DRAFT SAME AS FINAL

DRAFT
Part c operating

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#1)

GENERAL REQUIREMENTS

- Recorders will be rolled prior to the scenario and paper from selected recorders will be retained for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be in their normal storage places.
- All markable procedures, boards, etc. will be erased.
- All paper used by the crew will be retained for the examination team as requested.
- The simulator operators will keep a log of all communications during the scenario as requested by the examination team.

SCENARIO SOURCE HISTORY

- New

INITIAL SETUP

Initial Conditions

IC-14, 100% Power

Ensure recorder power is on, roll recorders as required.

Blocking Tags

Tag the Unit 2 HPCI:

- HPCI Aux Oil Pump to "PTL".

Activate APP "NRC2001#1", or insert the following:

Event Triggers

TRG1 E1 REACTOR_MODE_SWITCH_IN_SHUTDOWN (ZYPØ2A4SØ1 == 1)
TRG2 E2 MAIN_TURBINE_VIBRATION_GT_3 (TUVIB(9) > 3)
TRG3 E3 RHR_A_PUMP_RED_LIGHT_ON (ZLORH032AP35_2==TRUE)

Malfunctions

Malfunctions:

IMF RRS2Ø 5: ØØ Ø.3 1Ø:ØØ, "RECIRC LOOP RUPTURE ON A 5 MINUTE DELAY AT 0.3% SEVERITY WITH A 10 MINUTE RAMP ON ET 1.
IMF MAPØ6E, "13.2 KV #12 BKR" ON ET 2.
IMF MAPØ6F, "13.2 KV #22 BKR" ON ET 2.
IMF MAPØ6D, "13.2 KV # 2 BKR" ON ET 2.
IMF RCI04, "RCIC FLOW CONTROLLER AUTO CIRCUIT FAILS LOW" ON ET1.
IMF VED01_46, " MO-10-16A Magnetic Overcurrent Trip" on ET3.

Overrides:

IOR ZLOHPØ4BAUXOILP_1 OFF, AUX OIL PUMP (GREEN)
IOR ZLOHPØ4BAUXOILP_2 OFF, AUX OIL PUMP (RED)
IOR AN02Ø9LA2 ALARM_ON ON ET2.

Trip Overrides

None

Turnover Procedures

GP-5, "Power Operations needs to be available and marked up complete through step 3.3.5 with step 3.3.5 marked as N/A.

SIMULATOR MACHINE OPERATOR DIRECTIONS

EVENT 1 -- Support the crew for placing the A RBCCW pump in service.

When directed, report that the unit 2A RBCCW suction block valve (HV-2-35-24200A) and the discharge block valve (HV-2-25-24203A) are open.

When directed, report that there is proper oil level in the reservoir.

When directed, report that the 2A RBCCW pump is vented.

EVENT 2 -- Support crew for GP-5 power reduction.

EVENT 3 -- *****NOTE - NEEDS TO BE DONE BEFORE 93% POWER.*****

IMF CRHØ3A, "CRD HYDRAULIC PUMP A TRIP".

If an Equipment Operator is dispatched to inspect the 2A CRD circuit breaker, report that the breaker tripped on instantaneous overcurrent.

If an Equipment Operator is dispatched to inspect the 2A CRD pump, report that there are no indications of abnormalities at the pump.

When asked to perform pre-startup checks for the 2B CRD pump and Charging Header pressure drops below 940#, report that steps 4.1.1. through 4.1.5 are complete IAW SO 3.1.B-1, "CRDH System Startup With The System Filled and Vented."

When asked to slowly open HV-2-3-36B, modify the remote function as follows **MRF CRHØ1 OPEN** and then report that HV-2-3-36B is open.

EVENT 4 -- **IMF MCSØ5A**, "CONDENSATE PUMP A TRIP".

If an Equipment Operator is dispatched to inspect the 2A Condensate Pump, circuit breaker, report that the breaker tripped on instantaneous overcurrent.

If an Equipment Operator is dispatched to inspect the 2A Condensate Pump, report that the pump is secured, and the shaft is not rotating.

If an Equipment Operator is sent to the Cable Spreading Room to inspect the Lockout Relay, report that the Lockout Relay is tripped.

EVENT 5 -- Initiate pending events on event trigger E2 and verify:
IMF MAPØ6E, "13.2 KV #12 BKR".
IMF MAPØ6F, "13.2 KV #22 BKR".
IMF MAPØ6D, "13.2 KV #2 BKR".
IOR ANO2Ø9LA2 ALARM_ON, " 2 AUX BUS OVERCURRENT RELAYS".

If an Equipment Operator is dispatched to inspect the #2 Aux Bus, report that the #2 Aux Bus circuit breaker's overcurrent flags are up.

EVENT 6 -- **IMF RRS2Ø Ø.3 1Ø:ØØ**, "RECIRC LOOP RUPTURE AT 0.3% ON A 10 MINUTE RAMP TIME.

If asked, report that DWCW return header pressure is 35 psig.

EVENT 7 -- **IMF RCIØ4,** "RCIC FLOW CONTROLLER AUTO CIRCUIT FAILS LOW".

After the containment is sprayed, and the RCIC Flow Controller is in manual, increase the size of the leak rate as follows:

MMF RRS2Ø 3 1Ø:ØØ, "RECIRC LOOP RUPTURE AT 3% ON A 10 MINUTE RAMP.

EVENT 8 -- If directed to inspect the 2A RHR pump minimum flow valve, report that the valve indicates closed.

If directed to open the 2A RHR minimum flow valve, report that the valve is stuck.

TERMINATION --The scenario may be terminated after RPV depressurization and RPV water level is restored.

SHIFT TURNOVER

PLANT CONDITIONS:

Unit 2 is at 100% power.

INOPERABLE EQUIPMENT/LCOs:

HPCI is out of service for a failed HPCI Aux. Oil Pump Contactor that was discovered last shift.

Presently 4 hours into LCO 3.5.1. No time estimate for return to service.

SCHEDULED EVOLUTIONS:

1. The 2A RBCCW pump needs to be placed in service and the 2B RBCCW secured due to excessive leakage around the pump shaft. This needs to be done as soon as turnover is completed.

2. The 2A Condensate Pump needs to be secured because an Equipment Operator discovered that its vibration levels are higher than normal.

SURVEILLANCES DUE THIS SHIFT:

None.

ACTIVE CLEARANCES:

HPCI for a failed HPCI Aux. Oil Pump contactor.

GENERAL INFORMATION:

Reduce reactor power to the GP-5 limit to permit the 2A Condensate Pump to be removed for inspection and repair. The power drop is to be conducted using recirculation flow only in accordance with Reactor Engineering guidance. Reactor Engineering is standing by to support the Power Drop.

GP-5 has been completed up to step 3.3.5 to support the power drop. The Power System Director has been informed of the impending power drop.

Scenario Outline

ES-D-1

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

Examiners _____ **Operators** _____ CRS

_____ _____ PRO

_____ _____ URO

Scenario Summary The scenario begins with the reactor at full power and HPCI out of service due to a failed HPCI Aux. Oil Pump Contactor. The crew will swap Reactor Building Closed Cooling Water (RBCCW) Pumps and then lower power IAW GP-5 due to vibration problems with the "A" Condensate Pump. During the power reduction, the "A" CRD pump will trip on overcurrent. This will cause an entry into ON-107, "Loss of CRD Regulating Function". After the "B" CRD pump is placed in service, the "A" Condensate Pump will trip resulting in a Recirc Runback. After the crew responds to the Recirc Runback, a Loss of the # 2 Aux Bus will result in a loss of feedwater. The crew will manually scram the reactor and try to maintain RPV level with RCIC. The RCIC Flow Controller will fail in auto, resulting in the operator swapping to manual control of RCIC. A reactor coolant leak into the Drywell will be greater than the capacity of the RCIC System and require containment sprays. This will cause an entry into T-111, "Level Restoration" and T-102, "Primary Containment Control". When the low pressure ECCS pumps are started, the "A" RHR pump minimum flow valve will fail to open. When RPV level lowers to –172 inches, the crew will perform an Emergency Blowdown IAW T-112.

Initial Condition IC-14, 100% Power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1		N	URO PRO CRS	Swap Reactor Building Closed Cooling Water (RBCCW) Pumps
2		R	URO CRS PRO	Power Reduction with Recirculation Flow
3	CRH03A	C	URO PRO CRS	Trip of the "A" CRD Pump (Tech. Spec.)
4	MCS05A	C	URO PRO CRS	Trip of the "A" Condensate Pump
5	MAP06E MAP06F MAP06D	M	URO PRO CRS	Loss of the #2 Auxiliary Electrical Bus
6	RRS20	M	URO PRO CRS	Reactor Coolant Leak into the Primary Containment
7	RCI04	I	URO PRO CRS	Failure of the RCIC Flow Controller in Auto
8	Instructor Override	I	URO PRO CRS	"A" RHR Pump Minimum Flow Valve Failure

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

Op Test No.: **Scenario No.:** **#1** **Event No.:** **1** **Page** **1of 12**

Event Description: **Placing the Standby RBCCW Pump in Service.**

Cause: Excessive leakage around pump shaft.

Effects: None

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct the crew to place the 2A RBCCW pump in service in accordance with SO 35.6.A-2, "PLACING STANDBY REACTOR BUILDING CLOSED COOLING WATER PUMP IN SERVICE".
	PRO	Direct an equipment operator to perform steps 4.1.1, 4.1.2, and 4.1.3 of SO 35.6.A-2, "PLACING STANDBY REACTOR BUILDING CLOSED COOLING WATER PUMP IN SERVICE". 4.1.1 Verify suction and discharge block valves are open for the standby pump. 4.1.2 Verify proper oil level in reservoirs. 4.1.3 Vent the standby RBCCW pump.
	PRO	Start the 2A RBCCW pump. Verify RBCCW pressure on PI-2350 rises slightly. Trip the 2B RBCCW pump by placing control switch to off. Report to the CRS that the 2A RBCCW pump is in service.
	CRS	Direct that SO 25.8.A-2, "REACTOR BUILDING CLOSED COOLING WATER SYSTEM ROUTINE INSPECTION" be performed.

Op Test No.: **Scenario No.:** **#1** **Event No.:** **2** **Page 2 of 12**

Event Description: **GP-5 power reduction to support securing the "A" Condensate Pump.**

Cause: N/A

Effects: Reactor Power lowers

Time	Position	Applicant's Actions Or Behavior
	CRS	Review GP-5, "Power Operations", and prerequisites.
		Determine that recommended plant power level is < 80% total feedwater flow in accordance with GP-5, Table I.
	URO	Lower reactor power in accordance with GP-5, section 3.3.
	PRO	Monitor plant opertion during power change. Maintain the manual/automatic voltage regulator balanced.

Op Test No.: Scenario No.: #1 Event No.: 3 Page 3 of 12

Event Description: Trip of the "A" CRD Pump

Cause: Circuit breaker trips due to a phase-to-phase short.

Automatic Actions: Alarm 211 F-1, "CRD Water Pump Trip Alarm"
Alarm 211 F-2, "CRD Water Pump OVLD".

Effects: Cooling water, drive water, and motor amps decrease. CRD temperatures rise due to loss of cooling water flow. As accumulator pressure lowers, Accumulator Trouble lights on the Full Core Display will radomly illuminate.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Acknowledge annunciators 211 F-1, "CRD WATER PUMP TRIP ALARM" and 211 F-2, "CRD WATER PUMP OVLD" alarm.
	CRS	Enter and execute ON-107, "Loss of CRD Regulating Function".
		Direct the "B" CRD pump be placed in service per SO 3.1.B-2, "Control Rod Drive Hydraulic System Startup With the System Filled and Vented".
		Ensure compliance with Tech Specs 3.1.5.
		Brief that when Charging Header Pressure is less than 940 psig, and 2 or more CRD accumulator trouble indicators are lit on withdrawn control rods, then charging header pressure be restored to ≥ 940 psig within 20 minutes, or enter T-100, "Reactor Scram".
	URO	Place pump control switch to "STOP".
		Dispatch an equipment operator to check the status of the 2A CRD circuit breaker.
		Dispatch another equipment operator to check out the 2A CRD pump., and to also perform pre-startup checks of the 2B CRD pump IAW SO 3.1.B-2, step 4.1.
		Verify CRD flow valve controller in "MANUAL" and the Flow Control Valve is closed.

URO Open the MO-2-3-20, "Drive Water Pressure" valve.

Verify recirc pump seal purge is isolated by verifying closed MO-2-2A-8029 A and B.

Start the 2B CRD pump.

After CRD flow stabilizes, direct the equipment operator to slowly open HV-2-3-36B.

Return the CRD flow controller to auto IAW step 4.5 .

Throttle MO-2-3-20 to adjust CRD Drive Water pressure.

URO Restore Recirc Pump Seal Purge IAW SO 2A.1.C-2, "Operation of the Recirculation Pump Seal Purge System".

PRO Monitor Recirc. Pump Seal temperatures as directed.

Op Test No.: **Scenario No.: #1** **Event No.: 4**

Event Description: **Trip of the "A" Condensate Pump.**

Cause: Electrical Fault in motor.

Automatic Actions:
Alarm 203 E-2, "A Condensate Pump BKR Trip"
Alarm 203 E-1, "A Condensate Pump Overload"
Alarm 214 B-3, "A Recirc Flow Limit"
Alarm 214 G-3, "B Recirc Flow Limit"
Recirc pumps run back to 45% speed.

Effects: Reactor power decreases. Causes entry into OT-112, "Unexpected/Unexplained Change in Core Flow".

Time	Position	Applicant's Actions Or Behavior
	PRO URO	Recognize by reporting alarms 203 E-2, "A Condensate Pump BKR Trip" and 203 E-1, "A Condensate Pump Overload". Recognize by reporting alarms 214 B-3, "A Recirc Flow Limit" and 214 G-3, "B Recirc Flow Limit". Verify automatic actions including Recirc Pump 45% Runback and Reactor Feedwater Pump response.
	CRS	Refer to GP-5, "Power Operations" for operation with a condensate pump out of service. Enter and execute OT-112, "Unexpected/Unexplained Change in Core Flow". - Determine position on GP-5-1, Power Flow Operation Map". - Direct that monitoring for T.H.I. be conducted. - Verify recirc jet pump loop flows are within limits.
	PRO	Dispatch equipment operators to investigate the 2A Condensate pump, the 2A Condensate pump breaker, and the lock-out relay on panel 20C23 in the Cable Spreading Room. Green flag the 2A Condensate Pump control switch.

Op Test No.: **Scenario No.: #1** **Event No.: 5** **Page 6 of 12**

Event Description: **Loss of the #2 Aux Bus**

Cause: Electrical fault on the #2 Aux Bus

Automatic Actions: Loss of the B and C Condensate pumps. Reactor level drops due to loss of high pressure feed.

Effects: The reactor will scram at a vessel level of 1 inch, unless normally scrammed first.

Time	Position	Applicant's Actions Or Behavior
	PRO	Diagnose and report to the CRS that there is a loss of the 2 Aux. Bus.
	URO	Identify that RPV level is rapidly dropping. Inform the CRS that the Mode Switch is being placed in Shutdown.
	CRS	Enter and execute T-100, Reactor Scram. (Note: RPV level will be dropping rapidly due to the loss of high pressure feed. The CRS could exit T-100 quickly and enter T-101, "RPV Control").
	URO	Perform applicable scram actions: - Place the mode switch to shutdown. - Verify control rods are inserting. - Verify APRMs are downscale. - Report that RPV level is dropping, no feedwater pumps are available.
	PRO	Perform applicable scram actions: - Transfer 13 KV house loads (#1 Bus only). - Trip main turbine at approx. 50 MWe. - Verify main generator lockout. - Verify Group II & III isolations and SGTS initiation. - Verify scram discharge volume vents and drains are closed. - Verify HWC isolated. - Verify recirc pumps are tripped. - Monitor Instrument Air header pressure and drywell pressure. - Report to the CRS that Instrument Air header pressure is greater than drywell pressure.

CRS Enter and execute T-101, "RPV Control" on –48 inches RPV level.

For RC/L:

- Direct that RPV level be restored and maintained between +5" and +35" using RCIC.
- Direct that SBLC be started to augment RPV level control, if required.
- Enter T-111, "Level Restoration" when it is determined that RPV level cannot be maintained above –172 inch.

For RC/P:

- Direct that Instrument Nitrogen be restored by performing Instrument Nitrogen Bypass (GP-8E).
- Direct that RPV pressure be stabilized below 1050 psig.

PRO Bypass and restore drywell instrument nitrogen IAW GP-8E.

URO Operate RCIC to try and maintain RPV level.

Trend RPV level and report to the CRS.

URO Start SBLC for RPV level augmentation, if directed.

Trend RPV level and report to the CRS.

Op Test No.: **Scenario No.: #1** **Event No.: 6** **Page 8 of 12**

Event Description: **Reactor Coolant Leak into the Primary Containment**

Cause: A leak develops on a weld joint on the suction piping of the "B" Reactor Recirculation Pump after it tripped. Leak size propagates over time.

Automatic Actions: Initial alarms: 210 F-2, 225 A-4, "Drywell Hi-LO Press".

Effects: Drywell pressures and temperatures will rise at an increasing rate, eventually leading to a high drywell (DW) pressure alarm, ECCS automatic start signals, and PCIS isolation signals. Conditions escalate requiring the use of containment sprays.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Acknowledge and report to the CRS that DW pressure is rising.
	CRS	Enter and execute followup actions of OT-101, "High Drywell Pressure": - If DW pressure reaches 2 psig, then enter T-101, "RPV Control" (Event 4), and T-102, Primary Containment Control" and execute concurrently with OT-101. - Direct that additional DW cooling be placed in service.
	URO PRO	Maximize DW cooling by placing all DW Cooler Fans to RUN.
	CRS	Enter and execute T-102, "Primary Containment Control" when DW pressure reaches 2 psig: For PC/P: - Direct GP-8B, "Manual Isol of RBCCW and DW Chilled Wtr".

CRS - Direct that Torus Sprays be initiated IAW T-203, "Initiation of Torus Sprays Using RHR".

For DW/T:

- Direct that DW cooling be maximized by performing T-223, "DW Cooler Fan Bypass".

- When DW pressure and temperature plot within the safe region of the Drywell Spray Initiation Limit Curve:

  - Direct that DW cooling fans be shut down.
  - Direct that DW sprays be initiated IAW T-204, "Initiation of DW Sprays Using RHR".

For PC/G:

- Direct that CAD be placed in service when time permits.

URO PRO Monitor T-102 parameters (torus temperature, torus level, drywell pressure, torus pressure, drywell temperature) and provide trends to the CRS as appropriate.

Perform GP-8B, "Manual Isol of RBCCW and DW Chilled Wtr".

PRO Spray the torus in accordance with T-203, "Initiation of Torus Sprays Using RHR".

URO Maximize DW Cooling by performing T-223, "DW Cooler Fan Bypass".

Shutdown DW cooling fans when directed.

PRO Spray the drywell in accordance with T-204, "Initiation of DW Sprays Using RHR".

CT

URO PRO Place CAD in service when directed.

Op Test No.: Scenario No.: #1 Event No.: 7 Page 10 of 12

Event Description: **Failure of the RCIC Flow Controller in Auto**

Cause: Auto output of controller fails to zero.

Automatic Actions: Alarm 222 B-1, "RCIC LO FLOW"

Effects: Turbine governor control valve closes, causing RCIC flow, discharge pressure, speed and exhaust pressure to lower to the minimum setpoint of the controller. The RCIC Flow Controller is available in the manual mode.

Time	Position	Applicant's Actions Or Behavior
	PRO URO	Acknowledges alarm 222 B-1, "RCIC LO FLOW" and reports this to the CRS. Diagnoses that the RCIC flow controller has "failed low" in the automatic mode. Places the RCIC Flow Controller to manual and re-injects into the RPV.
	URO PRO	Monitor RPV level, and report to the CRS that RPV level is continuing to lower.
	CRS	Exit the RC/L leg of T-101, "RPV Control", and enter/execute T-111, "Level Restoration": - Direct that ADS be inhibited. - Direct that Core Spray and LPCI pumps be started. - When RPV level drops to –172 inches, direct that T-112, "Emergency Blowdown" be performed. For T-112, "Emergency Blowdown": - Direct that 5 ADS SRVs be opened. After T-112, direct that RPV injection be maximized with all systems, subsystems, and alternate subsystems.

	CRS	After it is determined that RPV level can be maintained above –172 inches, exit T-111 and enter T-101, RPV Control at step RC/L-1.
		Direct that RPV level be restored to +5" to +35".
	PRO URO	Inhibit ADS when directed.
		Start all available Core Spray and LPCI pumps when directed.
CT		Open the 5 ADS SRVs when directed.
CT		Maximize injection with all systems, subsystems, and alternate subsystems.

Operator Actions

Op Test No.: **Scenario No.: #1** **Event No.: 8**

Event Description: **"A" RHR Pump Minimum Flow Valve Valve Failure**

Cause: Magnetic overcurrent trip.

Automatic Actions: None.

Effects:

Time	Position	Applicant's Actions Or Behavior
	PRO	Observes that the indication for MO-2-10-016A, "2A RHR Min Flow Valve", indicates that the valve failed closed.
		Reports this to the CRS
	CRS	Determines that with all four Core Spray pumps, and three other operating RHR pumps, that the 2A RHR pump can be secured.
		Directs the PRO to secure the 2A RHR pump.
	PRO	Secures the 2A RHR pump.

TERMINATION CRITERIA: The scenario may be terminated when 5 SRVS are open, the RPV is depressurized, and RPV level is under control.

POST SCENARIO EMERGENCY CLASSIFICATION:

Classification is a Site Area Emergency per EAL 3.2, Fission Product Barrier Status.

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#2)

GENERAL REQUIREMENTS

- Recorders will be rolled prior to the scenario and paper from selected recorders will be retained for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be in their normal storage places.
- All markable procedures, boards, etc. will be erased.
- All paper used by the crew will be retained for the examination team as requested.
- The simulator operators will keep a log of all communications during the scenario as requested by the examination team.

SCENARIO SOURCE HISTORY

- New

INITIAL SETUP

Initial Conditions

- IC- 67, 70% Power (IC-20 lowered to 70% with recirc.)
- Ensure recorder power is on, roll recorders as required
- Verify the 'A' Hotwell Level Controller is selected for service.

Blocking Tags

- RHR Loop "A" blocked.

Malfunctions:

**** Verify that the "A" Hotwell Level Controller is in service. ****

The following malfunctions are for the "A" RHR loop equipment block:

IMF RHRØ1A, Pump Trip for equipment blocking.
IMF RHRØ1C, Pump Trip for equipment blocking
IMF VEDØ1_39 MO-10-31A, Magnetic Overcurrent for equipment blocking
IMF VEDØ1_40 MO-10-26A ,Magnetic Overcurrent for equipment blocking
IMF VEDØ1_42 MO-10-154A ,Magnetic Overcurrent for equipment blocking
IMF VEDØ1_43 MO-10-38A ,Magnetic Overcurrent for equipment blocking
IMF VEDØ1_44 MO-10-39A ,Magnetic Overcurrent for equipment blocking
IMF VEDØ1_46 MO-10-16A ,Magnetic Overcurrent for equipment blocking
IMF VEDØ1_47 MO-10-16C ,Magnetic Overcurrent for equipment blocking

The following malfunction is for the preexisting failure of the "C" SRV:

IMF MSSØ8C Ø, Reactor Pressure Relief Valve Failure.

Overrides:

The following overrides are for the "A" RHR Loop equipment block:

IOR ZLORHØ3MO1Ø13A_2 OFF Torus Suction MO-10-13A Red Light OFF
IOR ZLORHØ3MO1Ø13C_2 OFF Torus Suction MO-10-13C Red Light OFF
IOR ZLORHØ3MO1Ø15A_1 OFF Recirc Suction MO-10-15A Green Light OFF
IOR ZLORHØ3MO1Ø15C_1 OFF Recirc Suction MO-10-15C Green Light OFF
IOR ZLORHØ3MO1Ø34A_1 OFF Full Flow Test MO-10-34A Green Light OFF
IOR ZLORHØ3MO1Ø25A_1 OFF MO-10-25A Green Light OFF
IOR ZLORHØ3MO1Ø25A_2 OFF MO-10-25A Red Light OFF
IOR ZLORHGRPMO1Ø34A_1 OFF MO-10-34A Green Light OFF
IOR ZLORHØ32AP35_1 OFF, 2A RHR Pump Green Light OFF
IOR ZLORHØ32CP35_1 OFF, 2C RHR Pump Green Light OFF
IOR ZYP12A1S36 STOP 2A RHR Pump Control Switch in STOP
IOR ZYP12A1S47 STOP 2C RHR Pump Control Switch in STOP

IOR ZYP12A3S23 CLOSE, Prevents Containment Sprays in instrument failure.

IOR ZYP12A3S19 OFF, Prevents Containment Sprays in instrument failure.

IOR ANO2Ø3BB3 ALARM_OFF, Simulates instrument failure by lack of receipt of alarm 225 B-3 "SYSTEM II DRYWELL PRESSURE PERMIT CONTAINMENT SPRAY"

IOR ANO2ØRB5 ALARM_OFF

Trip Overrides:

Enter the following Batch File: B_RPS_A_ARI_OVRD

or enter the following trip overrides individually:

MRF RPSØ3TO OVERRIDE
MRF RPSØ4TO OVERRIDE
MRF RPSØ6TO OVERRIDE
MRFARIØ1TO OVERRIDE

Turnover Procedures

RT-O-001-400-2 completed through Step 6.1.3 (Scram Margin 21%).

Provide GP-2 copy completed through Step 6.3.48.

SIMULATOR MACHINE OPERATOR DIRECTIONS

EVENT 1 -- Support crew for Main Turbine Stop Valve Routine Test.

EVENT 2 -- Insert Malfunction "**IMF MCSØ3A**" to fail the "A" Hotwell level controller. Troubleshoot when requested with no time estimate for repair.

EVENT 3 -- Insert malfunction "**IMF MSSØ8A 4Ø**", Reactor Pressure Relief Valve A Failure, to fail the "A" SRV at 40% open.

Isolate B loop RHR stayfull when requested by entering "MRF **RHRØ2B CLOSE**".

Provide support to pull SRV Fuses as requested, by entering "**MRF ADSØ2A REMOVE**". Perform this only after Event 4 is in progress. Contact the Control Room and inform them that you have removed the fuses for the "A" SRV. Also, **delete malfunction MSSØ8A** after the fuses have been removed.

EVENT 4 – Support the crew for GP-9, Fast Power Reduction. Role play as the Power System Director when called.

EVENT 5 -- After the SRV fuses have been pulled and the GP-9 power reduction is in progress, insert malfunction "**IMF MSSØ1 1Ø 5:00"**, Steam Leakage Inside the Primary Containment, to cause a 10% steam leak at the SRV flange on a 5 minute ramp rate.

When asked, report that all Drywell Chillers are fully loaded.

When asked, report that DWCW pressure is 35 psig.

NOTE: **Do not permit the operators to utilize the Individual Scram Test Switches on the RPS panels when performing T-213 "Scram Solenoid Deenergization." When the candidate opens the panel, inform him that the individual scram switches are all in the down position.**

EVENT 6 -- When directed, provide support for T-213 as an Equipment Operator.

When directed, provide support for T-214 as an Equipment Operator.

When directed, provide support for T-220 as an Equipment Operator. After a suitable delay time, enter "**MRF T22Ø_2 CLOSE**" and report to the Control Room that HV-2-3-56 is closed.

When directed to perform T-221-2, wait 10 minutes and then **MRF T221_1 DEFEAT.** Report T-221-2, step 4.1 complete to the control room.

When directed, provide support for T-240 as an Equipment Operator. (ECCS Stayfull).

EVENT 7 -- Pre-inserted instrument failure will result in the inability of the crew to spray the Torus or the Drywell as evidenced by the lack of 225 B-3, "System II Drywell Pressure Permit Containment Spray".

After the crew attempts drywell sprays, then **MMF MSS01 40** to raise the severity of the steam leak.

EVENT 8 -- When directed, provide support for T-240 as an Equipment Operator. (ECCS Stayfull).

When RPV pressure is 200 psig, insert malfunction "**IMF CRHØ7 1ØØ 3Ø**". "Loss of Air Pressure To CRD HCU", and report to the Control Room as an Equipment Operator that you have successfully completed T-214.

TERMINATION -- The scenario may be terminated when 5 SRVS are open, the RPV is depressurized, and RPV level is under control.

SHIFT TURNOVER

PLANT CONDITIONS:

- Approximately 70% power with a GP-2 Startup in progress.
- GP-2 is complete through step 6.3.48.
- REs are currently evaluating the rod pattern and will contact you with directions.
- A routine Diesel Fuel Oil delivery is expected this shift.

INOPERABLE EQUIPMENT/LCOs:

- The "A" loop of RHR is out of service due to work on RHR valve MO-2-10-154A, "Outboard Discharge", 3 hours into LCO 3.5.1, expected return to service in 1 day.

SCHEDULED EVOLUTIONS:

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

ACTIVE CLEARANCES:

- "A" loop of RHR.

GENERAL INFORMATION:

- Complete the Main Turbine Stop Valve RT.

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 70% power. The crew will perform a Main Turbine Stop Valve Routine Test while at power. The crew should then recognize the high hotwell level and take action to control it. After hotwell level is restored, the "A" SRV will inadvertently open, causing the crew to enter OT-114, "Inadvertent Opening of a Relief Valve". Power will be reduced in accordance with GP-9-2, "Fast Power Reduction". The crew will have success in closing the "A" SRV by directing floor operators to pull fuses for the valve. A small steam leak inside the primary containment will occur. The crew will take actions in accordance with OT-101, "High Drywell Pressure". When the reactor is scrammed, an electric ATWS will occur. The crew will enter T-101, "RPV Control", and T-117, "Level/Power Control". The crew will also enter T-102, "Primary Containment Control" due to high drywell pressure. After diagnosing the inability to spray the containment due to an instrument failure, the crew will perform T-112, "Emergency Blowdown". One ADS SRV will fail to open, requiring the opening of another SRV. T-214, " Isolating and Venting the Scram Air Header", will result in rod insertion.

Initial Condition IC-67, 70% 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	MCSØ3	I	URO PRO CRS	Hotwell Level Transmitter Fails Low
3	MSSØ8A	C	URO PRO CRS	SRV "A" inadvertently opens. (Tech. Spec.)
4		R	URO PRO CRS	Perform a Fast Power Reduction
5	MSSØ1	M	URO PRO CRS	Steam leak in the primary containment
6	Pre-inserted Batch File	M	URO PRO CRS	Anticipated Transient Without Scram (Electric)
7	Pre-inserted Instrument Failure	I	PRO CRS	Pressure instrument failure prevents using containment sprays
8	MSSØ8C	C	URO PRO CRS	"C" SRV fails to open

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

Op Test No.: **Scenario No.:** **# 2** **Event No.: 1** **Page 1 of 10**

Event Description: **Perform the Main Turbine Stop Valve Routine Test.**

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct the PRO to perform RT-O-001-400-2, "Individual Full Closure of Main Turbine Stop Valves".
	PRO	Perform RT-O-001-400-2, "Individual Full Closure of Main Turbine Stop Valves". - Review RT. - Inform the Unit Reactor Operator that the test is going to be conducted and what indications can he expect to receive (this may be covered during a CRS briefing). - Place the CV/SV Test Selector Test to SV TEST. - Verify the lights on all four MSV test buttons are ON. - Place the Back-up EHC pump in RUN. - Record Back-up EHC pump number. - For each Main Turbine Stop Valve: a. DEPRESS and HOLD the Test Pushbutton. b. VERIFY Main Stop Valve position indicator moves smoothly at low speed to less than 10% open and then fast closes the remainder of valve travel. c. AFTER 2 to 3 seconds at full CLOSE, RELEASE the Pushbutton. d. VERIFY Main Stop Valve position indicator moves smoothly from 0% to 100% OPEN. - Place the CV/SV Test Selector switch to OFF. - Verify the lights on all four MSV test buttons are off. - Place Backup EHC pump to STOP. - Place Backup EHC pump in AUTO.
	URO	Monitor plant parameters/assist as directed.

Op Test No.: Scenario No.: # 2 Event No.: 2 Page 2 of 10

Event Description: Hotwell Level Transmitter Fails Low.

Cause: Level transmitter open circuit.

Initial Automatic Action(s): Course and fine makeup valves open, high level alarm ARC 203 E-3, F-3 and G-3.

Effects : If failed instrument is selected for control, then indicated level goes down, actual level goes up. If allowed to go high enough, a degradation of main condenser vacuum will occur.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize/take actions IAW ARC 203 E-3, F-3 and G-3. Also, inform the CRS. - Recognize one level indicator failed low and the remaining two are rising. - Recognize that the course and fine makeup valves are open, and inform the CRS.
	CRS	- Direct restoration of Hotwell level. - Direct selection of operable level transmitter for Hotwell level control or manual control. - Direct troubleshooting.
	URO PRO	- Restore and maintain hotwell levels to normal by selecting hotwell level control to an operable transmitter, or by taking manual control of the course and fine makeup valves (CV-2086A & B and CV-2087A & B).
	URO PRO	Monitor plant parameters/assist as necessary.

Op Test No.: **Scenario No.: # 2** **Event No.: 3** **Page 3 of 10**

Event Description: **SRV "A" inadvertently opens.**

Cause: Mechanical failure of relief valve pilot.

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.

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 the "B" loop of RHR be placed in Torus Cooling. - Direct attempts to close the "A" SRV.
	URO PRO	Confirm that the "A" SRV is open IAW OT-114.
	PRO	Place the "B" loop of 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 "A" SRV control switch when directed by the CRS.
	URO	Perform a Fast Power Reduction IAW GP-9-2 when directed by the CRS (See details in Event 4).
	URO PRO	Coordinate removal of fuses by Equipment Operators and monitor valve status during attempts to close the "A" SRV. Communicate to the CRS that the "A" SRV has closed.
	CRS	Declare the SRV Inoperable AND verify compliance with Tech Spec 3.4.3 – adequate SRVs available, AND 3.5.1. – 72 hrs. based on an RHR loop also out of service.

Op Test No.: **Scenario No.: #2 Event No.: 4**

Event Description: **Fast Power Reduction.**

Cause: Directed from OT-114, "Inadvertent Opening of a Relief Valve".

Automatic Actions: None.

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct a Fast Power Reduction until recirculation flow is reduced to approximately 51.25 Mlbs/hr.
	URO	Perform a Fast Power Reduction until recirculation flow is reduced to approximately 51.25 Mlbs/hr. - Insert Table I Rods full in. - Reduce Recirculation Flow to 51.25 Mlbs/hr. (May not get to the point of lowering recirc. flow.)
	PRO	Maintain the Main Generator Auto-Manual Regulator Balanced (when it alarms). Notify the Power System Director of the required power change.

Op Test No.: **Scenario No.: # 2** **Event No.: 5** **Page 5 of 10**

Event Description: **Steam leak in the primary containment.**

Cause: Steam leak at SRV "A" Mounting Boss. Steam cutting at break increases size of leak.

Automatic Actions: Initial Alarms: 210 F-2, 225 A-4, "DRYWELL HI-LO PRESS".

Effects: Drywell pressures and temperatures will rise at an increasing rate, eventually leading to a high drywell pressure alarm and scram if not scrammed manually. ECCS automatic start signals and PCIS isolation signals will be received. Conditions escalate requiring containment sprays.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize Drywell pressure rising. Communicate to the CRS as an OT-101, "High Drywell Pressure" Entry Condition.
	CRS	Enter/direct followup actions IAW OT-101: - Direct that if DW pressure cannot be maintained below 1.2 psig, then perform a GP-4, "Manual Scram". - Direct placing additional drywell cooling in service as necessary. - Direct terminating DW Inerting. - Direct isolation of potential leak sources.
	URO	Take Scram Actions when directed. - Place the Mode Switch to Shutdown. - Verify Rods are inserting. Report to the CRS that there is an ATWS, with Reactor Power > 4%. (T-101 Entry).
	PRO	Transfer House Loads and take Scram Actions when Scram attempt occurs. Verify the following: - House loads transferred. - Main Turbine Tripped (when < 50 MWE). - Main Generator Locked out (when tripped). - Group II & III isolations. - SBGT initiated. - HWC isolated. - Investigate sources of DW leakage.

URO PRO Recognize DW pressure/temperature are continuing to rise.

Recognize and report 2 psig in the Drywell as a T-101 AND T-102 Entry Condition.

Verify and take action for 2# automatic initiations and isolations. (HPCI initiation, Diesel Generator auto start, Group II/III isolations).

CRS Enter/direct actions for T-101, RPV Control:

Direct actions for the ATWS condition (see Event 6 for details):

- Verify URO/PRO Scram Actions.
- Direct DW Instrument Nitrogen be restored.
- Direct that RPV pressure be stabilized below 1050 psig.

PRO Bypass and restore DW Instrument Nitrogen.
Stablize RPV pressure below 1050 psig.

CRS Enter/direct actions for T-102, Primary Containment Control:

- Monitor Primary Containment Conditions.
- Direct manual isolation of RBCCW and DW Chilled Water using GP-8B.
- Direct restoration of DW cooling per T-223, "Drywell Cooler Fan Bypass".
- Direct Torus Sprays with the "B" loop of RHR IAW T-204.

Op Test No.: **Scenario No.: #2** **Event No.: 6** **Page 7 of 10**

Event Description: **Anticipated Transient Without Scram**

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 Level/Power Control.

Time	Position	Applicant's Actions Or Behavior
	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". - T-220, "Drive Rods". - Enter T-117, "Level/Power Control".
	URO	Performs T-101, RC/Q actions: - 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.
	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 except for RCIC.
CT		
	PRO	Performs T-117 actions: - Inhibits ADS. - Directs Equipment Operator to perform T-221. - Performs T-240 except for RCIC. Controls RPV level below –60" and within the specific RPV level band directed by the CRS.
CT		

Op Test No.: **Scenario No.: #2** **Event No.: 7** **Page 8 of 10**

Event Description: **Pressure instrument failure prevents using containment sprays.**

Cause: Drywell pressure input to spray logic permissive not functioning.

Automatic Actions: Alarm 225 B-3, "SYSTEM II DRYWELL PRESSURE PERMIT CONTAINMENT SPRAY" is NOT received.

Effects: Prevents Containment Spray

Time	Position	Applicant's Actions Or Behavior
	PRO	While attempting to initiate Torus Sprays, recognizes the inability to throttle MO-38B to obtain 9000 gpm. Also recognizes the lack of alarm 225 B-3, "SYSTEM II DRYWELL PRESSURE PERMIT CONTAINMENT SPRAY". Reports this to the CRS.
	CRS	Recognizes the inability to maintain drywell bulk average temperature less than 281 F.

Op Test No.: **Scenario No.: #2** **Event No.: 8** **Page 9 of 10**

Event Description: **"C" SRV fails to open.**

Cause: Valve is stuck on its main seat.

Automatic Actions: None

Effects:

Time	Position	Applicant's Actions Or Behavior
	CRS	Directs the PRO to terminate and prevent RPV injection using T-240 except for RCIC.
		Verifies that Torus level is above 7 feet.
		Verifies that RPV pressure is 50 psig or more above torus pressure.
CT		Directs the PRO to open all ADS SRVs with the exception of SRV "A". Directs another non-ADS SRV be opened for a total of five.
	PRO	Performs T-240 when directed.
CT	PRO	Places required SRV control switches to the open position. Recognizes that the "C " SRV fails to open, and reports this to the CRS.
	CRS	Directs the PRO to open another SRV, so that a total of 5 SRVs are open.
	PRO	Opens another SRV, reports to the CRS that 5 SRVs are open.
	CRS	Directs the PRO that when RPV pressure drops below 250 psig, to slowly raise RPV injection rate to restore and maintain RPV level above –195 inches.
	URO	Observes control rods inserting into the core and reports to the CRS when all rods are fully inserted.
	CRS	Exits T-117, and enters T-101 at step RC/L-1.

CRS Directs that RPV level be restored and maintained between +5 inches and + 35 inches.

TERMINATION CRITERIA: The scenario may be terminated when 5 SRVS are open and RPV level is under control.

POST SCENARIO EMERGENCY CLASSIFICATION:

If RPV level remains greater than –200 inches, classification is a Site Area Emergency per EAL 2.2.3.

If RPV level drops below –200 inches, classification is a General Emergency per EAL 2.2.4.

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#3)

GENERAL REQUIREMENTS

- Recorders will be rolled prior to the scenario and paper from selected recorders will be retained for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be in their normal storage places.
- All markable procedures, boards, etc. will be erased.
- All paper used by the crew will be retained for the examination team as requested.
- The simulator operators will keep a log of all communications during the scenario as requested by the examination team.

SCENARIO SOURCE HISTORY

New

INITIAL SETUP

Initial Conditions

- IC- 14, 100% Power
- Ensure recorder power is on, roll recorders as required

Blocking Tags

- Tag the Unit 2 HPCI:

  - HPCI Aux Oil Pump to "PTL".

Malfunctions

Activate APP "NRC2001#3", or insert the following:

Event Trigger:

TRG E1 REACTOR_MODE_SWITCH_IN_SHUTDOWN (ZYPØ2A4SØ1 == 1)

Malfunctions:

IMF CRHØ1B, "CRD FLOW CONTROL VALVE B FAILURE".
IMF RWCØ6 (E1 2:ØØ Ø) 5 15:ØØ, "RWCU INLET PIPING RUPTURE" ON A 2 MINUTE DELAY TIME, WITH A SEVERITY OF 5% AND A RAMP RATE OF 15 MINUTES.

OVERRIDES:

IOR ZLOHPØ4BAUXOILP_1 OFF, AUX OIL PUMP (GREEN)
IOR ZLOHPØ4BAUXOILP_2 OFF, AUX OIL PUMP (RED)
IOR ZYPØ1A6A1S17 ASIS, "RAISE PUSHBITTON FOR THE BYPASS JACK"
IOR ZYPØ3A2S52 OPEN, "RWCU Bottom Head Drain Valve MO-12-58"

Trip Overrides

None

Turnover Procedures

None

SIMULATOR MACHINE OPERATOR DIRECTIONS

EVENT 1 -- When the crew assumes the shift, call as the Reactor Building Equipment Operator and indicate that you are ready for the CRD FCV swap.

EVENT 2 -- Support crew requests for troubleshooting. The cause for the failure is in the valve positioner, and it's too early for time estimates to repair.
Support crew to swap back to the "A" FCV when requested.

EVENT 3 -- Insert malfunction **IMF CARØ2A**, "SJAE Steam Supply Valve A Fails Closed". If asked, report as an Equipment Operator that the "A" SJAE steam supply valve has a broken air line at the air regulator and cannot be opened.

EVENT 4 – Support the crew for GP-9, Fast Power Reduction. Role play as the Power System Director when called.

EVENT 5 -- Insert malfunction **IMF VACØ3J**, "480 VAC MCC E-124-R-C Fault".

If directed to investigate the E-124 Load Center, report that the E-124-R-C Feeder Breaker is tripped.

If directed to "green flag" the E-124-R-C feeder breaker, report that the breaker is green flagged. Enter malfunction "IOR ANO226AF1 ALARM_OFF".

If directed to investigate the E-124-R-C MCC, report that no breakers are tripped.

If directed to investigate annunciators caused by the power failure, respond as appropriate.

EVENT 6 -- Insert the following malfunctions:

IMF MTAØ1B 1ØØ 1Ø:ØØ, Main Turbine Bearing B High Temperature.
IMF MTAØ2B 1ØØ 1Ø:ØØ, Main Turbine Bearing B High Vibration.
IMF MTAØ2C 1ØØ 1Ø:ØØ, Main Turbine Bearing C High Vibration.

If directed to investigate the main turbine, wait 5 minutes and when bearing #2 is above 225 degrees F, report that there is no oil flow to the #2 bearing.

EVENT 7 -- Ensure malfunction **IMF RWCØ6 (E1 2:00 0) 5 15:** ØØ, "RWCU Inlet Piping Rupture" activates.

After T-101 is entered from step SCC-9 of T-103, raise the severity of **RWCØ6 to 2Ø% with a 1Ø minute ramp time.**

EVENT 8 -- Role play as plant staff if asked to investigate why the Bypass Valves will not open on the Manual Jack.

TERMINATION -- The scenario may be terminated when 5 SRVS are open, the RPV is depressurized, and RPV level is under control.

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit 2 at 100% Power.

INOPERABLE EQUIPMENT/LCOs:

- Unit 2 HPCI – Day 3 of TSA for a failed HPCI Aux. Oil Pump contactor.

SCHEDULED EVOLUTIONS:

- None

SURVEILLANCES DUE THIS SHIFT:

- Maintenance has requested that the CRD Flow Control Valves be swapped. The Reactor Building Equipment Operator is going to the CRD Flow Control Station with a copy of SO 3.6.D-2, "CRDH System Flow Control Valve Swapping", and will call you when he gets there.

ACTIVE CLEARANCES:

- HPCI for a failed Aux. Oil Pump Contactor

GENERAL INFORMATION:

- Maintain current power.

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 full power. The crew will then swap CRD Flow Control Valves and recognize and respond to the flow control valve failure. Upon successful return to the original Flow Control Valve, the crew will respond to a loss of main condenser vacuum. The crew should recognize the failure of the in service Steam Jet Air Ejector (SJAE), and reduce reactor power in accordance with GP-9-2, "Fast Power Reduction". The crew should transfer to the "B" SJAE to recover vacuum. Following vacuum restoration, an overcurrent trip of E-124-R-C will result in a Technical Specification determination that the reactor must be shutdown. A blockage of turbine lube oil will result in a high temperature and vibration condition for the main turbine. The crew will shutdown the reactor, and trip the main turbine. After the reactor scrams, an unisolable leak will develop in the Reactor Water Cleanup System. This will cause the crew to enter T-103, "Secondary Containment Control". The crew will enter T-112, "Emergency Blowdown," after efforts to isolate the secondary containment leak are unsuccessful.

Initial Condition IC-14, 100% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1		N	URO PRO CRS	Swap CRD Flow Control Valves
2	CRH01B	I	URO PRO CRS	CRD Flow Control Valve Fails open
3	CAR02A	C	URO PRO CRS	SJAE Steam Supply Valve "A" Fails Closed
4		R	URO PRO CRS	Perform a Fast Power Reduction
5	VAC03J	C	URO PRO CRS	Loss of Electrical Power to E-124-R-C (Tech. Spec.)
6	MTA01B MTA02B MTA02C	M	URO PRO CRS	Main Turbine Hi Temperature and Vibration
7	RWC06	M	URO PRO CRS	Reactor Water Cleanup Leak into the Secondary Containment
8	Pre-inserted instrument fault	I	URO PRO CRS	Turbine Bypass Valve Jack Fails To Open Bypass Valves

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

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

Event Description: **Swap CRD Flow Control Valves.**

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct the PRO to coordinate with local operator and swap CRD Flow Control Valves IAW SO 3.6.D-2, "CRDH System Flow Control Valve Swapping".
	URO	Swap CRD FCV IAW SO 3.6.D-2, Section 4.1. - Direct local operator to perform Steps 4.1.1.1 and 4.1.1.2. - Place CRD FCV Controller in "Manual" and adjust to zero. - Direct local operator to place the local flow control station selector switch in the valve "B" position. - NOTE: THE FLOW CONTROLLER CAN BE IDENTIFIED AS FAILED ANY TIME AFTER THE "B" POSITION IS SELECTED. -See Event #2 for failed Flow Control Valve
	PRO	Monitor plant parameters/assist as directed.

Op Test No.: Scenario No.: # 3 Event No.: 2 Page 2 of 10

Event Description: **CRD Flow Control Valve "B" Fails open.**

Cause: Failure in the "B" Flow Control Valve Positioner

Initial Automatic Action(s): Valve goes full open.

Effects : Differential pressure and flow rise, charging header pressure lowers, any rod movements will be faster than normal, rods may drift in from high cooling water differential pressure.

Time	Position	Applicant's Actions Or Behavior
	URO	Recognize the failed open flow control valve, and inform the CRS.
	CRS	Direct swapping the CRD FCV back to the "A" FCV.
	URO	Swap CRD FCV using SO 3.6.D-2, section 4.2: - Direct equipment operator to perform Steps 4.2.1.1 and 4.2.1.2. - Place CRD FCV Controller in "Manual" and adjust to zero. - Direct equipment operator to place local flow control station selector in the valve "A" position. - Open the "A" FCV to 55 – 65 gpm. - Place the CRD FCV Controller in "Automatic" and verify flow. - Direct equipment operator to perform Steps 4.2.5.1 and 4.2.5.2. - Perform Section 4.1 of CRD routine inspection. - Direct local operator to perform Section 4.3 of CRD routine inspection.

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

Event Description: **SJAE Steam Supply Valve "A" Fails Closed.**

Cause: Broken air line at the regulator.

Automatic Actions: Alarm 206 D-2, "Condenser Lo Vacuum".

Effects: The "A" SJAE fails due to low steam pressure. Due to this, main condenser vacuum will degrade.

Time	Position	Applicant's Actions Or Behavior
	PRO URO	Report condenser vacuum dropping.
	PRO URO	Acknowledge annunciator 206 D-2, "Condenser Lo Vacuum", and report this to the CRS.
	URO PRO	Recognize the loss of SJAE "A" due to low steam pressure.
	URO PRO	Inform the CRS of the condition and coordinate with Equipment Operators to investigate the loss of the "A" SJAE.
	CRS	Enter OT-106, "Condenser Low Vacuum", and direct the URO to reduce reactor power in accordance with GP-9-2, "Fast Power Reduction" until vacuum stops dropping (see event 4). Directs the PRO to restore vacuum by placing the standby SJAE in service IAW OT-106.
	PRO	Places the standby SJAE in service IAW OT-106, beginning at step 3.7. for the in-service air ejector: - place ALT INSTR AIR control sw. to open, if AO does not open proceed to next step - place standby SJAE in service - remove in-service SJAE by closing inlet and outlet valves - open standby SJAE 2nd stage inlet valve - raise steam pressure - open 1st stage inlet and SJAE outlet valves
	URO	Perform a Fast Power Reduction IAW GP-9-2 when directed by the CRS (See details in Event 4).

Op Test No.: **Scenario No.: #3 Event No.: 4**

Event Description: **Perform a Fast Power Reduction.**

Cause: Directed from OT-106, "Condenser Low Vacuum".

Automatic Actions: None.

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct a Fast Power Reduction in accordance with GP-9-2.
	URO	Perform a Fast Power Reduction in accordance with GP-9-2. - Reduce recirc. flow to 90% power - Insert Table I Rods full in. - Reduce Recirculation Flow to 51.25 Mlbs/hr. Power reduction to be stopped when vacuum begins to improve.
	PRO	Maintain the Main Generator Auto-Manual Regulator Balanced (when it alarms). Notify the Power System Director of the required power change.

Op Test No.: Scenario No.: # 3 Event No.: 5 Page 5 of 10

Event Description: **Loss of Electrical Power to E-124-R-C**

Cause: Overcurrent trip of 480 VAC MCC Circuit Breaker

Automatic Actions: Initial Alarms: 001 F-1, "E-124 MCC FDR BKR TRIP".

Effects: Multiple loss of power to equipment with indications available in the main control room. Ultimately, loss of ECCS equipment will result in a Tech Spec required shutdown.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize by reporting the "E-124 MCC FDR BKR Trip" Alarm.
	CRS	Enter and execute the alarm response card for "E-124 MCC BKR Trip" - Direct an Equipment Operator to investigate the E-124 MCC Feeder Breaker Trip". - Direct that the E-124 R-C feeder breaker be "green flagged". - Identify loads without power by monitoring panels, reviewing associated electrical prints, or AO 56E.2-2 for E-124-R-C. - Review Technical Specifications, and determine that a 3.0.3 shutdown is required.
	PRO	- Direct an equipment operator to investigate the E-124 MCC Feeder Breaker Trip. - Direct the equipment operator to "Green Flag" the tripped breaker by placing its local control switch to the TRIP position.

Op Test No.: Scenario No.: #3 Event No.: 6 Page 6 of 10

Event Description: **Main Turbine Hi Temperature and Vibration**

Cause: Lack of lube oil flow to the #2 main turbine bearing.

Automatic Actions: Initial Alarms:

Alarm 205 H-4, Turbine Bearing Metal Hi Temp.
Alarm 205 A-2, Turbine Vibration / Thrust High

Effects: Turbine bearing temperature and vibrations will rise. The main turbine will automatically trip with no operator action.

Time	Position	Applicant's Actions Or Behavior
	URO PRO	- Notify Shift Management of alarm 205, H-4, Turbine Bearing Metal Hi Temp.
	PRO	- Identify affected bearing on temperature recorder TR-2401.
		- Check turbine lube oil temp on TR-2401, and increase cooling water to lube oil coolers, if necessary.
		- Check vibration at VR-2657 of the affected bearing.
		- Dispatch operator to check proper oil flow AND temperature from affected bearing.
	CRS	- Direct operator actions IAW ARCs 205 H-4, "Turbine Bearing Metal Hi Temp" and 205 A-2, "Turbine Vibration/Thrust High".
		- Direct the reduction of turbine load IAW GP-9-2, "Fast Power Reduction". (CRS may go directly to GP-4 "Reactor Scram")
		- When bearing metal temperature increases to 250 F, then direct a GP-4, "Manual Scram"
	URO	Perform a GP-9-2 "Fast Power Reduction" as directed.
	URO PRO	Perform GP-4

CRS Enter and direct T-100 Scram Actions.

URO
- Place the Mode Switch to Shutdown.
- Verify control rods are inserting.
- Verify that APRMs are downscale.
- When RPV level begins to recover, then "Emergency Stop" all 3 RFPTs.
- Depress "SLOW RAISE" or "FAST RAISE" on the RFPT to remain in service.
- Close all RFP discharge valves and open "C" RFP discharge bypass valve.
- Establish and maintain RPV level control with feedwater.
- Verify all control rods are inserted.
- Verify RPV pressure, Trend, and status of EHC.
- Notify health physics of changing plant conditions.

CRS Direct the URO to control RPV level between +5" to +35" with feedwater.

URO
- Control RPV level between =5" to +35" with feedwater.

PRO
- Transfer 13 KV house loads.
- Trip Main turbine when directed by the CRS.
- Verify main generator lockout.
- Verify Group II and III isolations and SGTS initiation. Report that RWCU valve MO-2-12-15, Reactor Water Cleanup Inlet Isolation Valve has no indication.
- Verify scram discharge volume vents and drains are closed.
- Verify Hydrogen Water Chemistry is isolated.
- Verify both Recirc pumps speed have runback to 30%.
- Monitor Instrument Air header pressure and drywell pressure.
- When the CRS is ready, report scram actions.

CRS
- Direct the PRO to bypass and restore Instrument N2 to the Drywell.

PRO
- Bypass and restore Instrument N2 to the Drywell.

Op Test No.: **Scenario No.: #3** **Event No.: 7** **Page 8 of 10**

Event Description: **Reactor Water Cleanup Leak into the Secondary Containment.**

Cause: Piping break as a result of the Group III isolation.

Automatic Actions: None.

Effects: Secondary containment temperature as well as radiation levels increase. First alarm to actuate is 210 I-3, "High Area TEMP". This will cause an entry into T-103, "Secondary Containment Control".

Time	Position	Applicant's Actions Or Behavior
	URO PRO	Recognize and report annunciator 210, J-3, "High Area Temperature"
	CRS	Enter and direct T-103, "Secondary Containment Control". - Monitor and control secondary containment temperatures. - Perform a local evacuation using GP-15. - Direct operators to isolate all systems discharging into the area except systems req'd to suppress a fire or be operated by the TRIP procedures. - Determine that a primary system is discharging into the Reactor Building.
	PRO	Monitor secondary containment temperatures on TR-2-13-139. Inform the CRS of the inability to close RWCU MO-2-12-15 due to the loss of power resulting from E-124-R-C. Perform a GP-15 Local Evacuation as directed.
	CRS	When a T-103 parameter exceeds an action level, enter T-101 and perform it concurrently with T-103. Also, direct that the RPV be depressurized per T-101.

CT	CRS	When the same parameter exceeds an action level in more than one area AND the primary system breach has not been isolated, then perform an Emergency Blowdown using T-112. - Verify Torus Level is above 7 feet. - Verify RPV pressure is 50 psig or more above torus pressure. - Direct that 5 ADS SRVs be opened.
CT	PRO	Open five ADS SRVs.

Event Description: **Turbine Bypass Valve Jack Fails To Open Bypass Valves.**

Cause: Instrument Malfunction in the EHC Logic Card.

Automatic Actions: None.

Effects: Step RC/P-12 of T-101 will not be able to be performed, therefore the RPV will not be able to be rapidly depressurized in anticipation of an Emergency Blowdown.

Time	Position	Applicant's Actions Or Behavior
	URO	Diagnoses that the Bypass Jack has no effect on opening the Main Turbine Bypass Valves and reports this to the CRS.
	CRS	Directs that the URO lower pressure set in an effort to perform RC/P-12.
	URO	Lower Pressure Set as directed by the CRS.

TERMINATION CRITERIA:

The scenario may be terminated when 5 SRVS are open, the RPV is depressurized, and RPV level is under control.

POST SCENARIO EMERGENCY CLASSIFICATION:

Site Area Emergency based on ERP-101 Table 3.2.

SIMULATOR OPERATOR INSTRUCTIONS FOR SCENARIO (#4)

GENERAL REQUIREMENTS

- Recorders will be rolled prior to the scenario and paper from selected recorders will be retained for the examination team as requested.
- All procedures, flow charts, curves, graphs, etc. will be in their normal storage places.
- All markable procedures, boards, etc. will be erased.
- All paper used by the crew will be retained for the examination team as requested.
- The simulator operators will keep a log of all communications during the scenario as requested by the examination team.

SCENARIO SOURCE HISTORY

New

INITIAL SETUP

Initial Conditions

- IC-66, 40% Power
- Ensure recorder power is on, roll recorders as required

Verify or insert the following:

Place 'B' Loop of RHR in Torus Cooling with the 'D' RHR and HPSW pumps running.

Event Trigger

TRG E1 REACTOR_MODE_SWITCH_IN_SHUTDOWN

Malfunctions:

IMF DGAØ1C "Diesel Generator 'C' Fails to Start"
IMF DGAØ1D "Diesel Generator 'D' Fails to Start"
IMF DGAØ2B "Diesel Generator 'B' Breaker Auto-Close Circuit Failure"
IMF ECWØ1 "ECW Pump Trip"
IMF HPCØ4 (E1 0 0) "HPCI Flow Controller Fails Low"

Turnover Procedures

GP-3 complete through step 6.18

SIMULATOR MACHINE OPERATOR DIRECTIONS

EVENT 1 -- Support crew for power reduction.

EVENT 2 -- Support crew for condensate pump shutdown.

If equipment operator is dispatched to close the condensate seal water supply valve, report after 5 minutes that the valve is closed.

EVENT 3 -- **IMF RHRØ1D "RHR Pump 'D' Trip**

If directed to investigate the 'D' RHR Pump, report that the oil level is out of sight low on the pump motor.

If directed to investigate the 'D' RHR Pump Breaker trip, report that the breaker has instantaneous overcurrent flags up.

EVENT 4 – **Activate Batch File 'LOOP' and verify or enter the following malfunctions and overrides:**

- **IMF MAPØ2A**
- **IMF MAPØ2B**
- **IMF MAPØ2C**
- **IMF MAPØ2D**
- **IMF MAPØ2E**
- **IMF MAPØ2F**
- **IOR ZAOED24EINS1 Ø**
- **IOR ZAOEDØ9ØØX11V Ø**
- **IOR ZAOED24EI2SUX Ø**

If contacted as the Power System Director, report that the cause of the loss of power is unknown and you will get back to the plant when more information becomes available.

If directed to perform Attachment B for the E-3 Diesel, wait 15 minutes and report that the starting air system pressure is 0 psig.

If directed to perform T-261, then after twenty minutes enter **MRF T261_1 OPEN.**

EVENT 5 -- **E22 Breaker Fails to Close**

Support crew as necessary.

EVENT 6 -- **EDG Fails to Start**

Support crew as necessary.

Enter DMF DGAØ1D to clear "Diesel Generator 'D' Fails to Start." When operator attempts to quick start the E-4 Diesel, enter MRF DGAØ1D RESET, "Diesel Local Trip Reset" to reset.

EVENT 7 -- **IMF HPCØ4 Ø "HPCI Flow Controller Fails in Automatic"**

If an equipment operator is sent to investigate HPCI, report back that nothing unusual has been found.

EVENT 8 -- When the E-22 breaker has been shut, the E-4 Diesel has been quick started and HPCI flow has been restored, then insert the following: **IMF MSSØ1 1Ø 1Ø:ØØ "Steam Leakage Inside Primary Containment" at 10% with a 10 minute ramp.**

If an equipment operator is dispatched to report DWCW Return Header pressure, report that it is 0 psig.

TERMINATION – The scenario may be terminated when Primary Containment parameters are under control.

SHIFT TURNOVER

PLANT CONDITIONS:

- Unit 2 at 40% Power with a shutdown in progress..

INOPERABLE EQUIPMENT/LCOs:

- None

SCHEDULED EVOLUTIONS:

- None

SURVEILLANCES DUE THIS SHIFT:

- None

ACTIVE CLEARANCES:

- None

GENERAL INFORMATION:

- Power should be lowered to 15% using GP-3 "Normal Plant Shutdown" to support a drywell entry to investigate a suspected instrument nitrogen leak in the drywell.

- "B" Loop of RHR is in Torus Cooling to support thermography of the 2D RHR Pump by Predictive Maintenance.

- GP-3 is complete through step 6.18.

- Control Rods have been inserted per GP-3-2, Appendix A-2 which has been completed through step 4 of Table 2.

ES-D-1

Scenario Outline

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

Examiners _____ **Operators** _____ CRS

_____ _____ PRO

_____ _____ URO

Scenario Summary The scenario begins with the reactor at 40% power with Torus Cooling in Service. The crew will lower reactor power using reactor recirculation flow and control rods. At approximately 35% power the crew will secure a Condensate Pump. Following the condensate pump shutdown, the 'D' Residual Heat Removal Pump will trip requiring the crew to secure the torus cooling lineup and consult technical specifications. A Loss of Offsite Power will occur requiring entry into SE-11, "Loss of Off-Site Power". The E-3 and E-4 Diesel Generator fail to start and the E-2 Diesel Generator Output Breaker fails to close. The E-2 Diesel Generator Output Breaker may be manually closed and the E-4 Diesel Generator will start when the Quick Start Push Button is depressed. The crew will stabilize plant parameters using T-101 "RPV Control". The crew will recognize and respond to a failure of the HPCI Flow Controller to operate in automatic. T-102 "Primary Containment Control" will be used to stabilize containment parameters with a leak in the drywell.

Initial Condition IC-66, 40% power

Turnover: See Attached "Shift Turnover" Sheet

Event No.	Malfunction No.	Event Type*		Event Description
1		R	URO PRO CRS	Lower Reactor Power with Reactor Recirculation Flow and Control Rods
2		N	URO PRO CRS	Secure a Condensate Pump
3	RHRØ1D	C	PRO CRS	RHR Pump Trip (Tech. Spec.)
4	BAT LOOP	M	URO PRO CRS	Loss of Off–Site Power
5	DGA02B	I	PRO CRS	E-2 Diesel Generator Breaker Auto Closure Failure
6	DGAØ1C DGAØ1D	C	PRO CRS	E-3 and E-4 Diesel Generators Fail to Auto Start/ E-4 May be Quick Started Manually
7	HPCØ4	I	URO CRS	HPCI Flow Controller Fails in Automatic
8	MSSØ1	M	URO PRO CRS	Steam Leak in Primary Containment

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

Op Test No.: **Scenario No.:** **# 4** **Event No.: 1** **Page 1 of 10**

Event Description: **Lower Reactor Power with Reactor Recirculation Flow and Control Rods**

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct URO to continue power reduction utilizing GP-3-2 APP A-2.
	URO	Reduce Recirculation Pump speed to below 480 rpm. Insert control rods in sequence directed by GP-3-2 APP A-2.
	PRO	Monitor plant equipment during power drop.

Op Test No.: **Scenario No.: # 4** **Event No.: 2** **Page 2 of 10**

Event Description: **Secure a Condensate Pump**

Time	Position	Applicant's Actions Or Behavior
	CRS	Direct the PRO to shutdown a condensate pump in accordance with SO 5.2.A-2.
	PRO	Review SO 5.2.A-2 "Condensate System Condensate Pump Shutdown" and ensure the prerequisites are met.
		Close the Condensate Pump discharge valve for the pump to be shut down.
		Stop the selected Condensate Pump by turning the control switch to STOP (within 2 minutes of closing the discharge valve).
		Direct an Equipment Operator to close the Seal Water Supply Valve for the condensate pump that was shut down.
	URO	Monitor reactor parameters during condensate pump shutdown.

Op Test No.: **Scenario No.: # 4** **Event No.: 3** **Page 3 of 10**

Event Description: **'D' RHR Pump Trip**

Cause: **Motor Overcurrent**

Automatic Actions: **None**

Effects: **Loss of torus cooling.**

Time	Position	Applicant's Actions Or Behavior
	PRO URO	Recognize by reporting the trip of the 'D' RHR Pump.
	CRS	Direct the Equipment Operator to investigate the trip of the 'D' RHR Pump.
	CRS	Recognize that a Technical Specification LCO is not met.
	CRS	Consult Tech Spec 3.5.1 and determine that operations can continue for 7 days.
	CRS	Direct the PRO to secure the torus cooling lineup.
	PRO	Secure the torus cooling lineup.
	NOTE:	The URO will be required to select alternate RHR pumps for containment sprays as a result of this failure (see Event 8).

Op Test No.: **Scenario No.: #4 Event No.: 4**

Event Description: **Loss of Off–Site Power**

Cause: **Loss of Grid**

Automatic Actions: Reactor scram, EDG receive start signal, emergency buses transfer to EDG when available.

Time	Position	Applicant's Actions Or Behavior
	PRO	Recognize by reporting the loss of off-site power.
	CRS PRO URO	Recognize by reporting the loss of off-site power as an entry into SE-11 "Loss of Off-Site Power".
	CRS	Enter and execute SE-11 "Loss of Off-Site Power" per the Nuclear Operations Manual.
	PRO	Recognize by reporting that the E-2 Diesel is running but the E-22 Breaker failed to close. (See event #4 for details).
	PRO	Recognize by reporting that the E-3 and E-4 Diesels failed to start. (See event #5 for details).
	CRS	Recognize by reporting the event as an entry condition for T-100 "RPV Control" procedure.
	CRS	Enter and execute T-100 "SCRAM Condition" procedure per the Nuclear Operations Manual.
	URO	Verify that the control rods are inserting.
	URO	Place the mode switch in Shutdown.
	URO	Verify that the reactor APRMs are downscale (when power is available).
	URO	Report to the CRS that the mode switch is in Shutdown, the control rods are inserting, and the APRMs are downscale (when power is available).

CRS	Direct the URO to maintain RPV level between +5 to +35 inches.
URO	Maintain RPV level +5 to +35 inches.
URO	Verify that all control rods are fully inserted.
URO	Report to the following to CRS: • RPV level, trend and the status of Feedwater. • RPV pressure, trend, and the status of EHC. • All control rods are inserted.
PRO	Verify main turbine trip and generator lockout.
PRO	Verify Group I, II, and III isolations and verify SGTS initiation, as appropriate.
PRO	Verify scram discharge volume vents and drains are closed.
PRO	Verify Hydrogen Water Chemistry is isolated.
PRO	Verify Recirc Pumps are tripped.
PRO	Monitor Instrument Air header pressure and Drywell pressure.
PRO	When the CRS is ready make the following report. • Main Turbine is tripped, Main Generator is locked out. • Group I, II, and III isolations are complete and SGTS is initiated (as appropriate), scram discharge volume vents and drains are closed, Hydrogen Water Chemistry is isolated. • Recirc Pumps are tripped.
CRS	Direct the URO to maintain RPV pressure below 1050 psig.
CRS	Direct restoration of instrument nitrogen using the Backup Instrument Nitrogen to ADS or by performing T-261.
URO	Restore drywell instrument nitrogen as direvted.

Op Test No.: **Scenario No. #4** **Event No.: 5** **Page 6 of 10**

Event Description: **E-2 Diesel Generator Breaker Auto Closure Failure**

Cause: Timer contact in breaker auto close circuit fails to close

Initial Automatic Actions: None

Effects (General Sequence): DG will auto start but the output breaker will not close on the Loss of Off-Site Power (breaker can be closed manually).

Time	Position	Applicant's Actions Or Behavior
CT	PRO	Recognize E-2 Diesel output breaker failure to auto close - Verify that no bus faults exist - Turn on the Sync Selector switch for E-22 output breaker - Close the E-22 output breaker from the Control Room - Verify that the bus reenergizes - Inform the CRS that the bus has been restored - Start the 'A' ESW pump
	CRS	Direct the E-2 output breaker to be closed, if not done
	NOTE:	THIS TASK IS CRITICAL IN THAT IT PROVIDES THE ELECTRICAL POWER REQUIRED FOR CONTAINMENT SPRAYS, WHICH WILL BE NEEDED IN EVENT #8, "STEAM LEAK IN PRIMARY CONTAINMENT."

Op Test No.: **Scenario No.: #4** **Event No.: 6** **Page 7 of 10**

Event Description: E3 DG Auto Start Failure (Quick Start Works)

Cause: DG start fails to occur automatically

Initial Automatic Actions: None

Effects (General Sequence): Diesel does not start automatically and must be manually started with the quick start pushbutton

Time	Position	Applicant's Actions Or Behavior
CT	PRO	Recognize E-3 and E-4 DG failure to start - Attempt a quick start from the control room - Recognize E-4 DG starts and loads its busses
	CRS	Direct E-3 and E-4 DG to be quick started, if not done
	NOTE:	THIS TASK IS CRITICAL IN THAT IT PROVIDES THE ELECTRICAL POWER REQUIRED FOR CONTAINMENT SPRAYS, WHICH WILL BE NEEDED IN EVENT #8, "STEAM LEAK IN PRIMARY CONTAINMENT."

Op Test No.: **Scenario No.: # 4** **Event No.: 7** **Page 8 of 10**

Event Description: **HPCI Flow Controller Fails in Automatic**

Cause: **Instrument Failure**

Automatic Actions: HPCI System will automatically initiate. However, the turbine will not reach sufficient speed to inject water into the reactor due to the flow controller failure.

Effects: Operator action required in order to utilize HPCI for RPV level and pressure control.

Time	Position	Applicant's Actions Or Behavior
	URO	Recognize by reporting the HPCI System is not injecting after start.
	URO	Respond to the failure by taking manual control of HPCI flow controller and raising turbine speed.
	URO	Report the HPCI flow control failure and current status of HPCI system to CRS.

Op Test No.: **Scenario No.: #4** **Event No.: 8** **Page 9 of 10**

Event Description: **Steam Leak in Primary Containment**

Cause: Unknown

Automatic Actions: 2 PSIG. : HPCI start, RPS scram, PCIS Isolations

Effects: None

Time	Position	Applicant's Actions Or Behavior
	PRO URO	Recognize by reporting the rise in Drywell pressure.
	PRO URO	Recognize by reporting the condition as an entry into OT-101 "High Drywell Pressure".
	CRS	Enter and execute OT-101 "High Drywell Pressure" per the Nuclear Operations Manual.
	CRS	Direct that drywell cooling be maximized as necessary.
	PRO	Report that Containment inerting is not in progress.
	CRS PRO URO	Recognize by reporting drywell pressure > 2 psig as an Entry Condition for T-101 "RPV Control" and T-102 "Primary Containment Control" procedure.
	CRS	Enter and execute T-102 "Primary Containment Control" procedure the Nuclear Operations Manual. **For PC/P:** • Direct GP-8B, "Manual Isol of RBCCW and DWCW • Direct that torus sprays be initiated IAW T-203, "Initiation of Torus Sprays Using RHR" **For DW/T:** • Direct DW cooling be maximized by performing T-223, "DW Cooler Fan Bypass" • When DW pressure and temperature plot within the safe region of the Drywell Spray Initiation Limit Curve: direct DW fans be shut down and that DW sprays be initiated IAW T-204, "Initiation of DW Sprays Using RHR." **For PC/G:** • Direct that CAD be placed in service.

	URO PRO	Monitor T-102 parameters (torus temperature, torus level, drywell pressure, torus pressure, drywell temperature) and provide trends to the CRS as appropriate.
	URO PRO	Perform GP-8B, "Manual Isolation of RBCCW and DWCW"
	URO	Spray the torus in accordance with T-203, "Initiation of Torus Sprays using RHR"
	PRO	Monitor Diesel Generator loads during RHR and HPSW pump starts.
	PRO	Maximize DW cooling by performing T-223, "DW Cooler Fan Bypass."
	URO PRO	Shutdown DW cooler fans when directed.
CT	URO	Spray the drywell in accordance with T-204, "Initiation of DW Sprays Using RHR."
	URO PRO	Place CAD in service when directed.

TERMINATION CRITERIA:

The scenario may be terminated when Primary Containment parameters, RPV pressure and level are stable and under control.

POST SCENARIO EMERGENCY CLASSIFICATION:

Classify the event as an Alert based on ERP-101, Table 3.2, "Fission Product Barrier Status Table"