

Facility: Monticello Scenario No.: NRC Scenario **5** Op-Test No.: MNGP 2010
 Examiners: _____ Operators: _____

Initial Conditions: 89% Power, for Turbine BPV Testing
 Division 2 Drywell Spray valve inoperable.
Turnover: Perform the Turbine BPV Test. Part A

Event No.	Malf. No.	Event Type*	Event Description
1	None	N BOP	Perform the Turbine BPV Test (No Faults).
2	None	R ATC/SRO	Raise power with Recirc.
3	02-A11P1-V (Ovrd)	I ATC/SRO	After a Recirc Speed adjustment, Recirc pump speed continues to increase. The ATC must lock the Scoop Tube to stop the runaway. The Recirc Pump speed mismatch should be verified to be within TS limits. (ABN) (TS)
4	HP01	C BOP/SRO	HPCI inadvertent initiation. (TS) (ABN) (CT) In-Plant personnel report a loud water hammer.
5	EG02A	C BOP/SRO	#11 Stator cooling Water Pump Trips. #12 Pump does not auto start but the BOP can manually start it. (ABN)
6	PC05	M Crew	An unisolable Torus leak begins. The first indication of a problem is high water level in the RHR Rooms, which requires entry into EOP 1300. The Torus HI/Low level alarm follows, which requires entry into EOP 1200. When Torus water Level cannot be controlled, The Crew manually scrams and performs Emergency Depressurization. (CT)
7	CH02_119	C ATC/SRO	When the reactor is scrammed, one rod fails to insert. This must be identified by the ATC, who can insert the rod with CRD. Failure to insert the rod will alter the Emergency Depressurization strategy.

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

<u>ES-301-4 Quantitative attributes:</u> Total Malfunctions (5-8): 5 Malfunction(s) after EOP (1-2): E7 Abnormal Events (2-4): E3, 4, & 5 Major Transient(s) /E-Plan entry (1-2): E6	<u>ES-301-5 Quantitative attributes:</u> BOP Normal: E1 ATC Reactivity (1 per set): E2 BOP I/C (4 / set): E4 & 5 ATC I/C (4 / set): E3 & 7
--	--

	<h2 style="margin: 0;">SIMULATOR EXERCISE GUIDE (SEG)</h2>
---	--

SITE: MONTICELLO

SEG # ILT-SS-15E

SEG TITLE: 2010 ILT NRC 5

REV. # 0

PROGRAM: INITIAL LICENSE TRAINING

#: MT-ILT

COURSE: NRC EXAM

#: M-8119

TOTAL TIME: 1.5 HOURS

Additional site-specific signatures may be added as desired.

Developed by:	<i>Instructor</i>	<i>Date</i>
Reviewed by:	<i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	<i>Date</i>
Validated by:	<i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	<i>Date</i>
Approved by:	<i>Training Supervision</i>	<i>Date</i>

Guide Requirements

Goal of Training:

ILT NRC Exam

Learning Objectives:

1. Demonstrate the ability to predict and/or monitor changes in parameters associated with operating system controls for the appropriate tasks.
 2. Demonstrate the ability to correctly use procedures to correct, control, or mitigate the consequences of normal and abnormal operations for the appropriate tasks.
 3. Demonstrate the ability to monitor automatic operations of the systems to ensure proper operation for the appropriate tasks.
 4. Demonstrate the ability to manually operate and/or monitor systems in the control room in accordance with approved procedures for the appropriate tasks.
 5. Demonstrate the ability to complete administrative requirements, as necessary, in order to operate the plant for the appropriate tasks.
 6. Demonstrate knowledge of and ability to implement shift supervision duties as they relate to crew operations for the appropriate tasks.
 7. Given a degrading or improving plant condition or event, demonstrate the ability to: (CRS)
 - a. Evaluate trends that may result in equipment damage or reduction in plant safety.
 - b. Ensure proper diagnosis of plant problems by monitoring and interpreting data (information from panel indications).
 - c. Evaluate and diagnose challenges to Critical Plant Parameters.
 - d. Evaluate events and accidents.
-

Prerequisites:

1. Completion of MT-ILT Training Program
-

Training Resources:

1. Full Scope Simulator
 2. 3139 (Control Room Shift Turnover Checklist)
 3. 3140 (Shift Supervisors Office Shift Turnover Checklist)
 4. Stopwatch
 5. Simulator Driver
-

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

-
- 6. Simulator Phone Talker
 - 7. Operations Representative
 - 8. Evaluators
-

References:

-
- 1. B.01.04-05, REACTOR RECIRCULATION SYSTEM
 - 2. C.2-05 (POWER OPERATION – SYSTEM OPERATION)
 - 3. C.4-A (REACTOR SCRAM)
 - 4. C.4-B.06.02.04-A (STATOR COOLING WATER FAILURE)
 - 5. C.4-G (INADVERTENT ECCS INITIATION)
 - 6. C.4.K (IMMEDIATE REACTOR SHUTDOWN)
 - 7. C.5-1100 (RPV CONTROL)
 - 8. C.5-1200 (PRIMARY CONTAINMENT CONTROL)
 - 9. C.5-1300 (SECONDARY CONTAINMENT CONTROL)
 - 10. C.5-2002 (EMERGENCY RPV DEPRESSURIZATION)
 - 11. C.5-3101 (ALTERNATE ROD INSERTION)
 - 12. C.5-3401, (TORUS WATER LEVEL MAKEUP)
 - 13. C.6-004-C-5 (FLUID DRIVE A SCOOP TUBE LOCK)
 - 14. C.6-005-B-24 (REACTOR WATER LEVEL HI/LO)
 - 15. C.6-006-B-9 (10) (HIGH WTR LEVEL RHR ROOM A (B)
 - 16. C.6-004-B-4, (SUPPRESSION WATER LEVEL HI/LOW)
 - 17. C.6-008-A-17 (NO. 1 GENERATOR COOLING WTR FAILURE)
 - 18. Tech Specs Section 3.4
 - 19. Tech Specs Section 3.5
 - 20. OSP-TRB-0570 PART A (EXERCISE MAIN TURBINE BYPASS VALVES)
-

Commitments:

-
- 1. None
-

Evaluation Method:

ILT NRC Exam

Operating Experience:

Not Applicable / ILT Exam

**Related PRA
Information:**

Initiating Event with Core Damage Frequency Contribution:

- Internal Flood (36.8%)
- Station Blackout (27.4%)
- Loss of High Pressure Injection (13.4%)
- ATWS (11.4%)
- LOCA (7.7%)
- Loss of Low Pressure Injection (2.0%)
- LOCA Outside Containment (0.6%)
- Loss of Containment Heat Removal (0.4%)

Important Components:

EDGs

HPCI

RCIC

Scram

Feed/Cond

SRV (When stuck open)

SRVs

Instrument AC

Fire System (for RPV Injection)

4160 VAC

Important Operator Actions with Task Number:

CR314.101, Emergency Depressurize

CR305.108, Recover Offsite Power

CR305.105/6, SBO-Recover an EDG

CR305.121, Align #13 EDG to Essential MCCs

CR314.126, Vent Containment

CR259.127, Control Feedwater following a Scram

CR314.112, Control Reactor Water Level during an ATWS

CR211.106, Inject with SBLC during an ATWS

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):**Shift Manager Tasks:**

None

SRO Tasks:

SS200.133	Direct Reactor Startup to Full Power	6, 7
SS200.134	Supervise and direct core thermal limits monitoring	6, 7
SS299.352	Apply administrative requirements for Tech Spec Section 3.4 and Bases to Reactor Coolant System	6, 7
SS299.353	Apply administrative requirements for Tech Spec Section 3.5 and Bases to ECCS and RCIC	6, 7
SS304.193	Implement RPV control	6, 7
SS304.194	Implement Primary Containment Control	6, 7
SS304.196	Implement Secondary Containment Control	6, 7
SS304.198	Implement Emergency RPV Depressurization	6, 7
SS314.115	Supervise Torus Water Level Makeup	6, 7
SS315.101	Supervise response to a reactor scram	6, 7
SS315.126	Supervise response to Stator Cooling Water Failure	6, 7
SS315.160	Supervise response to Inadvertent ECCS Initiation	6, 7
SS315.164	Supervise immediate reactor shutdown	6, 7

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

RO Tasks:

CR200.128	Increase reactor power to 100%	1-5
CR200.129	Perform core thermal limits monitoring	1-5
CR200.146	Perform the procedure for Reactor Scram	1-5
CR200.171	Perform the procedure Stator Cooling Water Failure	1-5
CR200.204	Perform the procedure for an inadvertent ECCS initiation	1-5
CR200.208	Perform the procedure for immediate reactor shutdown	1-5
CR202.114	Respond to unstable speed control on one (Recirc) pump	1-5
CR259.127	Control Feedwater following a Scram	1-5
CR304.102	Perform actions associated with RPV control	1-5
CR304.103	Perform actions associated with Primary containment control	1-5
CR304.105	Perform actions associated with Secondary Containment Control	1-5
CR314.101	Perform actions associated with Emergency Depressurization	1-5
CR314.105	Perform actions associated with Alternate Rod Insertion	1-5
CR314.119	Perform actions associated with Torus Water Level Makeup	1-5

STA Tasks:

None

Retention: Life of Plant**Retain in:** Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Recirc Flow increase
2. HPCI inadvertent Initiation
3. (Optional) Stator Cooling pump trip

After EOP Entry:

1. One rod fails to scram

Abnormal Events:

1. Recirc Flow increase
2. HPCI inadvertent Initiation

Major Transients:

1. Torus Rupture

Critical Tasks:

1. **CT-14: (Inadvertent ECCS initiation) Restore reactor power to within the license limit.**
2. **CT-26: When torus water level cannot be restored and maintained above -3.3', then scram and execute Emergency Depressurization per C.5-2002.**

SCENARIO OVERVIEW:**INITIAL CONDITIONS:**

1. IC 285, 89%
2. The initial plant conditions are:
 - 89% Power for Turbine BPV testing
3. The following equipment is OOS
 - Division 2 Drywell Spray in inoperable
4. The following evolutions are planned for the shift:
 - OSP-TRB-0570 (Exercise Main Turbine Bypass Valves), Part A

SEQUENCE OF EVENTS:**Event 1: (Optional) Perform the Turbine BPV Test**

- OSP-TRB-0570 (Exercise Main Turbine Bypass Valves) Part A is performed without incident.

Event 2: Raise power with Recirc

- The crew starts to raise Recirc Flow to return to full power.

Event 3: Unstable Recirc Speed Control (Runaway)

- After a Recirc Speed adjustment, Recirc pump speed continues to increase. The ATC must lock the Scoop Tube in response to the runaway. The Recirc Pump speed mismatch should be verified to be within TS limits.

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

Event 4: HPCI inadvertent initiation.

- HPCI inadvertently initiates forcing the crew to take actions per C.4-G (INADVERTENT ECCS INITIATION) to reduce Reactor power to within the license limit and secure HPCI. Crew will evaluate Tech Specs for HPCI to determine applicable conditions and required actions.

Event 5: (Optional) Stator Cooling Water Pump Trip

- The running Stator Cooling Pump trips but the standby pump does not automatically start. Operator action will start the standby pump and stabilize the system.

Event 6: Unisolable Torus leak

- An unisolable Torus leak begins. The Crew manually scrams and performs EOP 1200 and 1300.
- Emergency Depressurization can be anticipated and RPV pressure lowered using the Turbine Pressure Regulator Override
- When Torus water Level cannot be controlled, Emergency Depressurization is performed.

Event 7: Insert all control rods

- When the reactor is scrammed, one rod fails to insert. This must be identified by the ATC, who can insert the rod with CRD.

NOTE: Table may be modified as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. <u>INITIAL CONDITIONS (IC):</u>		
	a. IC: 285		
	b. Mode: 1		
	c. Power: 89%		
	d. Generator: 535 Mwe		
	e. Xcel system condition is GREEN		
	f. Plant CDF is GREEN		
	g. River temp is 56°F and NO towers are in service		
	h. Outside temp is 60°F		
	i. Division 2 Containment Spray is out of service		
	2. <u>SIMULATOR SET UP</u>		
	a. Set the plant initial conditions per the Initial conditions under the Scenario Overview, Initial Conditions, and Manual Settings.		
	b. Enter the malfunctions, remotes, overrides and event triggers per the "Simulator Input Summary".		
	c. Control Room and Shift Supervisor turnover checklists should be provided with the scenario IC.		

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	d. Core Damage Frequency (CDF) should be updated on the status board.		
	e. Tech Spec Required Actions should be updated on the status board.		
	3. <u>COMPLETE TURNOVER:</u>		
	a. Review applicable current Unit Status		
	b. Review relevant At-Power Risk status		
	c. Review current LCOs not met and Action Requirements		Tech Spec LCO 3.6.1.8 is not met with condition A and required action A.1 entered yesterday. MO-2023 is due back later in this shift.
	d. Verify crew performs walk down of control boards and reviews turnover checklists.		Tech Spec LCO 3.6.1.3 is not met with condition A and required actions A.1 and A.2 entered yesterday. This is due to work on MO-2023. MO-2021 is closed, deactivated and tagged.
	e. Plant Staffing		The following support is available:
			Weekday Night Shift
			The following support is available:
			Operations: Normal crew compliment only based on actual crew staffing.
			Maintenance: Staffed to support repair of MO-2023

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			Engineering: Staffed to support repair of MO-2023
	f. Shift Activities		Management: ERT Activated for repair of MO-2023
	1) Perform the Turbine Bypass Valve Test Part A		
	2) Return to full power		
	4. <u>SHIFT BRIEF</u>		
	a. Role Play as necessary. Turbine Building status:	CRS	Leads the Shift Brief
	1). 5 Condensate demins in service.	ATC/BOP	Participate in Shift Brief
	2). C highest @ 5.5 psid.		
	3). All systems in Turbine building are normal.		
	b. Role Play as necessary. Rx Building status:		
	4). MO-2023 is tagged out for motor repair.		
	5). All other systems in the Rx bldg are normal.	CRS	Crew assumes the duty.
	c. Role Play as necessary. Third Operator:		

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	6). Nothing to add.	CRS	Crew assumes the duty.

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 1	5. <u>(Optional) Perform the Turbine BPV Test</u>		
	Note: This event is OPTIONAL and has no bearing on the subsequent events. It may be omitted at the discretion of the Lead Examiner when the BOP candidate has had the requisite number Normal Events.	CRS	Supervises Test OSP-TRB-0570 Part A (Exercise Main Turbine Bypass Valves)
		BOP	Performs Test OSP-TRB-0570 Part A (Exercise Main Turbine Bypass Valves) for BV-1 and BV-2:
			<ul style="list-style-type: none"> Notify RP and Enter TS 3.7.7.A
			<ul style="list-style-type: none"> Record generator gross load
			<ul style="list-style-type: none"> Select respective valve with BYPASS VALVE TEST switch
			<ul style="list-style-type: none"> Press the BYPASS VALVE TEST pushbutton
			<ul style="list-style-type: none"> Time the bypass valve travel to the OPEN position
			<ul style="list-style-type: none"> Record the time to open (15-25 seconds)
			<ul style="list-style-type: none"> Record generator gross load
			<ul style="list-style-type: none"> Release the BYPASS VALVE TEST pushbutton
			<ul style="list-style-type: none"> Time the bypass valve travel to the CLOSE position
			<ul style="list-style-type: none"> Record the time to close (15-25 seconds)
			<ul style="list-style-type: none"> Verify valve cycling complete

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> Return the respective BYPASS VALVE TEST switch to OFF
		ATC	Monitors parameters at C-05 that are affected by the Bypass Valve test
Event 2	6. <u>Raise power with Recirc</u>		
	a. Provide the following:	CRS	Performs a Reactivity Manipulation Brief
	1) 2300 (Reactivity Adjustment)		CRS directs the ATC to raise Recirc speed to 98% per Reactivity maneuvering Step 2
	2) Nuclear Engineer Reactivity Maneuvering Steps	BOP	Provide a Peer Check
	b. Monitor reactor power. At >93% power, begin next event. (Event 3)	ATC	<ul style="list-style-type: none"> Raises Recirc speed to raise power.
			<ul style="list-style-type: none"> Maintains Flow parameters approximately equal
			<ul style="list-style-type: none"> Monitors the following parameters:
			<ul style="list-style-type: none"> Pump Speed
			<ul style="list-style-type: none"> Scoop Tube positions
			<ul style="list-style-type: none"> Reactor Differential pressure
			<ul style="list-style-type: none"> Total Jet Pump Flow

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> ○ Reactor Water Level and Feedwater Flow
			<ul style="list-style-type: none"> ○ Reactor Pressure and Steam Flow
			<ul style="list-style-type: none"> ○ APRMs
			<ul style="list-style-type: none"> ○ Core Thermal Limits
Event 3	7. <u>Unstable Recirc Speed Control (Runaway)</u>		
	a. When at least 93% power, after a Recirc Speed adjustment, and as directed by the Lead Examiner and insert MANUAL TRIGGER 1		<u>Key Parameter Response:</u> A Recirc Pump speed rising, Reactor power rising
	1) Verify OVERRIDE 02-A11P1-V becomes active		<u>Key Expected Alarms:</u> 4-C-5 (Fluid Drive A Scoop Tube Lock) once the OATC locks the scoop tube.
	<u>Recirc Runaway (Continued)</u>		<u>Auto Actions:</u> Reactor power rising, loop flow rising, pump speed rising
	b. Due to the speed of this event, the ATC may not identify the problem prior to reaching the high speed stop, but the scoop tube must still be locked.	ATC	Identifies that 11 Recirc speed continues to rise after releasing the control switch, verifies via recorder indication, locks the scoop tube and informs the CRS.
		CRS	Directs the RO to perform B.01.04-05.H.1 (Unstable Speed Control on One Pump).
	c. If called, respond appropriately as the Ops Manager, Plant Manager, Engineering or maintenance concerning notification of the event.		B.01.04-05.H.1 actions:
		Crew	Notify:

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			Ops Manager
			Engineering Plant and Systems Manager
	d. If called as an out-plant operator to investigate the #11 Recirc MG, there is no apparent problem.		Instrument Engineer
	e. Depending on how soon the ATC recognized the runaway recirc pump and locked the scoop tube, the mismatch may not be >10%. However, the CRS should still evaluate for entry into this condition.	CRS	Evaluate Tech Specs and enter TS 3.4.1 Condition A for mismatched Recirc flows (≤5% when operating at ≥70% rated core flow)
	f. For this scenario it is not expected that the crew will need to make recirc adjustments following the speed control issue. The CRS may direct a second operator to prepare for local manual adjustments	CRS	Notifies an extra licensed operator to make preparations for manually adjusting #11 Recirc scoop tube
		CRS	Suspends further power escalation until the problem with the Recirc speed control has been resolved.
Event 4	8. <u>HPCI inadvertent initiation.</u>		
	a. When directed by the Lead Examiner, insert MANUAL TRIGGER 3		<u>Key Parameter Response:</u> Reactor power rises, Reactor level rises, Generator output rises
	1. Verify Malfunction HP01 goes active.		<u>Key Expected Alarms:</u> 5-B-24 (REACTOR WATER LEVEL HI/LO)

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<u>Auto Actions:</u> None
		CREW	Notifies CRS of HPCI initiation.
		OATC	Reports power and level.
		CREW	Evaluates Reactor level and need for HPCI initiation and reports HPCI is NOT needed for Reactor level control.
		CRS	Directs response to HPCI Inadvertent Initiation
CT-14	(Inadvertent ECCS initiation) Restore reactor power to within the license limit.	OATC	Reduces power as needed to maintain power <100% using recirc.
		BOP	Carries out the following actions of C.4-G, step 3:
			<ul style="list-style-type: none"> Places AOP control switch to RUN.
			<ul style="list-style-type: none"> Trips HPCI turbine and ensures turbine has stopped.
			<ul style="list-style-type: none"> Places AOP control switch in PTL.
			Makes C.4 page announcement.
		BOP	Notifies System Engineer, Nuclear Engineer and Chemistry.
		CRS	Declares HPCI INOP.

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>HPCI Inadvertent Initiation (Continued)</u>	CRS	Consults Tech Spec 3.5.1 and determines Conditions J is applicable. Verify that RCIC remains Operable and restore HPCI to Operable in 14 Days. Other 3.5.1 conditions combine HPCI operability with operability of the LPCI mode of RHR, but not the Containment Spray mode.
Event 5	<u>(Optional) Event 4: Stator Cooling Pump Trip</u>		
	Note: This event is OPTIONAL and has no bearing on the subsequent events. It may be omitted at the discretion of the Lead Examiner when the BOP candidate has had the requisite number of I/C failures.		<u>Key Parameter Response:</u> Indicating lights for 11 Stator Cooling Pump; Red-OFF, Green-ON
	a. When directed by the Lead Examiner, insert MANUAL TRIGGER 5		<u>Key Expected Alarms:</u> 8-A-17 (No. 1 Generator Cooling Wtr Failure)
	1) Verify Malfunction EG02A goes active.		<u>Auto Actions:</u> Turbine Runback, Reactor scram
		BOP	<ul style="list-style-type: none"> • Respond to annunciator and notify the CRS
	b. When the 12 Stator Cooling Pump is taken to START, verify Event Trigger 28 goes active		<ul style="list-style-type: none"> • Verify a Stator Cooling water pump is running/ Take the 12 Stator Cooling Pump switch to START

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1) Verify Override 05-S088-02 (HS in STOP) is deleted in 1 second		<ul style="list-style-type: none"> Verify Annunciator 8-A-17 clears
	2) Verify Override 05-S088-01 (HS in START) goes active in 1 second and 12 Stator Cooling pump starts.	CRS	<ul style="list-style-type: none"> Supervise the Loss of the Stator Cooling Pump
	3) Verify the 1 minute delay for Malfunction PC05 (Torus drain in the next event) begins to time down		
Event 6	9. <u>Unisolable Torus leak</u>		
	a. If the Optional malfunction in Event 5 was not used or when directed by the Lead Examiner, manually actuate EVENT TRIGGER 28		<u>Key Parameter Response:</u> Torus Level on LI-2996 (C-04) or PLR 7251A/B (C-03) lowering
	1) Verify Malfunction PC05 at 100% severity goes active.		<u>Key Expected Alarms:</u> C-06B 9&10 High water level in RHR C-04B-4, Torus HI-LOW Level, C-04B 19, & 24 Torus Vacuum Breakers Open, C-05A-49, Radwaste Trouble, Room A&B
	Note: It takes at least 19 minutes to reach -3.3 ft, the decision point for a Reactor Scram and Emergency depressurization		<u>Auto Actions:</u> Torus to Drywell Vacuum breakers begin to cycle
		BOP ATC	Respond to C-06-B-9 (10) (HIGH WTR LEVEL RHR ROOM A (B) and notifies the CRS
			<ul style="list-style-type: none"> Notify Rad Protection that a harsh environment or increase radiation environment may exist in the RHR rooms and that entry is required

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 6	10. <u>Unisolable Torus Leak/ EOP 1300 Actions</u>		
	Note: The RHR Room water Level is never reported as having reached Max Safe Level (15 inches) and the timeline of local reports allows the Torus water level to be the critical parameter.	BOP ATC	<ul style="list-style-type: none"> • Dispatches an operator to investigate
	a. Role Play in-plant operator. When dispatched, WAIT 5 MINUTES then report that the water level in is approximately 8 inches in both RHR rooms . The water level appears to be rising slowly .		<ul style="list-style-type: none"> • Receive the report from the plant and relay the information to the CRS.
			<ul style="list-style-type: none"> • Reports EOP 1300 Entry Condition of RHR Room water levels above 0 inches.
	<u>Unisolable Torus Leak/ EOP 1300 Actions</u>	CRS	Enters and directs actions from EOP1300 Secondary Containment Control
	Note: Torus Level can be monitored on Insight File pct112.	BOP ATC	<ul style="list-style-type: none"> • Verify the Reactor Bldg Floor drain Sump Pump is running
	b. Role Play in-plant operator. If asked to report the source of the leak, WAIT UNTIL Torus Water Level is -1 feet , then report, from the catwalk, that the Leak source is a weld at the ring header in Bay 4		<ul style="list-style-type: none"> • Attempt to identify and isolate the source of the water
	c. Role Play in-plant operator. If asked to report water level in the RHR Rooms, WAIT UNTIL the source of the leak has been reported and then report that the level is now 13 inches and slowly rising.	CRS	Monitor Area Water Levels approach to Max Safe

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 6	11. <u>Unisolable Torus Leak/ EOP 1200 Actions</u>		
		BOP ATC	Respond to C04-B-4, (SUPPRESSION WATER LEVEL HI/LOW)
			<ul style="list-style-type: none"> • Check LI-2996 on C-04 or PLR-7251A/B on C-03
			<ul style="list-style-type: none"> • Identifies and reports the lowering trend
	Note it takes approximately 3 minutes to reach -4 inches Torus water level		<ul style="list-style-type: none"> • Reports EOP 1200 Entry Condition when Torus water level (Narrow Range) is < -4 inches
			<ul style="list-style-type: none"> • Monitors and reports Torus water level throughout
		CRS	Enters and directs actions from EOP1200 Primary Containment Control
			<ul style="list-style-type: none"> • Directs performance of C.5-3401, Torus Water Level Makeup
	a. Role Play the out-plant operator if assigned to perform C.5-3401: Wait 5 minutes and report that he must find boots as PPE for the water on the floor.	BOP ATC	<ul style="list-style-type: none"> • May direct an in-plant operator to perform C.5-3401 steps for Core Spray and RHR. (May choose not to perform due to safety concerns)
			<ul style="list-style-type: none"> • Verifies the HPCI CST Suction, MO-2063 Open
			<ul style="list-style-type: none"> • Opens the HPCI Pump Minimum Flow Valve CV-2065
			<ul style="list-style-type: none"> • Verifies the RCIC CST Suction, MO-2201 Open

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> • Opens the RCIC Pump Minimum Flow Valve CV-2104
Event 6	12. <u>Immediate Reactor Shutdown</u>		
CT-26	When torus water level cannot be restored and maintained above -3.3', then scram and execute Emergency Depressurization per C.5-2002.	CRS	When it is determined that Torus Water Level cannot be maintained above -3.3 ft, Manually Scram and enter EOP 1100.
		CRS	May directs an Immediate Reactor Shutdown per C.4.K (Immediate Reactor Shutdown)
		ATC	<ul style="list-style-type: none"> • May reduce Recirc Flow to minimum
			<ul style="list-style-type: none"> • Depresses pushbuttons for REACTOR SCRAM A and B
Event 6	13. <u>Reactor Scram response (ATC):</u>	CRS	Supervises response to a Reactor Scram
		ATC	Actions per C.4-A (Reactor Scram):
			<ul style="list-style-type: none"> • Place Mode Switch in SHUTDOWN.
	The OATC may address the stuck rod before proceeding with the remaining C.4.A actions		<ul style="list-style-type: none"> • Verify all Control Rods are inserted to or beyond position 04. 1 Rod remains full out (See Event 7)
	<u>Reactor Scram response (ATC) (Continued):</u>	ATC	<ul style="list-style-type: none"> • Provides scram script to CRS Reports when Reactor level drops to less than 9" EOP entry condition.

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> • Controls Reactor water level between +9 and +48 inches. When reactor water level starts to increase:
			<ul style="list-style-type: none"> ○ Place CV-6-13 Manual Loading Station Low Flow Valve in AUTO set between 15 and 20 inches
			<ul style="list-style-type: none"> ○ Close both Main FW Reg Valves
			<ul style="list-style-type: none"> ○ Close MO-1133 and MO-1134 (HP Feedwater Line Block valves
			<ul style="list-style-type: none"> ○ Verify CV-6-13 is closed when RPV level reaches +15 to +20 inches
			<ul style="list-style-type: none"> • Monitor Reactor Power
			<ul style="list-style-type: none"> ○ Insert SRM and IRM detectors.
			<ul style="list-style-type: none"> ○ Switch recorders from APRM to IRM.
			<ul style="list-style-type: none"> ○ Range down on IRMs as necessary.
			<ul style="list-style-type: none"> • Verify SDV Vent and Drain Valves closed.
			<ul style="list-style-type: none"> • Verify Recirc Pumps have run back to minimum
			<ul style="list-style-type: none"> • Ask for permission to reset the scram

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CRS	<ul style="list-style-type: none"> Authorize resetting the Reactor Scram
		ATC	<ul style="list-style-type: none"> Reset the Scram
	<u>Reactor Scram response (ATC) (Continued):</u>	ATC	<ul style="list-style-type: none"> Place DISCH VOL ISOL TEST switch in ISOL
			<ul style="list-style-type: none"> Place SDV HIGH WATER LEVEL BYPASS in BYPASS
			<ul style="list-style-type: none"> Reset the Scram using the SCRAM RESET switch
			<ul style="list-style-type: none"> Reset the Rod Drift alarms
			<ul style="list-style-type: none"> Evacuate personnel from the RB Floor and Equipment Drain Tank Room
			<ul style="list-style-type: none"> Verify the SDV Vent and Drain Valves open
			<ul style="list-style-type: none"> Verify the accumulators recharge
			<ul style="list-style-type: none"> When Annunciator 5-B-30 (DISCH VOLUME TANK NOT DRAINED) IS RESET, Place SDV HIGH WATER LEVEL BYPASS in NORMAL
Event 6	14. <u>Reactor Scram response (BOP):</u>	BOP	Starts performance of Part B of C.4.A
			<ul style="list-style-type: none"> Announce over the plant paging system that a Reactor Scram has occurred.
			<ul style="list-style-type: none"> Open Main Generator output breakers 8N4 & 8N5.

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> • Trip the Main Turbine.
			<ul style="list-style-type: none"> • Verify the Generator Field Breaker Open.
			<ul style="list-style-type: none"> • Start the Turbine Aux Oil Pump.
			<ul style="list-style-type: none"> • Verify Turbine Exhaust Hood Sprays in service.
			<ul style="list-style-type: none"> • Start the Turbine Bearing Lift Pumps (P-64A-F)
	<u>BOP Reactor Scram Response (Continued)</u>	BOP	<ul style="list-style-type: none"> • Verify Main Steam Pressure Control or Low-Low Set is controlling Reactor Pressure.
			<ul style="list-style-type: none"> • At C-25, Place the POST SCRAM switch in ON and verify all available Drywell Recirculation Fans are operating
			<ul style="list-style-type: none"> • Verify 3300 gpm through each operating Feed Pump
			<ul style="list-style-type: none"> • Verify Auxiliary Oil Pump running on any non-operating Feed Pump
			<ul style="list-style-type: none"> • Verify 3000 gpm through each operating Condensate Pump
Event 6	15. <u>Emergency Depressurization</u>	CRS	CRS May anticipate Blowdown per a C.5-1100 Override Statement and direct RPV pressure be lowered using the Turbine Bypass Valves

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
CT-26	When torus water level cannot be restored and maintained above -3.3', then scram and execute Emergency Depressurization per C.5-2002.	CRS	When it is determined that Torus Water Level cannot be maintained above -3.3 ft, Blowdown and enter EOP 2002 .
		CRS	<ul style="list-style-type: none"> Recognizes when Torus Water Level cannot be maintained above -3.3 ft
			<ul style="list-style-type: none"> Enters and directs EOP-2002 (Blowdown)
			<ul style="list-style-type: none"> Verifies Torus level > -5.9 ft.
			<ul style="list-style-type: none"> Directs that 3 ADS SRVs be opened
		BOP	If directed to lower RPV pressure using the Turbine Bypass Valves
	<u>Emergency depressurization (Continued)</u>		<ul style="list-style-type: none"> At C-07, places PRESS REG OVERRIDE in OPEN until both Bypass valves are open
		BOP	Perform Emergency Depressurization
			<ul style="list-style-type: none"> When directed by CRS, take 3 ADS SRVs to OPEN
			<ul style="list-style-type: none"> Verifies that 3 ADS SRV have opened
			<ul style="list-style-type: none"> Monitor RPV Pressure and Level

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 7	16. <u>One Control Rod fails to insert</u>		
			<u>Key Parameter Response:</u> No full in Green light for Control Rod 22-51
			<u>Key Expected Alarms:</u> None
			<u>Auto Actions:</u> None
	a. When the ATC places the ROD MOVEMENT CONTROL switch to ROD IN to insert Rod 22-51, verify EVENT TRIGGER 29 goes active and MALFUNCTION CH02_119 , Stuck Rod 22-51, is DELETED .	ATC	<ul style="list-style-type: none"> Identifies that Rod 22-51 did not fully insert
			<ul style="list-style-type: none"> Informs the CRS
			<ul style="list-style-type: none"> May reset the scram and insert the control rod
			<ul style="list-style-type: none"> May perform actions from C.4.A, Reactor Scram, to insert rod 22-51
	b. Role Play the Reactor Bldg Operator as necessary and, as requested wait 2 minutes and toggle ON MANUAL TRIGGER 9 to close CRD-14		<ul style="list-style-type: none"> Direct an out-plant operator to manually close CRD-14
			<ul style="list-style-type: none"> Bypass the RWM
	1) Verify REMOTE FUNCTION CH22 goes active to close CRD-14		<ul style="list-style-type: none"> Select and insert the full out rod
			<ul style="list-style-type: none"> Informs the CRS when all Rods are Fully inserted
	17. <u>SCENARIO TERMINATION</u>		

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	a. The scenario may be terminated when the conditions are stabilized as follows:		
	1) Actions taken to insert all control Rods		
	2) Emergency Depressurization has been performed		
	b. The scenario may be also terminated at the discretion of lead instructor/evaluator	Crew:	<ul style="list-style-type: none"> Remain in simulator for potential questions from evaluator.
	c. End the scenario by placing the simulator in FREEZE.	Crew:	<ul style="list-style-type: none"> No discussion of scenario or erasing of procedure marking is allowed.

Retention: Life of Plant

Retain in: Training Program File

Form retained in accordance with record retention schedule identified in FP-G-RM-01.

SIMULATOR INPUT SUMMARY				
Code	Description	Event Trigger	Delay	Ramp
MALFUNCTIONS <i>(Allow Tracking Off)</i>				
EG02A	Stator Cooling Pump #11 Trip	5	None	None
HP01	HPCI Auto Initiation	3	None	None
PC05	Torus Drain (Leak)	28	00:01:00	None
CH02_119	Control Rod 22-51 Stuck	30	None	None
CH02_119	Control Rod 22-51 Stuck (Inserts and deletes in 1 second)	29	None	None
REMOTE FUNCTIONS				
CH22	CRD-14 Accumulator Charging Water Isolation Valve	9	None	None

SIMULATOR INPUT SUMMARY				
Code	Description	Event Trigger	Delay	Ramp
OVERRIDES				
01-S044-02	A520P31-26 MO-2023 HS open	30	None	None
01-S072-02	A520P32-28 MO-2021 HS open	30	None	None
01-DS104-02	A531P30-32 MO-2023 RED LAMP	30	None	None
01-DS103-02	A531P30-33 MO-2023 GREEN LAMP	30	None	None
01-DS157-02	A531P31-30 MO-2021 RED LAMP	30	None	None
01-DS156-02	A531P31-31 MO-2021 GREEN LAMP	30	None	None
01-S030-02	A520P30-38 MO-2022 HS open	30	None	None
05-S088-02	A521P27-48 12 Stator Liquid Pump P-72B-STOP	30	None	None
05-S088-02	A521P27-48 12 Stator Liquid Pump P-72B-STOP (Inserts and deletes in 1 second)	28	None	None
02-A11P1-V	A520P31-37 11 Recirc Pump Manual- RAISE	1	None	None
05-S088-01	A521P27-45 12 Stator Liquid Pump P-72B-START	28	00:00:01	None

Event Trigger Definitions:

Code	Description	Event Trigger
ZD_SSCWP(2)	#12 Stator cooling Pump taken to Start	28
ZD_CRDIN	Rod Movement Control Switch taken to ROD IN	29

Manual Settings:

1. Reset to **IC 285**.
 - a. If necessary, IC 285 can be recreated as follows:
 - Reset to IC13, (89% Power).
 - Select an edge rod.
 - Establish Event Triggers and Commands per the Simulator Input Summary.
2. Manually activate event **Trigger 30** to establish the initial conditions for the scenario.
3. Hang **Caution Tags** for the Inoperable Division 2 Containment Spray Valves.
4. Verify **Event Trigger Definitions**:
 - a. Event Trigger 28 is used to delete the Auto start failure of the #12 Stator Cooling Pump and initiate the Torus leak one minute later.
 - b. Event Trigger 29 is used to delete the Stuck Rod malfunction when the Rod Movement Control Switch is taken to ROD IN.
5. Verify the **Malfunctions** match the Simulator Input Summary.
6. Verify the **Remote Functions** match the Simulator Input Summary.
7. Verify the **Overrides** match the Simulator Input Summary.
8. Verify the following conditions:
 - a. <90% Power
 - b. Edge Rod selected
9. Perform the applicable sections of the **SIMULATOR SETUP CHECKLIST**.
10. Provide the following for the operating crew :
 - a. OSP-TRB-0570 (Exercise Main Turbine Bypass Valves)
 - b. Stopwatch
 - c. Form for Reactivity manipulation of returning to 100 Power
 - d. A scenario specific Form 3139, Control Room Shift Turnover Checklist
 - e. A scenario specific Form 3140, Shift Supervision Turnover Checklist