Xcel Energy	SIMULATOR EXERCISE GUIDE (SEG)

SITE: MONTICELLO **SEG #** ILT-SS-05E

SEG TITLE: 2009 ILT NRC 2, LOCA & ALC **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:
LOCA

Important Components:
Containment

Important Operator Actions with Task Number:
XRPVBLDNY-Blowdown to prevent core damage

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

Shift Manager Tasks:

None

SRO Tasks:

SS200.133	Direct Reactor Startup to Full Power IAW C.1	6, 7
SS299.351	Apply Administrative requirements of T.S. Section 3.3 and Bases to Instrumentation	6, 7
SS299.353	Apply Administrative requirements of T.S 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
SS304.198	Implement Emergency RPV Depressurization	6, 7
SS314.106	Supervise use of alternate injection systems for RPV makeup	6, 7
SS314.107	Supervise RPV makeup with CRD	6, 7
SS314.119	Supervise containment spray	6, 7
SS315.101	Supervise response to reactor scram	6, 7
SS315.130	Supervise response to a Feedwater pump trip	6, 7
SS315.138	Supervise response to loss of Bus 11 or Bus 12	6, 7
SS315.159	Supervise rapid power reduction	6, 7
SS315.160	Supervise response to inadvertent ECCS initiation	6, 7

RO Tasks:

CR200.127	Perform a power ascension after the reactor is on line >15% power	1-5
CR200.146	Perform the procedure for a Reactor Scram	1-5
CR200.175	Perform the procedure for feedwater pump trip	1-5
CR200.182	Perform the procedure for a loss of Bus 11 or Bus 12	1-5
CR200.203	Perform the procedure for rapid power reduction	1-5
CR200.204	Perform the procedure for inadvertent ECCS initiation	1-5
CR203.111	Transfer the A(B) RHR from LPCI to Torus Cooling with normal offsite power available during abnormal and emergency conditions	1-5
CR299.353	Apply T.S. Section 3.3 and Bases to Instrumentation	2, 5

RO Tasks:

CR299.355	Apply Tech Spec 3.5 and Bases to ECCS and RCIC	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
CR314.110	Use alternate injection systems for RPV makeup	1-5
CR314.111	Perform actions associated with RPV makeup with CRD	1-5

STA Tasks:

None

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Core Spray Test
2. RWM INOP
3. RFP high vibes
4. CRD Flow Control failure
5. Inadvertent ADS timer initiation

After EOP Entry:

1. HPCI flow controller failure, then isolation

Abnormal Events:

1. RFP high vibes
2. Inadvertent ADS timer initiation

Major Transients:

1. LOCA with a loss of high pressure injection.

Critical Tasks:

1. **[Inhibit ADS to avoid auto initiation that would result in a violation of cooldown rate or a loss of adequate core cooling.]**
2. **[When RPV water level cannot be maintained >-149", Emergency Depressurize the reactor.]**

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. Reactor power ~55%

   - Startup in progress at C.1 Section VIII.A, Step 18 (Raise power with Rods per Reactor Engineer)
   - 2 RFPs in service
   - Waiting for Nuclear Engineer to verify predictor results and to provide a new withdrawal sequence.

2. The following equipment is OOS:
   - None

3. The following evolutions are planned for the shift:
   - Perform 'A' Core Spray Quarterly while waiting for new predictor results

SEQUENCE OF EVENTS:

Event 1:

- Perform Core Spray Quarterly.
  #11 Pump motor breaker trips on Lockout. (Note: This event is NOT intended as a Tech Spec evaluation for the CRS.)

Event 2:

- The RWM fails inoperable. The CRS refers to Tech Spec 3.3.2.1(B) and determines that the RWM can be bypassed.

Event 3:

- Reactor Feed Pump high vibration.
  The BOP will address this problem and eventually trip the RFP.

Event 4:

- The ATC will lower reactor power with Rods from 55% to 50% in preparation for securing the Feed Pump.

Event 5:

- CRD Flow Control valve fails closed.
  ATC will swap to alternate Flow Control Valve.

Event 6:

- ADS Timer inadvertent ECCS initiation. The BOP and CRS perform C.4-G, Inadvertent ECCS Initiation. CRS will address Tech Spec 3.3.5.1 and 3.5.1

Event 7:

- Bus 11 Lockout, reactor scram, LOCA.
- With RFP #12 secured, a Bus 11 Lockout results in the loss of all Feedwater.
- All rods fully insert but HPCI fails and RCIC can NOT keep up with the inventory loss. Alternate Level Control contingency is performed.
- Emergency Depressurization is finally necessary to allow low pressure systems to inject.
- EOPs C.5 1100 and 1200 are performed.

Event 8:

- HPCI fails to inject.
  The BOP or ATC will take manual control but HPCI eventually trips on high steam flow.

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 • Exposure: BOC • Power: ≈55% • Pressure: 964 psig • Generator: 311 Mwe • Total Recirc Flow: 35.5 M/lb/hr	(RO/LO/ SRO)	
	1. SIMULATOR SET UP Reset to IC 282 per SIMULATOR INPUT SUMMARY and Manual Setting and Instructions		
	2. Shift Brief: Turbine Building Status: 4 Condensate F/D are in service, 'C' demin has highest d/p indication at 5.3 psid. Conditions are normal. Reactor Building Status: Conditions are normal.	CRS	Performs Shift Brief CDF is GREEN, XCEL condition is GREEN. Wait for Nuc guidance for the reactor startup to continue Perform Core Spray quarterly surveillance

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	3. <u>COMPLETE TURNOVER:</u> Verify crew performs walk down of control boards and reviews turnover checklists. At the completion of the shift brief inform the CRS that their crew has the duty.		The following support is available: <u>Operations</u>: Normal Staffing for startup <u>Maintenance</u>: Support available upon request <u>Engineering</u>: Support available upon request
Event 1	**4. <u>Core Spray Quarterly surveillance:</u>** a. Provide candidates with a working copy of 0255-03-IA-1-1, (Core Spray Loop A Quarterly Pump and Valve Tests) b. Role Play the In-plant operator as necessary. The Local suction pressure is reading 5 psig. If asked about vibration readings, inform the CRS that vibrations readings are not required. c. When #11 CS Pumps is started, verify TRIGGER 1 goes active and that Malfunction **CS01A** goes active after a 5 sec delay	CRS BOP BOP	<u>Management</u>: Support available upon request Perform steps of 0255-03-1A-1-1 • Evaluate Tech Spec 3.5.1 • Place #11 Core Spray Pump in PULL-TO-LOCK. • Cycle and time MO-1741 • Place #11 Core Spray Pump in AUTO. • Check Annunciator 3-A-54 is reset • Record #11 CS Pump Suction and Discharge pressures • Calls for local Disch. Press C03 PI-14-48A • Makes plant page for 4KV breaker operation • Start #11 CS Pump. <u>Key Parameter Response</u>: 11 CS Pump won't start.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	d. Role Play the In-plant operator as necessary. The Core Spray pump breaker on Bus 15 has tripped on Lockout. There are no unusual indications at the Core Spray pump and motor. e. Role Play Single Point of Contact (or equivalent management) as necessary.	CRS	Key Expected Alarm: 3-A-22(Core Spray Pump 11 Lockout) Auto Actions: None o Dispatch in-plant operator(s) to: ▪ Inspect Bus 15 4KV area ▪ #11 core Spray Motor o May place #11 CS Pump in PTL • Notify the Single Point of Contact for the inoperable Core Spray pump
Event 2	**5. RWM INOP:** When directed by Lead Examiner, fail the Rod Worth Minimizer as follows: a. INSERT MANUAL **TRIGGER 3.** 1) Verify Malfunctions **RW01**, RWM INOP, and **C-05-A35** RWM Rod Block go active	ATC CRS	Key Parameter Response: Control Rod Block. Key Expected Alarm: 5-A-35 (RWM Rod Block) Auto Actions: Control Rod Block. Responds to annunciator 5-A-35 (RWM Rod Block) • Recognizes that a control rod block exists and that the RWM has a critical self-test fault. • Notifies CRS and System Engineer. Refers to Tech Spec 3.3.2.1(B) and determines that the RWM can be bypassed. • Directs the OATC to perform procedure 2169

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	2) Role Play an in plant licensed operator as necessary if directed to cycle power to the RWM instrument chassis in the Cable Spreading Room and provide the message number 50 for the Critical self-test failure. 3) If the Nuclear Engineer is asked about upcoming rod withdrawal, role play as necessary to confirm that additional rod withdrawals will be necessary	ATC	Performs procedure 2169 • Checks the self-test status on the RWM and determines that a critical self-test failure (50) has occurred. Marks step 1 with N/A. • Selects MESSAGES menu for current messages • Consults Table 2, RWM Rod Block Messages • Determines Step 4 is N/A. • Determines RWM may be bypassed per B.05.02-05.G.2 (RWM BYPASS). • Places the RWM keylock switch to BYPASS.
Event 3	**6. <u>#12 Reactor Feed Pump High Vibration:</u>** a. When directed by the lead evaluator, INSERT MANUAL **TRIGGER 5** 1) Verify the following Malfunction goes active: **C-06-A02**, #12 RFP high Vibration b. If called respond as the out plant operator and WAIT 3 minutes to report vibrations on the 12 RFP at 4.7 mils and rising slowly.	BOP	<u>Key Parameter Response</u>: RFP vibrations. <u>Key Expected Alarm</u>: 6-A-2 (Rct Feed Pump P-2b High Vibration): <u>Auto Actions</u>: None. Dispatch operator to the turbine building • Reports RFP #12 vibration of 4.7 mils, rising slowly, to CRS

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	c. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event. d. If directed to reset the RFP high vibration alarm as an in-plant operator, wait 3 minutes and then DELETE MALFUNCTION C-06-A02	CRS BOP	Recognize the 4.7 mils is in the DANGER range. • Provides crew brief • Directs Rapid Power reduction (≤50%) per C.4-F • Directs BOP to remove #12 RFP from service. • Makes plant page for 4KV breaker operation • Trips 12 RFP and performs 6-A-7 (RCT Feed Pump P-2b Trip) and C.4-B.06.05A (Feedwater Pump Trip) • Verifies Automatic Action: o CV-3490 RFP Recirc to CDSR closes after 11 seconds. o Verifies 12 RFP Aux Oil Pump running • Verifies that Recirc Pumps Auto-runback. • Allow plant conditions to stabilize. • Directs an out-plant operator to place #12 RFP in a Shutdown Lineup

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 4	**7. <u>Lower reactor power by inserting control rods:</u>** NOTE: Even with the RWM INOP the RPR rod sequence may be obtained and used as a guide to assist the OATC with rod insertion.	OATC CRS	Lowers power with control rods to be within the limits of 1 RFP (<50% power) per C.4.F (Rapid Power Reduction) • Verifies Recirc Flow > 35 Mlb/hr. • Reviews power/flow map to ensure <u>NOT</u> in buffer region. • Inserts control rods to position 04 or deeper using step 4 of C.4-F (RWM INOP) or RWM Rapid Power Reduction Menu. • Reduces reactor power to <50% in order to secure #12 RFP. Provides oversight for Rapid power Reduction reactivity manipulation

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5	**8. <u>CRD Flow Control Valve Failure:</u>**		<u>Key Parameter Response</u>: Reduced CRD cooling water flow <u>Key Expected Alarm</u>: 5-B-41 (CRD HI Temperature) <u>Auto Actions</u>: CRD Flow Control valve is closed.
		ATC	Responds to annunciator
	(Note: It takes 3.5 minutes for this malfunction to cause the 5-B-41 annunciator.)		• Informs Shift Supervision
Event 5 (Cont'd)	a. When directed by the lead evaluator, INSERT MANUAL **TRIGGER 7**		• Sends Reactor Building Operator to investigate CRD temperature recorder
	1) Verify the following MALFUNCTION goes active: **CHO7B**, CRD Flow control Valve fails closed		• Refers to procedure B.01.03-05 CRDH • Recognizes CRD FCV failure
		CRS	Directs swap to standby CRD FCV
	b. If directed to investigate CRD temperatures, wait 2 minutes and report that many CRD temperatures are rising and that CRD 26-15 is in alarm.	ATC	Coordinates with Reactor Building Operator and performs the following:
	c. When directed to report to the CRD FCV station to support shift of FCV, WAIT 3 minutes and report you are standing by.		• Opens standby FCV manual inlet/outlet valves • Places Flow Controller in MANUAL • Manually runs controller to 0

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	d. When directed to OPEN CRD-16-2 and CRD-18-2, WAIT 2 minutes, then use modify REMOTE FUNCTION **CH17** to OPEN and report this action to the Control room. e. When directed to CLOSE CRD-16-1 and CRD-18-1, WAIT 2 minutes, then modify REMOTE FUNCTION **CH16** to CLOSE and report this action to the Control room f. If directed to report CRD temperatures, report all alarms are clear and all temperatures are lowering to normal.	ATC	• Places the CRD Flow Selector to the B position • Slowly OPENS the B FCV manually to approximately 54 to 56 gpm • Places the FCV in AUTO • Closes previously in-service FCV manual inlet/outlet valves Acknowledge annunciator 5-B-41 clear and informs Shift Supervision.
Event 6	**9. <u>ADS Inadvertent Initiation</u>** **a.** When directed by the lead evaluator, INSERT MANUAL **TRIGGER 9** **[Inhibit ADS to avoid auto initiation that would result in a violation of cooldown rate or a loss of adequate core cooling.]** 1) Verify that **AP07**, ADS Timer Initiation goes active. **NOTE**: <u>IF</u> the timer reaches 0 seconds, **Insert Trigger 10** to open the ADS valves. **Delete Trigger 10** if the timer is inhibited after the ADS valves are open.	BOP BOP	<u>Key Parameter Response</u>: ADS Timer counting down <u>Key Expected Alarm</u>: 3-A-25 (Auto Blowdown Timer Activated) <u>Auto Actions</u>: ADS Valves open after 107 seconds if not inhibited. Reports the following: • ADS timer actuation Places ADS AUTO/INHIBIT control switch to INHIBIT Places ADS AUTO/INHIBIT control switch to INHIBIT

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	a. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event.	CRS CRS	Refers to ITS and enters Required Action G for LCO 3.3.5.1 and declares ADS SRVs inoperable per table 3.3.5.1-1 (function 4.b within 1 hour). Refers to ITS and enters Required Action L for LCO 3.5.1 (be in MODE 3 within 12 hours).
Event 7	**11. <u>Bus 11 Lockout:</u>** a. When directed by the lead evaluator, INSERT MANUAL **TRIGGER 11** 1) Verify the following Malfunctions go active: a) **ED05A**, Bus 11 Lockout b) **HP04B**, HPCI Speed control fails low c) (3 minute delay) **RR01B**, Small line break **<u>NOTE</u>:** An automatic Reactor Scram occurs 30 seconds after the bus 11 lockout due to the complete loss of Feedwater. The crew may manually Scram the Reactor during this time**.**	 ATC	<u>Key Parameter Response</u>: O volts on 11 Bus <u>Key Expected Alarm</u>: 8-B-14 (Bus 11 Lockout) <u>Auto Actions</u>: Loss of one Feed Pump and one Recirc Pump) • Check Bus 11 voltage on C08, which indicate 0 (or alternate indication). • Notify Shift Supervision. • Initiate an investigation to determine the cause of loss of power, and correct, if possible C.4-B.09.06.A actions • Monitor and control Reactor water level between +9 and +48 inches.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	NOTE: The following actions from C.4-B.09.06.A, C.4-B.06.05.A (Feedwater Pump Trip) and C.4-B.01.04.A (Trip Of One Recirc Pump) may NOT be performed at this time due to the intensity of the scenario:	BOP	• When Reactor water level decreases to +9 inches, verify a Reactor scram. C.4-B.09.06.A actions • Place the control switch for #11 RFP in the STOP position. C.4-B.06.05.A (Feedwater Pump Trip) • Verify the Aux Oil Pump running for #11 RFP. C.4-B.01.04.A (Trip Of One Recirc Pump) • Close the discharge valve for the tripped (Recirc) pump
Event 7	**12. Reactor Scram response:**	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 Reports when Reactor level drops to less than 9" EOP entry condition. • Verify HPCI and RCIC initiation. • Monitor Reactor Power o Insert SRM and IRM detectors.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			o Switch recorders from APRM to IRM. o Range down on IRMs as necessary. • Verify SDV Vent and Drain Valves closed.
Event 7	**Reactor Scram response:**	BOP	Performs Part B of C.4.A • Announce over the plant paging system that a Reactor Scram has occurred. • Open Main Generator output breakers 8N4 & 8N5. • Trip the Main Turbine. • Verify the Generator Field Breaker Open. • Start the Turbine Aux Oil Pump. • Verify Turbine Exhaust Hood Sprays in service. (See Event 7) • Verify Main Steam Pressure Control or Low-Low Set is controlling Reactor Pressure.
		CRS	Supervise response to reactor scram

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 8	**13. <u>HPCI Failures</u>:** a. A HPCI Flow control problem will force the operator to take manual control of HPCI b. When HPCI flow has been restored to rated INSERT MANUAL **TRIGGER 13,** c. Verify the following MALFUNCTION goes active:**HP03**, HPCI Turbine Trip	BOP / ATC	Attempt to maintain RPV level with HPCI • Recognize that HPCI is <u>NOT</u> operating at rated flow. • Take manual control of flow controller and maximize HPCI injection. • Identifies that HPCI has tripped & informs CRS
Event 7	**14. <u>LOCA RPV Control:</u>**	CRS	Directs performance of C.5-1100 (RPV Control) • Direct second CRD pump and SBLC pump be initiated for RPV injection.
	15. If requested to close the CRD Pump Discharge Bypass valve , CRD-168, Role Play as necessary and modify REMOTE FUNCTION **CH34** to **CLOSED**	ATC	Performs RPV Control actions • Starts second CRD pump. (C.5-3204) o Verifies Pump Discharge Bypass closed. • Starts a SBLC pump for RPV injection. o Verifies injection • Verifies proper RCIC operation • Adequately monitors and reports RPV level and Pressure, both values and trends.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 7	**16. <u>LOCA Primary Containment Control (Torus):</u>**	BOP CRS	Reports Drywell pressure rising • Reports EOP entry conditions. o DW pressure, DW Temp and Torus temp Directs performance of C.5-1200 (PC Control) • Start Torus sprays • Start all available Torus cooling • Spray the Drywell
Event 7	**<u>LOCA Primary Containment Control (Torus):</u>**	BOP	Performs C.5 1200 actions • Places Torus Sprays in service per C.5-3502: o Verifies RHR Pumps running o Takes Cont Spray/Cooling LPCI Initiation Bypass (A/B) to BYPASS o Opens MO-2006, 2010, & 2008 (A Loop) or Opens MO-2007, 2011, & 2009 (B Loop) o Verifies LPCI Inject Outboard Valves are closed; MO-2012 and MO-2013. • Initiates Containment Cooling o RHRSW Outlet valve controller set 20% o Place HX Bypass in CLOSE

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			o ECCS Load Shed to MANUAL OVERRIDE o Start RHRSW Pump(s) o Adjust flow to ≈3500 gpm per pump o Start room cooler
Event 7	**17. <u>LOCA Primary Containment Control (Drywell)</u>**:	BOP CRS BOP	Reports Drywell pressure rising • Reports EOP entry conditions. o DW pressure, DW Temp and Torus temp Directs performance of C.5-1200 (PC Control) • Start all available Drywell cooling • Spray the Drywell Performs C.5 1200 actions • Start all available drywell cooling (C.5-3503) o Place all D/W fan control switches to OFF o Open Knife switch KS3100 o Verify fan inlet dampers are in AUTO o Place all D/W fan control switches to ON o OPEN associated fan disch dampers

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			• Initiates Drywell Spray (C.5-3502) o Open Drywell Spray Outboard MO-2020 (2021) o Open Drywell Spray Inboard MO-2022 (2023) o Close Torus Cooling MO-2008 (2009)
Event 7	18. **<u>Alternate RPV Level Control /Blowdown</u>**: **[When RPV water level cannot be maintained >-149", Emergency Depressurize the reactor.]**	CRS BOP / OATC	Verifies two or more Injection Subsystems lined up with pumps running. When RPV level is < -126 inches and prior to -149 inches, directs performance of C.5-2002 (Emergency RPV Depressurization) • Verifies Torus level > -5.9 ft. • Directs opening of all 3 ADS SRVs. • Directs RPV Level restoration • Verifies that both Core Spray Subsystems and LPCI Pumps are available for injection • Opens 3 ADS SRVs • Monitor and report RPV level values and trends • Controls RPV injection from RHR. o Throttles MO-2012.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			• Controls RPV injection from Core Spray. o Throttles MO-1753 and MO-1754
End	19. When the conditions are stabilized or at discretion of lead instructor/evaluator 20. 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
5	Malfunction	C-06-A02	Annunciator 6-A-2 (RFP High vibration)			ON	
7	Malfunction	CH07B	CRD FCV fails closed			CLOSED	
11	Malfunction	ED05A	Bus 11 Lockout			TRUE	
11	Malfunction	RR01B	Small Line Break RX Recirc 12	3:00	10:00	100%	
11	Malfunction	HP04B	HPCI Speed controller fails low			TRUE	
13	Malfunction	HP03	HPCI Turbine Trip			TRUE	
	Malfunction	CS01A	#11 Core Spray Pump Lockout	5 Sec		TRUE	1 2D_S5ASR(1)
9	Malfunction	AP07	ADS Timer Initiation			TRUE	
3	Malfunction	RW01	RWM INOP			TRUE	
3	Malfunction	C-05-A35	RWM Rod Block Annunciator			TRUE (ON)	
10	Malfunction	AP01A	SRV A fails OPEN			TRUE	
10	Malfunction	AP01C	SRV C fails OPEN			TRUE	
10	Malfunction	AP01D	SRV D fails OPEN			TRUE	

SIMULATOR INPUT SUMMARY							
	*Remote (As requested)	CH17	B CRD FCV Station CRD16-2 & 18-2			OPEN	
	*Remote (As requested)	CH16	A CRD FCV Station CRD16-1 & 18-1			CLOSED	
	*Remote (As requested)	CH34	CRD-168, CRD Pump Bypass Isolation			CLOSED	

* NOT shown on Input Summary

Manual Setting and Instructions:

1. Reset to IC 282.
2. Verify Initial Conditions:
    a. An Edge Rod Selected.
3. Verify Event Trigger 1 assigned as 2D_S5ASR(1) (#11 Core Spray Pump handswitch in START).
4. Verify Simulator Input Summary matches IC282 Summary.
5. Verify availability of Core Spray Quarterly Surveillance procedure 0255 with steps up to H.1 completed.

(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.