2010 PRAIRIE ISLAND NUCLEAR GENERATING PLANT

INITIAL EXAMINATION

PROPOSED SCENARIOS

Xcel Energy

SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND **SEG # 2010 ILT NRC SIMULATOR EVALUATION #1**

SEG TITLE: 2010 ILT NRC SIMULATOR EVALUATION #1 **REV. # 0**

PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

TOTAL TIME: 1.5 HOUR

Additional site-specific signatures may be added as desired.

Developed by:	**John DuBose** *Instructor*	**10/14/09** *Date*
Reviewed by:	**Mike Fish** *Instructor* *(Simulator Scenario Development Checklist.)*	**12/13/09** *Date*
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Approved by:	 *Training Supervision*	 *Date*

Guide Requirements

Goal of Training:

During all plant operating conditions, the crew will demonstrate the ability to monitor and operate the plant within the limits of the Operations Manuals and Technical Specifications.

When presented with various scenario events, the crew will demonstrate the ability to respond to the events using appropriate operating and administrative procedures to return the plant to stable conditions.

Learning Objectives:

1. During all plant operating conditions, demonstrate the ability to perform communications, verification practices (STAR and peer checks), procedure use, alarm response, reactivity control, and crew briefs in accordance with Operations Standards and Expectations.
2. Raise reactor power from 50 to 60% per 1C1.4.
3. Place second Main Feedwater pump in service per 1C1.4 and 1C28.2.
4. Diagnose and respond to a charging pump trip per C47 and 1C12.1.
5. Diagnose and respond to PT-485, Turbine 1st Stage pressure transmitter, failure per C47 and 1C51.2.
6. Diagnose and respond to a RCS Leak per 1C4 AOP1.
7. Diagnose and respond to a Small Break LOCA per 1E-0 and 1E-1.
8. Diagnose and respond to a failure of the turbine to automatically trip per 1E-0.
9. Diagnose and respond to a failure of both safety injection pumps to automatically start.

Prerequisites:

1. NONE

Training Resources:

1. Full Scope Simulator
2. Lead Evaluator
3. Booth Operator
4. Backup Communicator

References:

1. NONE

Commitments: 1. NONE

Evaluation Method: This is an evaluation scenario

Operating Experience: None – Evaluation Scenario

Related PRA Information:

Initiating Event with Core Damage Frequency:
SLOCA (49%)

Important Components:
11 CHG PMP

Important Operator Actions with Task Number:
Perform RCS cooldown and depressurization on small LOCA. (38%)
CRO 000 009 05 01

TASKS ASSOCIATED WITH SIMULATOR EXERCISE:

None. This is an evaluation scenario and no credit will be taken for tasks performed.

GENERAL EXPECTATIONS

Over the duration of the scenario, monitor crew performance for adherence to the conduct of operations standards and Operations department Standards and Expectations:

- Communications
- Verification Practices (STAR and Peer Checks)
- Procedure Use
- Alarm Response
- Reactivity Control
- Crew Briefs

Performance for adherence to administrative procedural requirements and operations management expectations:

- Reportability of the malfunction or event
- Notifications to the Operations Manager and NRC Resident Inspector per SWI-O-28
- Notification to the Duty Station Manager per operations management request
- Tech Spec implementation; interpretation; and documentation of decision made, actions taken, and the basis for decisions made and actions taken

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Charging Pump trip.
2. Turbine First Stage Pressure Instrument fails high.
3. RCS Leak.

After EOP Entry:

1. Turbine fails to automatically trip.
2. Failure of both Safety Injection pumps to start automatically.

Normal Events:

1. Raise reactor power from 50 to 60%.
2. Place second Main Feedwater pump is service.

Abnormal Events:

1. Charging Pump trip.
2. Turbine First Stage Pressure Instrument fails high.
3. RCS Leak.

Major Transients:

1. Small Break LOCA.

Critical Tasks:

1. E-0 – H: Manually start at least one Safety Injection pump before transition out of E-0.
2. E-0 – Q: Manually trip the main turbine before transition out of E-0.
3. E-0 – TCOA4: Control AFW flow within 38 minutes following a Reactor Trip. (SWI O-35 identified Time Critical Operator Action).
4. E-1 – C: Trip all Reactor Coolant Pumps so that a severe challenge to Core Cooling does not occur when forced circulation in the RCS stops (Small Break LOCA).

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard (Specific) IC sets:
   - IC-19
2. The following equipment is OOS:
   - NONE

SEQUENCE OF EVENTS:

Event 1: Raise power from 50 to 60%
- Candidates will raise power from 50% to 60%
- Start second Main Feedwater pump per 1C1.4 and 1C28.2.

Event 2: 11 Charging Pump trip
- 11 Charging Pump trip
- RCP Seal injection flows will lower and labyrinth seal D/P will lower.
- The crew will stabilize the plant and respond per C47 and 1C12.1.

Event 3: Turbine 1st Stage Pressure Transmitter fails high
- Turbine 1st Stage Pressure Transmitter PT-485 fails high.
- Rods will withdrawal in automatic.
- The crew will respond to the failure using C47 and C51.

Event 4: RCS Leak
- The crew will respond to a RCS leak per 1C4 AOP1.

Event 5: Small Break LOCA
- When the crew manually trips the Reactor, a Small Break LOCA occurs.
- The crew will respond per 1E-0 and 1E-1.

Event 6: Turbine fails to trip
- Turbine Fails to trip automatically.

Event 7: Safety Injection Pumps fail to auto start
- Both Safety Injection pumps will fail to auto start on an SI signal.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: • IC-19 • Mode: 1 • Exposure: MOC • Power: 50% • Boron: (CB): 1023 ppm • Temperature: ~552°F • Pressure: ~2235 psig • Xenon: Increasing • Rods: "D" @ 173 • Generator: 229 MW	(RO/LO /SRO)	

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP a. Set up the simulator to IC-19. b. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary." c. Complete the "Simulator Setup Checklist." d. Place simulator in "RUN" 1) Remove 12 MFW pump from service per 1C1.4, step 5.2.16. Do not block open the feedwater pump recirc valve. 2) Place Turbine Control in "FSP" mode 3) Run simulator for at least 10 minutes and allow plant to stabilize and acknowledge heater drain alarms. 4) Maintain Tave and Tref matched. 5) Place simulator back in "FREEZE" once plant appears to be stable.		
	2. Simulator Pre-brief: a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. 1) Inform the crew that the TSO has requested that power be raised to 60% to support GRID loading. 2) Provide the crew a marked up copy of 1C1.4 section up to step 5.1.9 a) Inform crew there are no fuel conditioning requirements. b) Inform crew to raise power at 0.5% /minute with rods in "MANUAL" with Turbine in "AUTO" in FSP mode. 3) Provide the crew a reactivity plan developed by the off going RO for the power increase from 50% to 60%.		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	4) Inform the crew to verify the reactivity plan developed by the off going reactor operator. 5) Inform the crew that Nuclear Engineering was **not** available to provide a reactivity prediction. 6) Have SRO candidate perform the pre-job brief for the power increase and also placing 12 MFW pump in service.		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	3. COMPLETE TURNOVER: a. "UNIT 1 LPEO / PEO TURNOVER LOG." b. PRA Printout. a. Verify crew performs walk down of control boards and reviews turnover checklists.	CREW	Review the following with the off-going operator: • "Unit 1 LPEO / PEO Turnover Log" • PRA printout • Walk-down the control boards and ask questions as appropriate
EVENT 1	4. When the crew has assumed the duty they will proceed with raising power to 60% and also starting 12 MFW pump in accordance with 1C1.4, Unit 1 Power Operation.	CREW RO	**1C1.4, UNIT 1 POWER OPERATION** • Crew should start the power increase to 60% IAW 1C1.4, Unit 1 Power Operation, at section 5.1, step 5.1.9. • Crew will pre brief prior to coming in the simulator • All steps up to step 5.1.9 will be already completed • If desired, THEN place CS-46280, ROD BANK SELECTOR, in MANUAL". Refer to precaution 3.7 (Crew will leave rods in auto) • Start the load increase as follows: a. Using the "On Line Control" screen, select the desired Control Mode (VPC,FSP or LOAD). b. Using the "On Line Control" screen, select the desired rate. c. Verify the "VPL" control is not Red. IF the "VPL" control is Red, THEN using the "On Line Control" screen, lower the "Target" setting using the decrease control. Select the "Go" control to initiate the load decrease. Continue to reduce load until the

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		RO	"VPL" control is no longer Red. d. Raise the "VPL" to 101% using the "Valve Limiter" pop-up screen. e. If the ITC is positive, Then verify turbine control is in "VPC" control mode. f. Set the Target setting to the desired load by using the "On Line control" screen "Target" increase/decrease controls. g. Initiate an alternate dilution of the RCS per C12.5 as necessary. h. WHEN Tave shows an increase, THEN select "Go" control using the "On Line Control" screen. i. Adjust the alternate dilution rate or perform alternate dilutions per C12.5 as necessary to maintain Tave and Tref within the desired +/- 1.5°F band. j. To suspend the load increase, perform the following: i. Select turbine control "Hold" on the "On Line Control" screen. ii. Stop the alternate dilution per C12.5. iii. Verify CS-46280, ROD BANK SELECTOR, is returned to "AUTO".

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	a. The Lead operator will place the 12 MFW pump in service.	LEAD	**1C1.4, step 5.1.22** • Start the second feedwater pump per 1C28.2 **1C28.2 UNIT 1 FEEDWATER PUMP**
	b. When contacted to perform Turbine building actions for starting 12 MFP perform the following: 1) Follow along in 1C28.2 Step 5.5 and report actions complete after 2 minutes. Most of the outplant actions are modeled on the simulator. 2) **When asked to close F-22-4 update Remote FW117 to close. See relative order 0 on Simulator Input Summary Page.**	LEAD	• **Step 5.5 Starting a Second Feedwater Pump** o Establish plant load at 250 MW. o Verify two condensate pumps are running o Verify the following annunciators NOT LIT: ▪ 47010-0501, 11 FEEDWATER PUMP SEAL WATER LO PRESS. ▪ 47010-0503, 12 FEEDWATER PUMP SEAL WATER LO PRESS. ▪ 47010-0101, 11 FEEDWATER PUMP LOCKED OUT. ▪ 47010-0103, 12 FEEDWATER PUMP LOCKED OUT. o Verify oil levels in 12 FWP motor are approximately ¼ to ½ sight glass. o Place the computer points, listed in Attachment A, on trend, Operations Group Display: ▪ OP6 for 12 FWP o Verify the following: ▪ The Difference between 1T2826A and 1T2827A on 12 FWP is less than 40°F. ▪ 1P2449A 11/12 FW PMPS SUCT HDR P, IS APPROXIMATELY 400 psig.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD	o The 12 FWP recirc is NOT blocked open o Place the recirc valve control switch for the pump to be started in the "OPEN" position: ▪ CS-46417, 12 FWP RECIRC VLV CV-31875 o Start the second FWP: ▪ For 12 FWP, place CS-46419 to the "START" position AND hold until CV-31875, 12 FWP RECIRC VLV is Full OPEN. o Close the second FWP warm-up valve ▪ F-22-4, 12 FWP FW PMP WARMUP LINE o Check the local indications for the running FWP: o Increase plant load until the second FWP discharge flow is steady and reactor power is equal to or greater than 70 percent. o Place the second FWP recirc valve switch in "AUTO". ▪ CS-46417, 12 FWP RECIRC CV-31875

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 2	5. When the crew has increased power to 60%, and/or at the discretion of the Lead Evaluator, then enter the loss of 11 Charging Pump ***(Relative Order 1, Event Trigger 1)***. a. If directed to investigate 11 Charging pump, after 3 minutes, report that the 11 Charging pump appears intact with no visible damage and report that there is a VFD Overfrequency fault on 11 Charging Pump. b. If directed to verify 13 charging pump discharge desurger is pressurized, request that the pump be taken to PTL and after 3 minutes, report that the desurger is pressurized. c. If contacted as Operations Management per SWI O-28, then acknowledge the report of the failure, and agree to make other notifications to the NRC Resident Inspector, Duty Station Manager, etc., as asked. d. If contacted as the FIN team supervisor, inform the crew that you will write a work order and assign an Electrical Maintenance supervisor to investigate. e. If desired, allow the crew to hold a crew brief.	CREW RO RO	**Note: The crew may start 13 charging pump and/or restore charging and seal injection flow as plant stabilization actions. Also the crew may isolate the second orifice.** **47015-0103, 11 CHARGING PUMP TRIP** • If necessary then start another charging pump. • If letdown isolation occurred then restore letdown per 1C12.1, LETDOWN, CHARGING AND SEAL WATER INJECTION. • Maintain Pressurizer level and seal injection flow. • Determine reason for charging pump trip by checking the following: o If due to Local/Remote switch operation... o Observe and log any VFD fault indicated on 71114, 11 CHG PMP VFD CAB, and CS-7111403, 11 CHG PMP SPEED CONT KEYPAD. o Initiate Work Request as necessary. o Effect necessary repairs and return system to normal. **1C12.1, LETDOWN, CHARGING AND SEAL WATER INJECTION (5.3 Starting a second charging pump)** • Verify the discharge desurger, for pump to be started, is pressurized in accordance with Section 5.13. • Transfer the inservice charging pump from AUTOMATIC to MANUAL speed control per C7, Reactor Control System. • Verify that the speed controller of the charging pump to be started is in MANUAL at minimum speed. • Reduce the speed of the inservice charging pump until the seal injection flow drops from eight (8) gpm to approximately six (6) gpm.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		RO	• Verify charging pump discharge header pressure 1PI-133 is less than 2400 psig. • For the charging pump to be started, verify the control switch green light is "LIT" and white light is "OFF". • Start the second charging pump. • Adjust the charging pump speed to maintain charging pump discharge pressure, 1PI-133 less than 2500 psig and approximately eight (8) gpm seal injection. • After pressure and flow have stabilized, then simultaneously adjust charging pump speed and 1C-142, CHG LINE FLOW CONT, until: o Seal Injection flow is approximately eight (8.0) gpm. o One (1) charging pump is in service at minimum speed, in MANUAL. • Transfer the speed control for the charging pump which is operating at greater than minimum speed from MANUAL to AUTOMATIC per C7, Reactor Control System.
EVENT 3	6. When the crew has completed actions for the 11 Charging pump trip, rod control is in AUTO and/or at the discretion of the Lead Evaluator, then enter the turbine first stage pressure transmitter failing high (PT-485) ***(Relative Order 2, Trigger 2).*** a. Expected plant response is as follows: 1) Controls rods will withdrawal in auto b. The following alarms may actuate: 1) 47013-0305, AUCTIONEERED TAVG-TREF DEVIATION	CREW LEAD RO LEAD	**Note: As a plant stabilization action Rod Control may be placed in MANUAL prior to entering this ARP.** **47013-0305, AUCTIONEERED TAVG-TREF DEVIATION** • Check Tavg-Tref deviation. • If necessary, return Tavg to Tref using rods, boron, or turbine load change. • If due to channel failure, refer to 1C51. **47011-0405, FW CONTROL SYSTEM TROUBLE** • Verify SG level control operating properly in automatic. • Control level in manual for any SG which has shifted

SCENARIO TIME-LINE:			
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	2) 47011-0405, FW CONTROL SYSTEM TROUBLE c. If directed as I&C to trip bistables, report that two I&C technicians will be available in ≈45 minutes. **(Note: bistables will not be tripped during this scenario.)** a. If contacted as the FIN Team Supervisor, inform the crew that you will write a work order and assign an I&C Supervisor to investigate. d. If desired, allow the crew to hold a brief.	SS	to manual. • Refer to 1C51, INSTRUMENT FAILURE GUIDE – UNIT 1 for any Reactor Protection or Engineered Safeguards system input failure. **1C51.2 TURBINE FIRST STAGE PRESSURE 1P-485 - HIGH** • Place Rod Control in MANUAL and control Tave at value appropriate for power level. • Verify SG level control operating properly in automatic. • Steam dump will not operate as designed in Tave mode, consider placing steam dump in pressure mode. • Refer to T.S. LCO 3.3.1 Condition A and Table 3.3.1-1 Function 16.b.2. • Refer to TRM TLCO 3.3.4 Condition A and TRM Table 3.3.4-1 Function 3.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4	7. When the crew has completed actions for the turbine first stage pressure transmitter failing high, and/or at the discretion of the Lead Evaluator, then enter the RCS leak ***(Relative Order 3, Trigger 3).***	CREW	**1C4 AOP1, REACTOR COOLANT LEAK**
	8. The following indications will be observed: a. RCS pressure decreases slowly b. Pressurizer level decreases ~1/2 %/minute until charging pump speed increases c. ERCS leak rate indicates ~20 gpm leak rate d. Containment humidity increases	RO	• If at any time RCS inventory can not be maintained by available charging flow, then perform the following: o Manually trip the Reactor and enter 1E-0. o When Reactor is verified tripped, then initiate Safety Injection. o Exit this procedure. • Start additional charging pumps as needed to control pressurizer level. • If VCT level cannot be maintained by the makeup system, Then align charging pump suction to the RWST. • Use ERCS Real Time RCS Leakage (Leak 1) display and/or Control Board indications to determine approximate leak rate. • Determine the location of the leak using Figure 1 and the associated tables. • Isolate the leak if possible
	9. Once crew has determined that T.S. 3.4.14 will be entered continue with next event.	SS	• Comply with T.S. LCO 3.4.14 Condition A.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTS 5,6,7	10. When the crew has determined T.S. actions for the RCS leak, and/or at the discretion of the Lead Evaluator, then enter the Small Break LOCA ***(Relative Order 4, Trigger 4)***	CREW	**1E-0, REACTOR TRIP OR SAFETY INJECTION** • Verify Reactor Trip. ***Critical Task: Manually trip the main turbine before transition out of E-0.*** • Verify Turbine Trip. • Verify Both Safeguards Buses Energized. • Check if SI is actuated. • Check if SI is required.
	a. When called as the Turbine Building Operator to verify the status of Turbine Building Roof Exhausters, report that the Turbine Building Roof Exhausters are all secured. b. Upon hearing the announcement of Reactor Trip, or when called as the Turbine Building Operator to isolate the Unit 1 MSRs per Attachment J, enter CAEP – Att E-0 to start the isolation ***(Relative Order 5)***. When the isolation is complete, inform the crew that MSR's are isolated. c. Based on crew composition, at the discretion of the Lead Evaluator, personnel may be provided to perform Attachment L upon completion of all applicable critical tasks	CREW	***Critical Task: Manually start at least one Safety Injection pump before transition out of E-0.*** • Verify Status of Equipment on Attachment L. • Check AFW Status. • Check RCS Temperatures. • Check PRZR PORVs and Spray Valves. • Check if RCPs should be stopped. ***Critical Task: Trip all Reactor Coolant Pumps so that a severe challenge to Core Cooling does not occur when forced circulation in the RCS stops (Small Break LOCA).*** • Check if SGs are not faulted. • Check if SG tubes are not ruptured. • Check if RCS is intact. • Go to 1E-1, Loss of Reactor or Secondary Coolant.
		CREW	**1E-1, LOSS OF REACTOR OR SECONDARY COOLANT** • Check if RCPs should be stopped. • Check if SG(s) are not faulted. • Check intact SG levels • Check PRZR PORVs and block valves. • Reset SI.

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

	1E-1 response
	
	a. At the discretion of the Lead Evaluator personnel may be provided to secure the Diesel Generators and Safeguards Cooling water pumps.
	
	b. When called as the Auxiliary Building Operator to open RD-4-6 and 2RD-4-2, wait 2 minutes and report that these valves are open.
		CREW	• Reset Containment Isolation.
			• Establish IA to Containment.
			• Check power supply to Charging Pumps – Offsite Power available.
			• Check if Charging Flow has been established.
			• Check if SI flow should be terminated (Should not be)
			• Check if RHR Pumps should be stopped.
			Note: The following step is intended to diagnose a faulted steam generator and may require use of the bases to diagnose properly.
			• Check RCS pressure stable or decreasing.
			• Check pressure in both SGs stable or increasing.
			• Check if Diesel Generators should be stopped.
			• Check if Safeguards Cooling Water pumps should be stopped.
			• Initiate evaluation of plant status:
			  • Verify either Train A or Train B recirc available.
			  • Check Aux Building Radiation – normal.
			  • Start all Containment Dome Recirc Fans.
			• Check if outside air can be supplied to the control room.
			  • Open one train Control Room Alternate Outside Air Dampers.
			• Align Containment FCU Cooling Water Outlet Radiation Monitor R-16 and R-38:
			  • Locally open Sample Valves RD-4-6 and 2RD-4-2.
			  • Verify Solenoid Isolation Valves SV-33384 and SV-33907 are open.
			• Check Annulus Sump High Level Alarm OFF.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CREW	• Check if RCS cooldown and depressurization required. • RCS pressure greater than 550 psig. • Go to 1ES-1.1, Post LOCA Cooldown and Depressurization.
	Prior to transition to 1ES-1.1 the crew may transition 1FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION based on Critical Safety Function Status Tree's (CSFST's).	CREW	**1ES-1.1, POST LOCA COOLDOWN AND DEPRESSURIZATION** • Verify All AC Buses – ENERGIZED BY OFFSITE POWER • Check if RHR Pumps Should Be stopped. • Establish Charging Flow. • Check Intact SG Levels. • Place All PRZR Heaters in Off Position • Initiate RCS Cooldown to Cold Shutdown. • Check RCS Subcooling Based On Core Exit T/Cs – GREATER THAN 20°F[35°F]. • Check ECCS Pump Status • Depressurize RCS to Refill PRZR • Check If An RCP Should Be Started • Check If One SI Pump Should Be Stopped

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	11. When the crew has transitioned to 1ES-1.1 and stopped one SI pump OR transitioned to 1FR-P.1 and stopped safeguards pumps, and/or at the discretion of the Lead Evaluator, then place the simulator in FREEZE and inform the crew that training has the duty.	CREW	**1FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION** • Check RCS pressure – greater than 550 psig. • Check RCS cold leg temperatures – stable or increasing. • Check PORV block valves – power available and at least one block valve open. • Check if PORVs should be closed. • Check SI pumps – any running. • Check if SI should be terminated. • Reset SI. • Reset Containment Isolation. • Establish Instrument Air to Containment. • Stop SI pumps. • Stop RHR pumps.
	12. Emergency Plan Classification a. Alert – FA1 (Small Break LOCA)		

SIMULATOR INPUT SUMMARY							
Relative Order	**System Or Panel Drawing**	**Type**	**Code**	**Severity Or Value**	**Event Trigger**	**Timing**	**Description**
0		REMOTE	FW117	OPEN			12 FW PUMP WARM-UP LINE (F-22-2/4)
0		MALF	SI05A				Safety Injection Pump #11 Fails to Start Automatically
0		MALF	SI05B				Safety Injection Pump #11 Fails to Start Automatically
0		MALF	TC11A				Turbine fails to auto trip
1		MALF	VC04A		1		11 CHARGING PUMP TRIP
2		MALF	RX226	600	2		PT-485 FAILS HIGH
3	SIMRC02B	MALF	RC14	5	3		RCS leak ~20 gpm
4		MALF	RC07A	0.3	4	5 minute ramp	Small Break LOCA
5			E-0_Att-J.sch				Perform Attachment J

SIMULATOR SETUP CHECKLIST Standard IC-19

Before Training

__ __ Simulator Status:
___ 1. "Training Load" ___ 2. Step counters "ON"
___ 3. Alarm sound "ON" ___ 4. Reset to IC-19
___ 5. Speed: "REAL"

__ __ Cycle recorder power "OFF" then back "ON" to clear Yokogawa recorder memory

__ __ Verify Summary matches Simulator Input Summary page in the SEG

__ __ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset

__ __ MOC ΔI sheet displayed on C panel

__ __ Check all ERCS alarms are cleared

__ __ MOC Reactivity Briefing sheet available at Reactor Operator Desk

__ __ Chart recorders operating and forwarded

__ __ Turnover sheet/PRA sheet

__ __ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID)

__ __ Update Control Board Placards:
High Flux At Shutdown Alarm Setpoint placards: 1400 cps
Feedwater regulating valve position placard: 66/65, 67/64
RCS boron on the CVCS panel placard: 1023 ppm
Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions)
Shift Reactivity Guidance placard: BA: 3.2 gallons, RMU: 67 gallons

__ __ Magnetic placards in place:
___ 1. 11 BA TANK "Lined Up For Service"
___ 2. 11 BA PUMP "Lined Up To 11 BA Tank"
___ 3. CC TO SFP MV-32115 "In Service"
___ 4. Blowdown 46470 "SGB To CDSR"

__ __ Protected equipment tags in place:
___ 1. None

__ __ Attach Caution Tags to the following control switches:
___ 1. None

__ __ ERCS driven recorders are on-scale (RCS temperature scaled to 550º F to 560º F)

__ __ ERCS alarm screen operating and alarms reset

__ __ All ERCS terminals operating and set as follows:

CONF	VARS	**R02**	Alarm Summary Page
CONE1	Group OP31_U1	**R03**	AFD
CONC	SAS (XS11)	**R04**	TPM
CONG1	Group QP CCDATA	**R05**	QP LOADFOLL
ERCS-R01	Group RADMON_U1	**R06**	Alarm Summary Page

__ __ ERCS single point displays:

CONB	1T0499A	1U1613A
CONE2	1V4501A	1Q0340A

__ __ ERCS TPM set (NIS - Auto Scaling - LEFM)

__ __ Pens/Paper/Markers available on the simulator

__ __ Board-mounted EAL Table is cleaned

__ __ EAL sticker books in F3-2 are checked for missing stickers

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1.	F3-2	___ 2.	F3-2.1 Bases	___ 3.	F3-2 Copy 275
___ 4.	SWI O-28	___ 5.	Boration Card	___ 6.	47015-0103
___ 7.	1C12.1	___ 8.	47013-0305	___ 9.	1C51.2
___ 10.	1C4 AOP1	___ 11.	1E-0	___ 12.	1E-1
___ 13.	1ES-1.1	___ 14.	1FR-P.1	___ 15.	

__ __ On the NIS panel, verify Scaler Timer power switch is in Off position.

__ __ Set Turbine Control HMI Displays as follows:

___ 1. U1 E-H Turb Cont STA 2 **(48087)** to: **Control Valve Overview**

___ 2. U1 Turb Aux Cont **(48088)** to: **Turb Overview**

___ 3. U1 E-H Turb Cont STA 1 **(48086)** to: **On Line Control**

__ __ DEHC alarms cleared

__ __ Turbine Control in FSP mode

Post-Scenario Checklist

__ __ EOOS computer is cleared of information added during the scenario

__ __ Computer generated PINGP 577 cleared.

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1.	F3-2	___ 2.	F3-2.1 Bases	___ 3.	F3-2 Copy 275
___ 4.	SWI O-28	___ 5.	Boration Card	___ 6.	47015-0103
___ 16.	1C12.1	___ 17.	47013-0305	___ 18.	1C51.2
___ 19.	1C4 AOP1	___ 20.	1E-0	___ 21.	1E-1
___ 22.	1ES-1.1	___ 23.	1FR-P.1	___ 24.	

__ __ Protected equipment tags in place:
___ 1. None

__ __ Remove Caution Tags to the following control switches:
___ 1. None

__ __ **Board-mounted EAL Table is cleaned**

__ __ All books, note pads, and calculators put away

End Of Day Checklist

__ __ Signs/placards removed and put away unless normal simulator configuration

__ __ Floor PCs logged off if simulator will not be used again that day

__ __ Instructor station returned to normal with all books, paper, and etc. put away

__ __ Headsets turned off and put away if simulator will not be used again that day

__ __ Simulator reset to IC-10 unless another IC will be used for further training

__ __ Simulator placed in DORT if simulator will not be used again that day

__ __ Recorder power "OFF" if simulator will not be used again that day

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE: DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 0 ft^2 **SYSTEM CONDITION: GREEN**

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS
None
PROTECTED EQUIPMENT
None

RAD MONITORS OOS	ANNUNCIATORS OOS
OUTSTANDING SP'S	**FIRE DET / PROT EQP IMPAIRMENTS**

OTHER EQUIPMENT OOS / STATUS
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE
OPERATIONAL PLANS FOR COMING SHIFT
Raise power from 50% to 60%. Xenon building in, need to dilute 40 gals approximately every 10 minutes Place 12 MFW pump in service, 12 MFW pump recirc valve is NOT blocked open.
NEW PROCEDURES / INSTRUCTIONS

Reactivity Plan

The crew has been directed to raise reactor power from 50% to 60%.

Prior to simulator:

- verify the reactivity plan completed by the off going reactor operator
- complete a Pre-Job Brief

Current conditions are:

Power level: 50%

Xenon: Increasing, diluting 40 gals approximately every 10 minutes

Control Rod Position: Bank D @ 173 steps

Boron Concentration: 1023 ppm

Core Exposure: 10,000 MWD/MTU

Target: Power Level: 60%

Rate: 0.5% /minute

Control Mode: First Stage Pressure (FSP) with Rod Control in Manual

Boration/Dilution: 60 gal dilutions every two minutes

Reactivity Prediction:

Change in Power Defect: 142 pcm

Differential Boron Worth: -7.8 pcm/ppm

Calculated RCS PPM change: 18.2 ppm

Assumed half rods and half RMU addition

Calculated Boric Acid / Reactor Makeup Water addition: 9 ppm change = 272 gals RMU

Calculated final Control Rod Position : Bank D @ 182 steps

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.

	Yes	No
The scenario contains objectives for the desired tasks and relevant human performance tools.	X	
The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations.	X	
The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	X	
Plant PRA initiating events, important equipment, and important tasks are identified.	X	
Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	X	
The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	X	
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.	X	
The scenario includes related industry experience. SOER, SER and similar OE recommendations are clearly identified and fully addressed.*		X
The scenario guide incorporates verification of Operator Fundamental application.*		X
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.*		X
For evaluations, it has been verified that without operator action the critical tasks will be failed.	X	

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 X	No
2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	Yes X	No
3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	Yes X	No
4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	Yes X	No
5. During the simulator scenario, observed changes corresponded to expected plant response.	Yes X	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 X	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 X	No

Discrepancies noted (Check "none" or list items found) X 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.

Xcel Energy

SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND **SEG # 2010 ILT NRC SIMULATOR EVALUATION #2**

SEG TITLE: 2010 ILT NRC SIMULATOR EVALUATION #2 **REV. # 0**

PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

TOTAL TIME: 1.5 HOUR

Additional site-specific signatures may be added as desired.

Developed by:	**Mike Fish** *Instructor*	**12/11/09** *Date*
Reviewed by:	**John DuBose** *Instructor* *(Simulator Scenario Development Checklist.)*	**12/13/09** *Date*
Validated by:	**John DuBose** *Validation Lead Instructor* *(Simulator Scenario Validation Checklist.)*	**12/13/09** *Date*
Approved by:	 *Training Supervision*	 *Date*

Guide Requirements

Goal of Training:

During all plant operating conditions, the crew will demonstrate the ability to monitor and operate the plant within the limits of the Operations Manuals and Technical Specifications.

When presented with various scenario events, the crew will demonstrate the ability to respond to the events using appropriate operating and administrative procedures to return the plant to stable conditions.

Learning Objectives:

1. During all plant operating conditions, demonstrate the ability to perform communications, verification practices (STAR and peer checks), procedure use, alarm response, reactivity control, and crew briefs in accordance with Operations Standards and Expectations.
2. Diagnose and respond to a Main Feedwater pump trip per C47.
3. Diagnose and respond to N44 failing high per C47 and 1C51.
4. Diagnose and respond to Loss of Instrument Bus 113 per 1E-0, 1ES-0.1, C47 and 1C20.8 AOP1.
5. Diagnose and respond to MSLB per 1E-0, 1E-2, 1E-1, and 1FR-P.1.
6. Diagnose and respond to a failure of both MSIVs to close per 1E-0.

Prerequisites:

1. NONE

Training Resources:

1. Full Scope Simulator
2. Lead Evaluator
3. Booth Operator
4. Backup Communicator

References:

1. NONE

Commitments:

1. NONE

Evaluation Method:

This is an evaluation scenario

Operating Experience: None – Evaluation Scenario

Related PRA Information:

Initiating Event with Core Damage Frequency:
None

Important Components:
11 CC pump

Important Operator Actions with Task Number:
None

TASKS ASSOCIATED WITH SIMULATOR EXERCISE:

None. This is an evaluation scenario and no credit will be taken for tasks performed.

GENERAL EXPECTATIONS

Over the duration of the scenario, monitor crew performance for adherence to the conduct of operations standards and Operations department Standards and Expectations:	• Communications • Verification Practices (STAR and Peer Checks) • Procedure Use • Alarm Response • Reactivity Control • Crew Briefs
Performance for adherence to administrative procedural requirements and operations management expectations:	• Reportability of the malfunction or event • Notifications to the Operations Manager and NRC Resident Inspector per SWI-O-28 • Notification to the Duty Station Manager per operations management request • Tech Spec implementation; interpretation; and documentation of decision made, actions taken, and the basis for decisions made and actions taken

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. 11 Main Feedwater Pump Trip.
2. N44 Power Range NI Fails High
3. Loss of Power to Instrument Bus 113

After EOP Entry:

1. 11/12 MSIVs Fail to Automatically Close

Normal Events:

1. None

Abnormal Events:

1. 11 Main Feedwater Pump Trip.
2. N44 Power Range NI Fails High
3. Loss of Power to Instrument Bus 113

Major Transients:

1. MSLB - 11 Steam Generator faults inside Containment

Critical Tasks:

1. E-0 -- P: Manually close MSIVs before transition out of E-0.
2. E-0 – TCOA4 Control AFW flow within 38 minutes following a Reactor Trip. (SWI O-35 identified Time Critical Operator Action).
3. E-2 -- A: Isolate the faulted STEAM GENERATOR before transition out of E-2.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard (Specific) IC sets:
   - IC-25
2. The following equipment is OOS:
   - 11 CC pump

SEQUENCE OF EVENTS:

Event 1: 11 Main Feedwater Pump Trip
- 11 Main Feedwater Pump trip.
- The crew will respond per 1C4 AOP1.
- The crew will respond per C47.

Event 2: N-44 Power Range NI Fails High
- N-44 will fail high, resulting in automatic inward rod motion.
- The crew will respond per C47 and 1C51 to remove the instrument from service.

Event 3: Loss of Power to Instrument Bus 113
- The loss of power to Instrument Bus 113 will a cause reactor trip due to 2 of 4 logic with power range NI's due to N-44 being OOS.
- The crew will respond to the reactor trip per 1E-0 and transition to 1ES-0.1.
- The SS will have the Lead Operator perform actions in 1C20.8 AOP1 to restore power to Instrument Bus 113 from Panel 117.

Event 4: MSLB
- 11 Steam Generator faults inside Containment.
- The crew will respond per 1E-0, 1E-2, 1E-1, and 1FR-P.1.

Event 5: 11/12 MSIVs fail to automatically close
- During the Main Steam Line Break, 11/12 MSIVs fail to automatically close.
- The crew will manually close 11 MSIV using Attachment L of 1E-0.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: • Standard IC-25 • Mode: 1 • Exposure: MOC • Power: 71% • Boron: (CB): 706 • Temperature: 556°F • Pressure: 2235 psig • Xenon: Increasing • Rods: Bank D @ 187, all others at 228 • Generator: ~388 MWe		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP a. Set up the simulator to IC-25 b. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary." c. Complete the "Simulator Setup Checklist."		
	2. Simulator Pre-brief: a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator.		
	3. COMPLETE TURNOVER: a. "UNIT 1 LPEO / PEO TURNOVER LOG." b. PRA Printout. a. Verify crew performs walk down of control boards and reviews turnover checklists.	CREW	Review the following with the off-going operator: • "Unit 1 LPEO / PEO Turnover Log" • PRA printout • Walk-down the control boards and ask questions as appropriate

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 1	4. When the crew has assumed the duty, and at the discretion of the Lead Evaluator, then enter the 11 Feedwater Pump trip ***(Relative Order 1, Trigger 1)*** a. If asked to investigate the 11 FW pump lockout, acknowledge the request THEN wait 3 minutes and report overcurrent relay is actuated on BKR-11-3, 11 feedwater Pump. b. If contacted as Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked. c. If contacted as the FIN Team Supervisor, inform the crew that you will write a work order and assign an Electrical Supervisor to investigate.	LEAD LEAD/ RO	**47010-0101, 11 FEEDWATER PUMP LOCKED OUT** • If reactor power is greater than 85%, then trip the reactor and go to 1E-0. • If turbine power is greater than 330 MWe, then reduce to less than 330 MWe per 1C1.4 AOP1. **1C1.4 AOP1, RAPID POWER REDUCTION** • If any reactor or turbine trip setpoint is reached, then verify the reactor is tripped and go to 1E-0. • Place or verify the following control systems in automatic or control in manual per C7: o Rod control o Steam dump o Pressurizer pressure control o Pressurizer level control. o Place pressurizer heaters ON. o Reduce turbine load to the desired value using one of the following methods: ▪ Automatic ▪ Manual • Borate the RCS as necessary to maintain control rods above the insertion limit and control delta I within limits.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 2	5. When the crew has completed the power reduction, placed rod control in AUTO, and/or at the discretion of the Lead Evaluator, enter the N44 Power Range NI high failure ***(Relative Order 2, Event Trigger 2)***	RO	**NOTE: As a plant stabilization action the crew is expected to take rod control to manual once instrument malfunction is diagnosed.**
	6. The following indications will be observed: a. Indicator N-44 indicates off-scale high b. Control Rods insert in AUTO c. Annunciators: 1) 47013-0101, NIS POWER RANGE POSITIVE FLUX RATE CHANNEL ALERT 2) 47013-0102, NIS POWER RANGE HI SETPOINT CHANNEL ALERT 3) 47013-0103, NIS POWER RANGE OVERPOWER ROD WITHDRAWAL STOP 4) 47013-0203, NIS POWER RANGE CHANNEL DEVIATION 5) 47013-0303, COMPUTER ALARM DELTA I CHECK TYPER (Possible) 6) 47013-0403, COMPUTER ALARM FLUX TILT CHECK TYPER (Possible) d. If directed as I&C to trip bistables, report that 2 I&C technicians will be available in ≈45 minutes. **(Note: the OTDT and OTDT rod stop bistables will not be tripped during this scenario.)**	LEAD LEAD SS	**47013-0101, NIS POWER RANGE POSITIVE FLUX RATE CHANNEL ALERT** • Determine initiating channel(s) by observing NIS indications • If due to power range channel failure, Then refer to 1C51 **1C51.4, INSTRUMENT FAILURE GUIDE** • Place rod control in manual and maintain Tave at Tref using rods. Adjust turbine load as necessary o Rod withdrawal will not be possible until after Rod Stop is bypassed • Enter T.S. LCO 3.3.1 Condition A and Table 3.3.1-1 Functions 2a, 2b, 3a, 3b, 6, 16b.1, 16c, 16d, 16e. • Remove N-44 from service per C51 • Restore Tavg to Tref using control rods and then place rod control to "AUTO" • Direct I&C to trip the bistables • Initiate temporary logs and required surveillance procedures per C51 • Initiate repair activities

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	7. When the crew has completed the actions associated with the N44 Power Range NI failure, and/or at the discretion of the Lead Evaluator, enter the Loss of Instrument Bus 113 ***(Relative Order 3, Event Trigger 3).*** 8. The reactor will receive a automatic trip due to N44 being OOS and the loss of the instrument bus. 2 of 4 PR NI will reach the reactor trip setpoint due to the failure. **9. The crew will perform actions to restore power to Instrument Bus 113 once the plant is stable in 1ES-0.1. The SS should assign the LEAD operator to perform actions in 1C20.8 AOP1 and the SS should continue in 1ES-0.1.** 10. Upon hearing the announcement of Reactor Trip, or when called as the Turbine Building Operator to isolate the Unit 1 MSRs per Attachment J, enter CAEP – Att E-0 to start the isolation ***(Relative Order 5a).*** When the isolation is complete, inform the crew that MSR's are isolated.	CREW CREW	**1E-0, REACTOR TRIP OR SAFETY INJECTION** • Verify Reactor Trip • Verify turbine Trip • Verify Both Safeguards Buses – Energized • Check if SI is actuated o Transition to 1ES-0.1, Reactor Trip Recovery, due to no SI. • Continue actions in 1ES-0.1 **1ES-0.1, REACTOR TRIP RECOVERY** • Announce "Unit 1 Reactor Trip". • Transfer Steam Dump To Pressure Mode. • Check RCS Temperatures. • Check Cooling Water Header Pressures. • Notify turbine Building Operator To Isolate Unit 1 MSRs Per Attachment J. • Check FW Status. • Verify All Control Rods Inserted. **Note: Due to the loss of Instrument Bus 113 the crew must take manual control of Pressurizer level and pressure.** • Check PRZR Level Control. • Check PRZR Pressure Control. ***Critical Task: TCOA4 Control AFW flow within 38 minutes following a Reactor Trip.*** ***(SWI O-35 identified Time Critical Operator Action).*** • Check SG Levels. • Verify Offsite Power Available. • Check RCP Status – At Least One Running. • Check If Source Range Detectors Should Be Energized.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CREW	• Maintain Stable Plant Conditions. • Open Turbine Drain Valves. • Align AMSAC/DSS System. • Perform Administrative Notifications. • Check If AFW Pumps Can Be Stopped. • Align Generator Breakers. • Complete "Part A" Of PINGP 662, Reactor Trip Report • Perform Applicable Shutdown Steps Of 1C1.4. • Determine If Natural Circulation Cooldown Is Required.
		LEAD	**47005-0307, PNL 113 INSTR BUS 111(BLUE) LOSS OF VOLTAGE** • Verify bus undervoltage • Place Rod Control in "MANUAL" • At the instrument bus panel, transfer the main breaker for Panel 113 (Blue) to "PANEL 117 ALTERNATE SOURCE" Position per 1C20.8 AOP1, ABNORMAL OPERATION, INSTRUMENT AC INVERTERS
	11. When Turbine Building operator is contacted to transfer the source breaker to the "INTERRUPTABLE PANEL 117" position for Instrument Bus 113 enter ***(Relative Order 4, Event Trigger 4)*** in 1 minute.	LEAD	**1C20.8 AOP1, ABNORMAL OPERATION, INSTRUMENT AC INVERTERS** • If a loss of voltage to Instrument Bus 113 has occurred, Then perform the following: o Place Rod Control in "MANUAL" o At the instrument Bus 113 Panel, transfer the source breaker to the "INTERRUPTABLE PANEL 117" position

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4	11. When the crew has restore power to Instrument Bus 113, and/or at the discretion of the Lead Evaluator enter the 11 S/G Main Steam Line Break ***(Relative Order 5, Trigger 5).***	CREW	**1E-0, REACTOR TRIP OR SAFETY INJECTION** • Verify Reactor Trip. • Verify Turbine Trip. • Verify Both Safeguards Buses Energized. • Check if SI is actuated. • Check if SI is required.
	a. When called as the Turbine Building Operator to verify the status of Turbine Building Roof Exhausters, report that the Turbine Building Roof Exhausters are all secured.	LEAD	***Critical Task: Manually close MSIVs before transition out of 1E-0.*** • Verify Status of Equipment on Attachment L.
	b. Upon hearing the announcement of Reactor Trip, or ~~when called as the Turbine Building Operator~~ to isolate the Unit 1 MSRs per Attachment J, enter CAEP – Att E-0 to start the isolation ***(Relative Order 5a).*** When the isolation is complete, inform the crew that MSR's are isolated.	LEAD	***Critical Task: TCOA4 Control AFW flow within 38 minutes following a Reactor Trip.*** ***(SWI O-35 identified Time Critical Operator Action).*** • Check AFW Status. • Check RCS Temperatures. • Check PRZR PORVs and Spray Valves. • Check if RCPs should be stopped. • Check if SGs are not faulted. • Go to 1E-2, Faulted Steam Generator Isolation.
	NOTE: As part of Att. L step 6b the crew will also manually close the Instrument Air to Containment Valves as part of the Failure of the MSIV's to isolate.		

	12. 1E-2 response
	a. If asked as the chemist to take secondary samples, state that you will begin samples immediately.
		CREW	**1E-2, FAULTED STEAM GENERATOR ISOLATION**
			Critical Task: Isolate the faulted Steam Generator before transition out of 1E-2.
			• Check MSIV and Bypass Valve on affected SG(s) – CLOSED.
			• Check if either SG is not faulted.
			• Identify faulted SG.
			• Isolate faulted SG.
			  • Isolate Main Feedline
			  • Isolate AFW flow
			  • Close steam supply valve to TDAFWP

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			• Verify SG PORV closed. • Verify SGB isolation valve closed. • Check CST level greater than 10000 gallons. • Check secondary radiation. • Go to 1E-1.
		CREW	**1E-1, LOSS OF REACTOR OR SECONDARY COOLANT** • Check If RCPs Should Be Stopped. • Check If SGs Are Not Faulted. • Check Intact SG Levels. • Check Secondary Radiation - Normal. • Check PRZR PORVs And Block Valves. • Reset SI. • Reset Containment Isolation. • Established Instrument Air To Containment. • Check Power Supply To Charging Pumps – Offsite Power Available. • Check If Charging Flow Has Been Established. • Check If SI Flow Should Be Terminated. o Go To 1ES-0.2, SI Termination **Note: Crew may transition to 1ES-0.2, SI Termination based on Information Page.**
		CREW	**1ES-0.2, SI TERMINATION** • Reset SI. • Reset Containment Isolation. • Established Instrument Air To Containment. • Stop Safeguards Pumps.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Note: Crew may transition to 1FR-P.1 due to a integrity CSFST orange or red path.	CREW	**1FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION.** • Check RCS pressure – greater than 550 psig. • Check RCS cold leg temperatures – stable or increasing. • Check PORV block valves – power available and at least one block valve open. • Check if PORVs should be closed. • Check SI pumps – any running. • Check if SI should be terminated. • Reset SI. • Reset Containment Isolation. • Establish Instrument Air to Containment. • Stop Safeguards pumps.
	13. When the crew has stopped safeguards pumps in 1ES-0.2 or 1FR-P.1, or at the discretion of the lead evaluator, then place the simulator in FREEZE and inform the crew that training has the duty.		
	14. Emergency Plan Classification • **None**		

SIMULATOR INPUT SUMMARY							
Relative Order	**System Or Panel Drawing**	**Type**	**Code**	**Severity Or Value**	**Event Trigger**	**Timing**	**Description**
0		MALF	RP06				MSIVs fail to isolate
1		MALF	FW13A		1		11 FW pump trip
2	SIMNI03	MALF	NI05D	100	2		N44 Summing Amp failure high
3	SIMED13	MALF	ED08C		3		Loss of instrument bus 113
4		REMOTE	ED168	PNL 117	4		Source to 125VAC Panel 113 Transfer Switch
5		MALF	MS01A	100	5		Main Steam Line Break
5a			E-0_Att-J.sch				Perform Attachment J

SIMULATOR SETUP CHECKLIST Standard IC-25

Before Training

__ __ Simulator Status:
- ___ 1. "Training Load"
- ___ 2. Step counters "ON"
- ___ 3. Alarm sound "ON"
- ___ 4. Reset to IC-25
- ___ 5. Speed: "REAL"

__ __ Cycle recorder power "OFF" then back "ON" to clear Yokogawa recorder memory

__ __ Verify Summary matches Simulator Input Summary page in the SEG

__ __ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset

__ __ MOC ΔI sheet displayed on C panel

__ __ Check all ERCS alarms are cleared (ATWS scenario)

__ __ MOC Reactivity Briefing sheet available at Reactor Operator Desk

__ __ Chart recorders operating and forwarded

__ __ Turnover sheet/PRA sheet

__ __ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID)

__ __ Update Control Board Placards:
- ___ 1. High Flux At Shutdown Alarm Setpoint placards: 1400 cps
- ___ 2. Feedwater regulating valve position placard: 66/65, 67/64
- ___ 3. RCS boron on the CVCS panel placard: 734 ppm
- ___ 4. Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions)
- ___ 5. Shift Reactivity Guidance placard: BA: 2.3 gallons, RMU: 67 gallons

__ __ Magnetic placards in place:
- ___ 1. 11 BA TANK "Lined Up For Service"
- ___ 2. 11 BA PUMP "Lined Up To 11 BA Tank"
- ___ 3. CC TO SFP MV-32115 "In Service"
- ___ 4. Blowdown 46470 "SGB To CDSR"

__ __ Protected equipment tags in place:
- ___ 1. 12 CC pump

__ __ Attach Caution Tags to the following control switches:
- ___ 1. Place CS-46036, 11 CC pump control switch in "PULLOUT" and attach caution tag

__ __ ERCS driven recorders are on-scale (RCS temperature scaled to 550º F to 560º F)

__ __ ERCS alarm screen operating and alarms reset

__ __ All ERCS terminals operating and set as follows:

CONF	VARS	**R02**	Alarm Summary Page
CONE1	Group OP31_U1	**R03**	AFD
CONC	SAS (XS11)	**R04**	TPM
CONG1	Group QP CCDATA	**R05**	QP LOADFOLL
ERCS-R01	Group RADMON_U1	**R06**	Alarm Summary Page

__ __ ERCS single point displays: **CONB** 1T0499A 1U1613A
CONE2 1V4501A 1Q0340A

__ __ ERCS TPM set (NIS - Auto Scaling - LEFM)

__ __ Pens/Paper/Markers available on the simulator

__ __ Board-mounted EAL Table is cleaned

__ __ EAL sticker books in F3-2 are checked for missing stickers

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1. F3-2	___ 2. F3-2.1 Bases	___ 3. F3-2 Copy 275
___ 4. SWI O-28	___ 5. Boration Card	___ 6. 1E-0
___ 7. 1ES-0.1	___ 8. 1E-2	___ 9. 1E-1
___ 10. 1ES-0.2	___ 11. 1FR-P.1	___ 12. C47010-0101
___ 13. C47013-0101	___ 14. C47013-0102	___ 15. C47005-0307
___ 16. 1C4 AOP1	___ 17. 1C51.4	___ 18. TS 3.3.1
___ 19. TS 3.8.7	___ 20. 1C20.8 AOP1	___ 21.

__ __ On the NIS panel, verify Scaler Timer power switch is in Off position.

__ __ Set Turbine Control HMI Displays as follows:

___ 1. U1 E-H Turb Cont STA 2 **(48087)** to: **Control Valve Overview**
___ 2. U1 Turb Aux Cont **(48088)** to: **Turb Overview**
___ 3. U1 E-H Turb Cont STA 1 **(48086)** to: **On Line Control**

__ __ DEHC alarms cleared

Post-Scenario Checklist

__ __ EOOS computer is cleared of information added during the scenario

__ __ Computer generated PINGP 577 cleared.

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1.	F3-2	___ 2.	F3-2.1 Bases	___ 3.	F3-2 Copy 275
___ 4.	SWI O-28	___ 5.	Boration Card	___ 6.	1E-0
___ 7.	1ES-0.1	___ 8.	1E-2	___ 9.	1E-1
___ 10.	1ES-0.2	___ 11.	1FR-P.1	___ 12.	C47010-0101
___ 13.	C47013-0101	___ 14.	C47013-0102	___ 15.	C47005-0307
___ 16.	1C4 AOP1	___ 17.	1C51.4	___ 18.	TS 3.3.1
___ 19.	TS 3.8.7	___ 20.	1C20.8 AOP1	___ 21.	

__ __ Protected equipment tags in place:
___ 1. Remove tag from 12 CC pump

__ __ Remove Caution Tags to the following control switches:
___ 1. 11 CC pump

__ __ **Board-mounted EAL Table is cleaned**

__ __ All books, note pads, and calculators put away

End Of Day Checklist

__ __ Signs/placards removed and put away unless normal simulator configuration

__ __ Floor PCs logged off if simulator will not be used again that day

__ __ Instructor station returned to normal with all books, paper, and etc. put away

__ __ Headsets turned off and put away if simulator will not be used again that day

__ __ Simulator reset to IC-10 unless another IC will be used for further training

__ __ Simulator placed in DORT if simulator will not be used again that day

__ __ Recorder power "OFF" if simulator will not be used again that day

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE: DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 0 ft² **SYSTEM CONDITION: GREEN**

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS	
11 CC pump is OOS for pump seal replacement. Entered T.S. 3.7.7 Condition A at 0400 with expected return to service at 2300.	
PROTECTED EQUIPMENT	
12 CC pump	
RAD MONITORS OOS	**ANNUNCIATORS OOS**
OUTSTANDING SP'S	**FIRE DET / PROT EQP IMPAIRMENTS**
OTHER EQUIPMENT OOS / STATUS	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
12 SI pump	
OPERATIONAL PLANS FOR COMING SHIFT	
Suspend Tech Spec required shutdown due to repair of 12 SI Pump. Hold at current power for TSO, TSO will call when load change is desired. Xenon is building in after load decrease from 100%. Adding 125 gallons of RMU every 8 - 10 minutes to maintain Tave at Tref.	
NEW PROCEDURES / INSTRUCTIONS	

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 X	No
2.	The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations.	Yes X	No
3.	The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	Yes X	No
4.	Plant PRA initiating events, important equipment, and important tasks are identified.	Yes X	No
5.	Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	Yes X	No
6.	The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	Yes X	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 X	No
8.	The scenario includes related industry experience. SOER, SER and similar OE recommendations are clearly identified and fully addressed.*	Yes	No X
9.	The scenario guide incorporates verification of Operator Fundamental application.*	Yes	No X
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 X
11.	For evaluations, it has been verified that without operator action the critical tasks will be failed.	Yes X	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.

		Yes	No
1.	The desired initial condition(s) could be achieved.	X	
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	X	
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	X	
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	X	
5.	During the simulator scenario, observed changes corresponded to expected plant response.	X	
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	X	
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.	X	

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.

Xcel Energy | SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND **SEG # 2010 ILT NRC SIMULATOR EVALUATION #3**

SEG TITLE: 2010 ILT NRC SIMULATOR EVALUATION #3 **REV. # 0**

PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

TOTAL TIME: 1.5 HOUR

Additional site-specific signatures may be added as desired.

Developed by:	**John DuBose** *Instructor*	**10/30/09** *Date*
Reviewed by:	**Mike Fish** *Instructor* *(Simulator Scenario Development Checklist.)*	**12/13/09** *Date*
Validated by:	**Mike Fish** *Validation Lead Instructor* *(Simulator Scenario Validation Checklist.)*	**12/13/09** *Date*
Approved by:	 *Training Supervision*	 *Date*

2010 ILT NRC SIMULATOR EVALUATION #3, Rev. 0

Guide Requirements

Goal of Training:

During all plant operating conditions, the crew will demonstrate the ability to monitor and operate the plant within the limits of the Operations Manuals and Technical Specifications.

When presented with various scenario events, the crew will demonstrate the ability to respond to the events using appropriate operating and administrative procedures to return the plant to stable conditions.

Learning Objectives:

1. During all plant operating conditions, demonstrate the ability to perform communications, verification practices (STAR and peer checks), procedure use, alarm response, reactivity control, and crew briefs in accordance with Operations Standards and Expectations.
2. Raise power to the Point of Adding Heat IAW 1C1.2.
3. Transfer running Condensate Pumps per 1C28.3.
4. Diagnose and respond to failure of 122 Instrument Air Compressor per C47 and 1C34 AOP1.
5. Diagnose and respond to a Pressurizer Heater Backup Group 1B Breaker Trip per 1C20.6.
6. Diagnose and respond to PT-431 blue channel Pressurizer Pressure failure per C47 and 1C51.3.
7. Diagnose and respond to a Steam Generator Tube Rupture per 1E-0 and 1E-3.
8. Diagnose and respond to a Cooling Water pump failing to auto start per 1E-0 Attachment L.

Prerequisites:

1. NONE

Training Resources:

1. Full Scope Simulator
2. Lead Evaluator
3. Booth Operator
4. Backup Communicator

References:

1. NONE

Commitments:

1. NONE

Evaluation Method: This is an evaluation scenario

Operating Experience: None – Evaluation Scenario

Related PRA Information:

Initiating Event with Core Damage Frequency:
SGTR (2%)

Important Components:
11 CLG WTR PMP
12 DD CLG WTR PMP
121 MD CLG WTR PMP
122 STA AIR COMPR
123 STA AIR COMPR

Important Operator Actions with Task Number:
Cooldown and depressurize RCS from SGTR before SG overfill (2%)
CRO 3010040601

TASKS ASSOCIATED WITH SIMULATOR EXERCISE:

None. This is an evaluation scenario and no credit will be taken for tasks performed.

GENERAL EXPECTATIONS

Over the duration of the scenario, monitor crew performance for adherence to the conduct of operations standards and Operations department Standards and Expectations:

- Communications
- Verification Practices (STAR and Peer Checks)
- Procedure Use
- Alarm Response
- Reactivity Control
- Crew Briefs

Performance for adherence to administrative procedural requirements and operations management expectations:

- Reportability of the malfunction or event
- Notifications to the Operations Manager and NRC Resident Inspector per SWI-O-28
- Notification to the Duty Station Manager per operations management request
- Tech Spec implementation; interpretation; and documentation of decision made, actions taken, and the basis for decisions made and actions taken

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. 122 Air Compressor fails.
2. Pressurizer Heater Backup Group 1B Breaker Trip.
3. PT-431 Blue Channel Pressurizer Pressure fails.

After EOP Entry:

1. Failure of the SI signal to the Cooling Water system.

Normal Events:

1. Raise power to the Point of Adding Heat.
2. Transfer running Condensate Pumps.

Abnormal Events:

1. 122 Instrument Air Compressor fails.
2. Pressurizer Heater Backup Group 1B Breaker Trip.
3. PT-431 Blue Channel Pressurizer Pressure fails

Major Transients:

1. SGTR

Critical Tasks:

1. E-O – TCOA4: Control AFW flow within 38 minutes following a Reactor trip. (SWI O-35 identified Time Critical Operator Action).
2. E-3 – A: Isolate feedwater flow into and steam flow from the ruptured Steam Generator before a transition to ECA-3.1 occurs.
3. E-3 – B: Establish/maintain an RCS temperature so that transition from E-3 does not occur because of the inability to maintain required subcooling or such that an extreme or severe challenge to the Subcriticality and/or the Integrity CSF occurs.
4. E-3 – C: Depressurize RCS to meet SI termination criteria prior to overfilling the ruptured Steam Generator.
5. E-3 – D: Terminate SI prior to overfilling the ruptured Steam Generator.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard IC sets:
   - IC-26
2. The following equipment is OOS:
   - 13 Charging Pump OOS

SEQUENCE OF EVENTS:

Event 1: Raise power to the POAH
- Candidates will perform a pre-job brief prior to entering the Control Room.
- Power will be raised to the POAH.
- The crew will start 12 Condensate Pump and stop 11 Condensate Pump for Filter Demin Support.

Event 2: 122 Air compressor fails.
- 122 Instrument Air Compressor fails and 123 Instrument Air Compressor fails to function automatically.
- The Crew will respond per C47 and C34 AOP1, Loss of Instrument Air to start 123 Instrument Air Compressor.

Event 3: Pressurizer Heater Backup Group 1B Breaker Trip
- Pressurizer Heater Backup Group 1B Breaker Trips.
- The crew will respond to breaker failure per 1C20.6.

Event 4: PT-431 Pressurizer Pressure Channel fails high
- PT-431 fails high.
- Both Pressurizer spray valves will fully open and Pressurizer heaters will de-energize.
- The crew will take manual control of spray valves and close them.
- The crew will respond per C47 and 1C51.3 to change the controlling pressure channel and restore pressure.

Event 5: 12 Steam Generator tube rupture
- The Steam Generator tube leak will escalate to 400 GPM tube rupture.
- The Crew will respond per 1E-0 and 1E-3.

Event 6: SI Signal to CL System Fails To Actuate
- The SI signal to the Cooling Water system will fail.
- The crew will manually align the Cooling Water system.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: • IC-26 • Mode: 2 • Exposure: ZBC • Power: 1E-8 amps • Boron: 1822 ppm • Temperature: ~548°F • Pressure: ~2235 psig • Xenon: Free • Rods: "D" @ 140 • Generator: OFFLINE	(RO/LO /SRO)	

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP a. Set up the simulator to IC-26. b. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary." c. Complete the "Simulator Setup Checklist."		
	2. Simulator Pre-brief: a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. b. The crew will brief the power change and swapping of running condensate pumps prior to entering to Control Room.		
	3. COMPLETE TURNOVER: a. "UNIT 1 LPEO / PEO TURNOVER LOG." b. PRA Printout. a. Verify crew performs walk down of control boards and reviews turnover checklists.	CREW	Review the following with the off-going operator: • "Unit 1 LPEO / PEO Turnover Log" • PRA printout • Walk-down the control boards and ask questions as appropriate
EVENT 1	4. When the crew has assumed the duty allow the crew to raise power to the point of adding heat and start 12 Condensate pump and stop 11 Condensate pump.	RO	**1C1.2 UNIT 1 STARTUP PROCEDURE** • Starting at step 5.10.18 o Raise power to the POAH o When one or more intermediate range indicates greater than 1E-9 amps, THEN verify ERCS is in Mode 2. o Using ERCS display XS02 and C41, verify the Subcriticality CSF Activation Status is INACTIVE. o Maintain reactor power between 0.5 and 2.0%.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	5. Follow along in 1C28.3 step 5.6 and report back all local actions and checks are complete as requested after 2 minutes. None of the local checks are modeled in the simulator.	LEAD	**1C28.3, UNIT 1 CONDENSATE SYSTEM** • Step 5.6 Swapping Condensate Pumps o Check condensate pump oil cooling water flow using cooling water return sight glass. o Check condensate pump gland seal water flow using the following: ▪ Flow through the gland seal water sight glass – local. ▪ Seal water pressure is 18-24 psig – local. ▪ Following annunciators NOT LIT: • 47009-0402, 11 CONDENSATE PUMP SEAL WATER LO PRESS • 47009-0403, 12 CONDENSATE PUMP SEAL WATER LO PRESS • 47009-0404, 13 CONDENSATE PUMP SEAL WATER LO PRESS o Ensure the motor bearing of the condensate pump have the proper oil level - local. o Verify all condensate pump suction valves are open - local. o Notify the duty chemist that a condensate pump is being started and secondary chemistry may be affected. o Place the desired condensate pump selector switch in "MANUAL". o Start the desired condensate pump by placing

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD	the control switch to the "START position. o Check the pump visually for excessive vibration or seal leakage. o Check the bearing temperatures and motor stator temperatures on ERCS o Close the discharge vent of the running condensate pump - local. o Verify pump gland seal water pressure is 18-24 psig – local. o Verify heat removal fans have started – local. o Check condensate header pressure approx. 440 psig on 4122101, 11/12/13 CD PMP DISCH HDR PI. o Stop the desired condensate pump by placing the control switch to the "STOP" position. o If desired, Then place a condensate pump selector switch in "STANDBY". o Open the discharge vent valve of the condensate pump that was stopped – local.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 2	6. When the crew has stabilized power at the POAH, and/or at the discretion of the Lead Evaluator enter the failure of 122 Air compressor. ***(Relative Order 1, Trigger 1)***	LEAD	**NOTE: 123 Air Compressor may be manually started as a plant stabilization action.** **C47023-0102, 122 AIR COMPRESSOR LOCAL ALARM** • Check station and instrument air header pressures. • Start addition compressors as necessary. • Dispatch operator to Panel 70551, 122 Station Air Compressor Annunciator Panel to perform the following: o Determine the initiating alarm. o Respond per C70551, 122 STATION AIR COMPRESSOR REMOTE ALARM RESPONSE.
	NOTE: The Booth operator MUST remove the fault on 123 Air Compressor when actions are taken to start 123 Air Compressor (*Relative Order 1b*) a. If directed to investigate 122 Air Compressor trip, local alarm, and/or C70551 Panel alarm, after 2 minutes perform ***(Relative Order 1a)*** report the following: 1) 122 Air Compressor Low Oil Pressure alarm on Panel 70551. 2) 122 air compressor appears intact with no visible damage	LEAD	**C47023-0202, 122 AIR COMPRESSOR AUTOMATIC START OR STOP** • Check station and instrument air header pressures. • If alarm is due to normal cycling of standby air. • If instrument air pressure is low, then refer to C34 AOP1, LOSS OF INSTRUMENT AIR. **NOTE: The crew might refer to C34 AOP1, but no actions should be required. The loss of air is NOT expected to cause a reactor trip.**
	b. If directed to investigate C47023-0101, 121 AIR COMPRESSOR LOCAL ALARM, after 2 minutes report the following: 1) 121 Air Dryer Purge Exhaust Isolation CV-31960 Closed alarm was flashing on C75550 Panel and cleared when the alarm was acknowledged. c. If directed to investigate 123 Air Compressor after it has been started, after 3 minutes, report the air compressor and air dryer are operating normally. d. If contacted as the FIN team supervisor, inform the crew that you will write a work order and assign an Electrical Maintenance supervisor to investigate. e. If desired, allow the crew to hold a crew brief.	LEAD	**C47023-0101, 121 AIR COMPRESSOR LOCAL ALARM** • Check station and instrument air header pressures. • Start addition compressors as necessary. • Dispatch operator to Panel 70550, 121 Station Air Compressor Annunciator Panel to perform the following: o Determine the initiating alarm. • Respond per C70550, 122 STATION AIR COMPRESSOR REMOTE ALARM RESPONSE.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	7. When the crew has completed actions for the 122 Air Compressor failure, and/or at the discretion of the Lead Evaluator enter the Pressurizer Heater Backup Group 1B breaker failure ***(Relative Order 2, Trigger 2).***	CREW RO	• Crew will respond to ERCS alarm: BKRCHK: 1YB122C PZR BU-HTR • Determine Pressurizer Heater Backup Group 1B breaker tripped
	a. If asked to investigate 122C breaker tripping, after 2 minutes report back the following: 1) Report workers in the Bus 122 room dropped a latter which hit the 122C breaker. 2) The 122C breaker has significant damage.	LEAD SS	**1C20.6 UNIT 1 – 480V SYSTEM** • Transfer Unit 1 Pressurizer Heater Group B from Bus 122 to Bus 180 per step 5.35 o Enter T.S. LCO 3.4.9 Condition B.
	8. **When crew places CS-46242 PRZR HEATER BACK-UP GROUP 1B, to "OFF" remove OVERRIDE on control switch.** ***(Relative Order 2a)***	RO	o Place CS-46242 PRZR HEATER BACK-UP GROUP 1B, to "OFF".
	9. **When crew informs Turbine Building operator to transfer to backup power supply Bus 180 per 1C20.6 wait 3 minutes and then perform** ***(Relative Order 3, Trigger 3).***		o Have Turbine Building operator transfer power supplies locally o Place CS-46242 PRZR HEATER BACK-UP GROUP 1B, to "ON".

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4	10. When the crew has completed actions for the pressurizer heater breaker failure, and/or at the discretion of the Lead Evaluator, then enter the Blue Channel Pressurizer pressure failing high ***(Relative Order 4, Trigger 4).***	RO	**NOTE: As a plant stabilization action the crew is expected to take manual control of the Pressurizer Spray Valves and close them.** **C47012-0408, PRZR HI/LO PRESS CHANNEL ALERT**
	a. If directed as I&C to trip bistables, report that 2 I&C technicians will be available in ≈45 minutes. **(Note: bistables will not be tripped during this scenario.)**	LEAD/ RO	• If necessary, then refer to 1E-0 • Check pressurizer pressure high or low. • Restore pressure to normal through use of heaters or sprays. • If necessary, then refer to 1C51.
	b. If contacted as Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC Resident Inspector, Duty Station Manager, etc., as asked.	LEAD/ RO	**1C51.3, Pressurizer Pressure 1P-431 - HIGH** • If the blue channel is selected on the przr pressure control selector switch then: o Place pressurizer pressure controller in 'manual' and stabilize pressure. o Select position "2-1 (WHITE-RED)" on channel selector switch. o When pressure returned to normal with no deviation from setpoint, then return pressure control to automatic. • Verify pressurizer pressure recorder not selected to blue channel.
	c. If contacted as the FIN team supervisor, inform the crew that you will write a work order and assign an I&C supervisor to investigate. d. If desired, allow the crew to hold a crew brief.	SS	• Refer to the following technical specification requirements: o T.S. LCO 3.3.1 condition A & Table 3.3.1-1 Functions 6, 8a, 8b. o T.S. LCO 3.3.2 Condition A & Table 3.3.2-1 Function 1d. o T.S. LCO 3.4.1.a • Trip bistables.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 5	11. When the crew has completed actions for the pressurizer pressure channel failing high, and/or at the discretion of the Lead Evaluator, then enter the 12 Steam Generator Tube Rupture ***(Relative Order 5, Trigger 5).***	CREW	**1E-0, REACTOR TRIP OR SAFETY INJECTION** • Verify Reactor Trip… • Verify Turbine Trip… • Verify Both Safeguards Buses – ENERGIZED. • Check if SI is actuated… • Verify status of equipment on ATTACHMENT L: SI alignment verification.
	a. Upon hearing the announcement of reactor trip, or when called as Turbine Building Operator to isolate the Unit 1 MSR's per Attachment J, then enter ***Relative Order 6 (Schedule file E-0_Att-J.sch)***	LEAD	**NOTE: During Att. L the failure of the SI signal to the cooling water system will require it to be aligned appropriately.** ***Critical Task: Control AFW flow within 38 minutes following a Reactor Trip. (SWI O-35 identified Time Critical Operator Action).***
	b. When called as the Turbine Building Operator to verify the status of Turbine Building Roof Exhausters, report that the Turbine Building Roof Exhausters are all secured.	CREW	• Check AFW status: o Verify total AFW flow – Greater than 200 gpm ▪ If SG wide range level greater than 50% in either SG… ▪ If SG wide range level less than 50% in both SGs, then manually start AFW pumps and align valves, as necessary. o Verify AFW pumps discharge pressure – greater than 900 psig. o Check SG levels – Narrow range greater than 5% o Control feed flow to maintain narrow range SG level between 5% and 50%
	c. Based on crew composition, at the discretion of the Lead Evaluator, personnel may be provided to perform Attachment L upon completion of all applicable critical tasks.		***Critical Task: Establish and maintain 200 GPM AFW flow to the Steam Generator(s) before transition out of E-0, unless the transition is to FR-H.1, in which case the task must be initiated***
	d. If asked to open FCU CLG WTR RTN BP VLVs perform ***(Relative Order 7, Trigger 7).***		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	NOTE: Due to Zero Burn Core/Low RCS activity and low initial reactor power radiation monitors may NOT alarm. The crew may NOT identify the SGTR at step 11. Crew will identify ruptured SG at step 15 and go to 1E-3.	CREW	***before RCPs are manually tripped in accordance with step 2 of FR-H.1.*** • Check RCS temperatures • Check PRZR PORVs and Spray Valves… • Check if RCPs should be stopped… • Check if SGs are not faulted… • Check if SG tubes are not ruptured: o Condenser air ejector radiation – normal o SGB radiation – normal o Main steamline radiation – normal • Check if RCS is intact • Check if SI flow should be terminated • Initiate montoring of critical safety function status trees • Check SG levels o NR level > 5% o Control feed flow to maintain NR levels 5 – 50% ▪ If SG NR level in one SG continues to increase in an uncontrolled manner, THEN go to 1E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
		CREW	**1E-3, STEAM GENERATOR TUBE RUPTURE** • Check if RCPs should be stopped… • Identify Ruptured SG… ***Critical Task: Isolate feedwater flow into and steam flow from the ruptured Steam Generator before a***

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CREW	***transition to ECA-3.1 occurs.*** • Isolate flow from ruptured SG… • Check ruptured SG level… • Reset SI • Check ruptured SG pressure – Greater than 210 psig ***Critical Task: Establish/maintain an RCS temperature so that transition from E-3 does not occur because of the inability to maintain required subcooling or such that an extreme or severe challenge to the Subcriticality and/or the Integrity CSF occurs.*** • Initiate RCS Cooldown… **Note:** ***During the cooldown, the SS must continue with step 8 to prepare the plant for depressurization.*** • Check intact SG level… • Check PRZR PORVs and Block Valves… • Reset SI • Reset Containment Isolation • Establish Instrument Air to containment • Check if RHR pumps should be stopped… • Establish Charging flow… • Check if RCS Cooldown should be stopped… • Check Ruptured SG pressure – Stable or increasing • Check RCS subcooling based on core exit T/Cs – greater than 40°F ***Critical Task: Depressurize RCS to meet SI termination criteria prior to overfilling the ruptured Steam Generator.*** • Depressurize RCS to minimize break flow and refill PRZR…

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CREW	• Check if SI flow should be terminated… ***Critical Task: Terminate SI prior to overfilling the ruptured Steam Generator.*** • Stop SI pumps • Establish Charging flow… • Verify SI flow not required…
	12. When the crew has stopped SI and verified it is not required, or at the discretion of the Lead Evaluator, then place the simulator in FREEZE and inform the crew that training has the duty.		
	13. Emergency Plan Classification • Site Area Emergency – EAL **SS1.1**		

SIMULATOR INPUT SUMMARY							
Relative Order	**System Or Panel Drawing**	**Type**	**Code**	**Severity Or Value**	**Event Trigger**	**Timing**	**Description**
0		OVRD	DI-46098SP	TRUE			FAILURE OF #123 AIR COMPRESSOR AUTO
0		MALF	RP12				SI SIGNAL TO CL WATER
0		MALF	IA02	5			AIR USAGE IN PLANT
1		MALF	IA03B		1		LOSS OF AIR COMPRESSOR #122
1		ANN MALF	M47023:0102W	CRY WOLF	1		122 AIR COMPRESSOR LOCAL ALRM
1a		ANN MALF	M47023:0102W	REMOVE			122 AIR COMPRESSOR LOCAL ALRM
1b		OVRD	DI-46098SP	REMOVE			REMOVE FAULT ON #123 AIR COMPRESSOR
2		OVRD	DI-46242OFF	TRUE	2		TRIP OFF PRZR HTR BU GROUP B
2A		OVRD	DI-46242OFF	REMOVE			TRIP OFF PRZR HTR BU GROUP B
3		REMOTE	RX100	BUS 180	3		PZR HTR GROUP B PS XFER
4		MALF	RX202	2500	4		PT-431 FAILS HIGH
5		MALF	SG02B	20	5	60 SECOND RAMP	12 SG TUBE RUPTURE (~400 GPM)
6			E-0_Att-J.sch				Perform Attachment J

SIMULATOR INPUT SUMMARY							
Relative Order	**System Or Panel Drawing**	**Type**	**Code**	**Severity Or Value**	**Event Trigger**	**Timing**	**Description**
7		REMOTE	CL105	OPEN	7		11/13 FCU CLG WTR RTN BP VLV
7		REMOTE	CL106	OPEN	7		12/14 FCU CLG WTR RTN BP VLV

2010 ILT NRC SIMULATOR EVALUATION #3, Rev. 0

SIMULATOR SETUP CHECKLIST Standard IC-26

Before Training

__ __ Simulator Status:
- ___ 1. "Training Load"
- ___ 2. Step counters "ON"
- ___ 3. Alarm sound "ON"
- ___ 4. Reset to IC-26
- ___ 5. Speed: "REAL"

__ __ Cycle recorder power "OFF" then back "ON" to clear Yokogawa recorder memory

__ __ Verify Summary matches Simulator Input Summary page in the SEG

__ __ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset

__ __ ZBC ΔI sheet displayed on C panel

__ __ Check all ERCS alarms are cleared.

__ __ ZBC Reactivity Briefing sheet available at Reactor Operator Desk

__ __ Chart recorders operating and forwarded

__ __ Turnover sheet/PRA sheet

__ __ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID)

__ __ Update Control Board Placards:
- ___ 1. High Flux At Shutdown Alarm Setpoint placards: 1400 cps
- ___ 2. Feedwater regulating valve position placard: BLANK
- ___ 3. RCS boron on the CVCS panel placard: 1822 ppm
- ___ 4. Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions)
- ___ 5. Shift Reactivity Guidance placard: BA: 6.0 gallons, RMU: 67 gallons

__ __ Magnetic placards in place:
- ___ 1. 11 BA TANK "Lined Up For Service"
- ___ 2. 11 BA PUMP "Lined Up To 11 BA Tank"
- ___ 3. CC TO SFP MV-32115 "In Service"
- ___ 4. Blowdown 46470 "SGB To CDSR"

__ __ Protected equipment tags in place:
- ___ 1. None

__ __ Attach Caution Tags to the following control switches:
- ___ 2. 13 Charging Pump in Pullout
- ___ 1. CS-46362, 4.16KV Bus 11 1M XFMR
- ___ 2. CS-46363, 4.16KV Bus 12 1M XFMR
- ___ 3. CS-46364, 4.16KV Bus 13 1M XFMR
- ___ 4. CS-46365, 4.16KV Bus 14 1M XFMR

__ __ ERCS driven recorders are on-scale (RCS temperature scaled to 545º F to 555º F)

__ __ ERCS alarm screen operating and alarms reset

__ __ All ERCS terminals operating and set as follows:

CONF	VARS	**R02**	Alarm Summary Page
CONE1	Group OP31_U1	**R03**	AFD
CONC	SAS (XS11)	**R04**	TPM
CONG1	Group QP CCDATA	**R05**	QP LOADFOLL
ERCS-R01	Group RADMON_U1	**R06**	Alarm Summary Page

__ __ ERCS single point displays: **CONB** 1T0499A 1U1613A
CONE2 1V4501A 1Q0340A

__ __ ERCS TPM set (NIS - Auto Scaling - LEFM)

__ __ Pens/Paper/Markers available on the simulator

__ __ Board-mounted EAL Table is cleaned

__ __ EAL sticker books in F3-2 are checked for missing stickers

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1.	F3-2	___ 2.	F3-2.1 Bases	___ 3.	F3-2 Copy 275
___ 4.	SWI O-28	___ 5.	Boration Card	___ 6.	C47012-0408
___ 7.	C47022-0108	___ 8.	C47023-0202	___ 9.	C47048:1R-15
___ 10.	C34 AOP1	___ 11.	1C20.6	___ 12.	1C51.3
___ 13.	1E-0	___ 14.	1E-3	___ 15.	

__ __ On the NIS panel, verify Scaler Timer power switch is in Off position.

__ __ Set Turbine Control HMI Displays as follows:

___ 1. U1 E-H Turb Cont STA 2 **(48087)** to: **Control Valve Overview**
___ 2. U1 Turb Aux Cont **(48088)** to: **Turb Overview**
___ 3. U1 E-H Turb Cont STA 1 **(48086)** to: **On Line Control**

__ __ DEHC alarms cleared

__ __ Markup 1C1.2, UNIT 1 STARTUP PROCEDURE thru step 5.10.17 as complete

Post-Scenario Checklist

__ __ EOOS computer is cleared of information added during the scenario

__ __ Computer generated PINGP 577 cleared.

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1.	F3-2	___ 2.	F3-2.1 Bases	___ 3.	F3-2 Copy 275
___ 4.	SWI O-28	___ 5.	Boration Card	___ 6.	C47012-0408
___ 7.	C47022-0108	___ 8.	C47023-0202	___ 9.	C47048:1R-15
___ 10.	C34 AOP1	___ 11.	1C20.6	___ 12.	1C51.3
___ 13.	1E-0	___ 14.	1E-3	___ 15.	

__ __ Protected equipment tags in place:

___ 1. None

__ __ Remove Caution Tags to the following control switches:

___ 1. 13 Charging Pump
___ 2. CS-46362, 4.16KV Bus 11 1M XFMR
___ 3. CS-46363, 4.16KV Bus 12 1M XFMR
___ 4. CS-46364, 4.16KV Bus 13 1M XFMR
___ 5. CS-46365, 4.16KV Bus 14 1M XFMR

__ __ Board-mounted EAL Table is cleaned

__ __ All books, note pads, and calculators put away

End Of Day Checklist

__ __ Signs/placards removed and put away unless normal simulator configuration

__ __ Floor PCs logged off if simulator will not be used again that day

__ __ Instructor station returned to normal with all books, paper, and etc. put away

__ __ Headsets turned off and put away if simulator will not be used again that day

__ __ Simulator reset to IC-10 unless another IC will be used for further training

__ __ Simulator placed in DORT if simulator will not be used again that day

__ __ Recorder power "OFF" if simulator will not be used again that day

2010 ILT NRC SIMULATOR EVALUATION #3, Rev. 0

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE: DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 0 ft^2 **SYSTEM CONDITION: GREEN**

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS	
None	
PROTECTED EQUIPMENT	
None	
RAD MONITORS OOS	**ANNUNCIATORS OOS**
OUTSTANDING SP'S	**FIRE DET / PROT EQP IMPAIRMENTS**
OTHER EQUIPMENT OOS / STATUS	
13 Charging Pump is OOS for motor replacement.	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
OPERATIONAL PLANS FOR COMING SHIFT	
Reactor power is currently stable at 1E-8 amps in the Intermediate Range (N-35 &N-36). Main Feedwater is in service. Raise Power to Point of Adding Heat per 1C1.2, Unit 1 Start Procedure. Start 12 Condensate Pump and stop 11 Condensate pump for Filter Demin support.	
NEW PROCEDURES / INSTRUCTIONS	

Simulator session will include a power change.

Prior to simulator:

- Provide crew a copy of 1C1.2, Unit 1 Startup Procedure marked up to step 5.10.17.
- The crew should prepare a reactivity plan to raise power to Point of Adding Heat.
- The crew should complete a Pre-Job Brief for the power increase.

Current conditions are:
Power level - 1E-8 amps

Xenon - None

Control Rod Position - CBD @ 140 steps

Boron Concentration - 1822 ppm

Core Exposure - ZBC

Desired Endpoint:
Power Level – 1-2%

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 X	No
2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations.	Yes X	No
3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	Yes X	No
4. Plant PRA initiating events, important equipment, and important tasks are identified.	Yes X	No
5. Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	Yes X	No
6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	Yes X	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 X	No
8. The scenario includes related industry experience. SOER, SER and similar OE recommendations are clearly identified and fully addressed.*	Yes	No X
9. The scenario guide incorporates verification of Operator Fundamental application.*	Yes	No X
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 X
11. For evaluations, it has been verified that without operator action the critical tasks will be failed.	Yes X	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 X	No
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	Yes X	No
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	Yes X	No
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	Yes X	No
5.	During the simulator scenario, observed changes corresponded to expected plant response.	Yes X	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 X	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 X	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.

Xcel Energy

SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND **SEG # 2010 ILT NRC SIMULATOR EVALUATION #4**

SEG TITLE: 2010 ILT NRC SIMULATOR EVALUATION #4 **REV. # 0**

PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT

TOTAL TIME: 1.5 HOUR

Additional site-specific signatures may be added as desired.

Developed by:	**Mike Fish** *Instructor*	**10/12/09** *Date*
Reviewed by:	**John DuBose** *Instructor* *(Simulator Scenario Development Checklist.)*	**12/13/09** *Date*
Validated by:	**John DuBose** *Validation Lead Instructor* *(Simulator Scenario Validation Checklist.)*	**12/13/09** *Date*
Approved by:	 *Training Supervision*	 *Date*

Guide Requirements

Goal of Training:

During all plant operating conditions, the crew will demonstrate the ability to monitor and operate the plant within the limits of the Operations Manuals and Technical Specifications.

When presented with various scenario events, the crew will demonstrate the ability to respond to the events using appropriate operating and administrative procedures to return the plant to stable conditions.

Learning Objectives:

1. During all plant operating conditions, demonstrate the ability to perform communications, verification practices (STAR and peer checks), procedure use, alarm response, reactivity control, and crew briefs in accordance with Operations Standards and Expectations.
2. Perform power reduction per 1C1.4.
3. Remove Heater Drain Pump from service per 1C28.4.
4. Diagnose and respond to a Loss of Bus 16 per C47 and 1C20.5 AOP2.
5. Diagnose and respond to a failed Steam Generator pressure transmitter per C47 and 1C51.
6. Diagnose and respond to a Tave instrument failure per C47 and C51.
7. Diagnose and respond to a failure of the Reactor to automatically trip and an ATWS condition per 1E-0 and 1FR-S.1.

Prerequisites:

1. NONE

Training Resources:

1. Full Scope Simulator
2. Lead Evaluator
3. Booth Operator
4. Backup Communicator

References:

1. NONE

Commitments:

1. NONE

Evaluation Method: This is an evaluation scenario

Operating Experience: None – Evaluation Scenario

Related PRA Information:

Initiating Event with Core Damage Frequency:
None

Important Components:
11 TDAFW pump

Important Operator Actions with Task Number:
None

TASKS ASSOCIATED WITH SIMULATOR EXERCISE:

None. This is an evaluation scenario and no credit will be taken for tasks performed.

GENERAL EXPECTATIONS

Over the duration of the scenario, monitor crew performance for adherence to the conduct of operations standards and Operations department Standards and Expectations:

- Communications
- Verification Practices (STAR and Peer Checks)
- Procedure Use
- Alarm Response
- Reactivity Control
- Crew Briefs

Performance for adherence to administrative procedural requirements and operations management expectations:

- Reportability of the malfunction or event
- Notifications to the Operations Manager and NRC Resident Inspector per SWI-O-28
- Notification to the Duty Station Manager per operations management request
- Tech Spec implementation; interpretation; and documentation of decision made, actions taken, and the basis for decisions made and actions taken

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Loss of Bus 16
2. Steam Generator Pressure Transmitter PT-478 fails high (12 SG PORV Fails Open)
3. Tavg instrument fails high
4. Turbine Trip with ATWS

After EOP Entry:

1. 11 TDAFW Pump Fails to Auto Start

Normal Events:

1. Reduce power from 100% to 90% per 1C1.4.
2. Stop 12 Heater Drain Pump for Brush inspection per 1C28.4.

Abnormal Events:

1. Loss of Bus 16
2. Steam Generator Pressure Transmitter PT-478 fails high (12 SG PORV Fails Open)
3. Tavg instrument fails high

Major Transients:

1. Turbine Trip with ATWS

Critical Tasks:

1. E-0 – F: Establish and maintain 200 gpm AFW flow to the Steam Generator(s) before transition out of E-0, unless the transition is to FR-H.1, in which case the task must be initiated before RCPs are manually tripped in accordance with step 2 of FR-H.1.

2. FR-S.1 – C: Insert negative reactivity into the core by inserting rods or establishing emergency boration flow to the RCS during the performance of FR-S.1.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard (Specific) IC sets:
   - IC-10
2. The following equipment is OOS:
   - 12 Motor Driven AFWP
   - 13 Heater Drain Pump

SEQUENCE OF EVENTS:

Event 1: Reduce power from 100% to 90% using 1C1.4
- The crew will reduce reactor power from 100% to 90% in accordance with 1C1.4, Unit 1 Power Operation, for Main Turbine Valve Testing.
- The crew will remove 12 Heater Drain Pump from service for brush inspection per 1C28.4.

Event 2: Loss of Bus 16
- The normal supply breaker to Bus 16 will trip open due to operator error.
- The Bus 16 sequencer will fail to re-energize Bus 16.
- The crew will respond per 1C20.5 AOP 2 to re-energize the bus.
- The sequencer failure will not be addressed in this scenario.

Event 3: Steam Generator Pressure Transmitter PT-478 Fails High
- "B" Steam Generator PORV will open.
- The crew will manually close the PORV.
- The crew will respond per C47 and 1C51.

Event 4: Tavg instrument Fails High
- Blue channel Thot fails high.
- Control rods will insert in automatic
- The crew will place rod control in manual
- The crew will place running charging pumps in manual
- The crew will respond per C47 and C51.

Event 5: ATWS
- The Turbine will trip, but the Reactor will not automatically trip.
- The reactor cannot be tripped from the Control Room and the crew will enter 1FR-S.1 and manually trip the reactor.
- The crew will perform 1FR-S.1 and locally trip the Reactor.

Event 6: 11 TDAFW Pump Fails to Automatically Start

- 11 TDAFW Pump will not auto start during the ATWS event.
- The crew will manually start the 11 TDAFW Pump per 1FR-S.1.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: • IC-10 • Mode: 1 • Exposure: MOC • Power: 100% • Boron: (CB): 669 ppm • Temperature: ~560°F • Pressure: ~2235 psig • Xenon: Equlibrium • Rods: "D" @ 218 • Generator: 571 MW	(RO/LO /SRO)	

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP a. Set up the simulator to IC-10. b. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary." c. Complete the "Simulator Setup Checklist."		
	2. Simulator Pre-brief: a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. 1) Inform the crew a power reduction to 90% is necessary to remove 12 Heater Drain Pump from service for brush inspection. 2) Provide the crew a marked up copy of 1C1.4 section step 5.2 a) N/A steps 5.2.1 b) Sign off step 5.2.2 (these notifications are not necessary) 3) Provide the crew a reactivity plan developed by the off going RO for the power reduction from 100% to 90%. 4) Inform the crew to verify the reactivity plan developed by the off going reactor operator. 5) Inform the crew that Nuclear Engineering was **not** available to provide a reactivity prediction. 6) Have SRO candidate perform the pre-job brief for the power reduction.		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 1	3. When the crew has assumed the duty they will proceed with a power reduction to 90% in accordance with 1C1.4, Unit 1 Power Operation.	CREW LEAD RO	Crew should start the power reduction to 90% IAW 1C1.4, Unit 1 Power Operation, at section 5.2, step 5.2.6. • Notify Duty Chemist of the load decrease • Turn ON all pressurizer heaters • Increase letdown flow if desired (80 gpm letdown flow will already be established, no actions will be needed) • If desired, THEN transfer Heating System to Unit 2 or to heating boiler (No actions will be needed since power reduction is only to 90%) • If desired, THEN place CS-46280, ROD BANK SELECTOR, in MANUAL". Refer to precaution 3.7 • Start the load decrease as follows: a. Using the "On Line Control" screen, select the desired Control Mode (VPC,FSP or LOAD). b. Using the "On Line Control" screen, select the desired rate. c. Set the desired Target setting using the "Target" increase/decrease controls using the "On Line Control" screen. d. Initiate a negative reactivity addition by using control rods or boration of the RCS per C12.5 e. WHEN Tave shows a decrease, THEN select "Go" on the "On Line Control" screen to initiate the load decrease.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	4. The crew should stop the load decrease at 90% IAW 1C1.4, Unit 1 power Operation".	RO	f. Vary the boration rate or batch borate as necessary to maintain Tave and Tref within the desired +/- 1.5°F band. g. To suspend the load decrease, perform the following: i. Select "Hold" on the "On Line Control" screen. ii. Stop the boration per C12.5, if necessary iii. If reduced power steady state operation is anticipated, THEN, change ERCS TPM Power Source from NIS to calorimetric (LEFM preferred source) when steady state conditions are attained. iv. Place CS-46300, MAKE-UP MODE SELECTOR, in "AUTO". v. Momentarily turn CS-46457, BORIC ACID MAKE-UP CONTROL, to "START". vi. Verify CS-46280, ROD BANK SELECTOR, is returned to "AUTO".
	5. When power is less than 95% the Lead operator should remove 12 Heater Drain Pump from service per 1C28.4. a. The crew may choose to start a additional condensate pump.	LEAD	**1C28.4, UNIT 1 HEATER DRAINS** • Step 5.7, Single Heater Drain Pump Operation with Reactor Power Greater Than 50% **a.** Verify reactor power is less than or equal to 95%.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	b. When requested to open the discharge vent on 12 HD Pump wait 2 minutes and report valve is open. This action is not modeled on the simulator.	LEAD	**b.** Place all three HTR DRN Pump selector switches to "MANUAL". **c.** IF Auto Speed Control if available, Then verify HTR DRN Pump Speed Selector switch for HDT Pump to be left running is in "AUTO". **d.** Verify the HDT DRN Pump Speed Selector switch for the pump to be stopped is in "MANUAL". **e.** Gradually lower the speed of the HDP to be removed from service to minimum while verifying the speed of the HDP to remain in service is increasing. **f.** Throttle open 15 FW heater drains to the condenser approximately equal amounts to maintain 15 FW HTR levels normal with HDT level stable or increasing. **g.** Stop the Heater Drain Pump to be removed form service. **h.** Open the discharge vent on the HTR DRN pump that was stopped. i. If necessary, Then start the standby condensate pump.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 2	6. When the crew has removed 12 Heater Drain Pump from service, reduced power to 90% and/or at the discretion of the Lead Evaluator, enter the de-energization of Bus 16 ***(Relative Order 1, Event Trigger 1)***	RO	**As plant stabilization action SS may direct the RO to removing a letdown orifice from service IAW 1C12.1 since only one charging pump is running.** • Respond to loss of 11 charging pump using C12.1 AOP 1 or by increasing the speed of 12 charging pump in manual • Respond to loss of Bus 16 per C47024-0204 and 1C20.5 AOP 2 • Record alarms and bus targets • Determine cause of de-energization (local operator error) • Isolate and repair the problem, no repairs are needed • Place Bus 16 sequencer in MANUAL • Determine desired voltage source for bus 16 (CT-11 is preferred) • Place source breakers in MANUAL • Place loads in pullout • Re-energize bus • Restore loads • SS should enter T.S. 3.8.9 Condition A and T.S. 3.8.4 Condition A for Bus 16 inoperable(de-energized).
	7. After the bus 16 is deenergized, verify override DI-46924T auto DELETES*(Relative Order 1)* This restores light indication on the CT11 supply breaker.	Lead	
	8. The following indications will be observed: a. Bus 16 will be de-energized b. All bus 16 source breakers indicate open c. D2 EDG will auto start d. 11 Charging pump trips, seal injection and charging flows decrease e. Multiple annunciators associated with loss of Bus 16, including: 1) 47024-0204 BUS 16 4.16 KV UNDERVOLTAGE 2) 47024-0205 BUS 122 480V UNDERVOLTAGE 3) 47024-0206 BUS 121 480V UNDERVOLTAGE 4) 47024-0704 BUS 16 SEQUENCER CHANNEL ALERT 5) 47024-0904 BUS 16 SEQUENCER FAILURE	SS	

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	6) 47024-1206 D2 EMERGENCY GENERATOR LOCAL ALARM 7) 47024-1003 BUS 16 SEQUENCER NOT IN SERVICE when sequencer placed in MANUAL 9. Perform the following actions as directed to simulate actions of personnel outside the Control Room: **a. 1 minutes after the bus de-energizes, call the control room as the Turbine Building operator and inform them that you inadvertently tripped breaker 16-8 while performing OJT** b. When asked to check bus 16 breakers and targets, report UV relays are the only targets showing and that all bus breakers are open c. If asked as the system engineer for a recommendation regarding re-energizing the bus, recommend re-energizing the bus from CT-11 d. If directed to investigate D2 Local alarm, acknowledge the alarm ***(Relative Order 2, Event Trigger 2)*** and report the alarm is due to failure of the constant lube oil alarm **NOTE :** **When the crew responds to 47024-0904 BUS 16 SEQUENCER FAILURE and goes to 1C20.7 AOP3, BUS 16 LOAD SEQUENCER OUT OF SERVICE have Unit 2 take over required actions. Completing these actions is not part of this scenario.**	SS	After Bus 16 power is restored the crew will respond to 47024-0904 BUS 16 SEQUENCER FAILURE and go to 1C20.7 AOP3, BUS 16 LOAD SEQUENCER OUT OF SERVICE

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	10. When the crew has restored power to Bus 16 or at the discretion of the Lead Evaluator, then enter the Steam Generator Pressure Transmitter PT-478 (blue) high failure. ***(Relative Order 3, Event Trigger 3).***	LEAD	**Note: As a plant stabilization action the crew may close the "B" Steam Generator PORV prior to ARP entry.**
	a. If directed as I&C to trip bistables, report that 2 I&C technicians will be available in ≈45 minutes. **(Note: bistables will not be tripped during this scenario.)**	LEAD	**C47011-0405. FW CONTROL SYSTEM TROUBLE** • Verify Steam Generator Level Control operating properly in automatic. • Control level in manual for any Steam Generator which has shifted to manual. • Refer to 1C51 Instrument Failure Guide.
	b. If contacted as Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC Resident Inspector, Duty Station Manager, etc., as asked.	LEAD	**1C51.3 12 STEAM GENERATOR PRESSURE 1P-478 HIGH** • Take manual control of 12 SG PORV and ensure valve is closed. • Verify SG Level Control operating properly in automatic.
	c. If contacted as the FIN team supervisor, inform the crew that you will write a work order and assign an I&C supervisor to investigate. d. If contacted as computer group, acknowledge the information and agree to investigate if further actions are warranted. e. If desired, allow the crew to hold a crew brief. **f. Ensure rods are in auto prior to moving to next event.** g. **Ensure charging is in auto prior to the next step.**	SS	• Refer to T.S. LCO 3.3.2 Condition A and Table 3.3.2-1 Function 1e. (6 hours to trip B/S) • Trip and concurrently verify the following bistables… • If the Thermal Power Monitor is selected to Calorimetric input, then perform the following: o Check if TPM power is affected by the steam pressure channel failure. o If TPM power is affected, then change TPM "power source" input from "Calorimetric" to "NIS" and notify the computer group.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES

EVENT 4	11. When the crew has completed actions for the Steam Generator Pressure transmitter failure or at the discretion of the Lead Evaluator, enter the malfunction to cause the Blue channel of Thot to fail high ***(Relative Order 4, Event Trigger 4)***.
	a. If contacted as I&C to trip bistables, acknowledge the request and inform the Control Room that you will have two technicians available in 45 minutes. **(Note: bistables will not be tripped during this scenario.)**
	b. If contacted as Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked.
	c. If contacted as the FIN Team Supervisor, inform the crew that you will write a work order and assign an Electrical Supervisor to investigate.
		RO
		
		LEAD
		
		LEAD/ RO
			Note: As a plant stabilization action, the crew should diagnose the failure and place Rod Control in manual.
			C47012-0104, REACTOR COOLANT SYSTEM LO-LO TAVG
			• Check RCS Tavg.
			• If due to an instrument malfunction, then:
			• Place rod control in MANUAL and adjust rod position as necessary.
			• Shift charging pump control to MANUAL and adjust speed as necessary.
			• Verify steam dumps are not armed. If armed and open, then:
			• Place steam dump controller in MANUAL.
			• If necessary, then close steam dumps using manual controller.
			• Refer to 1C51.
			1C51.3 (Tavg Loop 1B 1T-403 - High)
			• Place rod control in MANUAL and maintain Tavg at Tref.
			• Place charging pump speed control in MANUAL and maintain pressurizer level.
			• If necessary, then take manual control of steam dump.
			• Select Blue channel on the Tavg defeat switch and pull out.
			• Return the following to AUTO:
			  • Rod control
			  • Charging pump speed control
			  • Steam dump control.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		SS	• Refer to Technical Specifications. • TS LCO 3.3.1 Condition A and Table 3.3.1-1 Functions 6,7 • TS LCO 3.3.2 Condition A and Table 3.3.2-1 Function 4d • TRM LCO 3.3.3 Condition A

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 5	12. When the crew has completed actions for the Tave high failure or at the discretion of the Lead Evaluator, enter the malfunction to cause the Turbine to Trip and the Failure of the reactor to trip/ATWS ***(Relative Order 5, Event Trigger 5.***	CREW	**1E-0, REACTOR TRIP OR SAFETY INJECTION** • Verify Reactor Trip • Manually trip the reactor. • If power is greater than 5%, then go to 1FR-S.1
	a. Upon hearing the announcement of Reactor Trip, or when called as the Turbine Building Operator to isolate the Unit 1 MSRs per Attachment J, enter CAEP – Att E-0 to start the isolation ***(Relative Order 5a)***. When the isolation is complete, inform the crew that MSR's are isolated.	CREW	**1FR-S.1, RESPONSE TO NUCLEAR GENERATION/ATWS** • Verify Reactor Trip.
	b. When called as the Turbine Building Operator to open the reactor trip breakers, **verify RO is driving in rods, wait 1 minute,** and delete the malfunctions to prevent opening the Reactor Trip Breakers ***(Relative Order 6)***	LEAD/ RO	***Critical Task: Insert negative reactivity into the core by inserting rods or establishing emergency boration flow to the RCS during the performance of FR-S.1.*** • Verify automatic control rod insertion OR manually insert Control Rods. • Verify Turbine Trip.
	13. 11 TDAFW pump fails to auto start	LEAD	***Critical Task: Establish and maintain 200 gpm AFW flow to the Steam Generator(s) before transition out of E-0, unless the transition is to FR-H.1, in which case the task must be initiated before RCPs are manually tripped in accordance with step 2 of FR-H.1.*** • Check AFW Pumps running. (Lead will need to manually start the TDAFW pump) • Manually start AFW pumps if required.
		LEAD	**(Lead will need to manually start the 11 TDAFW pump, 12 MDAFW pump is OOS)** • Initiate normal boration of RCS at 12 to 15 gpm • Check if a Reactor Trip and a Turbine Trip have occurred. • Dispatch operator to locally open Reactor Trip Breakers OR locally open Rod Drive MG Set Motor and Generator Breakers. • Check if Reactor is subcritical. • Power Range Channels (NFM less than 5%.)

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CREW	• Intermediate Range Channels (NFM) – NEGATIVE STARTUP RATE. • Go to step 15. • Return to procedure and step in effect, 1E-0.
	14. When the crew has returned to 1E-0, or at the discretion of the lead evaluator, then place the simulator in FREEZE and inform the crew that training has the duty.		
	15. Emergency Plan Classification • **Site Area Emergency** - EAL **SS2.1**		

SIMULATOR INPUT SUMMARY							
Relative Order	**System Or Panel Drawing**	**Type**	**Code**	**Severity Or Value**	**Event Trigger**	**Timing**	**Description**
0		MALF	RP07A				"A" Rx Trip Breaker mech failure
0		MALF	RP07B				"B" Rx Trip Breaker mech failure
0		OVRD DI	DI-46447B Block	True			AMSAC Switch to Block
0		OVRD DI	DI-46447I Initiate	False			Disable AMSAC Switch
0		ANN MALF	M47014:0606B	DISABLE			Disable AMSAC Annunciator
0		ERCS PT	CP-1Y0501D	RESET			Disable AMSAC in Test
0		ERCS PT	CP-1Y0500D	SET			Disable AMSAC Trouble
0	SIMED04	MALF	ED17B				Bus 16 sequencer failure
0	SIMFW08	MALF	FW34A				11 TDAFWP auto start failure
1	SIMED04	OVRD DI	DI-46924T	TRUE	1	5 second DELETE	Open breaker 16-8, CT-11 to bus 16
2	SIMDG02	REMOTE	DG107	SILENCE	2		Acknowledge D2 local alarm
3		MALF	RX216	1400	3		12 SG LOOP B (CHNL 111 – BLU) P XMTR (1PT-478) FAILS HIGH
4		MALF	RX05C		4		Blue Channel Thot fails high

SIMULATOR INPUT SUMMARY							
Relative Order	**System Or Panel Drawing**	**Type**	**Code**	**Severity Or Value**	**Event Trigger**	**Timing**	**Description**
5		MALF	TC12		5		Turbine Trip
5a			RP07A & B		DELETE		Delete Reactor Trip Bkr Failures
6	SIMMS03A		E0_ATT. J.sch				Perform Attachment J

SIMULATOR SETUP CHECKLIST Standard IC-10

Before Training

__ __ Simulator Status:
- ___ 1. "Training Load"
- ___ 2. Step counters "ON"
- ___ 3. Alarm sound "ON"
- ___ 4. Reset to IC-10
- ___ 5. Speed: "REAL"

__ __ Cycle recorder power "OFF" then back "ON" to clear Yokogawa recorder memory

__ __ Verify Summary matches Simulator Input Summary page in the SEG

__ __ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset

__ __ MOC ΔI sheet displayed on C panel

__ __ Check all ERCS alarms are cleared

__ __ MOC Reactivity Briefing sheet available at Reactor Operator Desk

__ __ Chart recorders operating and forwarded

__ __ Turnover sheet/PRA sheet

__ __ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID)

__ __ Update Control Board Placards:
- ___ 1. High Flux At Shutdown Alarm Setpoint placards: 1400 cps
- ___ 2. Feedwater regulating valve position placard: 66/65, 67/64
- ___ 3. RCS boron on the CVCS panel placard: 669 ppm
- ___ 4. Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions)
- ___ 5. Shift Reactivity Guidance placard: BA: 2.1 gallons, RMU: 67 gallons
  Dilutions @ 10 gal RMU, 1-2 times per shift

__ __ Magnetic placards in place:
- ___ 1. 11 BA TANK "Lined Up For Service"
- ___ 2. 11 BA PUMP "Lined Up To 11 BA Tank"
- ___ 3. CC TO SFP MV-32115 "In Service"
- ___ 4. Blowdown 46470 "SGB To CDSR"

__ __ Protected equipment tags in place:
- ___ 1. 11 TDAFW pump

__ __ Attach Caution Tags to the following control switches:
- ___ 1. Place CS-46439, 12 MD AFWP selector switch in "MANUAL"
- ___ 2. Place CS-46425, 12 MD AFWP control switch in "PULL TO LOCK"
- ___ 3. Place CS-46483, 13 HTR DRN PUMP in "PULL TO LOCK"
- ___ 4. Place CS-46464, 13 HTR DRN PUMP SPEED SELECTOR in "MANUAL"
- ___ 5. Place CS-46103, 13 HTR DRN PUMP SELECTOR in "MANUAL"

__ __ ERCS driven recorders are on-scale (RCS temperature scaled to 555º F to 565º F)

__ __ ERCS alarm screen operating and alarms reset

__ __ All ERCS terminals operating and set as follows:

CONF	VARS	**R02**	Alarm Summary Page
CONE1	Group OP31_U1	**R03**	AFD
CONC	SAS (XS11)	**R04**	TPM
CONG1	Group QP CCDATA	**R05**	QP LOADFOLL
ERCS-R01	Group RADMON_U1	**R06**	Alarm Summary Page

__ __ ERCS single point displays: **CONB** 1T0499A 1U1613A
CONE2 1V4501A 1Q0340A

__ __ ERCS TPM set (Calorimetric - Auto Scaling - LEFM)

__ __ Pens/Paper/Markers available on the simulator

__ __ Board-mounted EAL Table is cleaned

__ __ EAL sticker books in F3-2 are checked for missing stickers

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1. F3-2	___ 2. F3-2.1 Bases	___ 3. F3-2 Copy 275
___ 4. SWI O-28	___ 5. Boration Card	___ 6. 1E-0
___ 7. 1FR-S.1	___ 8. 1C1.4	___ 9. 47024-0204
___ 10. 1C20.5 AOP 2	___ 11. T.S. 3.8.9	___ 12. T.S. 3.8.4
___ 13. C47011-0405	___ 14. 1C51.3	___ 15. T.S. 3.3.1
___ 16. T.S. 3.3.2	___ 17. TRM 3.3.3	___ 18. 1C28.4
___ 19. C47024-0904	___ 20.	___ 21.

__ __ On the NIS panel, verify Scaler Timer power switch is in Off position.

__ __ Set Turbine Control HMI Displays as follows:

___ 1. U1 E-H Turb Cont STA 2 **(48087)** to: **Control Valve Overview**
___ 2. U1 Turb Aux Cont **(48088)** to: **Turb Overview**
___ 3. U1 E-H Turb Cont STA 1 **(48086)** to: **On Line Control**

__ __ DEHC alarms cleared

Post-Scenario Checklist

__ __ EOOS computer is cleared of information added during the scenario

__ __ Computer generated PINGP 577 cleared.

__ __ Procedures to be used during scenario are cleaned of any place keeping marks

___ 1.	F3-2	___ 2.	F3-2.1 Bases	___ 3.	F3-2 Copy 275
___ 4.	SWI O-28	___ 5.	Boration Card	___ 6.	1E-0
___ 7.	1FR-S.1	___ 8.	1C1.4	___ 9.	47024-0204
___ 10.	1C20.5 AOP 2	___ 11.	T.S. 3.8.9	___ 12.	T.S. 3.8.4
___ 13.	C47011-0405	___ 14.	1C51.3	___ 15.	T.S. 3.3.1
___ 16.	T.S. 3.3.2	___ 17.	TRM 3.3.3	___ 18.	1C28.4
___ 19.	C47024-0904	___ 20.		___ 21.	

__ __ Protected equipment tags in place:

___ 1. Remove tag from 11 TDAFW pump

__ __ Remove Caution Tags to the following control switches:

___ 1. Place CS-46439, 12 MD AFWP selector switch in "MANUAL"
___ 2. Place CS-46425, 12 MD AFWP control switch in "PULL TO LOCK"
___ 3. Place CS-46483, 13 HTR DRN PUMP in "PULL TO LOCK"
___ 4. Place CS-46464, 13 HTR DRN PUMP SPEED SELECTOR in "MANUAL"
___ 5. Place CS-46103, 13 HTR DRN PUMP SELECTOR in "MANUAL"

__ __ Board-mounted EAL Table is cleaned

__ __ All books, note pads, and calculators put away

End Of Day Checklist

__ __ Signs/placards removed and put away unless normal simulator configuration

__ __ Floor PCs logged off if simulator will not be used again that day

__ __ Instructor station returned to normal with all books, paper, and etc. put away

__ __ Headsets turned off and put away if simulator will not be used again that day

__ __ Simulator reset to IC-10 unless another IC will be used for further training

__ __ Simulator placed in DORT if simulator will not be used again that day

__ __ Recorder power "OFF" if simulator will not be used again that day

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:

DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 0 ft^2

SYSTEM CONDITION: GREEN

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS
12 MDAFW Pump is OOS for motor oil leak repair, entered T.S. 3.7.5 Condition B at 0400. Expect return to service at 2300 today
PROTECTED EQUIPMENT
11 TDAFW Pump

RAD MONITORS OOS	ANNUNCIATORS OOS
OUTSTANDING SP'S	**FIRE DET / PROT EQP IMPAIRMENTS**

OTHER EQUIPMENT OOS / STATUS
13 Heater Drain Pump is OOS for motor replacement.
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE
OPERATIONAL PLANS FOR COMING SHIFT
Reduce reactor power to 90% to remove 12 Heater Drain pump from service for brush inspection. Dilute 10 gallons 1-2 times per shift for temperature control.
NEW PROCEDURES / INSTRUCTIONS

Reactivity Plan

The crew has been directed to lower reactor power from 100% to 90% to remove 12 Heater Drain Pump from service for brush inspection.

Prior to simulator:

- verify the reactivity plan completed by the off going reactor operator
- complete a Pre-Job Brief

Current conditions are:

Power level: 100%

Xenon: @ equilibrium

Control Rod Position: Bank D @ 218 steps

Boron Concentration: 669 ppm

Core Exposure: 10,000 MWD/MTU

Target: Power Level: 90%

Rate: 1% /minute

Control Mode: First Stage Pressure (FSP) with Rods in MANUAL

Boration/Dilution: Batch additions of boric acid

Reactivity Prediction:

Change in Power Defect: 142 pcm

Differential Boron Worth: -7.8 pcm/ppm

Calculated RCS PPM change: 18.2 ppm

Assumed half rods and half boric acid addition

Calculated Boric Acid / Reactor Makeup Water addition: 9 ppm change = 15 gals boric acid

Calculated final Control Rod Position : Bank D @ 203 steps

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 x	No
2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations.	Yes x	No
3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	Yes x	No
4. Plant PRA initiating events, important equipment, and important tasks are identified.	Yes x	No
5. Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	Yes x	No
6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	Yes x	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 x	No
8. The scenario includes related industry experience. SOER, SER and similar OE recommendations are clearly identified and fully addressed.*	Yes	No x
9. The scenario guide incorporates verification of Operator Fundamental application.*	Yes	No x
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 x
11. For evaluations, it has been verified that without operator action the critical tasks will be failed.	Yes x	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 x	No
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	Yes x	No
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	Yes x	No
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	Yes x	No
5.	During the simulator scenario, observed changes corresponded to expected plant response.	Yes x	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 x	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 x	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.