Hydraulic Control Units. • Request permission and by pass the Rod Worth Minimizer. • Attempt to insert the rods using the Emergency In/Notch Override Switch. • Report to the CRS the inability to insert the control rods.
	PRO	Note that the PRO will be required to perform T-240, Termination and Prevention of Injection into the RPV, later in the scenario as a result of this ATWS condition.

Event Description: Drywell Spray Logic failure prevents containment spray.

Cause: Failed Containment Spray Override 2/3 Core Coverage switch (S18) prevents spray valve operation.

Automatic Actions: 2 psig isolations, HPCI auto start, emergency diesel starts.

Effects: Drywell pressure continues to rise above 2 psig and requires the crew to perform an Emergency Blowdown when drywell temperature cannot be maintained below 281°F.

Time	Position	Applicant's Actions Or Behavior
	URO/PRO	Recognize and respond to 2 psig drywell pressure and announce entry into T-101 and T-102: • Recognize and verify Group II/III isolations. • Recognize and verify Diesel Generator starts and has cooling water. • Recognize and report the HPCI auto start if it has not been previously identified by the CRS. • Trend and report containment parameters.
	CRS	Recognize and respond to 2 psig drywell pressure and announce entry into T-101 and T-102: • Reenter T-101, RPV Control, and enter T-102, Primary Containment Control. • Verify adequate level and may direct either a HPCI shutdown or isolation.
	PRO	Performs an isolation or shutdown of HPCI as directed by the CRS. • For an isolation, depress the HPCI isolation pushbutton and verify that HPCI shuts down and and the HPCI Steam Line Isolation Valves close. • For a HPCI shutdown, trip HPCI, verify that the HPCI aux oil pump starts as required, and place the HPCI Aux Oil Pump in Pull to Lock when HPCI stops rotating.
	CRS	Directs T-102 actions: • Directs Torus sprays IAW T-203 using 'B' Loop RHR • Directs T-223 actions to restore drywell ventilation. • Trends containment parameters specifically drywell pressure and bulk average temperature.

Event Description: Drywell Spray Logic prevents containment spray (continued)

Time	Position	Applicant's Actions Or Behavior
	PRO	Perform Torus Sprays IAW T-203, Initiation of Torus Sprays using RHR: • Open the MO-39B, Torus Hdr. Valve. • Open the MO-89D HPSW Outlet Valve. • With CRS permission, place the S18B switch in Manual Override. • Momentarily place the S17B switch in "MAN". • Start the "D" HPSW Pump • Start the "D" RHR Pump • Recognize by reporting to the CRS the failure of the logic that prevents Torus (or Drywell) Sprays from being placed in service.
	URO/PRO	Recognize and report Containment parameters: • Bulk Drywell temperature at 145°F and entry into T-102.
	CRS	• Re-enters T-102 on Bulk Average temperature 145°F
	CRS	Continues T-101 Actions: • Directs RPV level controlled +5 to +35 inches
	URO	Maintains RPV level using additional feedwater that is required to keep up with the recirc leak.
	URO/PRO	Trend and report containment parameters.
	CRS	Directs URO/PRO to perform T-223, Drywell Cooler Fan Bypass, to Bypass and restore drywell ventilation.
	URO/PRO	Performs T-223: • Directs EO to place drywell fans in slow. • Verifies T-223 requirements.
CT	CRS	When Drywell temperature cannot be maintained below 281°F, the CRS directs: • T-240, Terminate and Prevent Injection into the RPV (due to the 5 rod ATWS). • T-112, Emergency Blowdown.
	URO PRO	When directed, perform T-240 to Terminate and Prevent Injection into the RPV. • Verify that HPCI is not injecting. • Shutdown any running Reactor Feedwater Pumps by depressing the trip pushbuttons. • Contact the floor operator and direct the isolation of Stayfull from RHR and Core Spray. (This step does not need to be complete prior to the blowdown.)
CT	PRO	When directed, performs a Emergency Blowdown by opening all five ADS valves.

Event Description: Drywell Spray Logic prevents containment spray (continued)

Time	Position	Applicant's Actions Or Behavior
	URO	Control Reactor level as directed following the blowdown. (Note that level will swell high during the actual blowdown).

TERMINATION CRITERIA:
Scenario may be terminated when a plant depressurization has been performed.

POST SCENARIO EMERGENCY CLASSIFICATION:
Classify this condition as an ALERT (FA1)

Scenario Outline **ES-D-1**

Simulation Facility Peach Bottom **Scenario No.** #2 **Op Test No.**

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

Scenario Summary The scenario begins with the reactor at 100% power with a RCIC surveillance in progress. Following the RCIC testing, the crew is to commence a GP-3, Normal Plant Shutdown.

After the RCIC turbine is started, a low lube oil pressure alarm is received (similar to a recent Peach Bottom HPCI event). The crew will shutdown RCIC and complete a Tech Spec interpretation. The crew will then commence a GP-3, Normal Plant Shutdown. After the reactivity manipulation has been observed, the running Control Rod Drive pump will trip. The crew will pursue the issue using ON-107, Loss of CRD Regulating function. The inability to restore either CRD pump for 20 minutes after CRD Charging Header pressure drops below 940 psig with two accumulator alarms, will result in a required Tech Spec scram.

When the RO attempts to shutdown the plant, an electrical ATWS will occur requiring entry into T-101, RPV Control. Shortly after tripping the recirculation pumps, the 'D' SRV will fail full open requiring entry into OT-114, Stuck Open Safety Relief Valve, and ultimately T-102, Primary Containment Control.

When the RO maximizes torus cooling, the 'A' Loop RHR Torus Cooling Valve (MO-39A) will trip on magnetic overcurrent resulting in no Torus Cooling on the 'A' Loop of RHR causing torus conditions continue to degrade. This will result in an entry into T-102, Primary Containment Control when 95°F is reached. When torus temperature cannot be maintained below 110°F, Standby Liquid Control (SBLC) will be attempted and the pumps will fail to start.

After level has been lowered to control power, the ATWS will be terminated by T-214, Venting the Scram Air Header. The scenario may be terminated after all control rods are verified inserted.

Initial Condition IC-122, 100% power with the 'B' loop of Torus Cooling in service.

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1		N	PRO CRS	Perform RCIC Surveillance Test.
2	Preinserted Override on Event Trigger	C	PRO CRS	RCIC Low Lube Oil Pressure Alarm (Tech Spec).
3		R	URO PRO CRS	Commence GP-3, Normal Plant Shutdown with Control Rods.
4	CRH03	C	URO PRO CRS	Loss of Control Rod Drive System pumps results in a Tech Spec required scram when it cannot be restored promptly (Tech Spec).
5	Preinserted Overrides	M	PRO CRS	Electrical ATWS.
6	Preinserted MSS08D	C	URO PRO CRS	Safety Relief Valve 'D' fails open.

7	Preinserted Override	C	PRO	'A' RHR Loop Torus Cooling valve fails closed limiting torus cooling.
8	Preinserted SLC01	I	URO PRO CRS	Standby Liquid Control Pumps fail to start.

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit 2 at 100% Power
- ST-O-13-301-2, the RCIC Pump, Valve, Flow, and Unit Cooler Functional and In-Service Test has been completed through step 6.3.14.
- GP-3, Normal Plant Shutdown has been completed through step 6.4.

INOPERABLE EQUIPMENT/LCOs:

- RCIC is currently available, but not operable until post maintenance testing is complete. RCIC has been inoperable for over 13 days due to maintenance.

SCHEDULED EVOLUTIONS:

- Perform ST-O-13-301-2, the RCIC Pump, Valve, Flow, and Unit Cooler Functional and In-Service Test beginning with step 6.3.15.

- After the RCIC surveillance is complete, begin a shutdown using GP-3 Shutdown starting with step 6.5 and the existing Shutdown Sequence. The reactivity briefing has already been completed for this evolution and the Reactor Engineers will return to provide support after power has been lowered to 90% using the provided shutdown rod sequence.

SURVEILLANCES DUE THIS SHIFT:

- ST-O-13-301-2, the RCIC Pump, Valve, Flow, and Unit Cooler Functional and In-Service Test

ACTIVE CLEARANCES:

- .

GENERAL INFORMATION:

- A RCIC system outage has just been completed and it is due back in service no later than end of shift. RCIC requires the completion of ST-O-13-301-2, the RCIC Pump, Valve, Flow, and Unit Cooler Functional and In-Service Test to demonstrate operability. This ST has been completed through step 6.3.14. The 'B' Loop of Torus cooling has been placed in service in support of this test.

- A Fourth RO will be completing Torus Temperature Monitoring using Data Sheet 8 of ST-O-13-301-2.

- Station management has determined that Unit 2 will be shutdown following the RCIC surveillance. The reactivity briefing has already been completed for this evolution and the Reactor Engineers will return to provide support after power has been lowered to 90% using the provided shutdown rod sequence.

Op Test No.: Scenario No.: # 2 Event No.: 1 Page 1 of 9

Event Description: Perform the RCIC Pump, Valve, Flow and Cooling Unit Functional Test.

Cause: None

Automatic Actions: None

Effects: None

Time	Position	Applicant's Actions Or Behavior
	CRS	• Reviews the RCIC Surveillance Test and directs the completion of the RCIC surveillance test beginning with step 6.3.15.
	PRO	Start the RCIC pump by: • INITIATE AND TIME RCIC quick start by opening MO-2-13-131, RCIC Supply and starting the stopwatch. • OPEN MO-2-13-132, the RCIC Cooling Water Valve. • Adjust FC-2-13-091 between 600 and 615 gpm AND Throttle MO-2-13-030 to obtain desired flow rate greater than 600 gpm and discharge pressure of greater than 1090 psig. • Stop the stopwatch when the desired flow and pressure are obtained. • Verify that MO-2-13-027, the RCIC Min. Flow Valve closes automatically. • Record the initial system parameters on Data Sheet 2 (RCIC may be shutdown before readings are taken).
	URO	Monitor plant parameters/assist as directed or requested.

Op Test No.: Scenario No.: # 2 Event No.: 2 Page 2 of 9

Event Description: RCIC Low Lube Oil Pressure Alarm (Tech Spec)

Cause: None

Automatic Actions: None

Effects: RCIC must be shutdown and becomes inoperable.

Time	Position	Applicant's Actions Or Behavior
	PRO	Recognize by reporting RCIC TURB BEARING OIL LO PRESS (222 A-3) annunciator.
	CRS	Enter and execute the Alarm Response Card for 222 A-3. • Direct that the RCIC Turbine be shutdown using SO 13.2.A-2, RCIC System Shutdown. • Direct monitoring of RCIC Bearing Temperatures • Direct troubleshooting of the RCIC Turbine
	PRO	Shutdown the RCIC turbine (Note that the candidate may immediately manually trip RCIC and then follow-up with the procedure or may obtain the procedure prior to a shutdown). • Trip the RCIC turbine by depressing the Trip Pushbutton. • Verify closed MO-2-13-021, To Feed Line • Close MO-2-13-131, Supply • Verify the following: ♦ AO-2-13-034, Drain Isolation to Main Condenser OPEN ♦ AO-2-13-035, Drain Isolation to Main Condenser OPEN ♦ MO-2-13-132, Cooling Water CLOSES • Place MO-4487, Trip Throttle Valve to CLOSE, then back to OPEN (may leave tripped due to Lube Oil Failure).
	PRO	Contact Equipment Operators and/or the Work Week Manager/Outage Control Center to troubleshoot RCIC.
	URO	Monitor Balance of plant and assist as requested.
	CRS	Recognize that Tech Specs must be evaluated. Tech Spec 3.5.3 Condition A requires that RCIC be restored in 14 days, however, the plant is already 13 days into the RCIC spec so time will elapse at the end of shift.

Op Test No.: Scenario No.: # 2 Event No.: 3 Page 3 of 9

Event Description: Commence GP-3, Normal Plant Shutdown with Control Rods

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct initiating a GP-3 Shutdown to 90% power using Control Rods.
	URO	Commence driving Control Rods in accordance with the Shutdown Sequence. • Select the appropriate Control Rod. • Perform verification with second verifier including ♦ Rod Selected ♦ Current Position and Target Position ♦ Switch to be moved and direction. • Place the Rod Movement switch to IN and hold until the rod is full in. • Monitor rod position and release the switch when it is full in. • Move to next rod after settle function is complete.
	PRO	Monitor Plant conditions and assist if required.
	NOTE:	Scenario can move forward anytime the evaluators are satisfied with their evaluation of the reactivity manipulation.

Op Test No.: Scenario No.: #2 Event No.: 4 Page 4 of 9

Event Description: Loss of Control Rod Drive System results in a Tech Spec required scram when it cannot be restored promptly. (Tech Spec)

Cause: CRD Pumps trip in instantaneous ground overcurrent (Relay 150G)

Automatic Actions: Alarms 211 F-1

Effects: CRD Pump A trips, CRD Pump B cannot be started, a Tech Spec Shutdown will be required.

Time	Position	Applicant's Actions Or Behavior
	URO/PRO	Recognize by reporting 'A' CRD WATER PUMP TRIP (211 F-1) and 'A' CRD WATER PUMP OVLD (211 F-2).
	CRS PRO	Enter and execute Alarm Response Cards (ARC) 211 F-1 and 211 F-2.
	PRO	Direct an EO to check the breaker for relay flags.
	CRS PRO URO	Recognize by reporting that an entry condition exists for the Loss of CRD Regulating Function (ON-107).
	CRS	Enter and execute ON-107, Loss of CRD Regulating Function. • Direct placing the 'B' CRD Pump in service. • Direct shutting down the Reactor Water Cleanup System.
	PRO URO	Start the 'B' CRD Pump using SO-3.1.B-2, CRD Hydraulic System Startup with the System Filled and Vented. • Dispatch an operator to perform the pre-startup checks for the 'B' CRD Pump using step 4.1 of the SO procedure • Place the CRD Flow Control Valve controller in Manual and close the valve. • Verify MO-2-3-20, Drive Water Header Pressure Valve, is open • Verify the Reactor Recirc Pump Seal Purge is isolated by shutting MO-2-2A-8029A and B. • Attempt to start the 'B' CRD Pump • Recognize by reporting the failure of the 'B' CRD Pump to start.
	URO PRO	Shutdown the RWCU system by tripping the running pump and then shutting the MO-15, MO-18, and MO-68 Isolation Valves.

Op Test No.: Scenario No.: #2 Event No.: 4 Page 5 of 9

Event Description: Loss of Control Rod Drive System results in a Tech Spec required scram when it cannot be restored promptly. (Tech Spec)

Time	Position	Applicant's Actions Or Behavior
	CRS	Monitor Charging Water Header Pressure and when it drops to 940 psig and accumulator alarms for withdrawn control rods.
	URO	Monitor and report Charging Water Header Pressure and Accumulator Alarms as directed by the CRS.
	CRS	When Charging Water Header Pressure drops to 940 psig AND two or more accumulator alarms exist on withdrawn control rods, THEN start a 20 minute clock until a Reactor Scram is required.
	CRS	Direct that house loads be transferred (this can be directed in anticipation of the plant shutdown, or completed as a part of the GP-4 Shutdown).
	PRO	When directed, transfer house loads in accordance with RRC 53.1-2, Unit 2 House Loads Transfer During a Plant Event. For each 13 KV bus: • Install the sync switch key in the normal off-site source and turn it on. • Close the selected off-site source breaker • Verify that the associated Generator breaker trips. • Turn off the synch key. • Repeat for the other 13 KV bus. • Remove the alternate off-site breakers from Pull To Lock.
	CRS	When it is determined that CRD cannot be restored before 20 minutes elapses after Charging Water Header Pressure drops to 940 psig concurrent with two or more accumulator alarms on withdrawn control rods, then direct a GP-4, Manual Reactor Scram.
	URO	Perform a GP-4, Manual Reactor Scram • Run Recirculation Pumps to minimum speed. • Immediately place the Mode Selector Switch in Shutdown
CT	URO	Recognize by reporting that the reactor did NOT scram.
	CRS PRO URO	Recognize by reporting an entry condition into T-101, RPV Control.

Event Description: Anticipated Transient Without Scram (ATWS)

Cause: Scram Condition With Power Above 4% or Unknown.

Automatic Actions: None.

Effects: Requires the crew to take actions to terminate the ATWS, as well as enter T-117 Level/Power Control.

Time	Position	Applicant's Actions Or Behavior
CT	CRS	Direct T-101, RC/Q ATWS actions: • Initiation of ARI. • Trip Recirc pumps at least 10 seconds apart. • T-213, "Deenergize Scram Solenoids". • T-214, "Vent Scram Air Header". (This direction is critical because it is the only success path to insert control rods during the ATWS.) • T-220, "Drive Rods". • Enter T-117, "Level/Power Control".
	URO	Performs T-101, RC/Q actions when directed: • Initiates ARI. Report to the CRS that it was not successful. • Trips Recirc pumps at least 10 seconds apart. • Direct an Equipment Operator to perform T-213. Attempts URO portion of T-213. Reports to the CRS that it was not successful. • Direct an Equipment Operator to perform T-214. • Performs T-220 to insert control rods.
	CRS	Direct T-117 actions: • Inhibit ADS. • T-221, "Bypass the MSIV –160 inch Isolation". • Lower RPV level to below –60 inches by terminating and • Preventing RPV injection using T-240.
	PRO	Performs T-117 actions when directed: • Inhibits ADS. • Directs Equipment Operator to perform T-221, Main Steam Isolation Valve Bypass, to keep the MSIVs open as level is lowered. • Performs T-240. Controls RPV level below –60" and within the specific RPV level band directed by the CRS.

Event Description: Safety Relief Valve 'D' inadvertently fails open.

Cause: Mechanical drift of relief valve setpoint.

Automatic Actions: Alarms 210 D-2, "SAFETY RELIEF VALVE OPEN" and 227 B-4, "BLOWDOWN RELIEF VALVES HI TEMP".

Effects: Loss of Generator Load, steamflow/feedflow mismatch, heat input to the primary containment. SRV will later close when pressure lowers to 800 psig.

Time	Position	Applicant's Actions Or Behavior
	URO/PRO	Recognize, report, and take actions IAW ARC 210 D-2, "Safety Relief Valve Open", and ARC 227 B-4, "Blowdown Relief Valves Hi Temp".
	CRS	Enter/direct actions IAW OT-114: • Lead crew in confirming an SRV is open. • Direct Torus Cooling to be maximized. • Direct attempts to close the 'D' SRV.
	URO/PRO	Confirm that the 'D' SRV is open IAW OT-114.
	PRO	Place RHR in Torus Cooling IAW RRC 10.1-2, "RHR System Torus Cooling During a Plant Event", when directed by the CRS and monitor Torus temperature.
	PRO	Cycle the 'D' SRV control switch when directed by the CRS.
	URO/PRO	Coordinate removal of fuses by Equipment Operators and monitor valve status during attempts to close the 'D' SRV. Communicate to the CRS that the 'D' SRV has NOT closed.
	CRS	Declare the SRV Inoperable AND verify compliance with Tech Spec 3.4.3. (Since adequate SRVs available, this Tech Spec call will likely be delayed due to the transient condition)

Event Description: "A" Loop RHR Torus Cooling valve MO-39A trips on magnetic overcurrent reducing the effectiveness of Torus Cooling.

Cause: Magnetic Overcurrent of MO-39A

Automatic Actions: Valve trips and cannot be opened.

Effects: Torus cooling is unavailable on the 'A' Loop of RHR.

Time	Position	Applicant's Actions Or Behavior
	CRS PRO URO	Recognize by reporting entry into T-102, Primary Containment Control on High Torus Temperature of 95°F.
	CRS	Enter and execute T-102: • Direct that Torus Cooling be maximized.
	PRO	Establish maximum Torus Cooling: • Stroke open MO-39 A and B, RHR Torus Cooling Header Valves. • Stroke open MO-89 A and D, RHR Heat Exchanger HPSW Outlet Valves.
	PRO	Recognize by reporting the failure of the MO-39A valve to open. Complete lineup of 'B' Torus Cooling by: • Starting the 'D' HPSW Pump. • Starting the 'D' RHR Pump. • Opening MO-34B, Full Flow Test Valve. • Starting the 'B' HPSW Pump. • Opening MO-89B, HPSW Outlet Valve. • Starting the 'B' RHR Pump.
	CRS	Direct troubleshooting of the MO-39A valve.
	NOTE	This valve NOT opening will result in a significant loss of Torus Cooling capability causing the torus to heat up more rapidly, complicating the transient for the operators.
	CRS	When Torus Temperature reaches 110°F, directs the PRO to perform T-240 again to lower level until it reaches the T-240 Figure 2 conditions.
	PRO	Performs T-240 again to meet Figure 2 requirements. Specifically, RPV level is lowered and injection restored when any of the following are reached: - RPV level reaches -172 inches or - Reactor power drops below 4% or - All SRVs remain closed and Drywell pressure drops below 2 psig.
	CT	PRO controls level manually as directed by the CRS to prevent dropping level below -226 inches (2/3 Core Coverage).

Op Test No.: Scenario No.: # 2 Event No.: 8 Page 9 of 9

Event Description: Standby Liquid Control Pumps fail to start.

Cause: SBLC Pumps fail due to a common mode breaker failure.

Effects: SBLC Pumps are not available.

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct initiation of SBLC at or before 110°F is reached in the Torus.
	URO/PRO	Initiate SBLC Place the SBLC switch to either "System A" or "System B" Recognize by reporting the Standby Liquid Control Pump failure to start. Attempt the initiation with the other system. Recognize by reporting that it is also failed.
	CRS	Direct alternate methods of SBLC Injection. These could be any of the following: T-210, CRD System SBLC Injection T-211, CRD System Non-enriched Boric Acid and Borax Injection T-212, RWCU System SBLC Injection
	PRO URO	Direct Equipment Operators to perform alternate SBLC injection as directed by the CRS.
	NOTE	The failure of SBLC to inject will significantly complicate the transient by ensuring that the operators must lower level to control power.
	URO	Recognizes "Scram Valve Pilot Air Header Press Lo" (211 D-2) alarm and/or control rods inserting due to T-214 and informs the CRS.
	URO	Verifies all control rods inserted and informs the CRS.
	CRS	Determines the ATWS is terminated, exits T-117 Level /Power Control and enters T-101 RC/L: • Directs PRO to restore level to +5 to +35 inches. • Directs restoration actions.
	CRS	Exit T-117 Direct that level be restored to a normal level band.
	PRO	Restore level band as directed by the CRS

TERMINATION CRITERIA:
The Scenario may be terminated when all rods have been inserted and reactor level is being controlled above the top of active fuel.

POST SCENARIO EMERGENCY CLASSIFICATION:
Classify as a Site Area Emergency (MS4) (or a General Emergency (MG4) if level drops below -195".)

Scenario Outline **ES-D-1**

Simulation Facility Peach Bottom **Scenario No.** #3 **Op Test No.**

Examiners _____ **Operators** _____ CRS

_____ _____ PRO

_____ _____ URO

Scenario Summary The scenario begins with the reactor at 95% power. The turnover directs the crew to swap Control Rod Drive (CRD) Flow Control Valves when maintenance is ready to observe operation of the standby valve.

Shortly after assuming the shift, a Drywell Pressure Instrument will fail upscale without inserting the appropriate half reactor scram. The crew will apply tech specs and insert the half scram using GP-25, Installation of Trips/Isolations to satisfy Tech Spec/TRM Requirements. After the scram is inserted, maintenance will call requesting that the CRD flow control valve be swapped to the standby valve. When it is swapped, it will be recognized that the standby valve is failed open and CRD will be swapped back to the original flow controller. When the swap is complete, a single control rod will begin to drift. The crew will enter ON-121, Drifting Control Rod and drive the rod in. A fast power reduction to 950 Mwe will be required due to the drifted control rod. Again, the crew will review and apply the tech spec requirements for these conditions.

A leak develops in the Reactor Water Cleanup (RWCU) System and the crew will enter T-103, Secondary Containment Control. The RWCU valves cannot be isolated and a T-112, Emergency Depressurization will be required when max safe temperatures are exceeded in two areas. If the Bypass Jack is attempted for a normal or a rapid depressurization, it will fail to function. When the manual blowdown is initiated, the 'C' SRV will not open, requiring the crew to open an alternate SRV.

Initial Condition IC-123, 95% Power, Full Power Rod Pattern

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1	Overrides	I	URO PRO CRS	Drywell Pressure Instrument fails upscale without the expected half scram (Tech Spec).
2		N	URO PRO CRS	Swap Control Rod Drive Flow Control Valves.
3	Preinserted CRH03B	C	URO PRO CRS	Control Rod Drive Flow Control Valve Fails Open.
4	CRH043035	C	URO PRO CRS	Single Control Rod Drifts (Tech Spec).
5		R	URO PRO CRS	Fast Power Reduction due to the Drifting Control Rod.
6	RWC06	M	URO PRO CRS	RWCU Leak in the Reactor Building.
7	Preinserted Overrides	C	URO PRO CRS	RWCU Isolation Valves Fail Open.
8	Preinserted Overrides	I	URO PRO CRS	Bypass Jack Control Fails.

9	Preinserted MSS08C	C	URO PRO CRS	ADS SRV 'C' Fails to open manually.

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit 2 at 95% rated power operation due to a Minimum Generation Emergency.
- Power was reduced from full power using only recirculation flow in accordance with Reactor Engineer Guidance.

INOPERABLE EQUIPMENT/LCOs:

SCHEDULED EVOLUTIONS:

- Swap Control Rod Drive (CRD) Flow Control Valves

SURVEILLANCES DUE THIS SHIFT:

ACTIVE CLEARANCES:

GENERAL INFORMATION:

- The crew is to swap CRD Flow Control Valves from the AO-19A to the AO-19B using SO 3.6.D-2, "CRDH System Flow Control Valve Swapping", when maintenance reports that they are standing by to observe the function of the AO-19B.

Op Test No.: Scenario No.: # 3 Event No.: 1 Page 1 of 9

Event Description: Drywell Pressure Instrument fails upscale without the expected half scram (Tech Spec).

Cause: PIS-2-5-12A Fails Upscale

Automatic Actions: DRYWELL HI PRESS TRIP (210 F-1)
RPS/PCIS TRIP UNITS IN CALIBRATION OR GROSS FAILURE (210 D-4)

Effects: Drywell pressure instrument fails high in gross failure and half scram fails to occur as expected.

Time	Position	Applicant's Actions Or Behavior
	URO	Recognize by reporting the DRYWELL HI PRESSURE TRIP (210 F-1)
	URO PRO	Enter and execute the ARC for 210 F-1.
	CRS	Enter and execute the ARC for 210 F-1. Direct an EO to check the instrument racks in the Reactor Building to determine the cause of the trip.
	PRO	Contact an EO to investigate the trip.
	CRS PRO URO	Recognize by reporting that the DW Pressure instrument failed to cause a RPS half scram.
	CRS	Consult Tech Specs for RPS and PCIS: • TS 3.3.1.1 • TS 3.3.6.1 • TS 3.3.6.2 Recognize that trips must be installed in 12 hours
	NOTE	Crew may consult GP-25, but the required trips do not need to be installed for up to 12 hours.

Op Test No.: Scenario No.: # 3 Event No.: 2 Page 2 of 9

Event Description: Swap Control Rod Drive Flow Control Valves

Cause: None

Automatic Actions: None

Effects: Manual Operator actions.

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct the URO/PRO to coordinate with the Equipment Operator (EO) to swap CRD Flow Control Valves in accordance with SO 3.6.D-2, Section 4.1.
	URO PRO	Swap CRD Flow Control Valves (FCV) in accordance with SO 3.6.D-2, Section 4.1 • Direct the EO to perform Steps 4.1.1.1 and 4.1.1.2 • Place CRD FCV Controller in "Manual" and adjust to zero. • Direct the EO to place the local flow control station selector switch in the valve "B" position.
	NOTE	The Flow Control Valve Failure can be identified as failed anytime after the "B" position is selected and the operator attempts to control the FCV with the manual controller. *See Event #2 for details on the failed Flow Control Valve actions.*

Event Description: Control Rod Drive Flow Control Valve Fails Open

Cause: The standby flow control valve is failed open, which will be noted when it is placed in service.

Automatic Actions: Flow control valve position indication in the control room will indicate a solid red light with the green light off, indicating the valve is full open with the manual controller set to full closed.

Effects: Indicated flow will rise to greater than the flow setpoint.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize by reporting the failed open Flow Control Valve (FCV).
	CRS	Direct swapping back to the "A" Flow Control Valve.
	URO PRO	Swap CRD FCV using SO3.6.D-2, Section 4.2: • Direct the Equipment Operator (EO) to perform steps 4.2.1.1 and 4.2.1.2. • Place the CRD FCV Controller in "Manual" and adjust to zero. • Direct the EO to place the local FCV station selector in the "A" position. • Open the FCV to 55 - 65 gpm. • Place the CRD FCV Controller in "Automatic" and verify flow. • Direct the EO to perform steps 4.2.5.1 and 4.2.5.2. • Perform Section 4.1 of the CRD routine inspection. • Direct the EO to perform Section 4.3 of the CRD routine inspection.

Event Description: Single Control Rod Drifts.

Cause: Control Rod Drive Mechanism Fails permitting the rod to drift.

Automatic Actions: ROD DRIFT (211 D-4)

Effects: Control Rod 30-35 Begins to Drift.

Time	Position	Applicant's Actions Or Behavior
CT	URO	Recognize by reporting ROD DRIFT (211 D-4) • Determine which rod is drifting • Enter ON-121, Drifting Control Rod
	CRS	Enter and execute ON-121, Drifting Control Rod. • Direct that an EO be sent to investigate. • Direct that the control rod be selected and driven full in.
	PRO	Direct an EO to investigate the HCU.
	URO	Select Control Rod 30-35 Drive the Control Rod full in and hold for 30 seconds.
	CRS	Direct a power reduction to 950 MWe using GP-9-2, Fast Power Reduction.
	URO	Reduce power with Recirculation to 950 MWe. (See event #5 for details of the power reduction.)
	CRS	Reference Tech Spec 3.1.3 and declare the Control Rod Inoperable.

Op Test No.: Scenario No. #3 Event No.: 5 Page 5 of 9

Event Description: Fast Power Reduction due to drifting control rod

Cause: ON-121, Drifting Control Rod, action to place the plant in a safe power configuration.

Automatic Actions: None

Effects: Power reduction reduces the flux preventing damage from the out of position rod until it can be evaluated by Reactor Engineering.

Time	Position	Applicant's Actions Or Behavior
	CRS	Directs the URO to perform a GP-9, Fast Power Reduction, to 950 Mwe.
	URO	Performs power reduction using Recirc flow to approximately 950 Mwe IAW GP-9 "Fast Power Reduction".
	PRO	Assists in the power reduction • Monitor Reactor Feed Pump Flows during the power drop and remove a Reactor Feed Pump from service, if required. • Maintain the Generator Auto-Manual Voltage Regulator

Event Description: Reactor Water Cleanup (RWCU) leak in the Reactor Building

Cause: Crack in RWCU line in the secondary containment.

Automatic Actions: "High Area Temp" alarms (210 J-3)

Effects: Temperatures rise initially in the Reactor Building 165' Elevation Valve Pit and then spread throughout Reactor Building 165' Elevation.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize by reporting a Potential T-103 Entry on High Temperature. Verify which temperature point is alarming, confirm T-103 Entry, and inform the CRS.
	URO PRO	Monitor and trend Reactor Building conditions.
	CRS	Enter and execute T-103, Secondary Containment Control. Direct a GP-15 "Local Evacuation" of the Reactor Building
	CRS	Determine that a primary system is discharging into the Reactor Building. Enter and execute T-101 "RPV Control" from T-103. Direct a GP-4, Manual Reactor Scram. Enter T-101, RPV Control from T-103.
	PRO	Conduct a GP-15 evacuation of the Reactor Building.
	URO	GP-4, Manual Reactor Scram Actions • Places the Reactor Mode switch to Shutdown. • Verify control rods are inserting. • Verify that APRMs are downscale. • Establish and maintain RPV with feedwater. • Verify all control rods inserted. • Verify RPV pressure, trend and status of EHC.
	CRS	Direct URO to control level between +5 and +35 inches with Reactor Feedwater.
	PRO	Perform GP-4, Manual Reactor Scram Actions: • Transfer 13 KV House Loads. • Trip Main Turbine at <50 Mwe and verify the generator lockout. • Verify PCIS isolations and SGTS initiation. (See Event #7 for RWCU isolation failure actions). • Verify Scram Discharge Vents and Drains are closed. • Verify Hydrogen Water Chemistry is isolated. • Verify Recirc pumps have runback to 30%. • Monitor Instrument Air header pressure and drywell pressure. • Restore Drywell Instrument N2 when directed by the CRS.

Op Test No.: Scenario No.: # 3 Event No.: 7 Page 7 of 9

Event Description: RWCU Isolation Logic failure

Cause: Relay failures prevent a RWCU isolation

Automatic Actions: Isolation is failed for RWCU MO-15, MO-18, and MO-68.

Effects: Operators attempt a manual isolation and the valves will not close. Reactor Building conditions degrade requiring a RPV depressurization.

Time	Position	Applicant's Actions Or Behavior
	PRO	• Recognize excessively high temperatures in the 165' Reactor Building Valve Pit. • Recognize by reporting that RWCU has not automatically isolated. • Attempt to manually close the RWCU isolation valves by taking their control switches in the counter-clockwise direction to CLOSE.
	CRS	• Recognize excessively high temperatures in the 165' Reactor Building Valve Pit. • Directs the PRO to manually close the RWCU isolation valves (if it has not already been attempted).
	URO PRO	• Monitor and trend degrading Reactor Building conditions and temperatures. • Monitor for additional areas exceeding the Action levels. • Investigate the failed isolation valves. • Direct plant support personnel to troubleshoot and repair isolation valve failure.
	CRS	• Recognizes temperatures in additional T-103 areas continue to rise. • Continue T-101 actions and directs the URO/PRO to begin a RPV depressurization <100°F (See Event #8).
	CRS	If the crew has not yet identified the Bypass Jack Failure (Event 8), the CRS may direct a Rapid RPV depressurization with Bypass Valves in accordance with T-101, RPV Control Step RC/P-12 when he determines that the plant is approaching an Emergency Blowdown from T-103. *Note that this step is optional based on the CRS perception of the rate of rise in temperatures.*
CT	CRS	• Recognize two or more areas above the Action level and a primary system breach is in progress. • Directs T-112 Emergency Blowdown actions. • Directs the URO/PRO to open all ADS valves (See Event #9).

Op Test No.: Scenario No.: #3 Event No.: 8 Page 8 of 9

Event Description: The Bypass Valve Jack Control fails to function

Cause: Bypass Jack Control Failure

Automatic Actions: None

Effects: When the Bypass Jack use is attempted, for either cooldown or rapid depressurization, it will fail to operate.

Time	Position	Applicant's Actions Or Behavior
	PRO URO	Attempt to open the Bypass Valve Jack as directed by the CRS for either a normal or a rapid depressurization.
	PRO URO	Recognize by reporting the failure of the Bypass Jack.
	CRS	• Acknowledge the failure of the Bypass Valve Jack. • Direct that the normal depressurization be performed using Safety Relief Valves (SRVs).
	URO PRO	Use SRVs to initiate a normal depressurization as directed by the CRS.

Event Description: ADS SRV fails to open on Emergency Blowdown

Cause: ADS solenoid failure.

Automatic Actions: None

Effects: Only 4 ADS valves will initially open and operator action is required to open an additional SRV to accomplish the Blowdown as designed.

Time	Position	Applicant's Actions Or Behavior
CT	PRO	• Opens all ADS valves by placing their hand switches to open as directed by the CRS. • Recognize by reporting that the 'C' ADS Safety Relief Valve failed to open.
	CRS	Reviews T-112 steps and directs an additional SRV opened to achieve 5 open SRVs.
	PRO	• Opens an additional non-ADS SRV • Verify 5 open SRVs and informs the CRS.
	URO PRO	Control reactor level (which will initially swell very high) during the Emergency Blowdown.

TERMINATION CRITERIA:
The scenario may be terminated after the Emergency Blowdown is initiated to depressurize the RPV.

POST SCENARIO EMERGENCY CLASSIFICATION:
Classify the event as a Site Area Emergency (FS1)

Scenario Outline **ES-D-1**

Simulation Facility Peach Bottom **Scenario No.** #4 **Op Test No.**

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

Scenario Summary The scenario begins with the reactor at 97% power. The Power System Director has provided Peach Bottom with advance notice that he will be requiring Unit 2 to carry additional reactive loading.

Following turnover, A loss of DC power to the in-service RPS MG Set Output Breaker requires investigation and the application of tech specs. When the required actions have been taken, the Power System Director calls to request that Reactive Loading be raised to 200 MVARs. After reactive loading has been raised, HPCI will isolate requiring investigation and the application of Tech Specs. When this is completed, the 'A' Condensate Pump will trip and the expected Recirculation System Runback will not occur. Power must be manually reduced using Recirculation to prevent a low-level scram.

When conditions have stabilized, the #2 Auxiliary Bus will trip on overcurrent removing the remaining Condensate Pumps from service. The automatic and manual scrams will fail requiring entry into T-101, RPV Control, and the use of Alternate Rod Insertion to shutdown the reactor. The Scram Discharge Volume will fail to isolate and must be manually isolated. When started either manually or automatically, RCIC will trip removing the final source of high pressure feed.

As level deteriorates, the crew should enter T-111, Level Restoration, and start available low pressure ECCS pumps. When level reaches -172 inches, the reactor will be depressurized using T-112, Emergency Depressurization and level will be recovered with low pressure ECCS. The scenario may be terminated when level has been restored to greater than -172 inches.

Initial Condition IC-14, reduced to 97% power, Full Power Rod Pattern

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1	IOR ANO236RE2 ALARM_ON	I	URO PRO CRS	Loss of DC Power to the 'B' RPS MG Set Output Breaker (Tech Spec).
2		N	URO PRO CRS	Raise Reactive Loading as requested by the Power System Director.
3	BATCH FILE HPCI_AUTO_ ISOLATION	I	URO PRO CRS	HPCI isolates due to a logic system malfunction (Tech Spec).
4	IMF MCS05A WITH IOR ZYP06A521S16 FALSE	C	URO PRO CRS	'A' Condensate Pump Trips/Automatic Recirc Runback Fails to Occur.
5		R	URO PRO CRS	Power Reduction with Recirc in response to the failed Recirc Runback.
6	BATCH BUS_2_ OVERCURREN T_LOCKOUT	M	URO PRO CRS	#2 Auxiliary Bus Locks Out on Overcurrent.
7	RPS OVERRIDE	I	URO PRO CRS	RPS fails to initiate a Scram/Alternate Rod Insertion (ARI) is required.

8	IMF CRH09A-D IMF CRH11A-B	I	URO PRO CRS	Scram Discharge Volume Vents and Drains fail to auto isolate.
9	RCI03 ON ET AT 500 RPM	C	URO PRO CRS	RCIC Trips when started manually or automatically.

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit 2 at 97% Power
- Control Rods are in a full power alignment.

INOPERABLE EQUIPMENT/LCOs:

- None

SCHEDULED EVOLUTIONS:

- Recover power to full power as directed by the instructions provided by the Reactor Engineers.

SURVEILLANCES DUE THIS SHIFT:

-

ACTIVE CLEARANCES:

- .

GENERAL INFORMATION:

- GP-5, Power Operations, power had been lowered to 90% under the Reactor Engineers guidance to perform a rod pattern adjustment. Rod manipulations are complete. The Reactor Engineers will bring guidance for raising to full power when they complete running predictors.

Op Test No.: Scenario No.: # 4 Event No.: 1 Page 1 of 9

Event Description: Loss of DC Power to the 'B' RPS MG Set Output Breaker

Cause: Loss of DC power to breaker from 2DD25, circuit 19

Automatic Actions: Loss of Trip Capability for the RPS Output Breaker.

Effects: Diagnostics, Tech Spec Interpretation and actions.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	• Recognize by reporting RPS 'B' M-G SET TROUBLE OR IN TEST (208 E-2) Annunciator. • Recognize that RPS 'B' is NOT tripped.
	CRS	Enter and Execute ARC 208 E-2: • Recognize that 2BC757 breaker is not tripped due to RPS not tripping with resultant plant effects. • Direct that the EO be contacted to verify the status of DC Control Power at 2DD25, Ckt. 19.
	PRO	Use the ARC to assist in troubleshooting the annunciator as directed.
	URO	Monitor plant parameters/assist as directed or requested.
	CRS	Reference Tech Spec 3.3.8.2 to make the following determination: • With DC power and therefore trip capability lost for one of the two RPS Output Breakers, the associated RPS MG Set must be removed from service in 72 hours.

Op Test No.: Scenario No.: # 4 Event No.: 2 Page 2 of 9

Event Description: Raise Reactive Loading as requested by the Power System Director.

Cause: Request from Power System Director.

Automatic Actions: None

Effects: Reactive Loading is raised to 200 MVARs.

Time	Position	Applicant's Actions Or Behavior
	PRO	Receive request from Power System Director (PSD) to raise reactive power on Unit 2 to 200 MVARs and forward the request to the CRS.
	CRS	Review the request to raise reactive loading to 200 MVARs. Consider the Generator Capacity Curve to ensure that adequate room is available. (NOTE: due to the operators awareness of the capacity of the generator, they could raise loading without referencing the curve. If the evaluator has any question, it should be asked during post scenario follow-up questioning).
	CRS	Direct that reactive loading be raised to 200 MVARs.
	PRO	Raise reactive loading by slowly turning the AUTO VOLTAGE REG RHEOSTAT in the CLOCKWISE direction until the meter indicates 200 MVARs.

Op Test No.: Scenario No.: # 4 Event No.: 3 Page 3 of 9

Event Description: HPCI isolates due to a logic system malfunction.

Cause: HPCI Logic malfunctions and results in an automatic initiation and isolation of the HPCI system.

Automatic Actions: HPCI RELAYS NOT RESET (228 C-5)
HPCI TURB TRIP (221 B-1)

Effects: HPCI will become inoperative requiring a Tech Spec interpretation and severely challenging RPV level recover later in the scenario.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize by reporting the isolation of the HPCI system.
	CRS	Recognize by announcing that HPCI is unavailable
	PRO	• Investigate the HPCI isolation using ARCs. • Enter SO 23.7.C-2, High Pressure Coolant Injection (HPCI) System Recovery from System Isolation or Turbine Trip.
	CRS	Reference Tech Spec. 3.5.1 Condition C to determine that with HPCI inoperable: • RCIC must be verified operable immediately by administrative means AND • HPCI System must be restored to an operable status within 14 days OR • the plant must be in MODE 3 within 12 hours and reactor steam dome pressure must be $\leq$150 psig within 36 hours.
	CRS	Request the Work Week Manager (or others) to assist in troubleshooting HPCI.

Op Test No.: Scenario No.: #4 Event No.: 4 Page 4 of 9

Event Description: 'A' Condensate Pump Trip/Automatic Recirc Runback Fails

Cause: 'A' Condensate Pump trips on overcurrent/Recirc fails to runback due to a relay failure in the runback logic

Automatic Actions: A CONDENSATE PUMP BKR TRIP (203 E-2)
A CONDENSATE PUMP OVERLOAD (203 E-1)
Recirc automatic runback is failed.

Effects: Reactor level will begin to drop and will lower until power is reduced with recirculation.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognizes by reporting the trip of the 'A' Condensate Pump.
	URO PRO CRS	Recognize by announcing entry into the Operating Transient (OT) Procedure for Reactor Low Level (OT-100).
CT	URO PRO CRS	Recognize by reporting that the 45% Recirc Pump Runback failed to occur automatically. NOTE: Actions in response to this runback failure are contained in the actions for Event #5.
	URO	Recognize that the level drop is caused by a lack of makeup capability requiring that power be lowered with Recirculation.
	PRO	Investigate the cause of the 'A' Condensate Pump Trip using the ARCs. • Direct an EO to investigate the breaker for the cause of the trip. • Green flag the 'A' Condensate Pump Control Switch.
	CRS	Refer to GP-5, Power Operations, to determine that GP-5 recommends that power be limited to <80% total feedwater flow with 2 Condensate and 3 Reactor Feedwater Pumps.

Event Description: Power reduction with recirculation

Cause: Runback failed to occur automatically when the condensate pump tripped.

Automatic Actions: None.

Effects: Operator is required to manually run recirc flow to 45%.

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct the URO to lower power by lowering recirc flow manually to 45% speed. NOTE: the RO may wait for the CRS to direct this action, but is NOT required to wait since a failure of an automatic action has occurred and needs to be manually verified.
	URO	Reduce power (which will also stop the RPV level drop) by lowering both the 'A' and the 'B' Recirc Pump Controllers to a Recirc Speed Demand of 45%. This must be performed in a controlled manner that does not result in a high level trip of the Reactor Feed Pumps on the power drop.
	PRO	Monitor RPV level to ensure proper Reactor Feedwater Pump response to this power change.
	CRS	Enter and execute OT-112, Unexpected/Unexplained Change in Core Flow. • Determine position on the PBAPS Power Flow Operation Map. • Direct monitoring for Thermal Hydraulic Instability (THI).
	URO	Monitor for THI as directed.

Op Test No.: Scenario No.: #4 Event No.: 6 Page 6 of 9

Event Description: #2 Auxiliary Bus Locks Out on Overcurrent.

Cause: Failure in the bus work results in an overcurrent condition.

Automatic Actions: 2 AUX BUS OVERCURRENT RELAYS (219 A-2)
2 AUX BUS LO VOLTAGE (219 B-2)
2 Aux Bus Breakers trip deenergizing the bus and its loads.

Effects: The most immediate impact of the Loss of #2 Aux Bus is that the remaining condensate pumps lose power and reactor level drops rapidly requiring a Reactor Scram.

Time	Position	Applicant's Actions Or Behavior
	PRO	Recognize by reporting the loss of the #2 Aux Bus.
	URO	• Recognize by reporting that reactor level is dropping rapidly. • Attempt to manually shutdown the reactor by placing the Mode Selector Switch in Shutdown.
	CRS	• Acknowledge the reports related to the #2 Bus and reactor level.

Event Description: RPS fails to Scram resulting in an ATWS/ARI is effective

Cause: RPS 'B' Automatic and Manual Channel Failure.

Automatic Actions: Full Reactor Scram does not occur.

Effects: Crew is required to procedure for ATWS conditions. Reactor level drop is greater because more time is spent under power conditions with no High Pressure Feed.

Time	Position	Applicant's Actions Or Behavior
	URO	• Recognize by reporting that a full RPS scram has failed to occur. • Report entry into T-101, RPV Control, for the ATWS condition. • Attempt to scram 'B' RPS by depressing the scram pushbutton.
CT	CRS	Enter and execute T-101. • Direct that Alternate Rod Insertion (ARI) be initiated.
	URO	• Initiate ARI and report that the Scram Header is depressurizing. • Monitor and report when rods begin to insert and when all rods are fully inserted.
	URO	• Announce an additional entry condition for T-101 based on Reactor Level below -48" and dropping.
	CRS	• Direct maximizing CRD flow using T-246. • Direct injecting with Standby Liquid Control.
	URO	• Coordinate with the EO to maximize CRD flow using T-246 (may not initially be time for many of these actions, will follow through on when possible). • Initiate injection with Standby Liquid Control by placing the SBLC Keylock switch in either START SYS A or START SYS B.
	CRS	Determine that level cannot be maintained >-172" and enter and execute T-111, Level Restoration: • Direct inhibiting the Automatic Depressurization System (ADS). • Direct starting all Core Spray and RHR Pumps on minimum flow.
	PRO	• Inhibit ADS by placing keys in both ADS keylock switches and placing them in the INHIBIT position. • Start ALL Core Spray and RHR Pumps on minimum flow.

Op Test No.: Scenario No.: # 4 Event No.: 8 Page 8 of 9

Event Description: Scram Discharge Volume Vents and Drains fail to automatically isolate.

Cause: PCIS Logic failure

Automatic Actions: Auto isolation does not occur.

Effects: A failure of the SDV vents and drains is effectively a primary to secondary containment leak. The SDV vents and drains can, however, be manually isolated.

Time	Position	Applicant's Actions Or Behavior
CT	URO/PRO	Recognize by reporting the failure of the SDV vents and drain valves to automatically isolate. Upon recognizing a failure to isolate, the RO should: • Manually isolate the valves by moving the SDV Isolation Handswitches counter-clockwise to the CLOSE position. • Ensure a complete isolation. • Inform the CRS as conditions permit.
	CRS	• Acknowledge SDV Vent and Drain Valve isolation failure. • Reinforce manually verifying the isolation if required.

Op Test No.: Scenario No.: # 4 Event No.: 9 Page 9 of 9

Event Description: RCIC Trips when started manually or automatically.

Cause: Trip Throttle valve failure.

Automatic Actions: RCIC will attempt to start and then will trip when it reaches 500 RPM.

Effects: RCIC will attempt to start and then will trip when it reaches 500 RPM. This removes the last source of High Pressure Feedwater to the RPV. Severely complicates level recovery.

Time	Position	Applicant's Actions Or Behavior
	PRO	• Recognize by reporting that RCIC has tripped and is NOT injecting. • Monitor and report RPV level drop.
	CRS	Acknowledge report on RCIC and request assistance to assist in recovering RCIC for injection.
	CRS	When level drops to -172", then enter T-112, Emergency Blowdown. • Direct that Instrument Nitrogen be bypassed and restored (if not already complete). • Direct that all five ADS SRVs be opened. • When Core Spray and RHR begin to inject, direct that level be recovered to an appropriate band (+5 to +35 inches or another suitable band above the top of active fuel at -172").
	PRO	• Restore drywell instrument nitrogen by placing the valves to close, placing the keylock switch in bypass, and then reopening instrument nitrogen valves. (NOTE: this activity may be coordinated between the URO and the PRO). • When directed, open ALL five ADS SRVs to perform an Emergency Blowdown. • When Core Spray and RHR begin to inject, manually control pumps to control level in the CRS specified band.
	URO	• Assist in critical parameter monitoring. • Complete other assigned tasks.

TERMINATION CRITERIA:
The scenario may be terminated after the RPV has been depressurized and reactor level has been recovered and controlled.

POST SCENARIO EMERGENCY CLASSIFICATION:
Classify the event as a Site Area Emergency (FS1)

Scenario Outline ES-D-1

Simulation Facility Peach Bottom **Scenario No.** #5 **Op Test No.**

Examiners _____ **Operators** _____ CRS

_____ _____ PRO

_____ _____ URO

Scenario Summary The scenario begins with the plant at 73% power with the "B" RHR Pump Blocked For Motor Replacement. The turnover will direct the crew to perform a Main Turbine Stop Valve Routine Test.

A loss of Feedwater Heaters will require the crew to respond to a positive reactivity addition and reduce power to ensure thermal limits are not exceeded. The crew should recognize and respond to the failure of a RPS Low Vacuum Pressure Transmitter.

Following the Tech Spec determination, a steam leak develops in the Turbine Building. As the steam leak grows in magnitude, the crew should recognize the need to shutdown the plant. During the manual scram, a Reactor Mode Switch failure will require the crew to use the manual pushbuttons or Alternate Rod Insertion (ARI) to terminate the ATWS.

A failure of the Group I isolation will require a manual isolation and the 'D' MSL will fail to isolate. The crew will enter T-104, Radioactive Release and evaluate the release. When the release exceeds General Emergency level, the crew will perform an Emergency Blowdown per T-112, Emergency Blowdown. A failure prevents three ADS valves from opening which requires alternate depressurization methods.

Initial Condition IC-125, 73% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1		N	URO PRO CRS	Perform the Main Turbine Stop Valve Routine Test.
2	Override	C	URO PRO CRS	Loss Of Extraction Steam To Feedwater Heaters (Tech Spec).
3		R	URO PRO CRS	Reduce Reactor Power.
4	Override	I	URO PRO CRS	Failure of a Vacuum Transmitter (Tech Spec).
5	MSS10	M	URO PRO CRS	Steam Leak In The Turbine Building.
6	PCI01 Override	C	URO PRO CRS	Group I Failure To Auto Isolate (Manual works)/Failure Of The "D" MSL To Manually Isolate.
7	Override	I	URO PRO CRS	Failure To Scram (Reactor Mode Switch/B RPS Auto Channel Failure).
8	Override MSS08	C	URO PRO CRS	Unable To Restore Drywell Nitrogen/Only 2 SRVs Operate On Emergency Blowdown/Depressurization Via Alternate Methods.

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

SHIFT TURNOVER

PLANT CONDITIONS:

- Approximately 73% power with a GP-2 Startup in progress.
- GP-2 is complete through step 6.3.57.
- REs are currently evaluating the rod pattern and will contact you with directions.
- The Unit 2 Turbine Building 116' Cardox Tank is being refilled.
- A routine Diesel Fuel Oil delivery is expected this shift.

INOPERABLE EQUIPMENT/LCOs:

- "B" RHR Pump out of service for motor replacement, 6 hours into LCO 3.5.1, expected return to service in 2 days

SCHEDULED EVOLUTIONS:

- Perform RT-0-001-400-2, "Individual Full Closure of Main Turbine Stop Valves". It is already completed through step 6.1.3.

SURVEILLANCES DUE THIS SHIFT:

- Perform RT-0-001-400-2, "Individual Full Closure of Main Turbine Stop Valves". It is already completed through step 6.1.3.

ACTIVE CLEARANCES:

- "B" RHR Pump

GENERAL INFORMATION:

- Complete the Main Turbine Stop Valve RT

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

Event Description: Main Turbine Stop Valve Routine Test

Cause: None

Automatic Actions: None

Effects: None

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct PRO to perform RT-O-001-400-2, the Main Turbine Stop Valve Individual Full Closure Routine Test.
	PRO	Perform RT-O-001-400-2, the Main Turbine Stop Valve Individual Full Closure Routine Test: • Review RT • Place the CV/SV Test Selector to SV TEST • Verify all four MSV test button lights are ON • Place the backup EHC Pump in Run and document in RT • For Each Main Turbine Stop Valve ♦ Depress and Hold the Test pushbutton ♦ Verify the position indicator moves smoothly at low speed to less then 10% open and then fast closes ♦ After 2-3 seconds at full close, release the pushbutton ♦ Verify that the indicator moves smoothly from 0-100% • Place the CV/SV Test switch to OFF • Verify the lights on all four MSV test buttons are OFF • Place the backup EHC Pump in STOP and then AUTO
	URO	Monitor plant parameters/assist as directed

Op Test No.: Scenario No.: #5 Event No.: 2 Page 2 of 8

Event Description: Loss Of Extraction Steam To Feedwater Heaters

Cause: AO Valves supplying various heaters fail closed due to a common airline break

Automatic Actions: None, no alarms

Effects: Loss of extraction steam to heaters, lowering feed temps, rising reactor power

Time	Position	Applicant's Actions Or Behavior
	URO	Recognize rising reactor power, inform CRS and announce entry into the Positive Reactivity OT (OT-104)
	CRS	Enter/direct actions IAW OT-104 • Monitor position on Figure 1 of OT-104 • Direct the insertion of control rods as required to bring power to 10% below the pre-transient level. • Lead crew in determining the cause of the Positive Reactivity • Direct troubleshooting of feedwater heater problem • Direct isolation of the air leak
	URO PRO	Investigate cause of power rise • Recognize lowering feedwater temperatures, inform CRS • Recognize loss of extraction steam to feedwater heaters, inform CRS
	URO	Reduce power as directed by the CRS (see Event #3 for details).
	PRO	Assist with troubleshooting feedwater heaters as directed
	CRS	Evaluate the crews position on Figure 1, to determine whether Tech Spec Action is required to implement Thermal Limit penalties, recover FW heating, or drop power <25%.

Op Test No.: Scenario No.: #5 Event No.: 3 Page 3 of 8

Event Description: Reduce reactor power.

Cause: Loss of Feedwater Heaters

Automatic Actions: None, no alarms

Effects: Power reduction

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct power to be lowered as directed by OT-104 • Maintain power 10% below the pretransient level using GP-9-2 rods.
	URO	• Maintain power 10% below initial pre-transient level by driving GP-9-2 Rods as required (to 63%)
	PRO	• Inform Power Systems Director of the power reduction. • Monitor plant parameters (especially feedwater flow status) and assist as necessary.

Event Description: Failure of a Vacuum Transmitter (Tech Spec)

Cause: PT-2-5-11C fails resulting in an RPS Trip

Automatic Actions: 210 B-1 "CONDENSER LO VACUUM TRIP" Alarm
"A" RPS Channel Half Scram

Effects: "A" RPS Channel Half Scram, no rod motion

Time	Position	Applicant's Actions Or Behavior
	URO PRO	• Recognize and report 210 D-1, "CONDENSER LO VACUUM TRIP" • Recognize and report the "A" Channel Half Scram • Verify actual condenser vacuum is normal
	URO	Take action IAW ARC 210 D-1 "CONDENSER LO VACUUM TRIP" and 211 B-1 ("A" Channel Auto Scram)
	CRS	• Direct troubleshooting of failed instrument • Refer to Tech Spec 3.3.1.1 to determine that a trip must be inserted in "A2" RPS within 12 hours • Initiate GP-25 to insert a redundant trip into the "A2" RPS logic using Appendix 1. (Note: that this is not required to be performed for 12 hours and may not be performed during the course of this scenario)
	PRO	If directed, perform GP-25 Appendix 1 to insert a redundant trip into the "A2" RPS logic.

Event Description: Steam Leak In The Turbine Building

Cause: "D" MSL weld cracks

Automatic Actions: Initially alarms will be received indicating vent stack problems and then will progress to Group 1 conditions

Effects: High steam line flow Group 1 isolation condition and resultant reactor scram signal on MSIV closure

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize, report, and take actions IAW ARC 218 B-5 & C-5 (Vent Exhaust Stack Hi Radiation) • Monitor RI-2979 to verify a valid signal • Enter ON-104, Vent Stack High Radiation
	CRS	Enter ON-104 and direct search for source of high vent exhaust rad
	URO PRO	Recognize and report High Area Temperature Alarm with a potential T-103 (Secondary Containment Control) Entry
	PRO	• Monitor Area Temperatures and determine that the leak is in the turbine building and NOT a T-103 entry • Recognize by reporting the Group 1 alarms and failure of the Group 1 to occur
	CRS	Direct a Reactor Scram and closure of the MSIVs
	URO	Attempt to scram the reactor and report the ATWS and entry into T-101, "RPV Control" SEE EVENT #7 FOR FAILURE TO SCRAM DETAILS
	PRO	• Attempt to manually isolate the MSIVs • Report inability to isolate the "D" Main Steam Line to the CRS SEE EVENT #6 FOR FAILURE TO ISOLATE DETAILS

Event Description: Group I Failure To Auto Isolate (Manual works)/Failure Of The "D" MSL To Manually Isolate

Cause: Failure of remaining channel of isolation logic to actuate (see Event 4), "D" MSL will not isolate manually

Automatic Actions: None, no alarms

Effects: Group 1 failure to isolate, manual isolation will work on all MSL with the exception of the "D" line, reactor scram signal from MSIV closure will not occur until MSIVs closed by operator

Time	Position	Applicant's Actions Or Behavior
CT	PRO	• Recognize by reporting indications of major steam leak and the MSIVs failing to close • Close MSIVs with handswitches, recognize the "D" Main Steam Line Failure to manually isolate
	CRS	• Direct the performance of AO 1A.2-2, Closing Stuck Open MSIVs • Direct a GP-15 evacuation of the Turbine Building
	PRO	• Direct an EO to perform AO 1A.2-2 for the MSIVs • Perform a GP-15 evacuation of the Turbine Building
	URO PRO	• Recognize, report alarms 218 B-4 & C-4 (Vent Stack Exhaust Hi Hi Rad) • Announce T-104 "Radiation Release" Entry
	CRS	Enter/direct actions IAW T-104, "Radiation Release" • Initiate Dose Assessment/Reference ERP101 as appropriate • Continue to attempt to isolate the MSIVs • Continue to take action in T-101, "RPV Control" to shutdown and depressurize the plant (SEE EVENT #7) • When the release can not be maintained below the General Emergency Level by Dose Assessment Reports, then direct T-112, "Emergency Blowdown" (SEE EVENT #8 FOR DETAILS)

Event Description: Failure to scram (Reactor Mode Switch / B RPS Auto Scram Channel failure)

Cause: Mode Selector Switch (MSS) contacts do not make up, MSS remains in "Run", 'B' RPS Channel does not trip

Automatic Actions: Alarms 211 D-1 & E-1 are NOT received

Effects: Manual pushbuttons or ARI will scram the reactor

Time	Position	Applicant's Actions Or Behavior
	URO	• Initiate Scram actions by placing the Mode Selector Switch in Shutdown. • Recognize by reporting that the control rods are not inserting and APRMs are NOT downscale (ATWS)
	CRS	Exit T-100 and enter T-101 based upon scram condition with power greater than 4% (MSS failure) • Direct that Manual Scram Pushbuttons be pressed or ARI be initiated
CT	URO	• Press Manual Scram pushbuttons or press ARI manual pushbuttons • Verify and report that the rods inserting and APRMs are downscale
	CRS	• Verify URO/PRO Scram Actions completed • Direct that level be maintained +5 to +35 inches • Direct the restoration of drywell instrument nitrogen • Direct a depressurization
	URO	Control level +5 to +35 inches after initial transient.
	PRO	Performs Scram actions • Verify house loads transferred • Verify main turbine tripped and generator locked out • Attempt to restore Drywell instrument nitrogen (SEE EVENT #8) • Initiate a depressurization (if time allows – RPV is depressurizing slowly through the break)

Event Description: Only 2 SRVs Operate On Emergency Blowdown/Depressurization Via Alternate Methods

Cause: Drywell nitrogen not available and some SRVs with mechanical failures

Automatic Actions: None

Effects: Only able to open 2 of the required 5 SRVs for the Emergency Blowdown, required to depressurize via alternate methods

Time	Position	Applicant's Actions Or Behavior
	PRO	Recognize by reporting that while attempting to restore DW instrument nitrogen, the valves will not reopen
CT	CRS	• Direct alternate methods of supplying nitrogen to the SRVs • Determine that release rates are going to reach General Emergency level by plant indications or outside reports. • Emergency depressurize the reactor using T-112, 'Emergency Blowdown" ◆ Direct URO to control condensate injection ◆ Direct PRO to open all ADS SRVs
	URO	Prevent uncontrolled condensate injection
	PRO	• Take the switches to open on all ADS valves • Recognize that 5 ADS valves will not open, inform CRS
	CRS	Direct additional SRVs to be opened until 5 are open
	PRO	• Attempt to open SRVs until 5 are open • Recognize by reporting that only 2 SRVs can be opened
	CRS	Direct depressurization using alternate means, such as: • Main Steam Line Drains • HPCI Steam Line Drains • RCIC Steam Line Drains • Others from Step EB-17 of T-112.

TERMINATION - Scenario may be terminated when alternate depressurization is initiated.

POST SCENARIO EMERGENCY CLASSIFICATION:
Classify this condition as a General Emergency (RG1)