Xcel Energy	SIMULATOR EXERCISE GUIDE (SEG)

SITE: MONTICELLO **SEG #** ILT-SS-04E

SEG TITLE: 2009 ILT NRC 1 - ATWS **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:
ATWS

Important Components:
SBLC, CRD

Important Operator Actions with Task Number:
SS304.201 – Implement the response for Failure to Scram.
CR314.104 – Perform actions associated with Failure To Scram.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

Shift Manager Tasks:

None

SRO Tasks:

SS200.133	Direct Reactor Startup to Full Power IAW C.1	5, 6, 7
SS299.352	Apply administrative requirements for Tech Spec Section 3.4 and Bases to Reactor Coolant System (RCS)	5, 6
SS299.353	Apply administrative requirements for Tech Spec Section 3.5 and Bases to ECCS and RCIC	5, 6
SS304.193	Implement RPV control.	5, 6, 7
SS304.194	Implement primary containment control.	5, 6, 7
SS304.201	Implement the response for a failure to scram	5, 6, 7
SS314.101	Supervise alternate rod insertion	5, 6, 7
SS314.108	Supervise terminate and prevent	5, 6, 7
SS315.126	Supervise response to a stator cooling water failure.	5, 6, 7
SS315.160	Supervise response to inadvertent ECCS initiation.	5, 6, 7

RO Tasks:

CR200.127	Perform a power ascension after the reactor is on line >15% power.	1, 2, 3, 4
CR200.171	Perform the procedure for a stator cooling water failure.	1, 2, 3, 4
CR200.204	Perform the procedure for inadvertent ECCS initiation.	1, 2, 3, 4
CR202.114	Respond to unstable speed control on one pump.	1, 2, 3, 4
CR299.354	Apply Tech Spec 3.4 and Bases to the Reactor Coolant System (RCS)	2, 5
CR299.355	Apply Tech Spec 3.5 and Bases to ECCS and RCIC	2, 5
CR304.102	Perform actions associated with RPV Control.	1, 2, 3, 4

RO Tasks:

CR304.103	Perform actions associated with Primary Containment Control.	1, 2, 3, 4
CR314.104	Perform actions associated with Failure To Scram	1, 2, 3, 4
CR314.105	Perform actions associated with Alternate Rod Insertion	1, 2, 3, 4
CR314.112	Perform actions to Terminate and Prevent injection	1, 2, 3, 4

STA Tasks:

None

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. #11 Recirc Pump speed control failure
2. Inadvertent initiation of RCIC
3. Loss of Stator Water cooling flow

After EOP Entry:

1. Failure of a SBLC pump to start

Abnormal Events:

1. Inadvertent initiation of RCIC
2. Loss of Stator Water cooling flow

Major Transients:

1. ATWS

Critical Tasks:

1. **{Perform the actions to inhibit ADS during an ATWS situation.}**
2. **{During failure to scram conditions with reactor power above 3%, terminate and prevent injection from all sources except SBLC, RCIC, and CRD until level lowers to at least -33".}**
3. **{During failure to scram conditions with a critical reactor, insert control rods using one or more methods contained within C.5-3101 to achieve reactor shutdown under all conditions}**

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from:

- Adjust an IC to ≈40% power with 11 RFP running and the 'A' Main Feedwater Regulating Valve in service (IC-281).

2. The initial plant conditions are:

- Normal Plant Startup in progress
- Initial power Level – 38%
- Electrical lineup – 2R Supplying
- Excel Condition – Green
- CDF – Yellow
- Master Level control is in Auto with the 'A' M/A station in AUTO
- Plant staffing – Normal Week day with the normal plant staffing on site for a startup.

3. The following equipment is OOS:

- 12 Service Water Pump out for replacement of pump and motor.

4. The following evolutions are planned for the shift:

- Continue C.1 (STARTUP). Power Ascension - VIII.A. at Step 11.
- Place the 'B' Main FWRV in service.
- Raise power to 48% using Recirc Pumps.
- Nuclear Engineer recommendations for power ascension to 48% are provided
- Nuclear Engineering is recalculating data for power rise from 48% to 100% power.

SEQUENCE OF EVENTS:

Event 1: Perform power escalation as directed by the Nuclear Engineer

- The crew will take the duty with the plant at ≈38% reactor power. Power is being raised for a Normal plant startup. After taking the duty the CRS will direct the performance of C.1 (Startup) VIII.A Step 11 (page 78). This will have the BOP place the 'B' Main Feedwater Regulating Valve in service and then the OATC will place level control in 3 Element and continue raising reactor power using recirc.

Event 2: Raise Reactor Power with Recirc

- After the 'B' Main Feedwater Regulating Valve is in service the OATC will begin to raise reactor power to 48% by raising Recirc pump speed.

Event 3: 11 Recirc Speed Control Signal Failure

- While raising power with Recirc pumps, a failure will occur causing a slow, steady rise in No. 11 Recirc pump speed. The OATC should diagnose this failure of speed control and by procedure lock the scoop tube. The crew should suspend any further power escalation until the speed control problem has been addressed. The CRS should address Tech Specs for recirc pump speed mismatch.

Event 4: RCIC Auto Initiation

- After the Speed control problem with No. 11 Recirc Pump has been addressed, an inadvertent initiation of RCIC will occur. The crew should work together to diagnose this event by watching reactor water level and RCIC controls and indications. The crew should enter the C.4 to secure RCIC and determine Tech Spec requirements. The RCIC Trip pushbutton will fail to work requiring the BOP to secure RCIC using MO-2075 or MO-2080.

Event 5: Complete loss of Stator Water cooling flow

- Once actions are complete for the inadvertent RCIC initiation, #11 Stator Water Cooling (SWC) pump will trip and #12 SWC pump will fail to start. The BOP will take action to restart a pump but will be unsuccessful. This will require the insertion of a manual scram.

Event 6: Reactor Scram/ATWS with SBLC failure

- When the Reactor scrams an ATWS situation develops and the Reactor remains at power. The crew will enter 2007 for guidance. Following guidance in C.5-3101, the rods will fully insert. The CRS will then transfer back to C.5-1100 once rods are fully inserted and restore RPV water level to the normal band.

Event 7 SBLC Failure

The first SBLC pump that is attempted to be started will fail to start. When a start of the second pump is attempted, it will start.

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. 40 % power IC-281 b. Mode: 1 c. Exposure: MOC d. Present Power: 38% e. XCEL Condition: Green f. CDF: Yellow g. Generator: ~200 MWe		
	2. <u>SIMULATOR SET UP</u> a. Set the plant initial conditions per the Initial conditions under the Scenario Overview. b. Enter the malfunctions, remotes, overrides and event triggers per the "Simulator Set-up Checklist".		
	3. <u>SHIFT BRIEF:</u> Verify crew performs walk down of control boards and reviews turnover checklists. **When asked for out plant status provide the following**:	CRS	Conducts Shift Brief: Plant is at 38% power, XCEL System condition is Green, and CDF is Yellow. A normal plant startup is in progress and the second Main FWRV is ready to be placed in service IAW C.1 (Startup) VIII (Power Ascension) Step 11, (Page 78)

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Turbine Building Status: • 4 Condensate Demineralizers are in service with the E vessel available to be placed in service. B vessel is the highest at 5.9 psid. • 12 Service Water Pump is tagged out and removed, ready for the new pump & motor. Reactor Building Status: • Processing water later in the shift • All systems are normal for continuing plant startup At the completion of the shift brief inform the CRS that their crew has the duty.		The following support is available: Operations: Normal staffing for the startup. Maintenance: Support available for normal plant startup. Engineering: Support available for normal plant startup. Management: Support available for normal plant startup.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 1	**4. <u>PLACE 'B' MAIN FWRV IN SERVICE</u>**		**<u>PLACE 'B' MAIN FWRV IN SERVICE</u>**
	a. CRS directs the continuance of C.1 (STARTUP) VIII.A Step 11.a (page 78) which directs performance of B.05.07-05.D.4 (Place Remaining B MAIN FW REG VAVE CV-6-12B in Service).	CRS	Directs the BOP to place the 'B' Main FWRV in service IAW B.05.07-05.D.4 (Place Remaining B Main FW Reg Valve CV-6-12B in Service).
		BOP	Performs the required actions from B.05.07-05.D.4 (Place Remaining B MAIN FW REG VAVE CV-6-12B in Service). • Verifies MO-1134, Hp Fw Line B Block valve is OPEN • Verifies CV-6-12B Feedwater Control M/A Station (6-84B) bias (vertical scale is set at ZERO, <u>Or</u> slightly negative. • Monitors RPV level during this operation. • Slowly OPEN CV-6-12B controller (6-84B) and observe output signal increasing (horizontal scale). • Monitor Vessel Level and Feedwater Loop Flows as CV-6-12B opens • WHEN CV-6-12B controller (6-84B) output (horizontal scale) matches the demand signal (vertical scale), THEN place CV-6-12B controller (6-84B) in AUTO position.
	CRS directs the performance of VIII.A.11.b & c	OATC	• Places Reactor Level Control in 3 Element Control
	If called for the status of the RBM jumpers, inform the CRS that the jumpers are removed.	CRS	Verifies any jumper hung to bypass the Rod Block Monitor per Operations Manual B.05.01.02-05.H has been removed.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 2	**5. <u>Raise Reactor Power with Recirc</u>**		**<u>Raise Reactor Power with Recirc</u>**
	a. CRS directs the OATC to raise Recirc speed to 48% reactor power using the following:		
	1) 2300 (Reactivity Adjustment)	CRS	CRS directs the OATC to raise Recirc speed to 48%
	2) Nuclear Engineer Reactivity Maneuvering Steps	OATC	Raises Recirc speed to raise power.
	b. BOP is required to Peer check		Maintains loop flow parameters approximately equal
Event 3	**6. <u>RECIRC PUMP RUNAWAY:</u>**		**<u>RECIRC PUMP RUNAWAY</u>**
	a. When directed by the Lead Instructor, at approximately 42% power, insert **MANUAL** TRIGGER **1 (RR09C).** This should be inserted when the OATC raises 11 Recirc speed. The failure will engage and speed will continue rising until the OATC takes action.		<u>Key Parameter Response</u>: Pump speed rising. <u>Key Expected Alarms:</u> 4-C-5 (Fluid Drive A Scoop Tube Lock) once the OATC locks the scoop tube. <u>Auto Actions:</u> Reactor power rising, loop flow rising, pump speed rising
	b. If called, respond appropriately as the Ops Manager, Plant Manager, Engineering or maintenance concerning notification of the event.	OATC	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). B.01.04-05.H.1 actions:

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	c. If called as an in-plant operator to investigate the #11 Recirc MG, there is no apparent problem.	OATC	Lock the scoop tube drive
	d. 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	Crew	Notify: Ops Manager Engineering Plant and Systems Manager Instrument Engineer
	e. Depending on how soon the OATC 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 B for mismatched Recirc flows (>10% when operating at < 70% rated core flow)
		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.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 4	**2. <u>RCIC INADVERTANT AUTO INITIATION</u>**		**<u>RCIC INADVERTANT AUTO INITIATION</u>**
			<u>Key Parameter Response:</u> Pump speed rising.
			<u>Key Expected Alarms:</u> 4-A-14 (RCIC Low Flow)
	a. When directed by the Lead Examiner, insert **MANUAL TRIGGER 3 (RC02)** to cause an auto initiation of RCIC with a failure of the turbine trip pushbutton.		<u>Auto Actions:</u> RCIC starts and injects, Feed flow may reduce to compensate.
		Crew	Recognizes the RCIC start and informs CRS
		Crew	Makes a plant announcement about RCIC in operation and about evacuation of the RCIC Room
		CRS	Directs BOP to use C.4-G and secure RCIC
			Performs the required actions per C.4-G (Inadvertent ECCS Initiation Signal).
		BOP	Notify CRS
		BOP	Determines was caused by a spurious signal.
		BOP	Depresses the RCIC Turbine Trip pushbutton.
	b. With a failure of the RCIC Trip Pushbutton, two additional methods may be used to shutdown RCIC.	BOP	Determines that HO-7, Turbine Stop Valve, remains open.
		BOP	Notifies CRS
		CRS	Directs the BOP to secure RCIC by:

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	CRS may reference C.4-B.04.01.E (PCIS Group 5) for alternate methods to shutdown RCIC	BOP	**1. Closing MO-2080:** Places the handswitch for MO-2080 to close. Observes HO-7 closing Verifies that RCIC speed lowers when the valve has closed and reports to the CRS that RCIC has been shutdown.
	c. MO-2076 and MO-2078 will reopen if closed due to receiving an open signal from the initiation signal. d. MO-2075 will remain closed.	BOP	**2. For closing the Steam line isolation valves:** Closes MO-2075 Verifies one of the steam line isolations remain closed Verifies RCIC speed lowers when the steam line isolates Notifies CRS that RCIC has been shutdown
	e. If called, respond appropriately as the Ops Manager, Plant Manager, Engineering, RP or maintenance concerning notification.	Crew	Notifies Management, RP and Single Point of Contact.
		CRS	References TS 3.5.3 to assess RCIC operability
		CRS	Determines RCIC is INOP (but available in an emergency) and Condition A applies Required Action A.1 – HPCI is administratively operable Required Action A.2 – Restore in 14 days

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5	**3. <u>TRIP OF #11 Stator Water Cooling Pump</u>** a. When directed by the Lead Examiner, **insert MANUAL TRIGGER 5 (EG02A & EG02B)**. This will trip the running SWC Pump and prevent the Standby pump from starting automatically or manually. b. Additionally with Manual Trigger 5, **verify CH16 and CH19 activate** which will cause the ATWS when the crew inserts a Scram c. When the reactor is scrammed and the Mode Switch is taken to SHUTDOWN **verify**	BOP CRS OATC	**<u>TRIP OF #11 Stator Water Cooling Pump</u>** <u>Key Parameter Response:</u> Loss of running pump indication. <u>Key Expected Alarms:</u> 8-A-17 (No. 1 Generator Cooling Wtr Failure) <u>Auto Actions:</u> Standby pump fails to start Performs the required actions of C.4-B.06.02.04.A: (Stator Cooling Water Failure) Verify a Stator Cooling water pump is running. • The BOP should attempt to start the standby pump and possibly the tripped pump. • The BOP should recognize that neither pump will start and communicate to the CRS that a reactor scram is required. <u>If</u> a total loss of Stator Cooling has occurred, <u>And</u> cooling can <u>NOT</u> be immediately restored, <u>Then</u> initiate a Reactor Scram. Directs OATC to insert a manual reactor scram. May direct reducing Recirc Flow to minimum first. • If directed, reduces Recirc Flow to minimum • Inserts a manual reactor scram.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	MANUAL TRIGGER 6 activates. This will cause the turbine to trip simulating a problem with the runback circuitry from the loss of stator water cooling. This will complicate the ATWS forcing the crew to inject SBLC.		• Takes the Mode Switch to SHUTDOWN
Event 6	**4. <u>EOP ACTIONS (ATWS)</u>**	OATC	**<u>EOP ACTIONS (ATWS)</u>** Provides a Scram Report • Mode Switch is in Shutdown • All rods are <u>NOT</u> in • Reactor power is >3% • EOP Entry
		CRS	Enters EOP 1100 RPV Control, transitions to EOP 2007, Failure to Scram, and directs: • Inhibit ADS • Defeat MSIV Low-Low Level Isolation (C.5-3301) • Prevent Core Spray injection (C.5-3205) • Perform ATWS hard card actions
	{Perform the actions to inhibit ADS during an ATWS situation.}	BOP	Inhibits ADS
		BOP	Defeat MSIV low-low level isolation

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	{During failure to scram conditions with reactor power above 3%, terminate and prevent injection from all sources except SBLC, RCIC, and CRD until level lowers to at least -33".}	BOP OATC	Terminates and Prevents Core Spray <u>Power Leg Actions:</u> Performs the Power Leg hard card. Enters 3101 to insert the control rods
Event 6	**ATWS Actions (Cont'd)** **{During failure to scram conditions with a critical reactor, insert control rods using one or more methods contained within C.5-3101 to achieve reactor shutdown under all conditions}** a. Part C will be successful with elevated drive pressure and driving rods. b. **DELETE CH19** when directed by the lead instructor to allow rods to drift in and be driven in. c. Insert **MANUAL TRIGGER 11 (CH 34)** to close CRD-168 when requested. d. Insert **MANUAL TRIGGER 13 (CH 22)** to close CRD-14 when requested.	OATC	<u>3101 Actions:</u> Performs Part C to insert rods Closes CRD-168, CRD-79-1 & CRD-79-2 Closes CRD-14 to raise drive pressure

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 7	**5.** SBLC Failure a. Event Triggers 7 or 9 will auto activate to clear the trip on the second SBLC pump that is started. b. If #11 SBLC is attempted to be started first, **verify SL01B deletes** so #12 SBLC pump will start. c. If #12 SBLC is attempted to be started first, **verify SL01A deletes** so #11 SBLC pump will start.	OATC	Initiates SBLC before Torus temp reaches 110ºF • Whichever SBLC pump is attempted to be started will fail to start. • When the opposite pump is attempted to be started it will start.
Event 6	**6.** <u>Level Leg Actions:</u> a. Meets the override conditions and therefore enters the forced level reduction leg.	BOP	<u>Level Leg Actions:</u> Verify needed auto actions With power >3% & level above -33” • Prevents injection from Condensate & Feedwater, HPCI, and LPCI

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	b. For level control, the CRS should direct condensate and feedwater injection be re-established and used to maintain level in the desired band.	CRS	• Lets level drop until - Power is <3% or - All SRVs stay closed and DW < 2 psig or - Level reaches -126 inches Records final level and sets level band Uses Condensate & Feedwater as necessary to maintain established level band.
Event 6	**7.** <u>Pressure leg actions:</u> a. When directed by the Lead Examiner, **Delete CH16** to allow the control rods to insert.	CRS/ BOP OATC	Stabilize RPV pressure below 1056 psig using SRVs Recognizes and reports all rods are fully inserted.
Event 6	**8. <u>EOP ACTIONS (PRIMARY CONTAINMENT CONTROL)</u>** (Note: Malfunctions for the Generator Lockout and stuck closed Turbine Bypass valves are included to ensure heat addition to the Primary Containment and necessitate SBLC operation.) a. EOP C.5-1200 steps become applicable only if Torus Water Temperature exceeds 90°F	BOP CRS	Monitor Primary Containment Parameters • If Torus Water Temperature exceeds 90°F, notify the CRS of the EOP C.5-1200 entry condition. Enters EOP C.5-1200 Primary (Containment Control) • Directs start of all available Torus Cooling

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		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).
		BOP	• 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.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS/INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	9. <u>SCENARIO TERMINATION</u> a. When the conditions are stabilized or at discretion of lead instructor/evaluator. 1) All rods inserted and the crew has entered C.5-1100 and/or restored RPV water level to the normal band with Hot Shutdown Boron Injected. 2) End the scenario by placing the simulator in **FREEZE.**	CRS OATC Crew:	**<u>SCENARIO TERMINATION</u>** Exits C.5-2007 and enters C.5-1100. Restores water level to +9 to +48 inches using condensate and feedwater. • 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	RR09C	11 Recirc Pump runaway	00:00:00	00:00:00	10	None
3	Malfunction	RC02	RCIC Auto-Initiation	00:00:00	00:00:00	True	None
5	Malfunction	EG02A	11 Stator Cooling Pump Trip	00:00:00	00:00:00	True	None
5	Malfunction	EG02B	12 Stator Cooling Pump Trip	00:00:00	00:00:00	True	None
7	Malfunction	SL01A	SBLC PUMP #11 TRIP	00:00:00	00:00:00	True	ZD_SLSS2
9	Malfunction	SL01B	SBLC PUMP #12 TRIP	00:00:00	00:00:00	True	ZD_SLSS1
5	Malfunction	CH16	Failure to Scram	00:00:00	00:00:00	True	None
5	Malfunction	CH19	Multiple Control Rods Stuck	00:00:00	00:00:00	True	None
6	Malfunction	TC02	Turbine Master Trip	00:00:00	00:00:00	True	ZD_S1SHD
5	Malfunction	TC06A	#1 BPV Stuck Closed	00:00:00	00:00:00	True	
5	Malfunction	TC06B	#2 BPV Stuck Closed	00:00:00	00:00:00	True	
5	Malfunction	EG03	Generator Lockout	00:02:00	00:00:00	True	
11	Remote	CH34	CRD-168	00:00:00	00:00:00	Closed	None

SIMULATOR INPUT SUMMARY							
Manual Trigger	**Type**	**Code**	**Description**	**Delay**	**Ramp**	**Final Severity Or Value**	**Event Trigger**
13	Remote	CH22	CRD-14	00:00:00	00:00:00	0	None
Initial Condition	Override	02-S17-04	A520P31-31 – RCIC Turbine Trip	00:00:00	00:00:00	Off	None
Initial Condition	Override	04-A1DS108-02	A530P32-03 – 12 SWP green light	00:00:00	00:00:00	Off	None
*Initial Condition	Remote	TC01	Exhaust Hood Spray Control Valve	00:00:00	00:00:00	Normal	None

*= Built into IC-281 and NOT shown on Input summary

Manual Settings & Instructions:

1. Reset to IC 281.
2. Verify the remote for Exhaust Hood Spray is set to Normal.
3. Insert the override for the RCIC Turbine Trip. This will prevent the RCIC Turbine Trip pushbutton from working during the inadvertent initiation.
4. To isolated #12 Service Water Pump:
   a. Place #12 Service Water pump handswitch to STOP to clear the Stby Setup light.
   b. Hang a SECURE/CAUTION tag.
   c. Install the override to turn off the green light indication.
5. Activate Manual Triggers 7 and 9 at the beginning of the scenario. The event triggers for these remove the trip in one second from the SBLC pump that is NOT initially started. This will allow the second SBLC Pump to start.

6. Verify 4 Condensate Demineralizers are in service.
7. Event Trigger 6 will activate the Turbine Master trip when the Mode Switch is taken to SHUTDOWN on the scram. The Turbine ETV will NOT trip but the turbine master trip will force SRVs to lift ensuring the crew takes action to inject SBLC.
8. Verify availability of Nuclear Engineer Recommendations for power ascension to 48%.

(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.