Xcel Energy	SIMULATOR EXERCISE GUIDE (SEG)

SITE: MONTICELLO **SEG #** ILT-SS-06E

SEG TITLE: 2009 ILT NRC 3, DRYWELL HIGH TEMPERATURE BLOWDOWN **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: _____
Instructor *Date*

Reviewed by: _____
Instructor *Date*
(Simulator Scenario Development Checklist.)

Validated by: _____
Validation Lead Instructor *Date*
(Simulator Scenario Validation Checklist.)

Approved by: _____
Training Supervision *Date*

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:

Completion of MT-ILT Training program

Training Resources:

Simulator

References:

1. FP-T-SAT-72
2. FP-T-SAT-75
3. NUREG 1021, Rev.9, Supplement 1

Commitments:

None

Evaluation Method:

ILT NRC EXAM

Operating Experience:

None

Related PRA Information:

Initiating Event with Core Damage Frequency:
Steam line break in the Drywell

Important Components:
Containment sprays

Important Operator Actions with Task Number:
Emergency Depressurization

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

Shift Manager Tasks:

None

SRO Tasks:

SS299.349	Apply Administrative requirements of T.S. Section 3.1 and Bases to Reactivity Control systems	6, 7
SS299.351	Apply administrative requirements for T.S. Section 3.3 and Bases to Instrumentation	6, 7
SS299.354	Apply administrative requirements for T.S Section 3.6 and Bases to Containment Systems	6, 7
SS299.356	Apply administrative requirements of T.S. Section 3.8 and Bases electrical power systems	6, 7
SS304.193	Implement RPV Control	6, 7
SS304.194	Implement Primary Containment Control	6, 7
SS304.198	Implement Emergency RPV Depressurization	6, 7
SS314.119	Supervise containment spray	6, 7
SS315.101	Supervise response to reactor scram	6, 7
SS315.102	Supervise response to loss of CRD pump flow	6, 7
SS315.109	Supervise response to stuck open relief valve	6, 7
SS315.140	Supervise response to a loss of Bus 15 or Bus 16	6, 7
SS315.159	Supervise rapid power reduction	6, 7
SS315.167	Supervise response to a control rod drifting	6, 7

RO Tasks:

CR200.146	Perform the procedure for a Reactor Scram	1-5
CR200.147	Perform the procedure for loss of CRD pump flow	1-5
CR200.154	Perform the procedure for a stuck open relief valve	1-5
CR200.184	Perform the procedure for loss of bus 15 or 16	1-5
CR200.203	Perform the procedure for rapid power reduction	1-5
CR200.226	Respond to a drifting control rod	1-5
CR262.133	Transfer of plant busses from 2R to 1R using the Emergency method	1-5
CR299.351	Apply T.S. Section 3.1 and Bases to Reactivity Control Systems	2, 5

RO Tasks:

CR299.353	Apply T.S. Section 3.3 and Bases to Instrumentation	2, 5
CR299.366	Apply T.S. Section 3.6 and Bases to Containment Systems	2, 5
CR299.358	Apply T.S. Section 3.8 and Bases electrical power systems	2, 5
CR304.102	Perform the actions associated with RPV Control	1-5
CR304.103	Perform the actions associated with Primary Containment Control	1-5
CR314.101	Perform actions associated with Emergency RPV Depressurization	1-5
CR314.123	Perform actions associated with containment spray	1-5
CR314.124	Defeat Drywell cooler trips	1-5

STA Tasks:

None

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Rod Drift in
2. SRV opening
3. 2R Trouble
4. Bus 16 lockout
5. CRD Pump fails to start

After EOP Entry:

1. A Drywell Spray failure

Abnormal Events:

1. Rod Drift in
2. SRV opening
3. Bus 16 Lockout

Major Transients:

1. LOCA with loss of Drywell Spray

Critical Tasks:

1. **{Within 5 minutes of the second accumulator low pressure alarm, scram the reactor when no CRD pump is running and the second accumulator low pressure alarm is received.}**
2. **{When drywell temperature cannot be restored and maintained below 281°F, then perform Emergency Depressurization per C.5-2002.}**

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. 100% Power with 12 CRD Pump in service for vibration testing.

2. The following equipment is OOS:
   - 1AR Transformer, inspecting due to a hot spot.

3. The following evolutions are planned for the shift:
   - BOP to place 12 RBCCW Pump in service and place 11 RBCCW Pump in standby
   - Vibration testing on 12 CRD pump
   - Continued investigation on 1AR Transformer

SEQUENCE OF EVENTS:

Event 1:
- Transfer to the standby RBCCW Pump

Event 2:
- The OATC will respond to a single control rod drift in due to a leaking scram outlet valve.
- The CRS will enter the appropriate tech spec (3.1.3. Required Action C.1 & C.2).

Event 3:
- Stuck open Relief Valve
  The BOP will address this problem. The SRV will close when C.4-B.03.03.A (Stuck Open Relief Valve) is implemented. The CRS will enter the appropriate tech spec (3.3.6.3 Condition A and 3.6.1.5 for Low-Low Set inoperable.

Event 4:
- Rapid Power Reduction is performed for the leaking SRV

Event 5:

- A significant oil leak on 2R Transformer requires emergency transfer to 1R. The CRS will address Tech Specs for offsite sources, 3.8.1

Event 6:

- Bus 16 (4KV Essential Bus) Lockout, #11 CRD Pump will NOT start, manual reactor scram.

Event 7:

- All rods fully insert and EOP C.5 1100 is performed.
- A steam leak inside the Drywell develops and EOP C.5-1200 is performed.
- Emergency Depressurization becomes necessary due to elevated Drywell temperatures.

Event 8:

- A RHR can NOT be initiated in DW Spray mode.
  This results in use of the Emergency Depressurization Contingency.

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
	INITIAL CONDITIONS (IC): • Mode: 1 • Power: 100% • Pressure: 1000 • Generator: 608 MWe	CRS ATC BOP	
	1. SIMULATOR SET UP Reset to IC 283 per SIMULATOR INPUT SUMMARY and Manual Setting and Instructions		
	2. SHIFT BRIEF: Verify crew performs walk down of control boards and reviews turnover checklists. **When asked for out plant status provide the following**: <u>Turbine Building Status</u>: 5 Condensate F/D are in service, 'C' demin has highest d/p indication at 3.8 psid. All conditions are normal. <u>Reactor Building Status</u>: All conditions are normal. At the completion of the shift brief inform the CRS that their crew has the duty.	CRS	Performs Shift Brief CDF is GREEN, XCEL condition is GREEN. 1AR Transformer out of service to investigate a hot spot The following support is available: Normal Day Shift <u>Operations</u>: normal crew compliment plus 3 relief crew NLOs <u>Maintenance</u>: Support available upon request <u>Engineering</u>: Support available upon request <u>Management</u>: Support available upon request

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 1	3. **Transfer from #11 RBCCW Pump to #12 RBCCW Pump.** a. Role play and complete necessary actions as an in-plant operator: 1) The #12 pump suction and discharge valves are open prior to starting 2) The pump and motor operate normally after starting 3) When directed to operate the #11 Pump discharge valve, Role Play as necessary. (This operation is transparent to the control room operators)	BOP	Transfer to the standby RBCCW Pump. • Station an operator at RBCCW Pumps • Establish communications • Insure #12 RBCCW Pump suction and discharge valves are open • Start #12 RBCCW Pump • Confirm proper operation with in-plant operator • Direct in-plant operator to close the #11 RBCCW Pump discharge valve • When the #11 RBCCW Pump discharge valve is closed, immediately trip the pump • Direct the in-plant operator to re-open the #11 RBCCW Pump discharge valve • Place the #11 RBCCW Pump switch in Auto-standby

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 2	**4. <u>Rod Drift_IN</u>** a. When directed by the lead evaluator, INSERT MANUAL **TRIGGER 1**, 1) Verify the following Malfunction goes active: **CH06_052** Control Rod 42-23 Scram Outlet Valve Leaking. b. If asked about CRD Pump Bypass Flow, Role Play the Reactor Bldg. Operator and report that flow is 30 gpm. c. If asked to check out HCU, state that the scram outlet line is hot to the touch. d. If asked to hydraulically isolate the HCU, wait 3 minutes, DELETE MALFUNCTION **CH06_052** and report the HCU is isolated.	OATC CRS	<u>Key Parameter Response</u>: Rod 42-23 drifting in. <u>Key Expected Alarms</u>: 5-A-27 (Rod Drift) <u>Auto Actions</u>: None • Takes actions per C.4-B.01.03.C • Take ROD SELECT POWER SWITCH to OFF and back to ON • Reselect drifting rod and insert to position 00 • Notify Shift Supervision • Verify proper CRD System parameters • Verify core thermal power and margins to thermal limits have <u>NOT</u> been exceeded • Notify Nuclear Engineer Supervisor Evaluate LCO not met and enters T.S. 3.1.3 Condition C. Required action C.1 is met and C.2 is due in 4 hours Directs HCU be disarmed

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 3	5. **Stuck open Relief Valve:** a. When directed by the lead evaluator, INSERT MANUAL **TRIGGER 3.** 1) Verify the following Malfunction goes active: **AP01E,** Stuck Open SRV 2) Verify the following Override goes active **A531P30-39**, E SRV Red Lamp ON **NOTE: The BOP should leave the simulator and go to the upper booth area to simulate going to the Cable Spreading Room (CSR).**	BOP	Key Parameter Response: Amber and Red CO3 light is on for SRV E open; MWe lowering, lower steam flow in A Main Steam line Key Expected Alarms: 5-A-46 (SRV Open) Auto Actions: None Implement C.4-B.03.03.A (Stuck Open Relief Valve) • Place handswitch 2E-S4E for SRV E in OPEN and then return to the normal position. • Place handswitch 2E-S4E for SRV E in CLOSE. • Place Div II Lo-Lo Set Logic Switch (HS-S3B) at panel C-253D in BYPASS • With SRV E still OPEN, verify keylock switch (HS-S43) at Panel C-253D in OFF. • Monitor and control Reactor pressure • Directs and supervises Rapid Power Reduction for Step 6 of C.4-B.03.03.A

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	b. When the BOP simulates fuse removal for E SRV,		• Simulate fuse removal for E SRV at C-253A in the CSR, F1 & F2 on Strip AA
	1) Delete Override **A531P30-39**, E SRV Red Lamp ON	CRS	• Initiate 0444-B for Torus Heat Addition. • If Torus Water Temperature exceeds 90°F, enter C.5-1200, (Primary Containment Control)
	2) Delete Malfunction **AP01E,** Stuck Open SRV	BOP	• The CRS will declare TS 3.3.6.3 not met and enter Condition A (72 hour LCO) and 3.6.1.5 (14 Day LCO) for Low-Low Set inoperable
Event 4	**6. Rapid Power Reduction for SRV:**	CRS	Supervises Rapid Power Reduction for Step 6 of C.4-B.03.03.A
		ATC	Performs Rapid Power Reduction per C.4.F • Reduces recirculation flow • Does <u>NOT</u> go below 35Mlb/hr
	For notifications, Role Play Single Point of Contact and plant support personnel as necessary	CRS	• Make the following notifications for the unanticipated power change and degraded SRV: o Single Point of Contact

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 3	**7. Stuck open Relief Valve (Torus Cooling):** a. Even if Torus Water Temperature does <u>NOT</u> exceed 90°F, the CRS may elect to establish Torus Cooling. If so, these steps become applicable.	BOP	Starts all available Torus Cooling A (B) • Verify CV-1728 (1729), RHR HX SW Outlet, controller set at 20%. • START No 11(12) and or No 13(14) RHRSW pumps as needed. • Adjust flow for ~3500 gpm per pump using CV-1728 (CV-1729). • Verify No 11(12) and /or No 13 (14) RHR pumps running. • Partially OPEN MO-2008 (2009), Torus Cooling Inj/Test Inboard, by holding handswitch in OPEN position for 8 seconds. • Give MO-2006 (2007) an OPEN signal by momentarily placing RHR Div 1 Disch to Torus Otbd handswitch 10A-S14A (B) to OPEN. • THROTTLE OPEN MO-2008 (2009) to provide ~4000 gpm per pump. • CLOSE MO-2002 (2003), HX Bypass. • Verify V-AC-5 (4), A (B) RHR RM COOLER UNIT, in operation.
		BOP & CRS	• Enter T.S. 3.5.1 Conditions B&D for LPCI inject paths inoperable

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5	8. **Emergency transfer from 2R to 1R:**		Key Parameter Response: None
	a. When directed by the lead evaluator, INSERT MANUAL **TRIGGER 5**		Key Expected Alarms: 8-B-01 (No. 2R XFMR TROUBLE) Auto Actions: None
	1) Verify the following Remote goes active: **C-08-B01**, 2TR Trouble	BOP	• Dispatch an operator to investigate from a distance. • Verify that 2R Voltages appear normal
	b. Role Play the dispatched operator: Wait 2 minutes and then report that a steady stream of oil is leaking out of 2R and a large pool of oil has already formed		• Relay information about the oil leak to the CRS
		CRS	Directs emergency transfer from 2R to 1R
		BOP	Performs emergency closed bus transfer from 2R to 1R • Makes plant page about 4KV breaker operation and to clear personnel from vicinity of 2R and 1R • Verify 115KV system voltage is ≥117.4 KV or confirm that the 10TR/XFMR auto load tap changer is in service. • Bus 13 o Place 152-302/CS to CLOSE o Place 152-301/CS to TRIP • Bus 14 o Place 152-402/CS to CLOSE o Place 152-401/CS to TRIP

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5 (Cont'd)	Emergency closed bus transfer from 2R to 1R c. Role Play the equipment operator dispatched to open 3N4 as necessary. Modify Remote Function **ED06**, 3N4 Local operation, to OPEN d. If asked, Role Play personnel to confirm that the 10TR XFMR Auto load tap changer is in service. e. Role Play System Dispatcher as necessary when called to isolate the 2R Transformer Role Play as necessary to inform the crew that another operator will be called in to perform OSP-MSC-0542	BOP CRS	• Bus 11 o Place 152-102/CS to CLOSE o Place 152-101/CS to TRIP • Bus 12 o Place 152-202/CS to CLOSE o Place 152-201/CS to TRIP • Open knife switch 16 on panel C-31 • Open 3N4 34.5KV Circuit Breaker • Open 3N5 34.5KV Circuit Switch • Dispatch an operator to place the 2R Load Tap Changers in Manual and adjust voltages locally • Contact the System Dispatcher to isolate the 2R Transformer Evaluate Tech Spec 3.8.1 • Determine T.S. 3.8.1 Condition A is applicable • Initiate SR 3.8.1.1 (OSP-MSC-0542, Weekly Breaker Alignment, Indicated Power Availability, and Voltage to AC & DC Power Distribution Checks)

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	For notifications, Role Play Single Point of Contact and plant support personnel as necessary		• Make the following notifications for the LCO Entry. o Single Point of Contact
Event 6	9. **Bus 16 Lockout:** a. When directed by the lead evaluator, INSERT MANUAL **TRIGGER 7**.		Key Parameter Response: Loss of 16 Bus voltage Key Expected Alarms: 8-C-18 (No. 16 4160V BUS LOCKOUT) Auto Actions: RPS B Half Scram
		BOP	Recognizes the loss of Bus 16 and take action per C.4-B.09.06.C (4KV Essential Bus)
	1) Verify the following Malfunction goes active: **ED05F**, Bus 16 Lockout		• Check Bus 16 voltage on C08, which indicate 0 (or alternate indication).
	2) Verify the following Overrides go active **03-S55-01**, #11 CRD Pump fails to start **01-S030-02**, MO-2022 DW Spray failure		• Notify Shift Supervision.
	b. If requested to supply Service Water to #12 DG, Role Play in plant personnel as necessary and Modify Remote Function **SW10** to Open		• Shuts down #12 DG or supplies Service Water
		ATC	Recognizes the loss of CRD and takes actions per C.4-B.01.03.A (Loss of CRD Pump Flow) • Attempt to start the #11 CRD pump

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	[Within 5 minutes of the second accumulator low pressure alarm, scram the reactor when no CRD pump is running and the second accumulator low pressure alarm is received.]		• Notify the CRS that #11 CRD can NOT be started **NOTE: The 1st HCU alarms in 2 minutes and the 2nd HCU alarms in 3.5 minutes. The crew may manually Scram the Reactor during this time.** • When a second CRD accumulator alarm is received, manually scram the reactor.
	NOTE: The following actions from C.4-B.09.06.C and C.4-B.09.07.D (Loss of Power to LC-104 or Its MCCs) may NOT be performed at this time due to the intensity of the scenario:	CRS	Direct actions for a loss of Bus 16 and complete loss of CRD flow • Monitor system operation and take appropriate action for RBCCW, Instrument Air, Drywell Coolers, Service Water, Reactor Pressure Control, RWCU • Place the following Control Switches in PULL-TO LOCK o 152-610/CS 1AR Trans to16 Bus o 152-602/CS 12 STDBY Diesel Gen to 16 Bus

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 6 Scram	**10. <u>Reactor Scram response</u>:** a. When the Mode Switch is taken to SHUTDOWN, verify **Trigger 9** goes active. b. After a 1 minute delay, verify the following Malfunction goes active **MS04B**, Main steam rupture inside Drywell	ATC	Actions per C.4-A (Reactor Scram): • Place Mode Switch in SHUTDOWN. • Verify all Control Rods are inserted to or beyond position 04. • Provides scram script to CRS when RPV level drops to less than 9" EOP Entry Condition • Monitor Reactor Power o Insert SRM and IRM detectors. o Switch recorders from APRM to IRM. o Range down on IRMs as necessary. • Verify SDV Vent and Drain Valves closed. • Maintain RPV Water Level 9-48 inches
	<u>NOTE</u>: The BOP may <u>NOT</u> complete all Part B actions listed because the next event starts 2 minutes after the Mode Switch is taken to SHUTDOWN and will be a higher priority.	BOP	Starts performance of Part B of C.4.A • Announce over the plant paging system that a Reactor Scram has occurred. • Open Main Generator output bkrs 8N4 & 8N5. • Trip the Main Turbine. • Verify the Generator Field Breaker Open. • Start the Turbine Aux Oil Pump.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			• Verify Turbine Exhaust Hood Sprays in service. • Verify Main Steam Pressure Control or Low-Low Set is controlling Reactor Pressure.
Event 6	11. EOP-1100 after Reactor scram:	CRS	Supervise response to reactor scram, enters EOP-1100 and directs: • Maintain RPV Water Level 9-48 inches • With DW Press >2 psig, before 320 psig Reactor Pressure prevent injection from Core Spray and LPCI NOT needed for core cooling • Verifies that RPV pressure is stable and <1056 psig
		BOP	When directed, prevent injection from Core Spray and LPCI NOT needed for core cooling (per C.5-3205) • Prevents CS injection from Div 1 & Div 2 o Takes CS Injection Bypass switches to BYPASS (14A-S16A & B) o Closes CS Injection Outboard valves (MO-1751 and MO-1752) o Takes CS pump Handswitches to Pull-To-Lock o Closes CS Injection Inboard valves (MO-1753 and MO-1754)

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			• Prevents LPCI Injection o Bypasses LPCI Initiation 5-minute seal in by opening knife switches 10A-S31A and 10A-S31B o Verify closed MO-2012 Div 1 Inj Outboard o Verify closed MO-2013 Div 2 Inj Outboard
Event 7	**12. LOCA:** <u>NOTE</u>: The severity of the leak will ramp in over 15 minutes. If mitigating actions are taken promptly Drywell Air Temperature will exceed 281°F in approximately 10 minutes. If mitigating actions are <u>NOT</u> performed efficiently, 281°F will be exceeded more quickly.	BOP CRS	Reports Drywell pressure rising • Reports drywell pressure and temperature and torus temperature EOP entry conditions, values, and trends Enters EOP-1200 and directs: • Start all available torus cooling • Start all available drywell cooling • Start torus sprays • Start drywell sprays
Event 7	**13. Torus Cooling / Torus Sprays:**	BOP	Places Torus Sprays in service per C.5-3502: • Verifies RHR Pumps running • Takes Cont Spray/Cooling LPCI Initiation Bypass to BYPASS, 10A-S17A • Opens Discharge to Torus Outboard, MO-2006

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			• Opens Torus Spray Inboard, MO-2010 • Throttles Torus Cooling Inj/Test Inboard, MO-2008 • Verifies LPCI Inject Outboard Valves are closed; MO-2012 and MO-2013.
Event 7	**14. Torus Cooling / Torus Sprays:**	BOP	• Initiates Containment Cooling o RHRSW Outlet valve controller set to 20% o Place HX Bypass in CLOSE, MO-2002 o Start RHRSW Pump(s) o Adjust flow to ≈3500 gpm per pump o Verify HX Bypass closed, MO-2002 o Verify RHR Room Cooler in operation, V-AC-5
Event 7	**15. Drywell Cooling:**	BOP / ATC	Start all available drywell cooling (C.5-3503) • Place all D/W fan control switches to OFF • Open Knife switch KS3100 • Verify fan inlet dampers are in AUTO, HS-8040 A&C

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			• Place all D/W fan control switches to ON, V-RF-1&3 • OPEN associated fan disch dampers, V-D-15 & 19 at 100%
Event 8	16. **Drywell Spray failure**	BOP / ATC	Start D/W sprays • Opens the Outboard Drywell Spray valve, MO-2020 • Attempts to open the Inboard Drywell Spray valve, MO-2022 • Reports inability to spray drywell
Event 8	**17. Drywell Spray failure/ Blowdown** **[When drywell temperature cannot be restored and maintained below 281°F, then perform Emergency Depressurization per C.5-2002.]**	CRS	May anticipate Emergency Depressurization / direct opening the Turbine Bypass valves When D/W temp can NOT be maintained below 281°F directs performance of C.5-2002 (Emergency RPV Depressurization) • Directs injection be prevented from Core Spray and LPCI (NOT needed for Core Cooling) • Verifies Torus level > -5.9 ft. • Directs opening of all 3 ADS SRVs. • Directs RPV Level restoration

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		BOP/ ATC	If directed, anticipate Blowdown • At C07, places the Pressure Regulator Override (PRO) to OPEN Perform Blowdown • Prevents injection from Core Spray and LPCI (NOT needed for Core Cooling) • Opens 3 ADS SRVs • Monitor and report RPV level values and trends • Controls RPV water Level with Feedwater
End	18. When the conditions are stabilized or at discretion of lead instructor/evaluator 19. End the scenario by placing the simulator in freeze	Crew:	• Remain in simulator for potential questions from evaluator. • No discussion of scenario or erasing of procedure marking is allowed.

SIMULATOR INPUT SUMMARY

Manual Trigger	Type	Code	Description	Delay	Ramp	Final Severity or Value	Event Trigger
1	Malfunction	CH06_052	Control Rod 42-23 Scram outlet valve leaking			100	
3	Malfunction	AP01E	Stuck open SRV			TRUE (1)	
7	Malfunction	ED05F	Bus 16 Lockout			TRUE (1)	
	Malfunction	MS04B	Main Steam Rupture in Drywell	1:00	15:00	11%	9 ZD_S1SHD
5	Malfunction	C-08-B01	2R Trouble			TRUE (1)	
3	Override	01-DS-174-02	E SRV Red Lamp			ON	
7	Override	03-S55-01	#11 CRD Pump Handswitch START Position			FALSE	
7	Override	01-S030-02	MO-2022 Handswitch OPEN Position			FALSE	
	*Remote (As requested)	ED06	3N4 Local operation			OPEN	
	*Remote (As requested)	SW10	B ESW Inlet Isolation valve SW-229			OPEN	

Manual Setting and Instructions:

1. Reset to IC 283
2. Verify Initial Conditions:
    a. C08, 1AR Transformer out of service
    - 1AR Breakers to Bus 15 and 16 are in PTL
    - 1AR Transformer volts on C08 reading 0 volts
    - Mimic updated

    b. C07, Hood Spray in Normal
    c. C05, #12 CRD Pump running
3. Verify Event Trigger 9 definition as ZD_S1SHD (Mode Switch to Shutdown)
4. Verify available copies of 0444-B for Torus Temperature monitoring and OSP-MSC-0542 for the loss of 2R.

(This table may be modified based on site simulator)

Attach the following site-specific information as necessary:

- Simulator Set-up Checklist (before and after training)
- Pre-evaluation Brief Guide (for evaluations only)
- Post-evaluation Critique (for evaluations only)
- Turnover Log

Historical Record: New Create

SIMULATOR SETUP CHECKLIST (IC *)

Before Training or Evaluation:

- ☐ Simulator in Training Load
- ☐ Alarm Sound "ON" on simulator console
- ☐ Simulator reset to correct IC (malfunctions, remotes, overrides entered per guide)
- ☐ MTF-7100-051 (Attendance Record) available
- ☐ Chart recorders operating and forwarded
- ☐ Tags hung per simulator guide (Caution, Danger, Info)
- ☐ Pens, paper, markers, available
- ☐ Turnover Sheet, LCO log, PRA sheet as applicable
- ☐ SPDS terminals operating
  - ☐ Verify that SPDS is the EOF has "MPIRT" in the lower right corner of display.
    - ☐ Verify "SPIRT" does NOT appear in the lower right corner. (If it does, contact John Shriver)
    - ☐ Check for outside air temperature approximately the same as real air temperature on the SPDS (another indication that the SPDS is indicating Live data or Simulator data).
- ☐ Process Computer alarm screen up and clear
- ☐ Numac alarms reset and displays off
- ☐ RWCU filter demin flows set to desired flow (approx. 80 gpm)
- ☐ RWCU temperature set between 115° and 118°F
- ☐ Generator MVAR loading ≤50 MVAR delivered
- ☐ Turbine lube oil temperature between 111° and 113°F
- ☐ Reactor water level control is in 3 element and Median selected (unless IC specifies a different configuration)
- ☐ Status board updated
- ☐ Verify all Hi / Hi-Hi alarms are reset on C-37 for neutron monitors.

Continued on Back

SIMULATOR SETUP CHECKLIST (IC *)
(Continued)

Before Evaluation Only:

- ☐ Videotape in VCR and setup to record (Taped evaluations only)
- ☐ Exam signs posted on all simulator doors
- ☐ Evaluation team briefed
- ☐ SEC contacted if participating
- ☐ Determine individual responsible for SEC duties if SEC NOT participating
- ☐ Phone volume at Instructor Console in the Simulator Control Room turned down

After Training for the Day

- ☐ Simulator reset to IC-15
- ☐ Tags removed from control panels
- ☐ Exam/Training signs turned around
- ☐ Procedures cleaned and put away
- ☐ Headsets turned off and put away
- ☐ Recorders stopped
- ☐ Phone volume at Instructor Console in the Simulator Control Room returned to normal

Simulator Scenario Development Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

1. The scenario contains objectives for the desired tasks and relevant human performance tools.	Yes	No
2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations.	Yes	No
3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	Yes	No
4. Plant PRA initiating events, important equipment, and important tasks are identified.	Yes	No
5. Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	Yes	No
6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	Yes	No
7. The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices. Include estimated completion times and/or notes for use of time compression.	Yes	No
8. The scenario includes related industry experience. SOER, SER and similar OE recommendations are clearly identified and fully addressed.*	Yes	No
9. The scenario guide incorporates verification of Operator Fundamental application.*	Yes	No
10. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.*	Yes	No

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

* For evaluations these items may be marked NO without justification.

Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

1.	The desired initial condition(s) could be achieved.	Yes	No
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	Yes	No
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	Yes	No
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	Yes	No
5.	During the simulator scenario, observed changes corresponded to expected plant response.	Yes	No
6.	Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could NOT be satisfied, identify the objectives in the Simulator Action Request	Yes	No
7.	Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.	Yes	No

Discrepancies noted (Check “none” or list items found) ☐ None
SMAR = Simulator Action Request

SMAR:_____ SMAR:_____ SMAR:_____ SMAR:_____

Comments:_____

_____

_____

_____

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.