

Facility: PRAIRIE ISLAND

Scenario No.: 1

Op-Test No.: PI-ILT-NRC-14

Examiners: _____

_____Operators: _____

Initial Conditions:

Reactor Power at 1×10^{-8} amps, Boron Concentration at 1369 ppm, RCS temperature at 547°F, RCS pressure at 2235 psig, Xenon at equilibrium, Bank D rods at 144 steps, Generator Power at 0 MW.

No equipment is out of service.

Turnover:

Raise reactor power to the point of adding heat.

Event No.	Malf. No.	Event Type*	Event Description
1		R (ATC) N (SRO)	RAISE POWER TO THE POAH
2		I (ATC, SRO) TS (SRO)	PRZR PRESSURE CHANNEL FAILS LOW (CONTROLLING CHANNEL)
3		C (ATC, SRO) TS (SRO)	22 GPM RCS LEAK INTO CONTAINMENT
4		M (ALL)	SMALL BREAK LOCA
5		C (BOP, SRO)	11 & 12 SI PUMPS FAIL TO AUTO START
6		C (BOP, SRO)	11 & 12 CC PUMPS FAIL TO AUTO START
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: PRAIRIE ISLAND

Scenario No.: 2

Op-Test No.: PI-ILT-NRC-14

Examiners: _____

_____Operators: _____

Initial Conditions:

Reactor Power at 100%, Boron Concentration at 1299 ppm, RCS temperature at 560°F, RCS pressure at 2235 psig, Xenon at equilibrium, Bank D rods at 218 steps, Generator Power at 581 MW.

12 RHR Pump is out of service. T.S. LCO 3.5.2 Condition A was entered with 48 hours remaining. D1, 11 TD AFW Pump, 11 RHR Pump, 11 SI Pump, 11 CC Pump, and 12 CLW Pump are PROTECTED. BKR 16-10 is out of service.

Turnover:

Place a 2nd Letdown Orifice in service in preparation of SP 1047, Control Rod Quarterly Exercise.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	PLACE 2 ND LETDOWN ORIFICE IN SERVICE
2		TS (SRO)	CONTAINMENT PRESSURE CHANNEL FAILS HIGH
3		I (ATC, SRO) TS (SRO)	PRESSURIZER LEVEL FAILS HIGH
4		C (BOP, SRO)	TURBINE MALFUNCTION (10 MW LOAD CYCLING)
5		R (ATC) N (SRO)	RAPID DOWNPOWER (100% TO 95%)
6		M (ALL)	LARGE BREAK LOCA
7		C (BOP, SRO)	MAIN TURBINE FAILS TO AUTO TRIP
8		C (ATC, SRO)	BOTH SAFEGUARD TRAINS FAIL TO AUTO ACTUATE
9		C (BOP, SRO)	11 & 12 AFW PUMPS FAIL TO AUTO START
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: PRAIRIE ISLAND

Scenario No.: 3

Op-Test No.: PI-ILT-NRC-14

Examiners: _____

_____Operators: _____

Initial Conditions:

Reactor Power at 50%, Boron Concentration at 1482 ppm, RCS temperature at 556°F, RCS pressure at 2235 psig, Xenon at equilibrium, Bank D rods at 181 steps, Generator Power at 272 MW.

PT-485, Turbine First Stage Pressure, is failed HIGH. Rod Control is in MANUAL. T.S. LCO 3.3.1 Condition A and R entered. P7 was verified to be in required state for existing unit conditions. TRM 3.3.4 Condition A was entered. A Work Request was initiated to repair PT-485. 123 Air Compressor is out of service. 13 Charging Pump Suction Stabilizer PM is complete are ready to be re-started.

Turnover:

Restore RCS Average Coolant Temperature to program temperature.

Swap charging pumps to 11 and 13 running and 12 is secured per 1C12.1.

Event No.	Malf. No.	Event Type*	Event Description
1		R (ATC) N (SRO)	RESTORE TAVE TO TREF
2		N (BOP)	SWAP CHARGING PUMPS
3		TS (SRO)	11 SI PUMP PLACED IN LOCAL
4		I (BOP, SRO) TS (SRO)	N43 PR NUCLEAR INSTRUMENT FAILS HIGH
5		C (ATC, SRO)	PRESSURIZER SPRAY VALVE DRIFTS OPEN
6		C (ATC, SRO)	LOOP A RCS LOSS OF FLOW & REACTOR FAILS TO AUTOMATICALLY TRIP
7		M (ALL)	FAULT IN 12 SG
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: PRAIRIE ISLAND

Scenario No.: 4

Op-Test No.: PI-ILT-NRC-14

Examiners: _____

_____Operators: _____

Initial Conditions:

Reactor Power at 50%, Boron Concentration at 1480 ppm, RCS temperature at 553°F, RCS pressure at 2235 psig, Xenon at equilibrium, Bank D rods at 175 steps, Generator Power at 265 MW.

13 Charging Pump is out of service. Two 40 GPM letdown orifices are in service. Pressurizer heaters are on. 11 and 12 Condensate Pumps are running. 11 and 12 Main Feed Pumps are running. 11 MFP recirculation valve is still open. 11 and 12 HDT Pumps are running.

Turnover:

Alternate CFCUs and discharge dampers such that 11 and 13 CFCUs are running in slow to the dome and 12 and 14 CFCUs are running in fast to support/gap.

When directed by the Shift Manager, perform a load increase from 50% to 60%.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	ALTERNATE CONTAINMENT FAN COIL UNITS AND DISCHARGE DAMPERS
2		I (BOP, SRO) TS (SRO)	11 SG PRESS CHANNEL FAILS HIGH CAUSING 11 SG PORV TO OPEN
3		R (ATC) N (SRO)	UNIT 1 LOAD INCREASE FROM 50% TO 60%
4		C (ATC, SRO)	DROPPED ROD (B-8) AND REACTOR FAILS TO AUTOMATICALLY TRIP
5		C (BOP, SRO)	TURBINE FAILS TO AUTOMATICALLY TRIP
6		M (ALL)	LOSS OF ALL AC (OCCURS 10 SECS AFTER TURB TRIP)
7		C (ATC, SRO)	11 TD AFW PUMP FAILS TO AUTO START
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: PRAIRIE ISLAND

Scenario No.: 5a

Op-Test No.: PI-ILT-NRC-14

Examiners: _____

_____Operators: _____

Initial Conditions:

Reactor Power at 100%, Boron Concentration at 853 ppm, RCS temperature at 560°F, RCS pressure at 2235 psig, Xenon at equilibrium, Bank D rods at 218 steps, Generator Power at 581 MW.

11 SI Pump is out of service. T.S. LCO 3.5.2 Condition A was entered with 48 hours remaining. D2, 12 MD AFW Pump, 12 RHR Pump, 12 SI Pump, 12 CC Pump, and 22 CLW Pump are PROTECTED. PT-485, Turbine First Stage Pressure, is failed LOW. Rod Control is in MANUAL. T.S. LCO 3.3.1 Condition A and R entered. P7 was verified to be in required state for existing unit conditions. TRM 3.3.4 Condition A was entered. A Work Request was initiated to repair PT-485. B/S 1PC-485A is tripped. Bus 15 and 16 are powered from CT11. A dedicated operator is monitoring phase currents at the G-Panel.

Turnover:

Transfer power on Bus 15 to 1RY after turnover is complete.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	TRANSFER POWER ON BUS 15 FROM CT11 TO 1RY
2		I (ATC, SRO) TS (SRO)	ROD E-3 POSITION INDICATION FAILS LOW
3		I (ATC, SRO) TS (SRO)	RCS THOT CHANNEL FAILS HIGH
4		C (BOP, SRO)	LOSS OF BUS DUCT COOLING
5		R (ATC) N (SRO)	RAPID DOWNPOWER (100% to 50%)
6		M (ALL)	12 SG TUBE RUPTURE
7		C (BOP, SRO)	SI TO CHILLED WATER SIGNAL FAILURE
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: PRAIRIE ISLAND

Scenario No.: 5b

Op-Test No.: PI-ILT-NRC-14

Examiners: _____

_____Operators: _____

Initial Conditions:

Reactor Power at 100%, Boron Concentration at 853 ppm, RCS temperature at 560°F, RCS pressure at 2235 psig, Xenon at equilibrium, Bank D rods at 218 steps, Generator Power at 581 MW.

11 SI Pump is out of service. T.S. LCO 3.5.2 Condition A was entered with 48 hours remaining. D2, 12 MD AFW Pump, 12 RHR Pump, 12 SI Pump, 12 CC Pump, and 22 CLW Pump are PROTECTED. PT-485, Turbine First Stage Pressure, is failed LOW. Rod Control is in MANUAL. T.S. LCO 3.3.1 Condition A and R entered. P7 was verified to be in required state for existing unit conditions. TRM 3.3.4 Condition A was entered. A Work Request was initiated to repair PT-485. B/S 1PC-485A is tripped. Bus 15 and 16 are powered from CT11. A dedicated operator is monitoring phase currents at the G-Panel.

Turnover:

Transfer power on Bus 15 to 1RY after turnover is complete.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	TRANSFER POWER ON BUS 15 FROM CT11 TO 1RY
2		TS (SRO)	ROD E-3 POSITION INDICATION FAILS LOW
3		I (ATC, SRO) TS (SRO)	RCS THOT CHANNEL FAILS HIGH
4		C (BOP, SRO)	LOSS OF BUS DUCT COOLING
5		R (ATC) N (SRO)	RAPID DOWNPOWER (100% to 50%)
6		M (ALL)	12 SG TUBE RUPTURE
7		C (BOP, SRO)	SI TO CHILLED WATER SIGNAL FAILURE
8		C (ATC, SRO)	FAILURE OF THE STEAM DUMP SYSTEM
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: PRAIRIE ISLAND**SEG # PI-ILT-NRC-1401S****SEG TITLE: 2014 ILT NRC SIMULATOR EVALUATION #1****REV. # 0****PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****TOTAL TIME: 2.0 HOURS**

Developed by:	Shawn Sarrasin <i>Instructor</i>	2/9/2014 <i>Date</i>
Reviewed by:	Fredrick Collins <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	2/28/2014 <i>Date</i>
Validated by:	Shawn Sarrasin <i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	4/21/2014 <i>Date</i>
Approved by:	Travis Ouret <i>Training Supervision</i>	7/18/2014 <i>Date</i>

Guide Requirements

Goal of Training:

1. 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.
 2. 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.
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Learning Objectives:

1. Raise power to the Point of Adding Heat per 1C1.2.
 2. Diagnose and perform corrective actions for a Pressurizer Pressure Instrument failing low per 1C51.3.
 3. Diagnose and respond to a RCS Leak per 1C4 AOP1.
 4. Diagnose and respond to a Small Break LOCA per 1E-0 and 1E-1.
 5. Diagnose and respond to a failure of the SI Pumps to automatically start per 1E-0 Attachment L.
 6. Diagnose and respond to a failure of the CC Pumps to automatically start per 1E-0 Attachment L.
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Training Resources:

1. Full Scope Simulator
 2. NRC Evaluation Team
 3. Booth Operator (Backup Communicator)
 4. Primary Communicator
-

Related PRA Information:
Initiating Event with Core Damage Frequency:

LOCA (5.1%)

Important Components:

11 SI PMP
 12 SI PMP
 11 CC PMP
 12 CC PMP

Important Operator Actions with Task Number:

NONE

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. 1P-431, Blue Channel Pressurizer Pressure Transmitter, fails low.
2. Unidentified RCS Leak at ~21 gpm.

After EOP Entry:

1. 11 and 12 SI Pumps fail to start automatically.
2. 11 and 12 CC Pumps fail to start automatically.

Abnormal Events:

1. Pressurizer Pressure Instrument Failure.
2. RCS Leak.

Major Transients:

1. Small Break LOCA from the A Loop RTD Bypass Cold Leg Manifold.

Critical Tasks:

1. E-0 – H: Manually start at least one Safety Injection pump before transition out of E-0.
2. E-0 – K: Manually start at least one CCW pump before transition out of E-0.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

- Exposure: MOC
- Power: 1×10^{-8} amps
- Boron (CB): 1369 ppm
- Temperature: 549°F
- Pressure: 2235 psig
- Xenon: Equilibrium
- Rods: "D" @ 148
- Generator: 0 MW

EQUIPMENT OOS

- NONE

SEQUENCE OF EVENTS:

Event 1: Raise Reactor Power to the Point of Adding Heat

- Reactor power is at 1×10^{-8} amps.
- Rods will be stepped out to establish a positive startup rate.
- Power will rise to between 0.5% and 2%.
- Rods will be stepped in to level power out.

Event 2: Blue Channel Pressurizer Pressure Instrument Fails LOW

- 1P-431 pressure instrument will peg low.
- All pressurizer heaters will turn on.
- Pressurizer spray valves will close.
- Pressurizer pressure will slowly rise.
- The crew will take manual control of pressurizer pressure.
- Pressurizer pressure will be returned to program.
- Pressurizer pressure control will be placed in the 2-1 position.
- Pressurizer pressure control will be returned to automatic.
- The SS will enter T.S. LCO 3.3.1 Conditions A, E, and K.
- The SS will enter T.S. LCO 3.3.2 Conditions A and D.

Event 3: RCS Leak

- An unidentified approximate 21 gpm leak will develop on the RCS.
- The leak will be un-isolable.
- Pressurizer level and pressure will slowly lower.
- The crew will enter 1C4 AOP1.
- The Letdown and Charging Line will be isolated.
- The Regenerative Heat Exchanger will be isolated.
- RCP Seal Injection will be isolated and then restored.
- The SS will enter T.S. LCO 3.4.14 Condition A.

Events 4, 5, & 6: Small Break Loss of Coolant Accident

- RCS pressure will rapidly lower.
- Pressurizer level will rapidly lower.
- The crew will enter 1E-0.
- The crew will manually:
 - Trip the reactor and actuate SI.
 - Start SI pump(s) and CC pump(s).
- The crew will transition to 1E-1.

Simulator Setup:

NOTE: The time between simulator reset and placing simulator in RUN should be minimized to reduce the difference between the ERCS time and actual time.

CAUTION: A reactivity and temperature transient will occur if 1HC-484, MAIN STM HDR PRESS (STM DUMP), is NOT set to 72% when the simulator is taken to RUN.

1. If IC-261 is available, then perform the following:
 - a. Reset to IC-261.
 - b. Verify 1HC-484, MAIN STM HDR PRESS (STM DUMP), set point is set to 72%.
 - c. Place the simulator in RUN.
 - d. Verify RCS Tavg stabilized at 549°F.
2. If IC-261 is NOT available:
 - a. Reset to IC-18.
 - b. Verify 1HC-484, MAIN STM HDR PRESS (STM DUMP), set point is set to 72%.
 - c. Place the simulator in RUN.
 - d. Verify RCS Tavg stabilized at 549°F.
 - e. Verify RCP Seal Injection at 8 gpm and charging flow balanced with letdown.
 - f. Adjust rods as necessary to establish reactor power at 1×10^{-8} amps and stable.
 - g. Insert Remote SG100 to CW.
 - h. Take to the following to PULLOUT
 - i. CS-46362, 4.16KV BUS 11 1M XFMR (BKR 11-4)
 - ii. CS-46363, 4.16KV BUS 12 1M XFMR (BKR 12-4)
 - iii. CS-46364, 4.16KV BUS 13 1M XFMR (BKR 13-9)
 - iv. CS-46365, 4.16KV BUS 14 1M XFMR (BKR 13-9)
3. Verify the ROD DEVIATION alarm is CLEARED as follows:
 - a. Log into the ERCS terminal with user "OVRD" and password "DUTY" (if needed).
 - b. Go to ERCS Screen RBU (Rod Bank Update).
 - c. Enter 148 as the new value for point 1U0052A, ROD POS BNK D.
 - d. Select "Apply".
 - e. Verify Annunciator 47013-0507, COMPUTER ALARM / ROD DEVIATION / SEQUENCING, has cleared.
4. Verify the Pen Recorder for RCS Tavg and Tref are set correctly as follows:
 - a. Log into the ERCS terminal with user "OVRD" and password "DUTY" (if needed).
 - b. Go to ERCS Screen PEN_TREND (Pen Trend Configuration).
 - c. Enter 545 as the new Min EU value for Pen 1U9001A (point 1T0499A).
 - d. Enter 555 as the new Max EU value for Pen 1U9001A (point 1T0499A).
 - e. Enter 545 as the new Min EU value for Pen 1U9002A (point 1T0496A).
 - f. Enter 555 as the new Max EU value for Pen 1U9002A (point 1T0496A).
5. If available, run schedule file **PI-ILT-NRC-1401S.sch** as follows:
 - a. Select open file in the Schedule application.
 - b. Locate schedule file.
 - c. Open schedule file by double clicking it.
 - d. Run the schedule file by pressing the "Stopped" button on the toolbar.
 - e. Verify the schedule file is running.
6. If schedule file is NOT available, then insert malfunctions, remotes, and overrides, as specified by the Simulator Input Summary.
7. If desired, start Scenario Based Testing Data Collection Program.
8. Complete the "Simulator Setup Checklist."

PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>1. SIMULATOR PRE-BRIEF:</p> <ul style="list-style-type: none"> a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. b. Review Unit 1 LPEO / PEO Turnover Log. c. Perform a pre-job brief for the following activity: <ul style="list-style-type: none"> 1) Raise power to the Point of Adding Heat per steps 5.10.20 – 5.10.23 of 1C1.2. <ul style="list-style-type: none"> (a) Provide Page 71 of 1C1.2 marked up to step 5.10.19. (b) This activity is to be performed after shift turnover is complete. (c) Section 5.6 of 1C1.2 is complete. <p>2. COMPLETE TURNOVER:</p> <ul style="list-style-type: none"> a. Crew performs a walk down of the control boards. b. Review PRA Printout. c. Crew takes the duty. 		
EVENT 1	<p>3. After the crew has assumed the duty, they will raise power to the Point of Adding Heat.</p>	RO/SS	<p>1C1.2, UNIT 1 STARTUP PROCEDURE</p> <ul style="list-style-type: none"> • Raise reactor power to the point of adding heat using manual rod control or boron concentration change. • When one or more intermediate range indicates greater than 1×10^{-9} amps, then verify ERCS is in Mode 2, STARTUP. • Maintain reactor power between 0.5 and 2.0%.

Retention: Life of Plant

Retain in: Training Program File

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

Retention: Life of Plant
Retain in: Training Program File
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PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	<p>6. After Pressurizer Pressure control is back in automatic, or at the discretion of the Lead Evaluator, enter Trigger 3, Reactor Coolant Leak at ~ 21 gpm.</p> <p>a. If contacted as the Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked.</p> <p>b. If contacted as a Maintenance or Engineering or Radiation Protection Department Supervisor, inform the crew that you will coordinate making a containment entry per F2 to locate the leak.</p> <p>7. Plant Response:</p> <p>a. RCS pressure lowers.</p> <p>b. Pressurizer Level lowers.</p> <p>c. Charging pump speed rises.</p> <p>d. R11 and R12 counts rise.</p> <p>e. RCS Leak rate rises.</p> <p>f. Containment humidity rises.</p> <p><u>EMERGENCY PLAN CLASSIFICATION</u> <i>UNUSUAL EVENT – SU5.1 due to unidentified RCS leakage greater than 10 gpm.</i></p>	<p>RO</p> <p>RO</p> <p>SS</p>	<p>1C4 AOP1, REACTOR COOLANT LEAK</p> <ul style="list-style-type: none"> • If, at any time, RCS inventory can not be maintained by available charging flow, then manually trip the reactor, manually initiate safety injection, and exit this procedure. • Start additional charging pumps as needed to control pressurizer level. • 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 associated tables, if necessary. • If unable to identify the source of the leak using tables 1, 2, 3, or 4, THEN attempt to locate the leak by sequentially isolating service systems from the RCS: <ul style="list-style-type: none"> ○ Remove Letdown from service. ○ Isolate Charging to the RCS. ○ Close CV-31328, 11 REGEN HX CHG LINE TO RCS. ○ Isolate Charging to the RCP Seals. • Comply with T.S. 3.4.14. Condition A to reduce leakage to within limits within 4 hours. • Notify the Operations Manager and Resident Inspector of entry into this AOP per SWI O-28.

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4, 5, & 6	8. At the discretion of the Lead Evaluator, enter: Trigger 4, Small Break LOCA. 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, then open and run schedule file E-0_Att-J.sch located in X:\Trex_PI\Lightning\Schedule\EOPs. When the isolation is complete, inform the crew the MSR's are isolated. b. Upon hearing the announcement of Safety Injection, or when called as the Turbine Building Operator to secure the Turbine Building Roof Exhausters, wait 2 minutes and report the Turbine Building Roof Exhausters are all secured. c. If Control Room personnel ask if Unit 2 personnel are available to perform Attachment L, then inform the Control Room that Unit 2 personnel are NOT available for performing Attachment L. d. If contacted as RP or Duty Chemist to sample for primary-to-secondary leakage, then wait 2 minutes and report cation column frisks indicate activity is reading background on 11 and 12 SGs.	RO/ LEAD	1E-0, REACTOR TRIP OR SAFETY INJECTION <ul style="list-style-type: none"> • Verify or manually trip the reactor. • Verify the Main Turbine is tripped. • Verify both Safeguards buses energized. • Determine SI is required. <ul style="list-style-type: none"> ○ Either SG pressure < 530 psig. ○ PRZR pressure < 1830 psig. ○ Containment pressure > 3.5 psig. • Manually actuate SI. • Perform Attachment L (see pages 12 & 13). • Check AFW Status: <ul style="list-style-type: none"> ○ Verify total AFW flow greater than 200 GPM. ○ Verify AFW pumps discharge pressure greater than 1000 psig. ○ Control feed flow to maintain 11 SG Narrow Range greater than 5% [Wide Range between 50% and 59%]. • Check RCS Temperatures trending to 547°F. • Check PRZR PORVs and Spray valves closed. • Determine RCPs should NOT be stopped. • Determine SGs are NOT faulted. • Determine SG Tubes are NOT ruptured. • Determine RCS is NOT intact due to Containment pressure rising. • Go to 1E-1.
	9. Plant Response: a. RCS pressure lowers. b. Pressurizer Level lowers. c. RCS Leak rate rises. d. Containment Pressure rises. e. A RC Bypass Flow lowers. f. Annunciator C47012-0503, REACTOR COOLANT RTD B-P LOOPS LO FLOW, is received.	SS	

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4, 5, & 6 (cont)	<p style="text-align: center;"><u>EMERGENCY PLAN CLASSIFICATION</u></p> <p><i>ALERT – FA1 due to a loss of the RCS Fission Product Barrier due to RCS leak rate greater than 60 gpm.</i></p> <p>10. If Control Room personnel ask if Unit 2 personnel are available to secure Diesel Generators and/or Safeguards Cooling Water Pumps, then inform the Control Room that Unit 2 personnel WILL secure the Diesel Generators and/or Safeguards Cooling Water Pumps.</p>	RO/SS	<p>1E-1, LOSS OF REACTOR OR SECONDARY COOLANT</p> <ul style="list-style-type: none"> • Determine RCPs should NOT be stopped. • Determine SGs are NOT faulted. • Check intact SG levels. • Control feed flow to maintain narrow range level between 5% and 50% [Wide Range 50% and 59%]. • Check secondary radiation is normal. • Check power to PRZR PORV block valves available. • Check PRZR PORVs are closed. • Check at least one PRZR PORV block valve is open. • Reset SI and Containment Isolation. • Establish Instrument Air to Containment. • Check power supply to charging pumps are from offsite power. • Check at least one charging pump is running. • Establish charging flow as necessary. • Determine SI flow should NOT be terminated due to subcooling and RCS pressure. • Stop RHR pumps. • Check RCS and SG pressures • Determine Diesel Generators should be stopped. • Determine Safeguards Cooling Water pumps should be stopped. • Initiate Evaluation of Plant Status.

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4, 5, & 6 (cont)	<p style="text-align: center;"><u>CRITICAL TASKS</u></p> <ul style="list-style-type: none"> • <i>Manually start at least one Safety Injection pump before transition out of E-0.</i> • <i>Manually start at least one CCW pump before transition out of E-0.</i> <p>11. If Control Room personnel ask for status of Unit 2 Cooling Water/Chilled Water lineup, then inform the Control Room that Unit 2 Cooling Water/Chilled Water valves are in there safeguards positions.</p> <p>12. If Control Room personnel ask for status of Battery Room Temperatures, then inform the Control Room that Battery Room temperatures are less than 84 °F.</p> <p>13. If Control Room personnel ask for status of Spent Fuel Cooling, then inform the Control Room that Spent Fueling level and temperature are normal.</p>	LEAD	1E-0 Attachment L: SI Alignment Verification <ul style="list-style-type: none"> • Verify Safeguards Component Alignment: • Verify both trains of SI actuated: <ul style="list-style-type: none"> ○ Both RHR pumps - RUNNING -OR- ○ Both SI pumps – RUNNING ○ Identify both SI pumps are NOT running and start both SI pumps. • "SI NOT READY" lights - NOT LIT • "SI ACTIVE" lights - LIT FOR PLANT CONDITIONS • Identify Both CC pumps are NOT running and start both CC pumps. • "CONTAINMENT ISOLATION" lights - LIT FOR PLANT CONDITIONS • Check Category 1 Vent Zone Boundary: • Close MV-32115, 122 SFP HX INLT HDR MV B • Check Cooling Water Header Pressures - BOTH GREATER THAN 65 PSIG • Verify Plant Announcements Complete: • Check If Main Steamlines Are Isolated: • Determine MSIVs, Bypass Valves, and Containment Instrument Air Valves do NOT need to be closed. • Verify SI Flow • Verify RHR Flow • Verify Containment Spray is actuated (if necessary). • Check RCP Cooling • Verify Local Actions Complete • Verify Generator Breakers – OPEN • Verify All Heater Drain Pumps – STOPPED • Check Turbine Valves: <ul style="list-style-type: none"> ○ Turbine reheat and intercept valves – CLOSED ○ Open turbine drain valves

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4, 5, & 6 (cont)		LEAD	<ul style="list-style-type: none"> • Verify Main Feedwater Alignment: <ul style="list-style-type: none"> ○ Both main feedwater pumps – STOPPED ○ Main and bypass FRVs - CLOSED • Verify All Condensate Pumps - STOPPED: • Place Steam Dump in "STM PRESS" Mode • Verify Unit 1 Cooling Water/Chilled Water Alignment: <ul style="list-style-type: none"> ○ CFCU control switches - "SLOW". ○ CFCU dampers - ALIGNED TO DOME ○ Unit 1 cooling water/chilled water valves closed ○ Unit 1 CRDM shroud cooling supply and return valves – CLOSED ○ CFCU cooling water supply and return valves – OPEN ○ CFCU chilled water supply and return valves – CLOSED • Verify 11 Safeguards Screenhouse Ventilation lineup. • Verify Control Room Ventilation Alignment: <ul style="list-style-type: none"> ○ Chillers and fans – RUNNING ○ Control room chiller suction/discharge tie closed - STATUS LIGHT LIT • Verify Unit 2 Cooling/Chilled Water Alignment • Verify 21 Safeguards Screenhouse Ventilation lineup. • Verify 11 and 12 Battery Charger Operation is normal. • Verify Battery Room temps less than 84°F. • Check status of Spent Fuel Cooling. • Check Status Of Notifications • Notify SS Of Any Discrepancies.
	14. Once the crew has stopped RHR 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.		

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

SIMULATOR INPUT SUMMARY

@Time	Event	Action	Description
00:00:00		Insert malfunction SI05A	SAFETY INJECTION PUMP #11 FAILS TO START AUTOMATICALLY
00:00:00		Insert malfunction SI05B	SAFETY INJECTION PUMP #12 FAILS TO START AUTOMATICALLY
00:00:00		Insert malfunction CC02A	COMPONENT COOLING WATER PUMP #11 FAILS TO START AUTOMATICALLY
00:00:00		Insert malfunction CC02B	COMPONENT COOLING WATER PUMP #12 FAILS TO START AUTOMATICALLY
	2	Insert malfunction RX202 to 1500.00000 on event 2	1 PRZR (CHNL III-BLU) P XMTR (1PT-431)
	3	Insert malfunction RC14 to 5.50000 on event 3	REACTOR COOLANT SYSTEM LEAKS (21 GPM)
	4	Insert malfunction RC11A to 25.00000 in 60 on event 4	SMALL BREAK LOCA - RTD BYPASS LOOP COLD LEG MANIFOLD (A LOOP)

Retention: Life of Plant

Retain in: Training Program File

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

SIMULATOR SETUP CHECKLIST

Before Scenario

- _____ Simulator Status:
- | | |
|---------------------------|---|
| _____ 1. "Training Load" | _____ 2. Step counters "ON" |
| _____ 3. Alarm sound "ON" | _____ 4. Steps 1 – 7 on page 6 complete |
| _____ 5. Speed: "REAL" | _____ 6. IC-261 or IC-18 running |
- _____ Delete the memory on the Yokogawa Model DX1000 recorders by cycling the Recorder Power OFF pushbutton in the simulator instructor's booth.
- _____ Verify Schedule File/Summary matches Simulator Input Summary page in the SEG.
- _____ Verify that control rod step counters on C panel and ERCS RBU matches the IC conditions.
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset.
- _____ MOC ΔI sheet displayed on C panel.
- _____ MOC Reactivity Briefing sheet available at Reactor Operator Desk.
- _____ Turnover sheet/PRA sheet available.
- _____ If it is the first scenario of the day, then perform a shutdown and restart of the floor PCs that are connected to the LAN.
- _____ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID).
- _____ Electronic PINGP 577 forms closed on LAN connected PCs.
- _____ Board-mounted EAL Tables are cleaned.
- _____ EOOS running on PC and updated as follows to reflect equipment OOS:
- _____ 1. NONE
- _____ Update Control Board Placards:
- | |
|---|
| _____ 1. NRC Current Authentication Code call date updated to current date. |
| _____ 2. High Flux At Shutdown Alarm Setpoint placards: 5900 cps. |
| _____ 3. Feedwater regulating valve position placard set to current values. |
| _____ 4. Recommended SG Blowdown flow set to current values. |
| _____ 5. RCS boron on the CVCS panel placard: 1369 ppm. |
| _____ 6. Turbine reference/setter values on the CVCS panel are blank. |
| _____ 7. Shift Reactivity Guidance placard: BA: 4.4 gallons, RMU: 67 gallons. |
- Dilutions @ NONE.
- _____ Magnetic placards in place:
- | |
|--|
| _____ 1. 11 BA TANK "Lined Up For Service" |
| _____ 2. 11 BA PUMP "Lined Up to 11 BA Tank" |
| _____ 3. 12 BA PUMP "Lined Up to 11 BA Tank" |
| _____ 4. CC to SFP MV-32117 "In Service" |
| _____ 5. Blowdown 46470 "SGB To RIVER" |
| _____ 6. HU Flag above 12 RHR HX CC inlet MV-32094 for "1C14 Limitation" |
| _____ 7. "H ₂ IN VCT SPACE" at VCT |
- _____ Pink Status Control Tags in place:

PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

- ___ 1. CS-46540, 22 CC WTR PUMP
- ___ 2. CS-46572, CC TO SFP MV-32117

___ Yellow Caution Tags in place:

- ___ 1. CS-46064, CC TO SFP MV-32115, in CLOSED
- ___ 2. CS-46362, 4.16 KV BUS 11 1M XFMR (BKR 11-4), in PULLOUT
- ___ 3. CS-46363, 4.16 KV BUS 12 1M XFMR (BKR 12-4), in PULLOUT
- ___ 4. CS-46364, 4.16 KV BUS 13 1M XFMR (BKR 13-9), in PULLOUT
- ___ 5. CS-46365, 4.16 KV BUS 14 1M XFMR (BKR 14-9), in PULLOUT

___ ERCS driven recorders are on-scale (RCS temperature scaled 545° F to 555° 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 (XS22)	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	1Q0340A	1V4501A

___ Verify that copy machine and printers are loaded with paper.

___ Pens/Paper/Markers available on the simulator.

___ Verify 121 IA Compressor is in PREFERRED and 122 IA Compressor is in 1st STANDBY, and 123 IA Compressor is in 2nd STANDBY.

___ Verify R11/R12 are lined up correctly (at the R11/R12 local panel):

- ___ 1. Sample pump is running.
- ___ 2. Alarms are reset.
- ___ 3. CS-8006106, Sample Inlet Switch, is selected to CNTMT.
- ___ 4. CS-8006107, Sample Outlet Switch, is selected to Aux Bldg Stack.

___ 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 **Off Line Control**.

___ DEHC alarms cleared.

___ N51 & N52 Display Sheets for current power are in place as necessary.

___ Headsets turned on as necessary.

___ Procedure checklist completed. See following page.

___ Peer Check performed for simulator setup.

PROCEDURE CHECKLIST

The following procedures will be used during this session. Verify the procedures are free of place keeping marks before starting the session and after the session are complete:

[illegible]

PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0**Post-Scenario Checklist**

- _____ LAN connected computers are cleared of information added during the scenario.
- _____ Computer generated PINGP 577 cleared.
- _____ Procedure checklist completed. See previous page.
- _____ Remove Pink Status Control Tags from the following equipment:
 - ___ 1. NONE
- _____ Magnetic placards removed:
 - ___ 1. NONE
- _____ Remove Yellow Caution Tags from the following equipment:
 - ___ 1. CS-46362, 4.16 KV BUS 11 1M XFMR (BKR 11-4)
 - ___ 2. CS-46363, 4.16 KV BUS 12 1M XFMR (BKR 12-4)
 - ___ 3. CS-46364, 4.16 KV BUS 13 1M XFMR (BKR 13-9)
 - ___ 4. CS-46365, 4.16 KV BUS 14 1M XFMR (BKR 14-9)
- _____ Erase marker on RCS temperature ERCS driven recorder.
- _____ 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	
NONE	
PROTECTED EQUIPMENT	
22 CC PUMP 121 SFP HX	
RAD MONITORS OOS	ANNUNCIATORS OOS
NONE	NONE
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
NONE	NONE
OTHER EQUIPMENT OOS / STATUS	
Station Air is supplementing Instrument Air per Section 5.1.3 of C34, Station Air System.	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
NONE	
OPERATIONAL PLANS FOR COMING SHIFT	
<ul style="list-style-type: none"> • Xenon is at equilibrium. • Raise Reactor Power from 1×10^{-8} amps to the POAH. • Stabilize power between 0.5 – 2%. • Section 5.6 of 1C1.2 is complete. 	
NEW PROCEDURES / INSTRUCTIONS	
Review altered scale on Tavg ERCS Recorder.	

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.

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0**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 conditions agreed with the reference plant with respect to reactor status, plant configuration, and system operation. | Yes
X | No |
| 2. The simulator operated in real time during conduct of validation. | Yes
X | No |
| 3. The simulator demonstrated expected plant response to operator input and to normal, transient, and accident conditions. | Yes
X | No |
| 4. The simulator permitted use of the reference plant's procedures. The scenario was completed without procedural exceptions, simulator performance exceptions, or deviation from the scenario sequence. | Yes
X | No |
| 5. The simulator did not "fail to cause" or "unexpectedly cause" any first principle alarm or primary automatic action. | Yes
X | No |
| 6. Observable changes in parameters relevant to the scenario corresponded in trend and direction to reference plant's expected response. | Yes
X | No |
| 7. All malfunctions and other instructor interface items were functional and demonstrated the expected reference plant's response to the initiating cause. | Yes
X | No |
| 8. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes
X | No |
| 9. The scenario satisfies the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence. | Yes
X | No |
| 10. Simulator fidelity has been demonstrated to be adequate for this scenario. | Yes
X | No |

Discrepancies noted (Check "none" or list items found) ☒ None

SMAR = Simulator Action Request

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

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1401S, 2014 ILT NRC SIMULATOR EVALUATION #1, REV. 0

Comments: _____

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

Validation Personnel		
Name	Job Title / Qualification	Validation Position
Shawn Sarrasin	Operations Instructor	Lead Evaluator
Fred Collins	Operations Instructor	Booth Driver
Jeff Human	Operations SRO	Shift Supervisor
Mark Haren	Operations RO	LEAD
Rick Martin	Operations RO	RO

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: PRAIRIE ISLAND**SEG # PI-ILT-NRC-1402S****SEG TITLE: 2014 ILT NRC SIMULATOR EVALUATION #2****REV. # 0****PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****TOTAL TIME: 2.0 HOURS**

Developed by:	Shawn Sarrasin <i>Instructor</i>	2/2/2014 <i>Date</i>
Reviewed by:	Fredrick Collins <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	2/26/2014 <i>Date</i>
Validated by:	Shawn Sarrasin <i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	4/22/2014 <i>Date</i>
Approved by:	Travis Ouret <i>Training Supervision</i>	7/18/2014 <i>Date</i>

Guide Requirements

Goal of Training:

1. 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.
 2. 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. Place a second letdown orifice in service per 1C12.1.
 2. Diagnose and perform corrective actions for a Containment Pressure Instrument failing high per C47018-0105.
 3. Diagnose and perform corrective actions for a Pressurizer Level Instrument failing high per 1C51.3.
 4. Diagnose and respond to a Turbine Malfunction per 1C23 AOP2.
 5. Perform a rapid power reduction per 1C1.4 AOP1.
 6. Diagnose and respond to a Large Break LOCA per 1E-0 and 1E-1.
 7. Diagnose and respond to a failure of the Main Turbine to Automatically Trip.
 8. Diagnose and respond to a failure of the Safeguards System to automatically actuate per 1E-0.
 9. Diagnose and respond to a failure of the AFW Pumps to automatically start per 1E-0 Attachment L.
-

Training Resources:

1. Full Scope Simulator
 2. NRC Evaluation Team
 3. Booth Operator (Backup Communicator)
 4. Primary Communicator
-

Related PRA Information:

Initiating Event with Core Damage Frequency:

LOCA (5.1%)

Important Components:

11 TD AFW PMP

12 MD AFW PMP

Important Operator Actions with Task Number:

NONE

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. 1P-950, Yellow Channel Containment Pressure Instrument, fails high.
2. 1LT-428, Blue Channel Pressurizer Level Transmitter, fails high.
3. Turbine Control System cycling output (10 MW Swing).

After EOP Entry:

1. Main Turbine fails to automatically trip.
2. Failure of safeguards automatic actuation.
3. 11 and 12 AFW Pumps fail to start automatically.

Abnormal Events:

1. Pressurizer Level Instrument Failure.
2. Turbine Malfunction.
3. Rapid Power Reduction.

Major Transients:

1. Large Break LOCA from the B Loop Hot Leg.

Critical Tasks:

1. E-0 – D: Manually actuate at least one train of SI-actuated safeguards equipment before transition out of E-0.
2. E-0 – Q: Manually trip the main turbine before transition out of E-0.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

- Exposure: BOC
- Power: 100%
- Boron (CB): 1299 ppm
- Temperature: 560 °F
- Pressure: 2235 psig
- Xenon: Equilibrium
- Rods: "D" @ 218
- Generator: 581 MW

EQUIPMENT OOS

- 12 RHR Pump
- BKR 16-10

SEQUENCE OF EVENTS:

Event 1: Place 2nd Letdown Orifice in Service

- Initially, there is only one 40 gpm letdown orifice in service.
- There are already two charging pumps running.
- The crew will place a second 40 gpm letdown orifice in service per 1C12.1.

Event 2: Yellow Channel Containment Pressure WR Instrument Fails HIGH

- 1P-950 pressure instrument will peg high.
- Containment High Pressure alarm will come in.
- The SS will enter T.S. LCO 3.3.2 Condition A, E, and D.

Event 3: Blue Channel Pressurizer Level Instrument Fails HIGH

- Charging pump speed will lower.
- 1L-428 level instrument will peg high
- Actual pressurizer level will lower.
- Charging pump speed control will be placed in manual.
- Pressurizer heaters will be controlled in manual.
- Pressurizer level control will be placed in the 2-1 position.
- Pressurizer level control will be returned to automatic.
- Pressurizer heater control will be returned to automatic.
- The SS will enter T.S. LCO 3.3.1 Conditions A and K.

Event 4: Turbine Malfunction

- A Turbine Control Trouble Alarm will be received.
- An approximately 10 MW load cycle will occur.
- RCS Tavg will rise and lower as turbine loading changes.
- Rods will step in and out as necessary to maintain RCS Tavg.
- First Stage Pressure indication on the Turbine Control System will oscillate.
- The crew will place Turbine Control in manual per 1C23 AOP2.

Event 5: Rapid Power Reduction

- The TSO will call the Control Room requesting Unit 1 power be reduced 5% over the next 10 minutes due to impending loss of transmission capacity.
- The crew will perform a Rapid Power Reduction to 95% per 1C1.4 AOP1.

Events 6, 7, 8, & 9: Large Break Loss of Coolant Accident

- RCS pressure will rapidly lower.
- Pressurizer level will rapidly lower.
- A reactor trip will automatically actuate.
- The main turbine will fail to automatically trip.
- The crew will manually trip the main turbine.
- Both trains of ECCS will fail to automatically actuate.
- The crew will manually actuate ECCS.
- 11 and 12 AFW pumps will fail to automatically start.
- The crew will manually start AFW pump(s).

Simulator Setup:

NOTE: The time between simulator reset and placing simulator in RUN should be minimized to reduce the difference between the ERCS time and actual time.

1. If available, reset the simulator to IC-262 and place in RUN.
2. If IC-262 is NOT available:
 - a. Reset to IC-9.
 - b. Place the simulator in RUN.
 - c. Place CS-46185, 12 RHR PUMP, in PULLOUT.
 - d. Place CS-46914, BUSTIE BUS 16 / BUS 26 BKR 16-10, in PULL TO LOCK.
3. If available, run schedule file **PI-ILT-NRC-1402S.sch** as follows:
 - a. Select open file in the Schedule application.
 - b. Locate schedule file.
 - c. Open schedule file by double clicking it.
 - d. Run the schedule file by pressing the "Stopped" button on the toolbar.
 - e. Verify the schedule file is running.
4. If schedule file is NOT available, then insert malfunctions, remotes, and overrides, as specified by the Simulator Input Summary.
5. If desired, start Scenario Based Testing Data Collection Program.
6. Complete the "Simulator Setup Checklist."

PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<ol style="list-style-type: none"> 1. SIMULATOR PRE-BRIEF: <ol style="list-style-type: none"> a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. b. Review Unit 1 LPEO / PEO Turnover Log. c. Perform a pre-job brief for the following activity: <ol style="list-style-type: none"> 1) Place a second 40 GPM Letdown Orifice in service per Section 5.9 of 1C12.1. <ol style="list-style-type: none"> (a) A second letdown orifice is being placed in service in preparation of SP 1047, Control Rod Quarterly Exercise. (b) SP 1047 is scheduled for the next day. (c) The Lead RO will conduct this activity. (d) This activity is to be performed after shift turnover is complete. 2. COMPLETE TURNOVER: <ol style="list-style-type: none"> a. Crew performs a walk down of the control boards. b. Review PRA Printout. c. Crew takes the duty. 		

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 1	<p>3. After the crew has assumed the duty, they will place a second 40 gpm letdown orifice in service per Section 5.9 of 1C12.1.</p> <p>a. If contacted as the RP Tech or Duty Chemist, acknowledge a second 40 gpm letdown orifice is being placed in service.</p> <p>b. If contacted as the Duty Chemist, acknowledge purification flow has been raised.</p>	LEAD	<p>1C12.1, LETDOWN, CHARGING, AND SEAL WATER INJECTION – UNIT 1</p> <ul style="list-style-type: none"> • Notify RP Tech that an additional letdown orifice is being placed into service. • Determine steps 5.9.2 through 5.9.8 are not applicable due to two charging pumps already running. • Place 11 Charging Pump in manual speed control. • Establish approximately 70 gpm charging flow to the Regen HX by: <ul style="list-style-type: none"> ○ Increasing charging pump speed. ○ Maintain 8 gpm seal injection to each RCP. • Place 1HC-135A, LTDN PRESS CONT, in MANUAL. • Using 1HC-135A, lower letdown heat exchanger outlet pressure to approximately 200 psig. • Open CV-31325, LETDOWN ORIFICE 40 GPM, using CS-46170. • Return 1HC-135A, LTDN PRESS CONT, to AUTO. • Transfer one (1) of the inservice charging pumps from MANUAL to AUTOMATIC speed control per C7. • Notify the Duty Chemist that purification flow has been raised.

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	<p>6. After the crew has responded to the Containment Pressure Instrument failing high, and/or at the discretion of the lead evaluator, then enter: Trigger 3, 1LT-428, Blue Channel Pressurizer Level, fails HIGH.</p> <p>a. If contacted as I&C to trip bistables, inform the crew two I&C Technicians will be available in 1 hour.</p> <p>b. If contacted as the Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked.</p> <p>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.</p> <p>d. If contacted as an out-plant operator, acknowledge the order to check Pressurizer Heater Backup Heater Breakers (closing springs charged).</p> <p>7. Plant Response:</p> <p>a. Blue Channel Pressurizer Level pegs high.</p> <p>b. 11 Charging Pump speed will lower.</p> <p>c. Pressurizer level will slowly lower.</p> <p>d. The following annunciators will come in:</p> <p>1) 47012-0307, PZR HI LVL CHANNEL ALERT.</p> <p>2) 47012-0507, PZR LVL DEVIATION.</p>	RO	<p>C47012-0307, PRZR HI LVL CHANNEL ALERT</p> <ul style="list-style-type: none"> • Check pressurizer level. • Control level in manual • Reduce level to program level. • Maintain pressurizer pressure • Refer to 1C51.
		RO	<p>C47012-0507, PZR LVL DEVIATION</p> <ul style="list-style-type: none"> • Verify charging pump in automatic and charging flow proper for the level. • Place charging pump speed control in MANUAL. • Control charging pump speed as necessary to restore pressurizer level to program level. • Refer to 1C51.
		RO	<p>1C51.3, Pressurizer Level 1L-428 – High</p> <ul style="list-style-type: none"> • Control pressurizer heaters manually. • Place charging pump speed control in Manual and adjust pressurizer level to setpoint. • Select position “2-1” (WHITE-RED) on PRZR Level Control Selector switch. • Return pressurizer heaters to AUTO. • Return one charging pump speed control to AUTO. • Ensure pressurizer level recorder not selected to blue channel.
		SS	<ul style="list-style-type: none"> • Enter T.S. LCO 3.3.1 Condition A <ul style="list-style-type: none"> ○ Reference Table 3.3.1-1 immediately. • Enter T.S. LCO 3.3.1 Condition K <ul style="list-style-type: none"> ○ Trip bistable for 1L-428 in 6 hours or reduce thermal power to less than P-7 and P-8 (10%).

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4	<p>8. When the plant is stable and/or at the discretion of the lead evaluator, then enter:</p> <p>Trigger 4, Turbine Malfunction (Cycling Output).</p> <ol style="list-style-type: none"> If contacted as the out-plant operator to investigate, wait 2 minutes and report there are no indication of an EH Oil System problem. If contacted as the Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked. If contacted as the FIN Team Supervisor or Turbine Engineer, inform the crew that you will write a work order and investigate. After the plant is stable, enter the Control Room as the Turbine Engineer and communicate the following to the crew: <ol style="list-style-type: none"> A 1 HR TIME COMPRESSION is being used. Both First Stage Pressure inputs to Turbine Control are faulted. Turbine Control will operate correctly in VPC or Load Mode. Plant Management has performed an ODMI and has decided the following: <ol style="list-style-type: none"> Exit the manual control screen by pressing the "exit" button. The crew can acknowledge the Turbine Control alarm, but do NOT reset it. Operate the turbine in VPC mode when load changes are NOT in progress. Operate the turbine in LOAD Mode during load changes. If necessary, restore the plant: <ol style="list-style-type: none"> 100% power. 	LEAD	<p>1C23 AOP2, MALFUNCTION OF TURBINE EH CONTROL SYSTEM</p> <ul style="list-style-type: none"> Place the turbine control system in Manual by selecting Manual control using the "On Line Control" screen AND attempt to control load using the CV decrease control. Notify System Engineer. <p>1C1.4, UNIT 1 POWER OPERATION</p> <ul style="list-style-type: none"> Notify the Duty Chemist of the load change. If desired, then place CS-46280, ROD BANK SELECTOR, in "MANUAL". Using the "On Line Control" screen, select the desired Control Mode (VPC, FSP, or LOAD). Using the "On Line Control" screen, select the desired demand rate. Verify the "VPL" control is not Red. Raise the "VPL" as necessary using the "Valve Limiter" pop-up screen. Set the "Target" setting to the desired load by using the "On Line Control" screen "Target" increase/decrease controls. Select the "Go" control using the "On Line Control" screen. To suspend the load change, select turbine control "Hold" on the "On Line Control" screen. Verify the load change stops when desired load is obtained. Lower the "VPL" until the "Valve Position Limit" signal is at or close to the "Current Valve Demand" signal. Verify CS-46280, ROD BANK SELECTOR, in "AUTO".

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4 (cont)	<p>(2) Bank D Rods at 218 steps. (3) Tavg at 560°F.</p> <p>9. Plant Response:</p> <ol style="list-style-type: none"> Annunciator 47008-0409, TURBINE CONTROL SYSTEM TROUBLE SCADA Yellow High Priority Alarm for 1st Stage Pressure Fault. Unexpected load changes. VPL limit red light cycling. Rods stepping in and then out. RCS Tavg temperature rising and lowering. 		<p>1C5, CONTROL ROD AND ROD POSITION INDICATION SYSTEMS</p> <ul style="list-style-type: none"> Verify automatic control rod withdrawal or insertion is NOT required. Transfer CS-46280, ROD BANK SELECTOR, to "MAN". Adjust Control Rod Bank to desired position, using CS-46281, DIGITAL ROD CONTROL. Verify NO rod control demand signals present. Return CS-46280, ROD BANK SELECTOR, to "AUTO".
EVENT 5	<p><u>OPTIONAL EVENT</u></p> <p><i>Event 5 can be skipped if the Lead Evaluator determines a sufficient reactivity manipulation was performed during Event 4.</i></p> <p>10. When the plant is stable and/or at the discretion of the lead evaluator, then:</p> <ol style="list-style-type: none"> As the TSO, call the Control Room and communicate the following: <ol style="list-style-type: none"> The King Plant has tripped offline. Generator output needs to be reduced to lower the power factor so a grid transformer breaker can be re-closed. Prairie Island Unit 1 generator output needs to be lowered to 555 MW within the next 15 minutes. This is urgent and needs to be done as soon as possible. <p><u>NOTE</u></p> <p><i>Once the Lead Evaluator is satisfied with the reactivity manipulation, proceed to Event 6.</i></p>	RO / SS	<p>1C1.4 AOP1, RAPID POWER REDUCTION UNIT 1</p> <ul style="list-style-type: none"> Determine the predicted Boron addition and final Control Rod Position by obtaining values from the appropriate contingency reactivity plan. Borate the RCS as necessary to maintain control rods above the insertion limit and control delta I within limits. Place pressurizer heaters to "ON". Using the "On Line Control" screen, select the "Control Mode" pop-up screen. Select the desired control mode ("VPC", "FSP", or "LOAD"). Using the "On Line Control" screen, select the "Demand Rate" pop-up screen. Select the desired rate of load change. Set the desired Target setting using the "On Line Control" screen. Using the "On Line Control" screen, select the Go control to initiate load reduction.

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 5 (cont)		RO / SS	1C12.5, UNIT 1 BORON CONCENTRATION CONTROL <ul style="list-style-type: none"> • Verify the Boric Acid integrator is reset. • Set 1YIC-110, BA TO BLENDER BATCH INTEGRATOR, to quantity desired. • Place CS-46300, MAKE-UP MODE SELECTOR, to "BORATE". • If desired, then adjust 1HC-110, BA TO BLENDER FLOW CONT, to "MANUAL" and adjust output for desired flow rate. • Momentarily place CS-46457, BORIC ACID MAKE-UP CONTROL, to "START", to initiate the boration. • When the desired quantity of boric acid has been added, then verify automatic makeup stopped as indicated by CS-46457, BORIC ACID MAKE-UP CONTROL, green light LIT. • If additional boration is desired, then return to step 2. • When the boration is complete, then verify 1HC-110, BA TO BLENDER FLOW CONT, is in "AUTO". • Reset the Boric Acid integrator. • Perform a 10 gallon flush.

Retention: Life of Plant

Retain in: Training Program File

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Retention: Life of Plant
Retain in: Training Program File
Form retained in accordance with record retention schedule identified in FP-G-RM-01.

PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7, 8, & 9 (cont)	12. Plant Response: a. RCS and PRZR pressure lowers rapidly. b. The reactor automatically trips on low pressurizer pressure.	RO/SS	1FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION <ul style="list-style-type: none"> Determine RCS pressure is less than 550 psig and RHR pump flow is greater than 950 gpm. Return to procedure and step in effect.
	<p style="text-align: center;"><u>EMERGENCY PLAN CLASSIFICATION</u></p> <p><i>ALERT – FA1 due to a loss of the RCS Fission Product Barrier due to RCS leak rate greater than 60 gpm or a red path in Integrity.</i></p> <p><i>SITE AREA EMERGENCY – FS1 due to a loss of the RCS Fission Product Barrier and potential loss of the Fuel Cladding Fission product barrier. This classification will only be applicable if an orange path in Core Cooling occurs.</i></p> <p>13. If Control Room personnel ask if Unit 2 personnel are available to secure Diesel Generators and/or Safeguards Cooling Water Pumps, then inform the Control Room that Unit 2 personnel WILL secure the Diesel Generators and/or Safeguards Cooling Water Pumps.</p>	RO/SS	1E-1, LOSS OF REACTOR OR SECONDARY COOLANT <ul style="list-style-type: none"> Stop RCPs if not already done in 1E-0. Determine SGs are NOT faulted and SG levels intact. Control feed flow to maintain narrow range level between 5% and 50% [Wide Range 50% and 59%]. Check secondary radiation is normal. Check power to PRZR PORV block valves available. Check PRZR PORVs are closed. Check at least one PRZR PORV block valve is open. Reset SI and Containment Isolation. Establish Instrument Air to Containment. Check power supply to charging pumps are from offsite power. Check at least one charging pump is running. Establish charging flow as necessary. Determine SI flow should NOT be terminated due to subcooling and RCS pressure. Determine RHR pumps should NOT be stopped due to RCS pressure being too low. Check RCS and SG pressures Determine Diesel Generators should be stopped. Determine Safeguards Cooling Water pumps should be stopped. Initiate Evaluation of Plant Status.

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7, 8, & 9 (cont)	<p style="text-align: center;">NOTE</p> <p><i>There should be NO discrepancies with Attachment L, except for 12 RHR pump being OOS.</i></p>	LEAD	<p>1E-0 Attachment L: SI Alignment Verification</p> <ul style="list-style-type: none"> • Verify Safeguards Component Alignment: • Verify both trains of SI actuated: <ul style="list-style-type: none"> ○ Both RHR pumps - RUNNING -OR- ○ Both SI pumps – RUNNING ○ 12 RHR Pump is OOS and should NOT be started. • "SI NOT READY" lights - NOT LIT • "SI ACTIVE" lights - LIT FOR PLANT CONDITIONS • "CONTAINMENT ISOLATION" lights - LIT FOR PLANT CONDITIONS • Check Category 1 Vent Zone Boundary: • Close MV-32115, 122 SFP HX INLT HDR MV B • Check Cooling Water Header Pressures - BOTH GREATER THAN 65 PSIG • Verify Plant Announcements Complete: • Check If Main Steamlines Are Isolated: • Determine MSIVs, Bypass Valves, and Containment Instrument Air Valves do NOT need to be closed. • Verify SI Flow • Verify RHR Flow • Verify Containment Spray is actuated (if necessary). • Check RCP Cooling • Verify Local Actions Complete • Verify Generator Breakers – OPEN • Verify All Heater Drain Pumps – STOPPED • Check Turbine Valves: <ul style="list-style-type: none"> ○ Turbine reheat and intercept valves – CLOSED ○ Open turbine drain valves • Verify Main Feedwater Alignment: <ul style="list-style-type: none"> ○ Both main feedwater pumps – STOPPED ○ Main and bypass FRVs - CLOSED

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7, 8, & 9 (cont)	<p>14. If Control Room personnel ask for status of Unit 2 Cooling Water/Chilled Water lineup, then inform the Control Room that Unit 2 Cooling Water/Chilled Water valves are in there safeguards positions.</p> <p>15. If Control Room personnel ask for status of Battery Room Temperatures, then inform the Control Room that Battery Room temperatures are less than 84 °F.</p> <p>16. If Control Room personnel ask for status of Spent Fuel Cooling, then inform the Control Room that Spent Fueling level and temperature are normal.</p>	LEAD	<ul style="list-style-type: none"> • Verify All Condensate Pumps - STOPPED: • Place Steam Dump in "STM PRESS" Mode • Verify Unit 1 Cooling Water/Chilled Water Alignment: <ul style="list-style-type: none"> ○ CFCU control switches - "SLOW". ○ CFCU dampers - ALIGNED TO DOME ○ Unit 1 cooling water/chilled water valves closed ○ Unit 1 CRDM shroud cooling supply and return valves – CLOSED ○ CFCU cooling water supply and return valves – OPEN ○ CFCU chilled water supply and return valves – CLOSED • Verify 11 Safeguards Screenhouse Ventilation lineup. • Verify Control Room Ventilation Alignment: <ul style="list-style-type: none"> ○ Chillers and fans – RUNNING ○ Control room chiller suction/discharge tie closed - STATUS LIGHT LIT • Verify Unit 2 Cooling/Chilled Water Alignment • Verify 21 Safeguards Screenhouse Ventilation lineup. • Verify 11 and 12 Battery Charger Operation is normal. • Verify Battery Room temps less than 84 °F. • Check status of Spent Fuel Cooling. • Check Status Of Notifications • Notify SS Of Any Discrepancies.
	17. Once the crew has determined SI Pumps and RHR Pumps should NOT be stopped and/or at the discretion of the Lead Evaluator, then place the simulator in FREEZE and inform the crew that training has the duty.		

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0**SIMULATOR INPUT SUMMARY**

@Time	Event	Action	Description
00:00:00		Insert override DI-46914P to True	BKR 16-10 OOS
00:00:00		Insert override DI-46914C to False	BKR 16-10 OOS
00:00:00		Insert override DI-46185P to True	12 RHR PUMP OOS
00:00:00		Insert override DI-46185ST to False	12 RHR PUMP OOS
00:00:00		Insert malfunction RP09A	FAILURE OF SFGDS AUTO ACTUATION TRAIN A
00:00:00		Insert malfunction RP09B	FAILURE OF SFGDS AUTO ACTUATION TRAIN B
00:00:00		Insert malfunction FW34A	AUX FW PUMP #11 (TURBINE DRIVEN) FAILS TO START AUTOMATICALLY
00:00:00		Insert malfunction FW34B	AUX FW PUMP #12 (MOTOR DRIVEN) FAILS TO START AUTOMATICALLY
	2	Insert malfunction CH01F to 100.00000 on event 2	CONTAINMENT PRESS XMTR 1P-950 FAILURE
	3	Insert malfunction RX206 to 100.00000 on event 3	1 PRZR (CHNL III-BLU) LVL XMTR (1LT-428)
	4	Insert malfunction TC03 to 100.00000 on event 4	TURBINE CONTROL SYSTEM CYCLING OUTPUT (10 MW SWING)
	4	Insert malfunction TC206 from 534.00000 to 630.00000 on event 4	FIRST STAGE PRESS XMTR 1 PT-21015 FAILS HIGH
	6	Insert malfunction RC06B to 20.00000 in 60 on event 6	LARGE BREAK LOCA - HOT LEG (B LOOP)
	6	Insert malfunction TC11A on event 6	AUTO TURBINE TRIP FAILURE

Retention: Life of Plant

Retain in: Training Program File

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SIMULATOR SETUP CHECKLIST

Before Scenario

- _____ Simulator Status:
- | | |
|---------------------------|---|
| _____ 1. "Training Load" | _____ 2. Step counters "ON" |
| _____ 3. Alarm sound "ON" | _____ 4. Steps 1 – 5 on page 6 complete |
| _____ 5. Speed: "REAL" | _____ 6. IC-262 or IC-9 running |
- _____ Delete the memory on the Yokogawa Model DX1000 recorders by cycling the Recorder Power OFF pushbutton in the simulator instructor's booth.
- _____ Verify Schedule File/Summary matches Simulator Input Summary page in the SEG.
- _____ Verify that control rod step counters on C panel and ERCS RBU matches the IC conditions.
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset.
- _____ BOC ΔI sheet displayed on C panel.
- _____ BOC Reactivity Briefing sheet available at Reactor Operator Desk.
- _____ Turnover sheet/PRA sheet available.
- _____ If it is the first scenario of the day, then perform a shutdown and restart of the floor PCs that are connected to the LAN.
- _____ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID).
- _____ Electronic PINGP 577 forms closed on LAN connected PCs.
- _____ Board-mounted EAL Tables are cleaned.
- _____ EOOS running on PC and updated as follows to reflect equipment OOS:
- | | |
|----------------------------|--|
| _____ 1. 12 RHR Pump | |
| _____ 2. BKR 16-10 (CLOSE) | |
- _____ Update Control Board Placards:
- | | |
|--|--|
| _____ 1. NRC Current Authentication Code call date updated to current date. | |
| _____ 2. High Flux At Shutdown Alarm Setpoint placards: 5900 cps. | |
| _____ 3. Feedwater regulating valve position placard set to current values. | |
| _____ 4. Recommended SG Blowdown flow set to current values. | |
| _____ 5. RCS boron on the CVCS panel placard: 1299 ppm. | |
| _____ 6. Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions). | |
| _____ 7. Shift Reactivity Guidance placard: BA: 4.2 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. 12 BA PUMP "Lined Up to 11 BA Tank" | |
| _____ 4. CC to SFP MV-32117 "In Service" | |
| _____ 5. Blowdown 46470 "SGB To CDSR" | |
| _____ 6. HU Flag above 12 RHR HX CC inlet MV-32094 for "1C14 Limitation" | |
| _____ 7. "H ₂ IN VCT SPACE" at VCT | |

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_____ Pink Status Control Tags in place:

- | | |
|--------------------------------------|----------------------------------|
| ___ 1. CS-46540, 22 CC WTR PUMP | ___ 5. CS-46184, 11 RHR PUMP |
| ___ 2. CS-46572, CC TO SFP MV-32117 | ___ 6. CS-46178, 11 SI PUMP |
| ___ 3. CS-46935, D1 DIESEL GENERATOR | ___ 7. CS-46036, 11 CC WTR PUMP |
| ___ 4. CS-46424, 11 TDAFWP | ___ 8. CS-46053, 12 CLG WTR PUMP |

_____ Yellow Caution Tags in place:

- ___ 1. CS-46064, CC TO SFP MV-32115, in CLOSED
- ___ 2. CS-46185, 12 RHR PUMP, in PULLOUT
- ___ 3. CS-46914, BUSTIE BUS 16 / BUS 26 BKR 16-10, in PULL TO LOCK

_____ ERCS driven recorders are on-scale (RCS temperature scaled 555° F to 565° 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	1Q0340A	1V4501A

_____ ERCS TPM set (Calorimetric - Auto Scaling - LEFM).

_____ Verify that copy machine and printers are loaded with paper.

_____ Pens/Paper/Markers available on the simulator.

_____ Verify 121 IA Compressor is in PREFERRED and 122 IA Compressor is in 1st STANDBY, and 123 IA Compressor is in 2nd STANDBY.

_____ Verify R11/R12 are lined up correctly (at the R11/R12 local panel):

- ___ 1. Sample pump is running.
- ___ 2. Alarms are reset.
- ___ 3. CS-8006106, Sample Inlet Switch, is selected to CNTMT.
- ___ 4. CS-8006107, Sample Outlet Switch, is selected to Aux Bldg Stack.

_____ 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 VPL set ~ 0.1 to 0.2 above current valve position (not on limiter).

_____ DEHC alarms cleared.

_____ N51 & N52 Display Sheets for 100% power are in place as necessary.

_____ Headsets turned on as necessary.

_____ Procedure checklist completed. See following page.

_____ Peer Check performed for simulator setup.

PROCEDURE CHECKLIST

The following procedures will be used during this session. Verify the procedures are free of place keeping marks before starting the session and after the session are complete:

[illegible]

PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0**Post-Scenario Checklist**

- _____ LAN connected computers are cleared of information added during the scenario.
- _____ Computer generated PINGP 577 cleared.
- _____ Procedure checklist completed. See previous page.
- _____ Remove Pink Status Control Tags from the following equipment:
 - ___ 1. CS-46935, D1 DIESEL GENERATOR
 - ___ 2. CS-46424, 11 TDAFWP
 - ___ 3. CS-46184, 11 RHR PUMP
 - ___ 4. CS-46178, 11 SI PUMP
 - ___ 5. CS-46036, 11 CC WTR PUMP
 - ___ 6. CS-46053, 12 CLG WTR PUMP
- _____ Magnetic placards removed:
 - ___ 1. NONE
- _____ Remove Yellow Caution Tags from the following equipment:
 - ___ 1. CS-46185, 12 RHR PUMP
 - ___ 2. CS-46914, BUSTIE BUS 16 / BUS 26 BKR 16-10
- _____ 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	
1. 12 RHR PUMP is OOS for corrective maintenance. <ul style="list-style-type: none"> T.S. 3.5.2 Condition A was entered with 48 hours remaining. 	
PROTECTED EQUIPMENT	
D1 DIESEL GENERATOR 11 TDAFWP 11 RHR PUMP 11 SI PUMP	11 CC PUMP 12 CLG WATER PUMP 22 CC PUMP 121 SFP HX
RAD MONITORS OOS	ANNUNCIATORS OOS
NONE	NONE
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
NONE	NONE
OTHER EQUIPMENT OOS / STATUS	
<ul style="list-style-type: none"> BKR 16-10 is OOS for corrective maintenance. Station Air is supplementing Instrument Air per Section 5.1.3 of C34, Station Air System. 	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
NONE	
OPERATIONAL PLANS FOR COMING SHIFT	
<ul style="list-style-type: none"> Xenon is at equilibrium. Maintain 100% power. Place a 2nd Letdown Orifice in service in preparation for SP 1047, Control Rod Quarterly Exercise. Dilute 10 gallons 1-2 times per shift for temperature control. 	
NEW PROCEDURES / INSTRUCTIONS	
NONE	

Retention: Life of Plant

Retain in: Training Program File

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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.

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Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0**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 conditions agreed with the reference plant with respect to reactor status, plant configuration, and system operation. | Yes
X | No |
| 2. The simulator operated in real time during conduct of validation. | Yes
X | No |
| 3. The simulator demonstrated expected plant response to operator input and to normal, transient, and accident conditions. | Yes
X | No |
| 4. The simulator permitted use of the reference plant's procedures. The scenario was completed without procedural exceptions, simulator performance exceptions, or deviation from the scenario sequence. | Yes
X | No |
| 5. The simulator did not "fail to cause" or "unexpectedly cause" any first principle alarm or primary automatic action. | Yes
X | No |
| 6. Observable changes in parameters relevant to the scenario corresponded in trend and direction to reference plant's expected response. | Yes
X | No |
| 7. All malfunctions and other instructor interface items were functional and demonstrated the expected reference plant's response to the initiating cause. | Yes
X | No |
| 8. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes
X | No |
| 9. The scenario satisfies the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence. | Yes
X | No |
| 10. Simulator fidelity has been demonstrated to be adequate for this scenario. | Yes
X | No |

Discrepancies noted (Check "none" or list items found) ☒ None

SMAR = Simulator Action Request

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

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1402S, 2014 ILT NRC SIMULATOR EVALUATION #2, REV. 0

Comments: _____

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

Validation Personnel		
Name	Job Title / Qualification	Validation Position
Shawn Sarrasin	Operations Instructor	Lead Evaluator
Nic Abney	Operations Instructor	Booth Driver
Jeff Human	Operations SRO	Shift Supervisor
Mark Haren	Operations RO	LEAD
Rick Martin	Operations RO	RO

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: PRAIRIE ISLAND**SEG # PI-ILT-NRC-1403S****SEG TITLE: 2014 ILT NRC SIMULATOR EVALUATION #3****REV. # 0****PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****TOTAL TIME: 2.0 HOURS**

Developed by:	Shawn Sarrasin <i>Instructor</i>	1/18/2014 <i>Date</i>
Reviewed by:	Fredrick Collins <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	2/26/2014 <i>Date</i>
Validated by:	Shawn Sarrasin <i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	4/22/2014 <i>Date</i>
Approved by:	Travis Ouret <i>Training Supervision</i>	7/18/2014 <i>Date</i>

Guide Requirements

Goal of Training:

1. 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.
2. 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. Restore RCS average coolant temperature to program per C47013-0305.
2. Swap running charging pumps per 1C12.1.
3. Diagnose and perform corrective actions for 11 Safety Injection Pump being placed in local control per C47018-0301.
4. Diagnose and perform corrective actions for N43, Blue Channel Power Range Nuclear Instrument, failing high per 1C51.3.
5. Diagnose and respond to a Pressurizer Spray valve failing 75% open per C47012-0508.
6. Diagnose and respond to a failure of the Reactor to automatically trip during a RCS Low Flow condition per C47017-0301 and 1E-0.
7. Diagnose and respond to 12 SG faulted into containment per 1E-0 and 1E-2.

Training Resources:

1. Full Scope Simulator
2. NRC Evaluation Team
3. Booth Operator (Backup Communicator)
4. Primary Communicator

Related PRA Information:

Initiating Event with Core Damage Frequency:

MSLB (<1%)

Important Components:

11 SI PUMP

Important Operator Actions with Task Number:

Operators fail to isolate AFW to affected SG (0.54%)

CRO 301 003 06 01 000 – Faulted Steam Generator Isolation

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. 11 Safety Injection Pump local-remote switch placed in local.
2. N43, Blue Channel Power Range Nuclear Instrument, fails high.
3. Pressurizer Spray valve opens to the 75% position.
4. Loop A RCS low flow due to Bus 11 lockout.

After EOP Entry:

1. Reactor fails to automatically trip.

Abnormal Events:

1. Nuclear Power Instrument Failure
2. Low Pressurizer Pressure

Major Transients:

1. 12 Steam Generator fault inside containment.

Critical Tasks:

1. E-0 – A: Manually trip the reactor from the control room before transition out of E-0.
2. 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.

NOTE: E-0 – F only applies if BOTH AFW pumps trip on low discharge pressure. This may occur due to the fault in 12 Steam Generator.

3. E-2 – A: Isolate the faulted STEAM GENERATOR before transition out of E-2, unless the transition is to FR-P.1, in which case the task must be completed prior to checking if safety injection should be terminated per step 6 of FR-P.1.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

- Exposure: BOC
- Power: 50%
- Boron (CB): 1482 ppm
- Temperature: 556°F
- Pressure: 2235 psig
- Xenon: Equilibrium
- Rods: "D" @ 181
- Generator: 272 MW

EQUIPMENT OOS

- 1PT-485, Turbine First Stage Pressure, is failed high.
- 123 Air Compressor

SEQUENCE OF EVENTS:

Event 1: Restore RCS Average Coolant Temperature to Program Temperature

- 1PT-485, Turbine First Stage Pressure, failed high prior to shift turnover.
- The previous crew has already responded per 1C5 AOP1, Uncontrolled Rod Motion, and 1C51.2, Instrument Failure Guide.
- RCS Tavg is at 556°F and Program Temperature is 553°F.
- Rods stepped out six steps prior to the previous crew placing Rods in manual.
- The crew will step rods in six steps in increments determined by the RO and SRO.
- Each rod step will change RCS Tavg approximately 0.5°F.

Event 2: Swap Running Charging Pumps

- 11 and 12 Charging Pumps are initially running.
- The crew will swap charging pumps to 11 and 13 running and 12 secured per 1C12.1.

Event 3: 11 Safety Injection Pump Local-Remote Switch placed in LOCAL

- Annunciator 47018-0301, 11 SI PUMP LOCAL CONTROL SI AUTO START BLOCKED, will alarm.
- After being dispatched, an out-plant operator will discover the local-remote switch for 11 SI Pump in local.
- The SS will enter T.S. LCO 3.5.2 Condition A for one train of ECCS inoperable.
- The crew will direct the out-plant operator to place 11 SI Pump in remote.

Event 4: N43, Blue Channel Power Range Instrument, fails HIGH

- Rods will NOT step in because rods are still in manual due to 1st Stage Pressure Instrument failed high.
- The SS will enter T.S. LCO 3.3.1 Conditions A, D, E, Q, and R.
- The crew will remove N43 from service per 1C51.3.

Event 5: Pressurizer Spray Valve Drifts Open

- The RCS Loop A Pressurizer Spray valve slowly opens to the 75% position.
- The crew will place the Pressurizer Spray valve in manual per C47012-0508.
- The Pressurizer Spray valve will close.

Event 6: Loop A RCS Loss of Flow

- Bus 11 locks out.
- Loop A RCS loss of flow occurs due to loss of power to 11 RCP.
- The reactor will fail to automatically trip.
- The crew will manually trip the reactor.
- The crew will enter 1E-0 and then transition to 1ES-0.1, Reactor Trip Recovery.

Event 7: 12 Steam Generator Faults into Containment

- RCS pressure will lower rapidly.
- 12 SG pressure will lower slowly.
- Containment pressure will rise slowly.
- Safety Injection will automatically actuate or be manually actuated by the crew.
- The crew will transition to 1E-0.
- The crew will diagnose a Faulted SG and transition to 1E-2.
- The crew will isolate 12 Steam Generator.
- The crew will transition to 1E-1.
- A red or orange path may occur in the Integrity CSF. If this occurs, the crew will transition to 1FR-P.1.

Simulator Setup:

NOTE: The time between simulator reset and placing simulator in RUN should be minimized to reduce the difference between the ERCS time and actual time.

1. If available, reset the simulator to IC-263 and place in RUN.
2. If IC-263 is NOT available:
 - a. Reset to IC-8.
 - b. Place the simulator in RUN.
 - c. Place CS-46098, 123 AIR COMPRESSOR, in PULLOUT.
 - d. Place CS-49011, 122 AIR COMPRESSOR, in PREFERRED.
 - e. Place CS-49012, 123 AIR COMPRESSOR, in 1st STANDBY.
 - f. Insert Remote IA101 (CP-40-7) to CLOSED.
 - g. Insert System Override RX226 to 616 (1st Stage Pressure Fails High).
 - h. Place CS-46280, ROD BANK SELECTOR, in MANUAL after rods step out 6 steps.
 - i. Place CS-46338, STEAM DUMP MODE, in STM PRESS.
3. Verify the ROD DEVIATION alarm is CLEARED as follows:
 - a. Log into the ERCS terminal with user "OVRD" and password "DUTY" (if needed).
 - b. Go to ERCS Screen RBU (Rod Bank Update).
 - c. Enter 181 as the new value for point 1U0052A, ROD POS BNK D.
 - d. Select "Apply".
 - e. Verify Annunciator 47013-0507, COMPUTER ALARM / ROD DEVIATION / SEQUENCING, has cleared.
4. Verify the Pen Recorder for RCS Tavg and Tref are set correctly as follows:
 - a. Log into the ERCS terminal with user "OVRD" and password "DUTY" (if needed).
 - b. Go to ERCS Screen PEN_TREND (Pen Trend Configuration).
 - c. Enter 550 as the new Min EU value for Pen 1U9001A (point 1T0499A).
 - d. Enter 560 as the new Max EU value for Pen 1U9001A (point 1T0499A).
 - e. Enter 550 as the new Min EU value for Pen 1U9002A (point 1T0496A).
 - f. Enter 560 as the new Max EU value for Pen 1U9002A (point 1T0496A).
5. If available, run schedule file **PI-ILT-NRC-1403S.sch** as follows:
 - a. Select open file in the Schedule application.
 - b. Locate schedule file.
 - c. Open schedule file by double clicking it.
 - d. Run the schedule file by pressing the "Stopped" button on the toolbar.
 - e. Verify the schedule file is running.
6. If schedule file is NOT available, then insert malfunctions, remotes, and overrides, as specified by the Simulator Input Summary.
7. If desired, start Scenario Based Testing Data Collection Program.
8. Complete the "Simulator Setup Checklist."

PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<ol style="list-style-type: none"> 1. SIMULATOR PRE-BRIEF: <ol style="list-style-type: none"> a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. b. Review Unit 1 LPEO / PEO Turnover Log. c. Perform a pre-job brief for the following activities: <ol style="list-style-type: none"> 1) Restore Tavg to program temperature per C47013-0305: <ol style="list-style-type: none"> (a) 1C51.2 actions are complete for the failed instrument with the exception of restoring Tavg to program temperature. (b) Rods are in MANUAL. (c) Hand out copy of ERCS trend showing <ol style="list-style-type: none"> (1) RCS Tavg. (2) RCS Tref. (3) Bank D Rod Height. (d) This activity is to be performed after shift turnover is complete. (e) If crew questions why Tavg was not restored prior to performing other actions in 1C51.2, then inform crew that Plant Management used the Operational Decision Making Process and determined to restore Tavg on a latter step. 2) After Tavg is restored to program, the crew will swap charging pumps per Section 5.4.1 of 1C12.1. <ol style="list-style-type: none"> (a) 11 and 12 Charging pumps are currently running. (b) 13 Charging Pump Suction Stabilizer PM is complete and ready to re-start. (c) 13 Charging Pump desurger has already been checked by the out-plant operator. (d) The crew will start 13 Charging Pump and secure 12 Charging Pump. (e) The Lead RO will perform this evolution. (f) The crew will also brief this evolution prior to entering the simulator. 2. COMPLETE TURNOVER: <ol style="list-style-type: none"> a. Crew performs a walk down of the control boards. b. Review PRA Printout. c. Crew takes the duty. 		

Retention: Life of Plant

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 1	3. After the crew has assumed the duty, they will restore Tavg to program.	RO/SS	<p>C47013-0305, AUCTIONEERED TAVG-TREF DEVIATION</p> <ul style="list-style-type: none"> • Check Tavg-Tref temperature deviation. • Recognize Tref is failed high due to instrument failure and use Figure C1-5 to determine program temperature. • Return Tavg to program using manual rod control. <p>1C5, CONTROL ROD AND ROD POSITION INDICATION SYSTEMS</p> <ul style="list-style-type: none"> • Verify automatic control rod withdrawal or insertion is NOT required. • Transfer CS-46280, ROD BANK SELECTOR, to "MAN". • Adjust Control Rod Bank to desired position, using CS-46281, DIGITAL ROD CONTROL. • Verify NO rod control demand signals present. • Return CS-46280, ROD BANK SELECTOR, to "AUTO".

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SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 2	<p>4. After the crew has restored Tavg to program temperature, they will swap charging pumps so that 11 and 13 are running.</p> <p>a. When contacted as the out-plant operator to verify 13 Charging Pump discharge desurger is pressurized, report the 13 Charging Pump discharge desurger is pressurized in accordance with Section 5.13.</p> <p>b. If contacted as the out-plant operator to check 13 Charging Pump suction stabilizer, report no issues noted.</p>	LEAD	<p>1C12.1, LETDOWN, CHARGING, AND SEAL WATER INJECTION – UNIT 1</p> <ul style="list-style-type: none"> • Verify 13 Charging Pump discharge desurger is pressurized. • Transfer the speed control for 11 Charging Pump to Manual per C7. • Verify 13 Charging Pump speed controller is at minimum. • Reduce 11 Charging Pump speed until seal injection flow drops to approximately six gpm. • Verify charging pump discharge header pressure 1PI-133 is less than 2400 psig. • Verify 13 Charging Pump control switch green light is "LIT" and white light is "OFF". • Start 13 Charging Pump. • Adjust 11 Charging Pump speed to maintain charging pump discharge pressure, 1PI-133 less than 2500 psig and approximately 9.5 gpm seal injection. • Ensure 12 Charging Pump speed is at minimum and seal injection flow is approximately 9.5 gpm. • Stop 12 Charging Pump.

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	<p>5. When charging pumps have been swapped, and/or at the discretion of the lead evaluator, then enter: Trigger 3, 11 SI PUMP LCL/REM-START/STOP, switch to "LOCAL".</p> <p>a. When contacted as the out-plant operator to investigate 11 SI Pump, wait 1 minute and report the 11 SI Pump Local-Remote Switch is in the LOCAL position and it was inadvertently bumped by NPSAs cleaning the area.</p> <p>b. When contacted as the out-plant operator to place CS-19624 to REMOTE, then wait 1 minute and enter: Trigger 13, 11 SI PUMP LCL/REM-START/STOP, switch to "REMOTE".</p> <p>6. Plant Response:</p> <p>a. Annunciator 47018-0301, 11 SI PUMP LOCAL CONTROL SI AUTO START BLOCKED.</p> <p>b. 11 SI Pump Green indicating light goes OFF.</p>	<p>LEAD</p> <p>SS</p>	<p>C47018-0301, 11 SI PUMP LOCAL CONTROL SI AUTO START BLOCKED</p> <ul style="list-style-type: none"> Dispatch an operator to investigate. Verify CS-46178, 11 SI PUMP, is in desired position, then return CS-19624, 11 SI PUMP LCL/REM-START/STOP, selector switch to "REMOTE". Refer to T.S. 3.5.2. and T.S. 3.5.3. <ul style="list-style-type: none"> Enter T.S. LCO 3.5.2 Condition A – Restore 11 SI Pump to operable within 72 hours. T.S. LCO 3.5.3 is only applicable in Mode 4 and Unit 1 is currently in Mode 1.
Retention:	Life of Plant		
Retain in:	Training Program File		

PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 4	<p>7. When 11 SI Pump Remote Control is restored, and/or at the discretion of the lead evaluator, then enter: Trigger 4, N43 Blue Channel Power Range Nuclear Instrument fails HIGH.</p> <p>a. If contacted as I&C to trip bistables, inform the crew two I&C Technicians will be available in 1 hour.</p> <p>b. If contacted as the Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked.</p> <p>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.</p> <p>8. Plant Response:</p> <p>a. N43 indication will peg high.</p> <p>b. Rods will NOT move because they are already in manual.</p> <p>c. The following annunciators will be received:</p> <ol style="list-style-type: none"> 1) 47013-0101, NIS POWER RANGE POS FLUX RATE CH ALERT. 2) 47013-0102, NIS POWER RANGE HI SETPOINT CH ALERT. 3) 47013-0103, NIS POWER RANGE OVERPOWER ROD WITHDRAWAL STOP. 4) 47013-0203, NIS POWER RANGE CHANNEL DEVIATION. 	<p>RO</p> <p>LEAD</p> <p>RO</p> <p>SS</p> <p>LEAD</p>	<p>C47013-0101, 0102, 0103, 0203, NIS POWER RANGE CHANNEL ALERT AND ALARMS</p> <ul style="list-style-type: none"> Determine N43 is the initiating channel by observing NIS indications. Determine a reactor trip is NOT necessary. Determine there is NO dropped, misaligned, or stuck rod. Refer to 1C51, INSTRUMENT FAILURE GUIDE. <p>1C51.3, Power Range Nuclear Instrument N-43 – High</p> <ul style="list-style-type: none"> Determine rod control is already in manual. Enter T.S. LCO 3.3.1 Condition A – Reference Table 3.3.1-1 immediately. Enter T.S. LCO 3.3.1 Condition D and Condition E – Place N43 channel in trip within 6 hours or be in Mode 3 in 12 hours. SR 3.2.4.2 is NOT required since thermal power is less than 85%. Enter T.S. LCO 3.3.1 Condition Q – Verify interlock is in required state for existing conditions (P10 Aqua Light LIT) within 1 hour or be in Mode 3 in 7 hours. Enter T.S. LCO 3.3.1 Condition R – Verify interlock is in required state for existing conditions (P7, P8, & P9 Aqua Lights NOT LIT) within 1 hour or be in Mode 2 in 7 hours. Remove N-43 from service as follows: Place Rod Stop Bypass switch in the “N-43” position. Place Power Mismatch Bypass switch in the “N-43” position. Place Upper Section Current Comparator Defeat switch in the “N-43” position and verify the Upper Section channel Defeat Light is LIT. Place Lower Section Current Comparator Defeat

Retention: Life of Plant

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 5	<p>9. When N-43 is removed from service (except for tripping bistables) and/or at the discretion of the lead evaluator, enter: Trigger 5, Pressurizer Spray Valve PCV-431 drifts to 75% open.</p> <p>a. If contacted as the Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked.</p> <p>b. If contacted as the FIN Team Supervisor, inform the crew that you will write a work order and assign a Maintenance Supervisor to investigate.</p> <p>10. Plant Response:</p> <p>a. Pressurizer pressure lowers slowly.</p> <p>b. Pressure will reach 1930 psig in approximately two minutes with NO operator action.</p> <p>c. Pressurizer Heaters turn ON.</p> <p style="text-align: center;"><u>CONTIGENCY</u></p> <p><i>If the crew trips the reactor due to low pressurizer pressure, then skip Event 6 and proceed to Event 7 after the crew transitions to 1ES-0.1, Reactor Trip Recovery.</i></p>	<p>RO</p> <p>SS</p>	<p>C47012-0508, PRZR HI/LO PRESS</p> <ul style="list-style-type: none"> • Determine pressure is low. • Verify all pressurizer heaters ON. • Verify PORVs, CV-31231 and CV-31232, are closed. • Verify both spray valves CLOSED. • Verify CV-31329, AUX PRZR SPRAY, is closed. • Verify pressurizer pressure control in automatic and functions properly. • Refer to T.S. 3.4.1 and ensure required DNB parameters are met. • If Pressurizer pressure drops below 2175 psig, then enter T.S. LCO 3.4.1 Condition A – Restore RCS DNB parameter(s) to within limit in 2 hours (i.e. restore pressurizer pressure above 2175 psig).

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 6	<p>11. When the plant is stable, and/or at the discretion of the lead evaluator, then enter: Trigger 6, Loss of Loop A RCS flow due to Bus 11 Lockout.</p> <p>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, then open and run schedule file E-0_Att-J.sch located in X:\Trex_PI\Lightning\Schedule\EOPs. When the isolation is complete, inform the crew the MSRs are isolated.</p> <p>12. Plant Response:</p> <p>a. Annunciators for a Bus 11 Lockout. b. 11 RCP NOT running indication. c. Loop A RCS flow lowers rapidly. d. Annunciator C47017-0301 (Reactor Trip First Out) is received. e. The reactor fails to automatically trip. f. The reactor is capable of a manual trip.</p> <p style="text-align: center;"><u>CRITICAL TASK</u></p> <p><i>Manually trip the reactor from the control room before transition out of E-0.</i></p> <p style="text-align: center;"><u>EMERGENCY PLAN CLASSIFICATION</u></p> <p><i>ALERT – SA2.1 due to the reactor failing to automatically trip during the RCS Low Flow condition and the crew successfully manually tripping the reactor.</i></p>	<p>RO</p> <p>RO/ LEAD</p> <p>SS</p> <p>RO/ LEAD/ SS</p>	<p>C47017-0301, ONE LOOP LO FLOW OR RCP BKR OPEN REACTOR TRIP</p> <ul style="list-style-type: none"> Perform 1E-0. <p>1E-0, REACTOR TRIP OR SAFETY INJECTION</p> <ul style="list-style-type: none"> Determine the reactor did NOT automatically trip. Manually trip the reactor. Verify turbine trip. Verify both safeguards buses are energized. Determine SI is NOT actuated. Transition to 1ES-0.1. <p>1ES-0.1, REACTOR TRIP RECOVERY</p> <ul style="list-style-type: none"> Announce “Unit 1 Reactor Trip”. Determine Steam Dump is already in pressure mode. Check RCS temperatures. Check Cooling Water Header Pressures greater than 75 psig. Notify Turbine Building Operator to Isolate Unit 1 MSRs per ATTACHMENT J. Check FW Status.
Retention:	Life of Plant		
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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 7 (cont)	<p style="text-align: center;"><u>NOTE</u></p> <p><i>If a RED or ORANGE path is received on the INTEGRITY CRITICAL SAFETY FUNCTION TREE when the crew transitions to 1E-2, then the crew will transition to 1FR-P.1 instead.</i></p> <p style="text-align: center;"><u>CRITICAL TASK</u></p> <p><i>Isolate the faulted STEAM GENERATOR before transition out of E-2, unless the transition is to FR-P.1, in which case the task must be completed prior to checking if safety injection should be terminated per step 6 of FR-P.1.</i></p>	<p>SS</p> <p>RO/ LEAD</p> <p>SS</p> <p>RO/ LEAD</p>	<ul style="list-style-type: none"> ○ Stop 12 RCP (11 RCP is already secured from the loss of bus 11). • Check if SGs are NOT faulted. • Determine 12 SG pressure is decreasing in an uncontrolled manner. • Stop feed flow to 12 SG. • Transition to 1E-2. <p>1E-2, FAULTED STEAM GENERATOR ISOLATION</p> <ul style="list-style-type: none"> • Check MSIV and Bypass valve on 12 SG are closed. • Determine 11 SG is NOT faulted. • Determine 12 SG is faulted. • Isolate 12 SG: <ul style="list-style-type: none"> ○ Isolate main feedline. ○ Isolate AFW flow. ○ Close steam supply valve to TD AFW pump from 12 SG. ○ Verify 12 SG PORV is closed. ○ Verify SGB isolation valve closed. • Check Secondary Radiation is normal. • Transition to 1E-1. <p>1FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION</p> <ul style="list-style-type: none"> • Check RCS pressure greater than 550 psig. • Determine RCS Cold Leg Temperatures lowering. • Verify SG PORVs & Steam dumps closed. • Control feed flow to 11 SG. • Verify MSIV and bypass valves closed. • Close steam supply from 12 SG to TD AFW Pump. • Isolate all FW to 12 SG.

Retention: Life of Plant

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 7 (cont)		LEAD	1E-0 Attachment L: SI Alignment Verification <ul style="list-style-type: none"> • Verify Safeguards Component Alignment: • Verify both trains of SI actuated: <ul style="list-style-type: none"> ◦ Both RHR pumps - RUNNING -OR- ◦ Both SI pumps - RUNNING • "SI NOT READY" lights - NOT LIT • "SI ACTIVE" lights - LIT FOR PLANT CONDITIONS • "CONTAINMENT ISOLATION" lights - LIT FOR PLANT CONDITIONS • Check Category 1 Vent Zone Boundary: • Close MV-32115, 122 SFP HX INLT HDR MV B • Check Cooling Water Header Pressures - BOTH GREATER THAN 65 PSIG • Verify Plant Announcements Complete: • Check If Main Steamlines Are Isolated: • MSIVs and bypass valves – CLOSED • Containment instrument air valves - CLOSED: • Verify SI Flow: • Verify RHR Flow • Verify Containment Spray actuated and verify lineup. • Check RCP Cooling • Verify Local Actions Complete • Verify Generator Breakers – OPEN • Verify All Heater Drain Pumps – STOPPED • Check Turbine Valves: <ul style="list-style-type: none"> ◦ Turbine reheat and intercept valves – CLOSED ◦ Open turbine drain valves • Verify Main Feedwater Alignment: <ul style="list-style-type: none"> ◦ Both main feedwater pumps – STOPPED ◦ Main and bypass FRVs - CLOSED • Verify All Condensate Pumps - STOPPED:

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 7 (cont)	<p>15. If Control Room personnel ask for status of Unit 2 Cooling Water/Chilled Water lineup, then inform the Control Room that Unit 2 Cooling Water/Chilled Water valves are in there safeguards positions.</p> <p>16. If Control Room personnel ask for status of Battery Room Temperatures, then inform the Control Room that Battery Room temperatures are less than 84 °F.</p> <p>17. If Control Room personnel ask for status of Spent Fuel Cooling, then inform the Control Room that Spent Fueling level and temperature are normal.</p>		<ul style="list-style-type: none"> • Place Steam Dump In "STM PRESS" Mode • Verify Unit 1 Cooling Water/Chilled Water Alignment: <ul style="list-style-type: none"> ○ CFCU control switches - "SLOW". ○ CFCU dampers - ALIGNED TO DOME ○ Unit 1 cooling water/chilled water valves closed ○ Unit 1 CRDM shroud cooling supply and return valves – CLOSED ○ CFCU cooling water supply and return valves – OPEN ○ CFCU chilled water supply and return valves – CLOSED • Verify 11 Safeguards Screenhouse Ventilation lineup. • Verify Control Room Ventilation Alignment: <ul style="list-style-type: none"> ○ Chillers and fans – RUNNING ○ Control room chiller suction/discharge tie closed - STATUS LIGHT LIT • Verify Unit 2 Cooling/Chilled Water Alignment • Verify 21 Safeguards Screenhouse Ventilation lineup. • Verify 11 and 12 Battery Charger Operation is normal. • Verify Battery Room temps less than 84 °F. • Check status of Spent Fuel Cooling. • Check Status Of Notifications • Notify SS Of Any Discrepancies.
	<p>18. Once the crew has transitioned to 1E-1, or completed step 6 of 1FR-P.1, and/or at the discretion of the Lead Evaluator, then place the simulator in FREEZE and inform the crew that training has the duty.</p>		

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

SIMULATOR INPUT SUMMARY

@Time	Event	Action	Description
00:00:00		Insert override DI-46098P to True	123 IA COMP OOS
00:00:00		Insert override DI-46098ST to False	123 IA COMP OOS
00:00:00		Insert malfunction RX226 to 616.00000	1 TURB 1ST STAGE STM (CHNL II-WHI) P XMTR (1PT-485)
00:00:00		Insert malfunction RP02A	FAILURE OF AUTOMATIC REACTOR TRIPS TRAIN A
00:00:00		Insert malfunction RP02B	FAILURE OF AUTOMATIC REACTOR TRIPS TRAIN B
	3	Insert malfunction M47018:0301W to Cry_Wolf on event 3	11 SI PUMP PLACED IN LOCAL
	3	Insert override DI-46178P to True on event 3	11 SI PUMP REMOTE START DISABLED
	3	Insert override DI-46178ST to False on event 3	11 SI PUMP REMOTE START DISABLED
	13	Delete malfunction M47018:0301W to Cry_Wolf on event 13	11 SI PUMP PLACED IN REMOTE
	13	Insert override DI-46178P to False on event 13 delete in 5	11 SI PUMP REMOTE START ENABLED
	13	Delete override DI-46178ST to False on event 13	11 SI PUMP REMOTE START ENABLED
	4	Insert malfunction NI05C to 100.00000 on event 4	IMPROPER POWER RANGE CHANNEL N43 RESPONSE
	5	Insert malfunction RX01A to 75.00000 in 30 on event 5	PRESSURIZER SPRAY VALVE PCV-431 A FAILS OPEN (75%)
	5	Insert malfunction M47014:0606B to Off on event 5	AMSAC/DSS BLOCKED ANNUNCIATOR TURNED OFF
	5	Insert malfunction CP-1Y0501D to RESET on event 5	AMSAC/DSS BLOCKED ERCS ALARM TURNED OFF
	5	Insert override DI-46447B after 2 to True on event 5	BLOCK AMSAC/DSS
	6	Insert malfunction ED09A on event 6	LOSS OF 4160V BUS #11
	7	Insert malfunction MS01B to 50.00000 in 180 on event 7	MS LINE #12 RUPTURE INSIDE CONTAINMENT UPSTREAM OF MSIV

Retention: Life of Plant

Retain in: Training Program File

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

SIMULATOR SETUP CHECKLIST

Before Scenario

- _____ Simulator Status:
- | | |
|---------------------------|---|
| _____ 1. "Training Load" | _____ 2. Step counters "ON" |
| _____ 3. Alarm sound "ON" | _____ 4. Steps 1 – 7 on page 6 complete |
| _____ 5. Speed: "REAL" | _____ 6. IC-263 or IC-8 running |
- _____ Delete the memory on the Yokogawa Model DX1000 recorders by cycling the Recorder Power OFF pushbutton in the simulator instructor's booth.
- _____ Verify Schedule File/Summary matches Simulator Input Summary page in the SEG.
- _____ Verify that control rod step counters on C panel and ERCS RBU matches the IC conditions.
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset.
- _____ BOC ΔI sheet displayed on C panel.
- _____ BOC Reactivity Briefing sheet available at Reactor Operator Desk.
- _____ Turnover sheet/PRA sheet available.
- _____ If it is the first scenario of the day, then perform a shutdown and restart of the floor PCs that are connected to the LAN.
- _____ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID).
- _____ Electronic PINGP 577 forms closed on LAN connected PCs.
- _____ Board-mounted EAL Tables are cleaned.
- _____ EOOS running on PC and updated as follows to reflect equipment OOS:
- _____ 1. 123 Air Compressor
- _____ Update Control Board Placards:
- | |
|--|
| _____ 1. NRC Current Authentication Code call date updated to current date. |
| _____ 2. High Flux At Shutdown Alarm Setpoint placards: 5900 cps. |
| _____ 3. Feedwater regulating valve position placard set to current values. |
| _____ 4. Recommended SG Blowdown flow set to current values. |
| _____ 5. RCS boron on the CVCS panel placard: 1482 ppm. |
| _____ 6. Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions). |
| _____ 7. Shift Reactivity Guidance placard: BA: 4.8 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. 12 BA PUMP "Lined Up to 11 BA Tank" |
| _____ 4. CC to SFP MV-32117 "In Service" |
| _____ 5. Blowdown 46470 "SGB To CDSR" |
| _____ 6. HU Flag above 12 RHR HX CC inlet MV-32094 for "1C14 Limitation" |
| _____ 7. "H ₂ IN VCT SPACE" at VCT |

PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

_____ Pink Status Control Tags in place:

- ___ 1. CS-46540, 22 CC WTR PUMP
- ___ 2. CS-46572, CC TO SFP MV-32117

_____ Yellow Caution Tags in place:

- ___ 1. CS-46064, CC TO SFP MV-32115, in CLOSED
- ___ 2. CS-46098, 123 AIR COMPRESSOR, in PULLOUT

_____ ERCS driven recorders are on-scale (RCS temperature scaled 550° F to 560° 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	1Q0340A	1V4501A

_____ ERCS TPM set (Calorimetric - Auto Scaling - LEFM).

_____ Verify that copy machine and printers are loaded with paper.

_____ Pens/Paper/Markers available on the simulator.

_____ Verify 121 IA Compressor is in PREFERRED and 122 IA Compressor is in PREFERRED.

_____ Verify R11/R12 are lined up correctly (at the R11/R12 local panel):

- ___ 1. Sample pump is running.
- ___ 2. Alarms are reset.
- ___ 3. CS-8006106, Sample Inlet Switch, is selected to CNTMT.
- ___ 4. CS-8006107, Sample Outlet Switch, is selected to Aux Bldg Stack.

_____ 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 VPL set to 22%.

_____ DEHC alarms cleared.

_____ N51 & N52 Display Sheets for 50% power are in place as necessary.

_____ Procedure 1C51 marked up for PT-485 failure.

_____ Headsets turned on as necessary.

_____ Procedure checklist completed. See following page.

_____ Peer Check performed for simulator setup.

PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0**PROCEDURE CHECKLIST**

The following procedures will be used during this session. Verify the procedures are free of place keeping marks before starting the session and after the session are complete:

Before	After	
_____	_____	1C12.1, LETDOWN, CHARGING, AND SEAL WATER INJECTION – UNIT 1
_____	_____	1C51.2, First Stage Pressure PT-485 - High
_____	_____	1C51.3, Power Range Nuclear Instrument N-43 – High
_____	_____	1E-0, REACTOR TRIP OR SAFETY INJECTION
_____	_____	1E-1, LOSS OF REACTOR OR SECONDARY COOLANT
_____	_____	1E-2, FAULTED STEAM GENERATOR ISOLATION
_____	_____	1ES-0.1, REACTOR TRIP RECOVERY
_____	_____	1FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION
_____	_____	C47012-0508, PRZR HI/LO PRESS
_____	_____	C47013-0101, NIS POWER RANGE POS FLUX RATE CH ALERT.
_____	_____	C47013-0102, NIS POWER RANGE HI SETPOINT CH ALERT.
_____	_____	C47013-0103, NIS POWER RANGE OVERPOWER ROD WITHDRAWAL STOP.
_____	_____	C47013-0203, NIS POWER RANGE CHANNEL DEVIATION.
_____	_____	C47013-0305, AUCTIONEERED TAVG-TREF DEVIATION
_____	_____	C47017-0301, ONE LOOP LO FLOW OR RCP BKR OPEN REACTOR TRIP
_____	_____	C47018-0301, 11 SI PUMP LOCAL CONTROL SI AUTO START BLOCKED
_____	_____	C7, REACTOR CONTROL SYSTEM
_____	_____	EAL BOARDS
_____	_____	EOP INFORMATION BOOK
_____	_____	F3-2 EAL STICKER BOOK checked for missing stickers
_____	_____	F3-2.1, EMERGENCY ACTION LEVEL TECHNICAL BASES
_____	_____	FIGURE C1-5, PROGRAMMED MODERATOR TEMPERATURE FOR POWER SWING
_____	_____	SWI O-28, NOTIFICATION OF OPERATIONS MANAGER & NRC RESIDENT INSPECTOR
_____	_____	SWI O-50, REACTIVITY MANAGEMENT
_____	_____	T.S. LCO 3.2.1
_____	_____	T.S. LCO 3.3.1
_____	_____	T.S. LCO 3.4.1
_____	_____	T.S. LCO 3.5.2
_____	_____	T.S. LCO 3.5.3
_____	_____	
_____	_____	
_____	_____	
_____	_____	

PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0**Post-Scenario Checklist**

- _____ LAN connected computers are cleared of information added during the scenario.
- _____ Computer generated PINGP 577 cleared.
- _____ Procedure checklist completed. See previous page.
- _____ Remove Pink Status Control Tags from the following equipment:
 ___ 1. NONE
- _____ Magnetic placards removed:
 ___ 1. NONE
- _____ Remove Yellow Caution Tags from the following equipment:
 ___ 1. CS-46098, 123 Air Compressor.
- _____ Erase marker on RCS temperature ERCS driven recorder.
- _____ 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**1. PT-485, Turbine First Stage Pressure, is failed HIGH.**

- T.S. 3.3.1 Condition A and R entered.
- P7 was verified to be in required state for existing unit conditions.
- TRM 3.3.4 Condition A was entered.
- A WR was initiated to repair PT-485.

PROTECTED EQUIPMENT

22 CC PUMP
121 SFP HX

RAD MONITORS OOS

NONE

ANNUNCIATORS OOS

NONE

OUTSTANDING SP'S

NONE

FIRE DET / PROT EQP IMPAIRMENTS

NONE

OTHER EQUIPMENT OOS / STATUS

- 123 Air Compressor is Out of Service.
- Instrument Air is separated from Station Air due to clam shelling in progress.

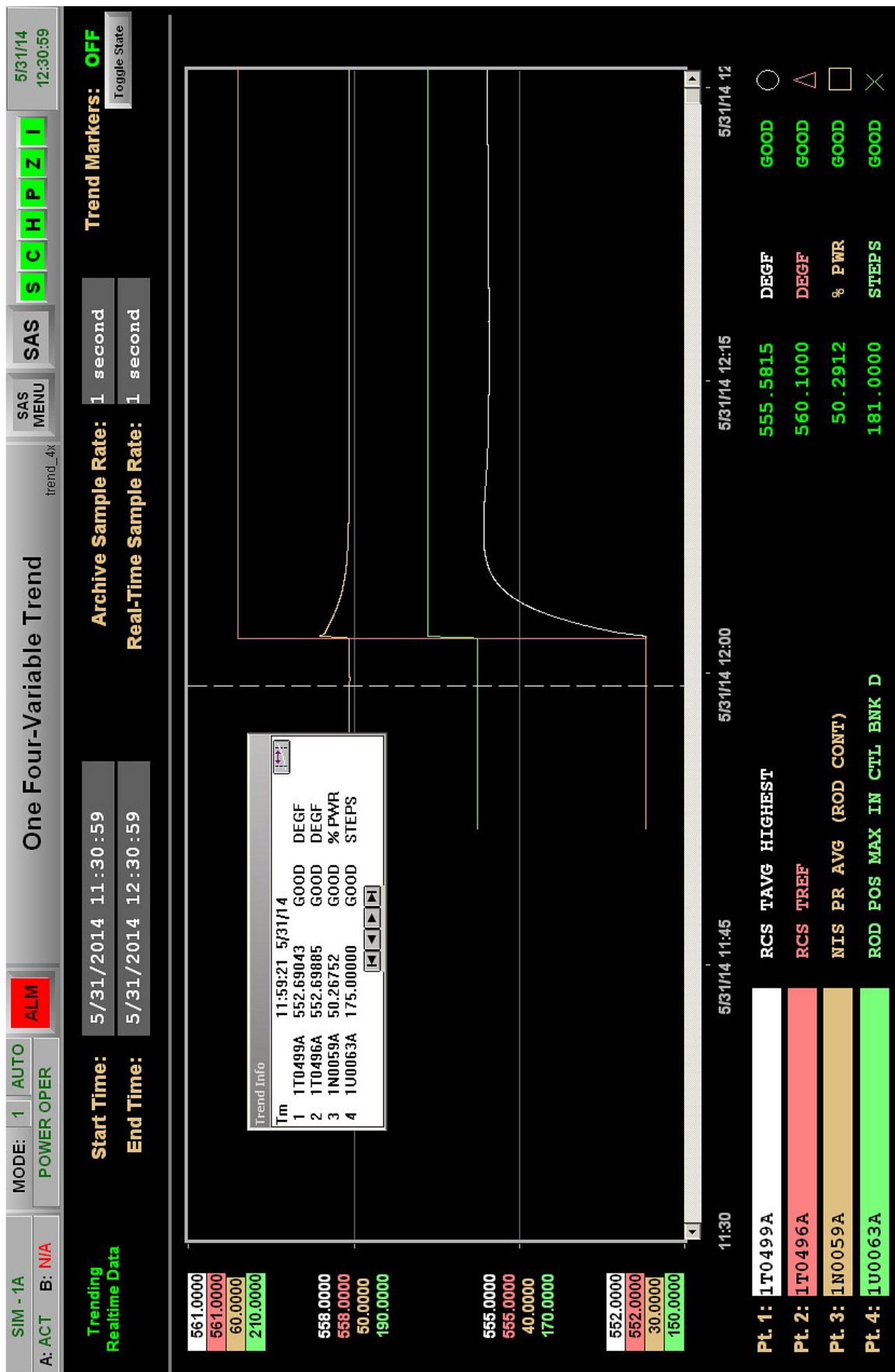
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE

- Unit 1 was returned on-line two days ago. A 51% hold is in effect due to chemistry.
- 13 Charging Pump Suction Stabilizer PM is complete and ready for re-start. 13 Charging Pump desurger has already been checked by the out-plant operator.

OPERATIONAL PLANS FOR COMING SHIFT

- Maintain Rod Control in Manual and Steam Dump in Steam Pressure Mode.
- 1C51.2 actions are complete for the failed instrument with the exception of restoring Tav_g to program temperature. Tref is currently pegged high.
- Restore RCS Average Coolant Temperature to program temperature.
- Swap charging pumps to 11 and 13 are running and 12 secured per Section 5.4.1 of 1C12.1.
- Xenon is at equilibrium. Maintain 50% - 51% power for the next 24 hours.
- Dilute 10 gallons 1-2 times per shift for temperature control.

NEW PROCEDURES / INSTRUCTIONSReview altered scale on Tav_g ERCS Recorder.



Retention: Life of Plant

Retain in: Training Program File

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

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.

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0**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 conditions agreed with the reference plant with respect to reactor status, plant configuration, and system operation. | Yes
X | No |
| 2. The simulator operated in real time during conduct of validation. | Yes
X | No |
| 3. The simulator demonstrated expected plant response to operator input and to normal, transient, and accident conditions. | Yes
X | No |
| 4. The simulator permitted use of the reference plant's procedures. The scenario was completed without procedural exceptions, simulator performance exceptions, or deviation from the scenario sequence. | Yes
X | No |
| 5. The simulator did not "fail to cause" or "unexpectedly cause" any first principle alarm or primary automatic action. | Yes
X | No |
| 6. Observable changes in parameters relevant to the scenario corresponded in trend and direction to reference plant's expected response. | Yes
X | No |
| 7. All malfunctions and other instructor interface items were functional and demonstrated the expected reference plant's response to the initiating cause. | Yes
X | No |
| 8. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes
X | No |
| 9. The scenario satisfies the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence. | Yes
X | No |
| 10. Simulator fidelity has been demonstrated to be adequate for this scenario. | Yes
X | No |

Discrepancies noted (Check "none" or list items found) ☒ None

SMAR = Simulator Action Request

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

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1403S, 2014 ILT NRC SIMULATOR EVALUATION #3, REV. 0

Comments: _____

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

Validation Personnel		
Name	Job Title / Qualification	Validation Position
Fred Collins	Operations Instructor	Lead Evaluator
Nic Abney	Operations Instructor	Booth Driver
Jeff Human	Operations SRO	Shift Supervisor
Rick Martin	Operations RO	RO
Mark Haren	Operations RO	LEAD

Retention: Life of Plant

Retain in: Training Program File

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	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: PRAIRIE ISLAND**SEG # PI-ILT-NRC-1404S****SEG TITLE: 2014 ILT NRC SIMULATOR EVALUATION #4****REV. # 0****PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****TOTAL TIME: 2.0 HOURS**

Developed by:	Shawn Sarrasin <i>Instructor</i>	1/25/2014 <i>Date</i>
Reviewed by:	Fredrick Collins <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	2/26/2014 <i>Date</i>
Validated by:	Shawn Sarrasin <i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	4/22/2014 <i>Date</i>
Approved by:	Travis Ouret <i>Training Supervision</i>	7/18/2014 <i>Date</i>

Guide Requirements

Goal of Training:

1. 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.
 2. 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. Alternate Containment Fan Coil Units and discharge dampers per 1C19.2.
 2. Diagnose and perform corrective actions for 1PT-468, Red Channel A Steam Generator Steam Pressure, failing high per 1C51.1.
 3. Perform a load increase per 1C1.4.
 4. Diagnose and respond to a Dropped Rod per 1C5 AOP4.
 5. Diagnose and respond to a failure of the Main Turbine to automatically trip per 1E-0.
 6. Diagnose and respond to a Station Blackout per 1ECA-0.0.
 7. Diagnose and respond to the TD AFW Pump failing to automatically start per 1ECA-0.0.
-

Training Resources:

1. Full Scope Simulator
 2. NRC Evaluation Team
 3. Booth Operator (Backup Communicator)
 4. Primary Communicator
-

Related PRA Information:
Initiating Event with Core Damage Frequency:

LOOP (1.5%)

Important Components:

11 TD AFW PMP

Important Operator Actions with Task Number:

NONE

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. 1PT-468, Red Channel A Steam Generator Pressure Instrument, fails high.
2. Dropped Rod (Control Bank A Group 1 Rod B8).

After EOP Entry:

1. Reactor fails to automatically trip.
2. Main Turbine fails to automatically trip.
3. 11 TD AFW Pump fails to automatically start.

Abnormal Events:

1. SG Pressure Instrument Failure.
2. Dropped RCCA.

Major Transients:

1. Loss of All AC.

Critical Tasks:

1. E-0 – A: Manually trip the reactor from the control room before transition out of E-0.
2. E-0 – Q: Manually trip the main turbine before transition out of E-0.
3. ECA-0.0 – B: Establish and maintain 200 GPM AFW flow to the Steam Generators prior to Step 3 of ECA-0.0.
4. ECA-0.0 – H: Isolate RCP seal injection before a charging pump is started.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

- Exposure: BOC
- Power: 50%
- Boron (CB): 1480 ppm
- Temperature: 553°F
- Pressure: 2235 psig
- Xenon: Equilibrium
- Rods: "D" @ 175
- Generator: 265 MW

EQUIPMENT OOS

- 13 Charging Pump

SEQUENCE OF EVENTS:

Event 1: Alternate Containment Fan Coil Units and Discharge Dampers

- 11 and 13 CFCUs are initially in fast speed and aligned to SUP/GAP.
- 12 and 14 CFCUs are initially in slow speed and aligned to the DOME.
- The crew will perform section 5.6.4.A of 1C19.2.
- 11 and 13 CFCUs will then be in slow speed and aligned to DOME.
- 12 and 14 CFCUs will then be in fast speed and aligned to the SUP/GAP.

Event 2: Red Channel A Steam Generator Pressure Instrument fails HIGH

- FW Control System Trouble alarm will be received.
- 1PT-468, A Steam Generator Pressure, rises until pegged high.
- A Steam Generator PORV will open.
- The crew will place A SG PORV in manual and close it.
- The SS will enter T.S. LCO 3.3.2 Condition A and D.

Event 3: Unit 1 Load Increase from 50% to 60% Power

- The crew briefed the load increase prior to taking the duty.
- Shift Management will direct the crew to raise power to 60% when the 50% chemistry hold is lifted.
- The crew will increase load per 1C1.4.

Event 4: Control Bank A Group 1 Dropped Rod (B-8)

- Control Bank A Group 1 Rod B-8 will indicate zero steps.
- RCS Tavg will lower.
- NI Power will lower.
- A negative flux rate reactor trip will be received.
- The reactor will fail to automatically trip.
- The crew will diagnose a dropped rod and manually trip the reactor per 1C5 AOP4.

Event 5: Main Turbine Fails to Automatically Trip

- The crew will enter 1E-0, Reactor Trip or Safety Injection.
- The Main Turbine will fail to automatically trip.
- The Lead will manually trip the turbine from the Control Room.

Events 6 & 7: Loss of All AC

- This event will occur after the Main Turbine is tripped.
- A loss of offsite power occurs.
- A lockout will occur on Bus 15 and Bus 16.
- The crew will transition to 1ECA-0.0, Loss of All Safeguards AC Power.
- 11 TD AFW Pump will have failed to automatically start after the reactor trip.
- The crew will manually start 11 TD AFW Pump from the Control Room.
- Since both safeguards buses are locked out, the crew will go to step 8.
- An out-plant operator will be directed to isolate RCP seals.
- Safeguards loads will be placed in pullout.
- Bus 15 and 16 will remain locked out for the remainder of the scenario.
- The crew will initiate depressurization of both SGs.

Simulator Setup:

NOTE: The time between simulator reset and placing simulator in RUN should be minimized to reduce the difference between the ERCS time and actual time.

1. If available, reset the simulator to IC-264 and place in RUN.
2. If IC-264 is NOT available:
 - a. Reset to IC-8.
 - b. Place the simulator in RUN.
 - c. Place ALL pressurizer heaters to ON.
 - d. Insert remote FW123 to OPEN.
 - e. Start 12 Condensate Pump using CS-46411.
 - f. Start 11 FWP using CS-46418.
 - g. Start 12 HDT Pump per 1C28.4.
 - h. Raise HDT Pump speed to stabilize HDT level.
 - i. Wait until heater drains have stabilized.
 - j. Insert remote MS118 to RESET.
 - k. Ensure Tav_g and Tref are matched.
 - l. Place CS-46294, 13 CHG PUMP, in PULLOUT.
 - m. Insert Malfunction VC04C.
3. Verify the ROD DEVIATION alarm is CLEARED as follows:
 - a. Log into the ERCS terminal with user "OVRD" and password "DUTY" (if needed).
 - b. Go to ERCS Screen RBU (Rod Bank Update).
 - c. Enter 175 as the new value for point 1U0052A, ROD POS BNK D.
 - d. Select "Apply".
 - e. Verify Annunciator 47013-0507, COMPUTER ALARM / ROD DEVIATION / SEQUENCING, has cleared.
4. Verify the Pen Recorder for RCS Tav_g and Tref are set correctly as follows:
 - a. Log into the ERCS terminal with user "OVRD" and password "DUTY" (if needed).
 - b. Go to ERCS Screen PEN_TREND (Pen Trend Configuration).
 - c. Enter 550 as the new Min EU value for Pen 1U9001A (point 1T0499A).
 - d. Enter 560 as the new Max EU value for Pen 1U9001A (point 1T0499A).
 - e. Enter 550 as the new Min EU value for Pen 1U9002A (point 1T0496A).
 - f. Enter 560 as the new Max EU value for Pen 1U9002A (point 1T0496A).
5. If available, run schedule file **PI-ILT-NRC-1404S.sch** as follows:
 - a. Select open file in the Schedule application.
 - b. Locate schedule file.
 - c. Open schedule file by double clicking it.
 - d. Run the schedule file by pressing the "Stopped" button on the toolbar.
 - e. Verify the schedule file is running.
6. If schedule file is NOT available, then insert malfunctions, remotes, and overrides, as specified by the Simulator Input Summary.
7. If available, run event file **PI-ILT-NRC-1404S.evt** as follows:
 - a. Select open file in the Event application.
 - b. Locate event file.
 - c. Open event file by double clicking it.
8. If event file is NOT available, then enter event codes as specified by the Simulator Event Summary.
9. If desired, start Scenario Based Testing Data Collection Program.
10. Complete the "Simulator Setup Checklist."

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>1. SIMULATOR PRE-BRIEF:</p> <ul style="list-style-type: none"> a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. b. Review Unit 1 LPEO / PEO Turnover Log. c. Perform a pre-job brief for the following activities: <ul style="list-style-type: none"> 1) Alternate CFCUs and Discharge Dampers per C19.2 section 5.6.4.A. <ul style="list-style-type: none"> (a) This is being performed so thermographs can be taken of the 12 and 14 CFCU breakers. (b) Current CFCU lineup: <ul style="list-style-type: none"> (1) 11 and 13 CFCUs are running in SLOW to the DOME. (2) 12 and 14 CFCUs are running in FAST to the SUP/GAP. (c) Shift CFCUs such that: <ul style="list-style-type: none"> (1) 11 and 13 CFCUs are running in FAST to the SUP/GAP. (2) 12 and 14 CFCUs are running in SLOW to the DOME. (d) A copy of C19.2 is provided. (e) The Lead RO will perform this activity. (f) This activity is to be performed after shift turnover is complete. 2) Raise power to 60%. <ul style="list-style-type: none"> (a) There is currently a power hold at 51% for chemistry control. (b) The Duty Chemist is performing samples and will inform the Shift Manager when it is ok to raise power to 60%. (c) Once power is at 60%, another hold for chemistry will be in effect. (d) A marked up copy of 1C1.4 Section 5.1 is provided (blank copy of the page for setting up turbine controls). (e) There are NO fuel conditioning requirements and NO turbine ramp limits. (f) Raise Reactor Power to 60%: <ul style="list-style-type: none"> (1) RATE: 0.5%/minute. (2) Rods in "MANUAL". (3) Turbine in "AUTO" in LOAD mode. (g) A reactivity plan was developed by the off going RO for the power increase from current power to 60%. (h) Verify the reactivity plan developed by the off going reactor operator. (i) Nuclear Engineering was NOT available to provide a reactivity prediction. <p>2. COMPLETE TURNOVER:</p> <ul style="list-style-type: none"> a. Crew performs a walk down of the control boards. b. Review PRA Printout. c. Crew takes the duty. 		

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 1	<p>3. After the crew has assumed the duty, they will alternate Containment Fan Coil Units and Discharge Dampers per section 5.6.4.A of 1C19.2 so that:</p> <p>a. 11 and 13 CFCUs are running in SLOW to the DOME.</p> <p>b. 12 and 14 CFCUs are running in FAST to SUP/GAP.</p>	LEAD	<p>1C19.2, CONTAINMENT SYS VENTILATION UNIT 1</p> <ul style="list-style-type: none"> • Shift the following fan coil units to SLOW by placing the control switch in “OFF” for 15 seconds, then placing the control switch in “SLOW:” <ul style="list-style-type: none"> ○ CS-46018, 11 CNTMT FAN COIL UNIT ○ CS-46019, 13 CNTMT FAN COIL UNIT • Align the fan coil unit discharge dampers as desired: <ul style="list-style-type: none"> ○ CS-46440, 11 FCU DISCH, to DOME. ○ CS-46441, 12 FCU DISCH, to SUP. ○ CS-46442, 13 FCU DISCH, to DOME. ○ CS-46443, 14 FCU DISCH, to GAP. • Verify the white fan coil unit damper improper lights remain NOT LIT: <ul style="list-style-type: none"> ○ ML-44002-0101, 11 CNTMT FCU DISCH DMPRS IMPROPER ○ ML-44002-0102, 12 CNTMT FCU DISCH DMPRS IMPROPER ○ ML-44002-0103, 13 CNTMT FCU DISCH DMPRS IMPROPER ○ ML-44002-0104, 14 CNTMT FCU DISCH DMPRS IMPROPER • Shift the following fan coil units to FAST by placing the control switch in “OFF” for at least one (1) second, then placing the control switch in “FAST:” <ul style="list-style-type: none"> ○ CS-46020, 12 CNTMT FAN COIL UNIT ○ CS-46021, 14 CNTMT FAN COIL UNIT.

Retention: Life of Plant

Retain in: Training Program File

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

Retention: Life of Plant
Retain in: Training Program File
Form retained in accordance with record retention schedule identified in FP-G-RM-01.

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	<p>6. When the plant is stable and/or at the discretion of the lead evaluator, then:</p> <p>a. As the Shift Manager, inform the Control Room the Unit 1 50% Power Hold for chemistry is lifted. Another Power Hold for chemistry will be in effect when Unit 1 power reaches 60%.</p> <p>b. If contacted as the duty chemist, acknowledge Unit 1 power will be raised from 50% to 60%.</p> <p style="text-align: center;">NOTE</p> <p><i>It is NOT intended to wait for the plant to reach 60% power prior to proceeding to the next event. Once the Lead Evaluator is satisfied with the reactivity manipulation, proceed to Event 4.</i></p>	RO/SS	<p>1C1.4, UNIT 1 POWER OPERATION</p> <ul style="list-style-type: none"> Place CS-46280, ROD BANK SELECTOR, in "MANUAL". Using the "On Line Control" screen: <ul style="list-style-type: none"> Select LOAD. Select 0.5% demand rate. Verify the "VPL" control is not Red. Raise the "VPL" to 101% using the "Valve Limiter" pop-up screen. Set the "Target" setting to the desired Load using "On Line Control" screen "Target" increase/decrease controls. Initiate an alternate dilution of the RCS per 1C12.5. When Tave shows an increase, then select the "Go" control using the "On Line Control" screen. Adjust the alternate dilution rate or perform alternate dilutions per 1C12.5 to maintain Tave and Tref with the desired $\pm 1.5^{\circ}\text{F}$ band.
		RO/SS	<p>1C12.5, UNIT 1 BORON CONCENTRATION CONTROL</p> <ul style="list-style-type: none"> Verify the RMU integrator is reset. Set 1YIC-111, RX MU WTR TO BLENDER BATCH INTEGRATOR, to quantity desired. Place CS-46300, MAKE-UP MODE SELECTOR, to "ALT DIL". Place CS-46454, BA BLENDER TO VCT INLT CV-31201, to "CLOSE". If desired, then adjust 1HC-111, RX MU WTR TO BLENDER FLOW CONT, set point to desired flow rate or place in "MANUAL" adjusted for desired flow rate. Momentarily place CS-46457, BORIC ACID MAKE-UP CONTROL, to "START", to initiate dilution.

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3 (cont)			<ul style="list-style-type: none"> • When the desired quantity of makeup has been added, then verify automatic makeup stopped as indicated by CS-46457, BORIC ACID MAKE-UP CONTROL, green light LIT. • If additional alternate dilution is desired, then return to step 2. • Verify CS-46454, BA BLENDER TO VCT INLT CV-31201, is selected to "AUTO". • Verify 1HC-111, RX MU WTR TO BLENDER FLOW CONT, is in "AUTO" set to 45%. • Place CS-46300, MAKE-UP MODE SELECTOR, to "AUTO". • Momentarily place CS-46457, BORIC ACID MAKE-UP CONTROL, to "START". • Reset the RMU integrator.

Retention: Life of Plant

Retain in: Training Program File

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

Retention: Life of Plant
Retain in: Training Program File
Form retained in accordance with record retention schedule identified in FP-G-RM-01.

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6 & 7	<p>9. Ten (10) seconds after the Main Turbine is manually tripped, verify: AUTO Trigger 6, LOSS OF ALL AC, is entered.</p> <p>a. Approximately 15 seconds after the Loss of All AC, announce the following: 1) "Attention all plant personnel, Unit 2 Reactor Trip. Attention all plant personnel, Unit 2 Reactor Trip."</p> <p>b. If contacted as an out-plant operator to establish communications with the CR to throttle AFW flow, then wait 2 minutes and report you are in the AFW Pump room standing by to throttle AFW flow. Throttle AFW flow as necessary using the following remotes: 1) FW134 – 11 AFW Pump to 11 SG (MV-32238) 2) FW135 – 11 AFW Pump to 12 SG (MV-32239)</p> <p>c. If directed to investigate Bus 15 and 16, after 2 minutes, report Bus 15 and Bus 16 have 50G over current relays showing. As an Electrical Maintenance Supervisor, report it will take at least 6 hours to get one safeguards bus restored.</p> <p>d. If contacted as an out-plant operator to isolate RCP seals, then enter: Trigger 16, Isolate RCP Seals. 1) When Trigger 16 is complete, report to the CR that Step 8 of 1ECA-0.0 is complete.</p> <p>e. If contacted as an out-plant operator to perform Attachment H, then acknowledge order.</p> <p>f. When the crew reaches step 18 of 1ECA-0.0, inform the crew that Unit 2 operators will perform the following: 1) Initiate monitoring of DC supply using ERCS 2) Dispatch personnel to open Foxboro instrument rack doors</p>	<p>SS RO</p> <p>LEAD</p>	<p>1ECA-0.0, LOSS OF ALL SAFEGUARDS AC POWER</p> <ul style="list-style-type: none"> • Check PRZR PORVs closed. • Check Letdown isolation valves closed. <ul style="list-style-type: none"> ○ CV-31255 ○ CV-31226 ○ CV-31330 • Recognize AFW flow is below 200 GPM. • Manually start 11 TD AFW Pump. • Announce Unit 1 Reactor Trip • Notify Shift Manager and SEC. • Check cooling water header pressures are both greater than 25 PSIG. • Determine neither safeguards bus is available for sequencer loading due to both being LOCKED OUT. • Proceed to step 8. • Dispatch personnel to locally close valves to isolate RCP seals. • Place the following equipment switches in PULLOUT. <ul style="list-style-type: none"> ○ MD AFW Pump. ○ Groups A & B PRZR heaters (Off position). ○ RHR pumps. ○ SI pumps. ○ CS pumps. ○ CFCUs (Off position). ○ CC pumps. ○ CR Chillers and Fans. ○ 121 and 122 Air Compressors. • Place safeguards bus voltage restoration switches to "MANUAL": <ul style="list-style-type: none"> ○ Bus 15 ○ Bus 16 • Verify Bus 15 and Bus 16 source breakers are open.

Retention: Life of Plant

Retain in: Training Program File

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

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

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0**SIMULATOR INPUT SUMMARY**

@Time	Event	Action	Description
00:00:00		Insert malfunction RP02A	FAILURE OF AUTOMATIC REACTOR TRIPS TRAIN A
00:00:00		Insert malfunction RP02B	FAILURE OF AUTOMATIC REACTOR TRIPS TRAIN B
00:00:00		Insert malfunction FW34A	AUX FW PUMP #11 (TURBINE DRIVEN) FAILS TO START AUTOMATICALLY
00:00:00		Insert malfunction M47010:0505W to Off	11 TD AFWP LUBE OIL LO PRESS OFF
00:00:00		Insert malfunction M47010:0507W to Off	12 MD AFWP LUBE OIL LO PRESS OFF
	2	Insert malfunction RX213 from 860.00000 to 1436.00000 in 30 on event 2	11 SG LOOP A (CHNL I-RED) P XMTR (1PT-468)
	4	Insert malfunction RD07A on event 4	DROPPED ROD B-8 - CBA GR1
	5	Insert malfunction TC11A on event 5	AUTO TURBINE TRIP FAILURE
	6	Insert malfunction ED14 after 10 on event 6	LOSS OF ALL OFFSITE AC POWER
	6	Insert malfunction ED09E after 10 on event 6	LOSS OF 4160V BUS #15
	6	Insert malfunction ED09F after 10 on event 6	LOSS OF 4160V BUS #16
	16	Insert remote VC120 after 30 to 0 on event 16	SEAL WTR RTRN ISOL (MV-32166)
	16	Insert remote VC100 after 60 to 0 on event 16	11 RCP SEAL INJ THROTTLE (VC-14-1)
	16	Insert remote VC101 after 90 to 0 on event 16	12 RCP SEAL INJ THROTTLE (VC-14-2)
	16	Insert remote CC106 after 120 to 0 on event 16	11 RCP BRG CLG WTR RETRN (CC-16-3)
	16	Insert remote CC107 after 150 to 0 on event 16	12 RCP BRG CLG WTR RETRN (CC-16-2)

SIMULATOR EVENT SUMMARY

Event ID	Code	Description
5	ZRPG439(1)==1	REACTOR TRIP
6	HWZTCT6427(1)==1	TURBINE TRIP

Retention: Life of Plant

Retain in: Training Program File

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

SIMULATOR SETUP CHECKLIST

Before Scenario

- _____ Simulator Status:
- | | |
|---------------------------|---|
| _____ 1. "Training Load" | _____ 2. Step counters "ON" |
| _____ 3. Alarm sound "ON" | _____ 4. Steps 1 – 9 on page 6 complete |
| _____ 5. Speed: "REAL" | _____ 6. IC-264 or IC-8 running |
- _____ Delete the memory on the Yokogawa Model DX1000 recorders by cycling the Recorder Power OFF pushbutton in the simulator instructor's booth.
- _____ Verify Schedule File/Summary matches Simulator Input Summary page in the SEG.
- _____ Verify Event File has been entered per Simulator Event Summary page in the SEG.
- _____ Verify that control rod step counters on C panel and ERCS RBU matches the IC conditions.
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset.
- _____ BOC ΔI sheet displayed on C panel.
- _____ BOC Reactivity Briefing sheet available at Reactor Operator Desk.
- _____ Turnover sheet/PRA sheet available.
- _____ If it is the first scenario of the day, then perform a shutdown and restart of the floor PCs that are connected to the LAN.
- _____ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID).
- _____ Electronic PINGP 577 forms closed on LAN connected PCs.
- _____ Board-mounted EAL Tables are cleaned.
- _____ EOOS running on PC and updated as follows to reflect equipment OOS:
- _____ 1. 13 Charging Pump
- _____ Update Control Board Placards:
- | | |
|--|--|
| _____ 1. NRC Current Authentication Code call date updated to current date. | |
| _____ 2. High Flux At Shutdown Alarm Setpoint placards: 5900 cps. | |
| _____ 3. Feedwater regulating valve position placard set to current values. | |
| _____ 4. Recommended SG Blowdown flow set to current values. | |
| _____ 5. RCS boron on the CVCS panel placard: 1465 ppm. | |
| _____ 6. Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions). | |
| _____ 7. Shift Reactivity Guidance placard: BA: 4.8 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. 12 BA PUMP "Lined Up to 11 BA Tank" | |
| _____ 4. CC to SFP MV-32117 "In Service" | |
| _____ 5. Blowdown 46470 "SGB To CDSR" | |
| _____ 6. HU Flag above 12 RHR HX CC inlet MV-32094 for "1C14 Limitation" | |
| _____ 7. "H ₂ IN VCT SPACE" at VCT | |

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_____ Pink Status Control Tags in place:

- ___ 1. CS-46540, 22 CC WTR PUMP
- ___ 2. CS-46572, CC TO SFP MV-32117

_____ Yellow Caution Tags in place:

- ___ 1. CS-46064, CC TO SFP MV-32115, in CLOSED
- ___ 2. CS-46294, 13 CHG PUMP, in PULLOUT

_____ ERCS driven recorders are on-scale (RCS temperature scaled 550° F to 560° 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	1Q0340A	1V4501A

_____ ERCS TPM set (Calorimetric - Auto Scaling - LEFM).

_____ Verify that copy machine and printers are loaded with paper.

_____ Pens/Paper/Markers available on the simulator.

_____ Verify 121 IA Compressor is in PREFERRED and 122 IA Compressor is in 1st STANDBY, and 123 IA Compressor is in 2nd STANDBY.

_____ Verify R11/R12 are lined up correctly (at the R11/R12 local panel):

- ___ 1. Sample pump is running.
- ___ 2. Alarms are reset.
- ___ 3. CS-8006106, Sample Inlet Switch, is selected to CNTMT.
- ___ 4. CS-8006107, Sample Outlet Switch, is selected to Aux Bldg Stack.

_____ 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 VPL set ~ 0.1 to 0.2 above current valve position (not on limiter).

_____ DEHC alarms cleared.

_____ N51 & N52 Display Sheets for 50% power are in place as necessary.

_____ Headsets turned on as necessary.

_____ Procedure checklist completed. See following page.

_____ Peer Check performed for simulator setup.

PROCEDURE CHECKLIST

The following procedures will be used during this session. Verify the procedures are free of place keeping marks before starting the session and after the session are complete:

[illegible]

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0**Post-Scenario Checklist**

- _____ LAN connected computers are cleared of information added during the scenario.
- _____ Computer generated PINGP 577 cleared.
- _____ Procedure checklist completed. See previous page.
- _____ Remove Pink Status Control Tags from the following equipment:
_____ 1. NONE
- _____ Magnetic placards removed:
_____ 1. NONE
- _____ Remove Yellow Caution Tags from the following equipment:
_____ 1. CS-46293, 12 CHG PUMP
- _____ Erase marker on RCS temperature ERCS driven recorder.
- _____ 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	
NONE	
PROTECTED EQUIPMENT	
22 CC PUMP 121 SFP HX	
RAD MONITORS OOS	ANNUNCIATORS OOS
NONE	NONE
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
NONE	NONE
OTHER EQUIPMENT OOS / STATUS	
<ul style="list-style-type: none"> 13 Charging Pump is Out of Service. Two 40 GPM Letdown Orifices are in service. Pressurizer Heaters are ON. 11 and 12 Condensate Pumps are running. 11 and 12 Main Feed Pumps are running. 11 MFP recirc valve is still open; waiting until 70 percent to close per step 5.5.12 and 5.5.13 of 1C28.2. Station Air is supplementing Instrument Air per Section 5.1.3 of C34, Station Air System. 	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
<ul style="list-style-type: none"> Unit 1 was returned on-line two days ago. A 51% hold is in effect due to chemistry. 	
OPERATIONAL PLANS FOR COMING SHIFT	
<ul style="list-style-type: none"> Xenon is at equilibrium. Per section 5.6.4.A of 1C19.2, alternate CFCUs and discharge dampers to the following in preparation of thermography on 12 and 14 CFCU breakers: <ul style="list-style-type: none"> 11 and 13 CFCUs running in SLOW to the DOME. 12 and 14 CFCUs running in FAST to SUP/GAP. Perform a load increase from 50% to 60% when Chemistry releases the hold. Dilute 10 gallons 1-2 times per shift for temperature control. 	
NEW PROCEDURES / INSTRUCTIONS	
Review altered scale on Tavg ERCS Recorder.	

Retention: Life of Plant

Retain in: Training Program File

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

Reactivity Plan

Load increase from 50% to 60%.

Prior to entering the simulator:

- Verify the reactivity plan completed by the off going reactor operator.
- Complete a Pre-Job Brief of 1C1.4 Section 5.1.

Current conditions are:

- 11 and 12 MFPs are running.
- 11 and 12 Condensate Pumps are running.
- Power level: 50% (263 MW)
- Xenon: Equilibrium
- Control Rod Position: Bank D @ 175 steps
- Boron Concentration: 1465 ppm
- Core Exposure: 1000 MWD/MTU

Target: Turbine Load: 311 MW (60%)

Rate: 0.50% /minute

Control Mode: LOAD control with Rod Control in Manual

Boration/Dilution: 267 gallon dilution (batch)

Final Control Rod Position: Bank D @ 178 steps

Reactivity Prediction:

Change in Power Defect: -100 pcm (Figure C1-7A)

Differential Boron Worth: -6.2 pcm/ppm (Figure C1-11A)

Differential Rod Worth: 3.8 pcm/step (Figure C1-4A)

Calculated RCS PPM change: -13 ppm ($80 \text{ pcm} \div -6.2 \text{ pcm/ppm}$)

Calculated Rod Step change: 5 steps ($20 \text{ pcm} \div 3.8 \text{ pcm/step}$)

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.

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0**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 conditions agreed with the reference plant with respect to reactor status, plant configuration, and system operation. | Yes
X | No |
| 2. The simulator operated in real time during conduct of validation. | Yes
X | No |
| 3. The simulator demonstrated expected plant response to operator input and to normal, transient, and accident conditions. | Yes
X | No |
| 4. The simulator permitted use of the reference plant's procedures. The scenario was completed without procedural exceptions, simulator performance exceptions, or deviation from the scenario sequence. | Yes
X | No |
| 5. The simulator did not "fail to cause" or "unexpectedly cause" any first principle alarm or primary automatic action. | Yes
X | No |
| 6. Observable changes in parameters relevant to the scenario corresponded in trend and direction to reference plant's expected response. | Yes
X | No |
| 7. All malfunctions and other instructor interface items were functional and demonstrated the expected reference plant's response to the initiating cause. | Yes
X | No |
| 8. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes
X | No |
| 9. The scenario satisfies the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence. | Yes
X | No |
| 10. Simulator fidelity has been demonstrated to be adequate for this scenario. | Yes
X | No |

Discrepancies noted (Check "none" or list items found) ☐ None

SMAR = Simulator Action Request SWO = Simulator Work Order

SWO: B4D-040 SMAR: SMAR: SMAR:

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1404S, 2014 ILT NRC SIMULATOR EVALUATION #4, REV. 0

Comments: The simulator is modeled to turn on the Low Press annunciator if the AFWP Aux Lube Oil Pump loses power. However, per B28B for both AFW Pumps, "A shaft-driven lube oil pump provides lubrication for the bearings during AFW pump operation. A motor-driven auxiliary oil pump is used to ensure a sufficient oil film for AFW pump starting is maintained during idle periods." The simulator modeling should be revised to have sufficient oil pressure, regardless of the power availability to the Aux LO Pump (i.e., have no alarm). Annunciators 47010-0505 and 47010-0507 were overridden to OFF for this scenario as a compensatory action until the simulator model is updated.

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

Validation Personnel		
Name	Job Title / Qualification	Validation Position
Shawn Sarrasin	Operations Instructor	Lead Evaluator
Nic Abney	Operations Instructor	Booth Driver
Jeff Human	Operations SRO	Shift Supervisor
Rick Martin	Operations RO	RO
Mark Haren	Operations RO	LEAD

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: PRAIRIE ISLAND**SEG # PI-ILT-NRC-1405S****SEG TITLE: 2014 ILT NRC SIMULATOR EVALUATION #5****REV. # 1****PROGRAM: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****COURSE: INITIAL LICENSE OPERATOR TRAINING #: FL-ILT****TOTAL TIME: 2.0 HOURS**

Developed by:	Shawn Sarrasin <i>Instructor</i>	8/7/2014 <i>Date</i>
Reviewed by:	Fredrick Collins <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	8/7/2014 <i>Date</i>
Validated by:	Shawn Sarrasin <i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	8/7/2014 <i>Date</i>
Approved by:	Travis Ouret <i>Training Supervision</i>	8/7/2014 <i>Date</i>

Guide Requirements

Goal of Training:

1. 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.
2. 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. Transfer power on Bus 15 from 1RY to CT11 per 1C19.2.
2. Diagnose and perform corrective actions for an Individual Rod Position Indicator failing low per 1C5 AOP4 and 1C5 AOP5.
3. Diagnose and perform corrective actions for a Red Channel RCS Thot Instrument failing high per 1C51.1.
4. Respond to a Loss of Bus Duct Cooling per 1C22.5 AOP1 and perform a rapid power reduction per 1C1.4 AOP1.
5. Diagnose and respond to a 12 Steam Generator Tube Rupture per 1E-0 and 1E-3.
6. Diagnose and respond to a failure of the Steam Dump System to operate during RCS cooldown per 1E-3.
7. Diagnose and respond to a failure of the SI to Chilled Water signal to actuate per 1E-0 Attachment L.

Training Resources:

1. Full Scope Simulator
2. NRC Evaluation Team
3. Booth Operator (Backup Communicator)
4. Primary Communicator

Related PRA Information:

Initiating Event with Core Damage Frequency:
SGTR (1.8%)

Important Components:
NONE

Important Operator Actions with Task Number:
Operator fails to cooldown and depress RCS for SGTR before SG overfill (1.46%)
CRO 301 004 06 01 000 – Steam Generator Tube Rupture

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Rod E-3 (SBA GR1) Position Indicator fails low.
2. 1TE-401, Red Channel RCS Thot Transmitter, fails high.
3. 11 and 12 Generator Bus Duct Cooler Blowers fail.

After EOP Entry:

1. Failure of SI to Chilled Water Signal to Actuate.
2. Steam Dump fails to operate during RCS Cooldown.

Abnormal Events:

1. RPI Failure.
2. RCS Thot Instrument Failure.
3. Loss of Bus Duct Cooling.
4. Rapid Power Reduction.

Major Transients:

1. 12 Steam Generator Tube Rupture.

Critical Tasks:

1. E-3 – A: Isolate feedwater flow into and steam flow from the ruptured Steam Generator before a transition to ECA-3.1 occurs.
2. 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.
3. E-3 – C: Depressurize RCS to meet SI termination criteria prior to overfilling the ruptured Steam Generator.
4. E-3 – D: Terminate SI prior to overfilling the ruptured Steam Generator.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

- Exposure: MOC
- Power: 100%
- Boron (CB): 853 ppm
- Temperature: 560°F
- Pressure: 2235 psig
- Xenon: Equilibrium
- Rods: "D" @ 218
- Generator: 581 MW

EQUIPMENT OOS

- 1PT-485, Turbine First Stage Pressure, is failed low.
- 11 Safety Injection Pump

SEQUENCE OF EVENTS:

Event 1: Transfer Power on Bus 15 from CT11 to 1RY

- Bus 15 is initially receiving power from CT11.
- A designated operator is stationed to monitor Bus Phase Currents.
- The crew will transfer Bus 15 to 1RY transformer per 1C20.5.

Event 2: Shutdown Bank Group 1 Rod E-3 Position Indication fails LOW

- Rod E-3 rod bottom light will turn on.
- Rod E-3 position indication will indicate 0.
- RCS Tavg and NI Power will remain stable.
- The crew will enter 1C5 AOP4 and 1C5 AOP5.
- The SS will enter T.S. LCO 3.1.7 Condition A.

Event 3: Red Channel RCS Thot Instrument Fails HIGH

- Rods will NOT step in because rods are still in manual due to 1st Stage Pressure Instrument failed low.
- Pressurizer level control will be controlled manually.
- Red Channel Tavg will be defeated.
- The crew will restore pressurizer level control to automatic.
- The SS will enter T.S LCO 3.3.1 Conditions A and E and T.S. LCO 3.3.2 Conditions A and D.

Events 4 & 5: Loss of Bus Duct Cooling and Rapid Power Reduction

- 11 Bus Duct Cooler Blower will trip offline.
- 12 Bus Duct Cooler Blower will fail to start.
- Bus Duct temperature will rise above 92°C.
- The crew will respond per 1C22.5 AOP1.
- The crew will perform a Rapid Power Reduction per 1C1.4 AOP1.

Events 6, 7 & 8: 12 Steam Generator Tube Rupture

- RCS pressure will slowly lower.
- Pressurizer level will slowly lower.
- The crew will:
 - Trip the reactor and initiate Safety Injection per 1E-0.
 - Isolate 12 Steam Generator per 1E-3.
 - Manually align Safeguards Chilled Water components per 1E-0, Attachment L.
 - Cooldown the RCS per 1E-3.
 - The Steam Dump System will fail to operate in manual.
 - The crew will use the 11 SG PORV to cooldown the RCS.
 - Depressurize the RCS to meet SI termination per 1E-3.
 - Terminate SI.

Simulator Setup:

NOTE: The time between simulator reset and placing simulator in RUN should be minimized to reduce the difference between the ERCS time and actual time.

1. If available, reset the simulator to IC-265 and place in RUN.
2. If IC-265 is NOT available:
 - a. Reset to IC-10.
 - b. Place the simulator in RUN.
 - c. Place CS-46178, 11 SI PUMP, in PULLOUT.
 - d. Place CS-46280, ROD BANK SELECTOR, in MANUAL.
 - e. Place CS-46338, STEAM DUMP MODE, in STM PRESS.
 - f. Insert System Override RX226 to 0 (1st Stage Pressure Fails Low).
 - g. Insert Remote RP181 (B/S PC-485A) to TRIP.
 - h. Transfer Bus 15 power to CT11 as follows:
 - i. Place CS-46909, BKR 15-7 MAN/AUTO, to MANUAL.
 - ii. Place CS-46951, BKR 15-3 MAN/AUTO, to MANUAL.
 - iii. Place CS-46906, BUS 15 SYNCH SEL SW, to CT11.
 - iv. Close BKR 15-7 using CS-46955.
 - v. Trip BKR 15-3 using CS-46953.
 - vi. Place CS-46909, BKR 15-7 MAN/AUTO, to AUTO.
 - vii. Place CS-46951, BKR 15-3 MAN/AUTO, to AUTO.
 - viii. Place CS-46906, BUS 15 SYNCH SEL SW, to OFF.
3. If available, run schedule file **PI-ILT-NRC-1405S Rev. 1.sch** as follows:
 - a. Select open file in the Schedule application.
 - b. Locate schedule file.
 - c. Open schedule file by double clicking it.
 - d. Run the schedule file by pressing the "Stopped" button on the toolbar.
 - e. Verify the schedule file is running.
4. If schedule file is NOT available, then insert malfunctions, remotes, and overrides, as specified by the Simulator Input Summary.
5. If desired, start Scenario Based Testing Data Collection Program.
6. Complete the "Simulator Setup Checklist."

PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1**SCENARIO TIME-LINE:**

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<ol style="list-style-type: none"> 1. SIMULATOR PRE-BRIEF: <ol style="list-style-type: none"> a. The Simulator Pre-Brief is conducted prior to the crew entering the simulator. b. Review Unit 1 LPEO / PEO Turnover Log. c. Perform a pre-job brief for the following activity: <ol style="list-style-type: none"> 1) Transfer power on Bus 15 from CT11 to 1RY per section 5.16 of 1C20.5. <ol style="list-style-type: none"> (a) Maintenance on Bus 15 1RY Source Breaker is complete and has been returned to service. (b) A designated operator is stationed at the G-Panel to monitor Bus Phase Currents and perform actions of "Bus 15 Sequencer Channel Alert" and "Bus 16 Sequencer Channel Alert" Alarm Response Procedures. (c) The designated operator is NOT one of the examinees. (d) The Lead RO will conduct the activity to transfer power on Bus 15 from CT11 to 1RY. (e) This activity is to be performed after shift turnover is complete. (f) After Bus 15 is transferred to 1RY, then secure the designated operator at the G-Panel. 2. COMPLETE TURNOVER: <ol style="list-style-type: none"> a. Crew performs a walk down of the control boards. b. Review PRA Printout. c. Crew takes the duty. 		

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 1	<p>3. After the crew has assumed the duty, they will transfer power on Bus 15 from CT11 to 1RY per section 5.16 of 1C20.5.</p> <p>a. If contacted as the out-plant operator to check Bus 15 Room clear, then wait two minutes and report back that Bus 15 Room is clear of personnel.</p> <p>b. If contacted as the out-plant operator to check closing springs on BKR 15-3, then wait two minutes and report back the closing springs are charged on BKR 15-3.</p>	LEAD	<p>1C20.5, UNIT 1 – 4.16KV SYSTEM</p> <ul style="list-style-type: none"> Place CS-46951, BKR 15-3 MAN/AUTO CLOSURE SEL SW, in “MANUAL”. Place CS-46906, BUS 15 SYNCHROSCOPE SEL SW, in “1RY”. Check 115 – 130 volts on Bus Incoming volt meter. Check 115 – 130 volts on Bus Running volt meter. Check the difference between incoming and running is less than 8 volts. Check Synchroscope is less than or approximately 20° from the twelve o'clock position. Check the two white synchronizing lights are NOT LIT. Place CS-46953, BKR 15-3 BUS 15 SOURCE FROM 1RY XFMR, in “CLOSE”. Place CS-46955, BKR 15-7 BUS 15 SOURCE FROM BUS CT11, in “TRIP”. Check Bus 15 voltage is approximately 4.16kv. Check 44021 Bus 15 light LIT. Place CS-46906, BUS 15 SYNCHROSCOPE SEL SW, in “OFF”. Place CS-46951, BKR 15-3 MAN/AUTO CLOSURE SEL SW, in “AUTO”.

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 2	<p>4. At the discretion of the lead evaluator, enter: Trigger 2, Rod E3 IRPI Failure.</p> <p>a. If contacted as the Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked.</p> <p>b. 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.</p> <p>c. If contacted as Nuclear Engineer, acknowledge order to perform applicable steps of SP 1319.</p> <p>5. Plant Response:</p> <p>a. Rod E3 rod bottom light</p> <p>b. Rod E3 rod position at 0 steps</p> <p>c. NO change in NIS.</p> <p>d. NO change in RCS Tavg.</p> <p>e. The following annunciators will come in:</p> <p>1) 47013-0407, ROD AT BOTTOM.</p> <p>2) 47013-0507, COMPUTER ALARM ROD DEVIATION/SEQUENCING.</p>	<p>RO</p> <p>SS</p>	<p>1C5 AOP4, DROPPED RCCA</p> <ul style="list-style-type: none"> Confirm rod drop using diverse indications: <ul style="list-style-type: none"> Rod Position Indication and RCS Tavg changes OR Rod Position Indication and NIS Changes Determine a Rod Drop did NOT occur. Go to 1C5 AOP5. <p>1C5 AOP5, MISALIGNED ROD, STUCK ROD, AND/OR RPI FAILURE OR DRIFT</p> <ul style="list-style-type: none"> Determine symptoms are indicative of a failed RPI. Declare Rod Position Indicator for Rod D4 inoperable. Initiate a work order. Enter T.S. LCO 3.1.7 Condition A. <ul style="list-style-type: none"> Verify position of rod once every 8 hours.

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 3	<p>6. After the crew has responded to the IRPI failure, and/or at the discretion of the lead evaluator, then enter: Trigger 3, 1T-401, Red Channel RCS Thot, fails HIGH.</p> <p>a. If contacted as I&C to trip bistables, inform the crew two I&C Technicians will be available in 1 hour.</p> <p>b. If contacted as the Operations Management, acknowledge the report of the failure, and agree to make other notifications to the NRC, Duty Station Manager, etc. as asked.</p> <p>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.</p> <p>7. Plant Response:</p> <p>a. Red Channel RCS Tavg pegs high.</p> <p>b. Red Channel ΔT pegs high.</p> <p>c. 11 Charging Pump speed will rise.</p> <p>d. Pressurizer level will slowly rise.</p> <p>e. The following annunciators will come in:</p> <ol style="list-style-type: none"> 1) 47012-0104, RCS HI TAVG. 2) 47012-0304, RCS TAVG DEVIATION. 3) 47012-0404, OVERPOWER ΔT CH ALERT. 4) 47012-0504, OVERTEMP ΔT CH ALERT. 5) 47012-0507, PRZR LVL DEVIATION. 6) 47012-0604, RCS DT DEVIATION. 7) 47013-0105, OPAT ROD STOP TURBINE RUNBACK CHANNEL ALERT. 8) 47013-0205, OTAT ROD STOP TURBINE RUNBACK CHANNEL ALERT. 	RO	<p>C47012-0104, 0304, 0404, 0504, 0507, & 0604, PANEL C ALARM RESPONSE PROCEDURES</p> <ul style="list-style-type: none"> • Check RCS Tavg and deviations. • Check RCS ΔT and deviations. • Verify Rod Control is in "MANUAL". • Check all pressurizer level channels. • Shift charging pump control to "MANUAL" and adjust speed as necessary. • Verify steam dumps are NOT open. • Refer to 1C51, INSTRUMENT FAILURE GUIDE. • Verify steam flow/feed flow balance.
		RO	<p>1C51.1, Tavg Loop 1B 1T-401 – High</p> <ul style="list-style-type: none"> • Determine Rod Control is already in manual. • Place charging pump speed control in "MANUAL" AND maintain pressurizer level. • Select Red channel on the Tavg defeat switch and pull out. • Return charging pump speed control to "AUTO". • Rod Control and Steam Dump Control should NOT be placed in AUTO due to the 1st Stage Pressure Instrument failure.
		SS	<ul style="list-style-type: none"> • Enter T.S. LCO 3.3.1 Condition A & E – Place channel in trip within 6 hours or be in Mode 3 in 12 hr. • Enter T.S. LCO 3.3.2 Condition A & D – Place channel in trip within 6 hrs or be in Mode 3 in 12 hrs AND in Mode 5 in 18 hrs. • Enter TLCO 3.3.3 Condition A – Place channel in trip.

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 5	10. Rapid Load Reduction: <ol style="list-style-type: none"> If contacted as the TSO, acknowledge that Unit1 is reducing power due to loss of bus duct cooling. If contacted as Unit 2 Control Room Operators to monitor Unit 1 Heater Drain Tank alarms (Panel F), then acknowledge request and inform Unit 1 Operators that an extra operator will monitor Panel F. <p style="text-align: center;">NOTE <i>It is NOT intended to wait for the plant to reach 55% power prior to proceeding to the next event. Once the Lead Evaluator is satisfied with the reactivity manipulation, proceed to Event 6.</i></p>	RO/SS	1C1.4 AOP1, RAPID POWER REDUCTION UNIT 1 <ul style="list-style-type: none"> Determine the predicted Boron addition and final Control Rod Position by obtaining values from the appropriate contingency reactivity plan. Borate the RCS as necessary to maintain control rods above the insertion limit and control delta I within limits. Control Rods in manual during the load reduction. Place pressurizer heaters to "ON". Using the "On Line Control" screen, select the "Control Mode" pop-up screen. Select the desired control mode ("VPC", "FSP", or "LOAD"). Using the "On Line Control" screen, select the "Demand Rate" pop-up screen. Select the desired rate of load change. Set the desired Target setting using the "On Line Control" screen. Using the "On Line Control" screen, select the Go control to initiate load reduction.
		RO/SS	1C12.5, UNIT 1 BORON CONCENTRATION CONTROL <ul style="list-style-type: none"> Verify the Boric Acid integrator is reset. Set 1YIC-110, BA TO BLENDER BATCH INTEGRATOR, to quantity desired. Place CS-46300, MAKE-UP MODE SELECTOR, to "BORATE". If desired, then adjust 1HC-110, BA TO BLENDER FLOW CONT, to "MANUAL" and adjust output for desired flow rate. Momentarily place CS-46457, BORIC ACID MAKE-UP CONTROL, to "START", to initiate the boration.

Retention: Life of Plant

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENT 5 (cont)			<ul style="list-style-type: none">• When the desired quantity of boric acid has been added, then verify automatic makeup stopped as indicated by CS-46457, BORIC ACID MAKE-UP CONTROL, green light LIT.• If additional boration is desired, then return to step 2.• When the boration is complete, then verify 1HC-110, BA TO BLENDER FLOW CONT, is in "AUTO".• Reset the Boric Acid integrator.• Perform a 10 gallon flush.

Retention: Life of Plant

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7 & 8	<p>11. When the lead evaluator is satisfied with the reactivity manipulation, enter: Trigger 6, 12 Steam Generator Tube Rupture.</p> <ol style="list-style-type: none"> Upon hearing the announcement of Reactor Trip, or when called as the Turbine Building Operator to isolate the Unit 1 MSRs per Attachment J, then open and run schedule file E-0_Att-J.sch located in X:\Trex_PIL\Lightning\Schedule\EOPs. When the isolation is complete, inform the crew the MSRs are isolated. Upon hearing the announcement of Safety Injection, or when called as the Turbine Building Operator to secure the Turbine Building Roof Exhausters, wait 2 minutes and report the Turbine Building Roof Exhausters are all secured. If Control Room personnel ask if Unit 2 personnel are available to perform Attachment L, then inform the Control Room that Unit 2 personnel are NOT available for performing Attachment L. If contacted as RP or Duty Chemist to sample for primary-to-secondary leakage, then wait 2 minutes and report cation column frisks indicate activity is high on 12 SG and reading background on 11 SG. <p>12. Plant Response:</p> <ol style="list-style-type: none"> RCS pressure lowers. 11 SG level rises. Secondary radiation rises. 	<div>RO/ LEAD</div> <div>SS</div>	<p>1E-0, REACTOR TRIP OR SAFETY INJECTION</p> <ul style="list-style-type: none"> • Manually trip the reactor or verify Reactor Trip. • Verify Turbine Trip. • Verify both Safeguards buses energized. • Determine SI is required or already actuated. <ul style="list-style-type: none"> ○ Either SG pressure < 530 psig. ○ PRZR pressure < 1830 psig. ○ Containment pressure > 3.5 psig. • Manually actuate SI if it did not already actuate. • Perform Attachment L (see pages 17 & 18). • Check AFW Status: <ul style="list-style-type: none"> ○ Verify total AFW flow greater than 200 GPM. ○ Verify AFW pumps discharge pressure greater than 1000 psig. ○ Control feed flow to maintain 11 SG Narrow Range between 5% and 50%. • Check RCS Temperatures trending to 547°F. • Check PRZR PORVs and Spray valves closed. • Determine RCPs should NOT be stopped due to RCS pressure greater than 1250 psig. • Determine SGs are NOT faulted. • Determine a SG Tube is ruptured. • Go to 1E-3.

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7 & 8 (cont)	<p style="text-align: center;"><u>EMERGENCY PLAN CLASSIFICATION</u></p> <p><i>ALERT – FA1 due to a loss of the RCS Fission Product Barrier due to the 12 Steam Generator Tube Rupture.</i></p> <p style="text-align: center;"><u>CRITICAL TASKS</u></p> <ol style="list-style-type: none"> <i>1. Isolate feedwater flow into and steam flow from the ruptured Steam Generator before a transition to ECA-3.1 occurs.</i> <i>2. 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.</i> 	RO/SS	<p>1E-3, STEAM GENERATOR TUBE RUPTURE</p> <ul style="list-style-type: none"> Determine RCPs should NOT be stopped due to RCS pressure greater than 1250 psig. Identify 12 Steam Generator as ruptured. Isolate flow from 12 SG: <ul style="list-style-type: none"> Verify 12 SG PORV at 75%. Check 12 SG PORV closed. Close steam supply valve from 12 SG to TD AFWP. Verify blowdown isolation valves closed on 12 SG. Close 12 SG MSIV. Stop feed flow to 12 SG after narrow range level is greater than 5%. Reset SI Check 12 SG pressure greater than 210 psig. Initiate RCS Cooldown: <ul style="list-style-type: none"> Determine required core exit temperature. Check one condensate pump running. Determine the Steam Dump to condenser will not open. Open the 11 SG PORV to establish RCS cooldown. Stop RCS cooldown. Maintain CETC less than required temperature. Control feed flow to 11 SG to maintain narrow range level between 5% and 50%. Check PRZR PORV Block valves open. Check PRZR PORVs closed. Reset SI and Containment Isolation. Verify IA to Containment is established.

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7 & 8 (cont)	<p style="text-align: center;"><u>CRITICAL TASKS</u></p> <p>3. <i>Depressurize RCS to meet SI termination criteria prior to overfilling the ruptured Steam Generator.</i></p> <p>4. <i>Terminate SI prior to overfilling the ruptured Steam Generator.</i></p>	RO/SS	<ul style="list-style-type: none"> • Stop RHR pumps because RCS pressure is greater than 250 psig. • Align charging pump suction to RWST. • Establish maximum charging flow. • Verify CETC less than required temperature. • Check 12 SG pressure is stable or increasing. • Check RCS subcooling greater than 40°F. • Depressurize RCS to minimize Break Flow and Refill PRZR. • Use one pressurizer spray to depressurize RCS until ANY of the following conditions satisfied: <ul style="list-style-type: none"> ○ Both of the following: <ul style="list-style-type: none"> ▪ RCS pressure less than 12 SG pressure. ▪ PRZR level greater than 7%. ○ PRZR level greater than 75%. ○ RCS subcooling less than 20°F. • Check RCS pressure increasing. • Check if SI flow should be terminated. • Stop 12 SI pump (11 SI pump is OOS).

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7 & 8 (cont)	<p>13. If contacted as the out-plant operator to locally close Safeguards Chilled Water Cross Tie, acknowledge order to close the valve. Wait 2 minutes, enter: Trigger 7 to CLOSE the CW Cross Tie Valves. a. Report completion to the Control Room.</p> <p>14. If Control Room personnel ask for status of Unit 2 Cooling Water/Chilled Water lineup, then inform the Control Room that Unit 2 Cooling Water/Chilled Water valves are in there: a. Non safeguards position if the crew has NOT re-aligned the cooling water/chilled water lineup on Unit 2. b. Safeguards position if the crew has re-aligned the cooling water/chilled water lineup on Unit 2.</p> <p>15. If Control Room personnel ask for status of Battery Room Temperatures, then inform the Control Room that Battery Room temperatures are less than 84°F.</p> <p>16. If Control Room personnel ask for status of Spent Fuel Cooling, then inform the Control Room that Spent Fueling level and temperature are normal.</p>	LEAD	<p>1E-0 Attachment L: SI Alignment Verification</p> <ul style="list-style-type: none"> • Verify Safeguards Component Alignment: • Verify both trains of SI actuated: <ul style="list-style-type: none"> ○ Both RHR pumps - RUNNING -OR- ○ Both SI pumps – RUNNING ○ 11 SI Pump is OOS and should NOT be started. • "SI NOT READY" lights - NOT LIT • "SI ACTIVE" lights - LIT FOR PLANT CONDITIONS • "CONTAINMENT ISOLATION" lights - LIT FOR PLANT CONDITIONS • Check Category 1 Vent Zone Boundary: • Close MV-32115, 122 SFP HX INLT HDR MV B • Check Cooling Water Header Pressures - BOTH GREATER THAN 65 PSIG • Verify Plant Announcements Complete: • Check If Main Steamlines Are Isolated: • Determine MSIVs, Bypass Valves, and Containment Instrument Air Valves do NOT need to be closed. • Verify SI Flow: • Verify RHR Flow • Determine Containment Spray is NOT required. • Check RCP Cooling • Verify Local Actions Complete • Verify Generator Breakers – OPEN • Verify All Heater Drain Pumps – STOPPED • Check Turbine Valves: <ul style="list-style-type: none"> ○ Turbine reheat and intercept valves – CLOSED ○ Open turbine drain valves • Verify Main Feedwater Alignment: <ul style="list-style-type: none"> ○ Both main feedwater pumps – STOPPED ○ Main and bypass FRVs - CLOSED

Retention: Life of Plant

Retain in: Training Program File

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

PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
EVENTs 6, 7 & 8 (cont)	<p style="text-align: center;"><u>NOTE</u> <i>The operator will have to perform the following to align safeguards chilled water for SI Alignment:</i></p> <ul style="list-style-type: none"> Place CS-46018, 11 CFCU, to SLOW. Place CS-46019, 13 CFCU, to SLOW. Place CS-46080, Train A Unit 1 CLG WTR/CHILLED WATER ISOL VALVES, in ISOLATE. Place CS-46081, Train B Unit 1 CLG WTR/CHILLED WATER ISOL VALVES, in ISOLATE. Place CS-46772, Train A Unit 2 CLG WTR/CHILLED WATER ISOL VALVES, in ISOLATE. Place CS-46773, Train B Unit 2 CLG WTR/CHILLED WATER ISOL VALVES, in ISOLATE. Place CS-46068, 121 CONT RM CHILLER & PUMP, in START. Place CS-46076, 122 CONT RM CHILLER & PUMP, in START. Determine 44071-0101, CR CHILLER XTIE LIGHT, is NOT LIT; therefore valve is open. 	LEAD	<ul style="list-style-type: none"> Verify All Condensate Pumps - STOPPED: Determine Steam Dump already in "STM PRESS" Mode Verify Unit 1 Cooling Water/Chilled Water Alignment: <ul style="list-style-type: none"> CFCU control switches - "SLOW". CFCU dampers - ALIGNED TO DOME Unit 1 cooling water/chilled water valves closed Unit 1 CRDM shroud cooling supply and return valves – CLOSED CFCU cooling water supply and return valves – OPEN CFCU chilled water supply and return valves – CLOSED Verify 11 Safeguards Screenhouse Ventilation lineup. Verify Control Room Ventilation Alignment: <ul style="list-style-type: none"> Chillers and fans – RUNNING Control room chiller suction/discharge tie closed - STATUS LIGHT LIT Verify Unit 2 Cooling/Chilled Water Alignment Verify 21 Safeguards Screenhouse Ventilation lineup. Verify 11 and 12 Battery Charger Operation is normal. Verify Battery Room temps less than 84°F. Check status of Spent Fuel Cooling. Check Status Of Notifications Notify SS Of Any Discrepancies.
	17. Once the crew has stopped 12 SI Pump and/or at the discretion of the Lead Evaluator, then place the simulator in FREEZE and inform the crew that training has the duty.		

Retention: Life of Plant

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

SIMULATOR INPUT SUMMARY

@Time	Event	Action	Description
00:00:00		Insert malfunction RP16	FAILURE OF SI TO CHILLED WATER SIGNAL TO ACTUATE
00:00:00		Insert override DI-46178P to True	11 SI PUMP OOS
00:00:00		Insert override DI-46178ST to False	11 SI PUMP OOS
00:00:00		Insert malfunction RX226 to 0	1 TURB 1ST STAGE STM (CHNL II-WHI) P XMTR (1PT-485)
	2	Insert malfunction RD0922 on event 2	ROD POSITION INDICIATION FAILS E-3 - SBA GR1
	3	Insert malfunction RX05A on event 3	REACTOR COOLANT LOOP TH TRANSMITTER TE-401A FAILS HIGH
	4	Insert malfunction EG08A on event 4	11 GENERATOR BUS DUCT COOLER BLOWER FAILURE
	4	Insert malfunction EG08B on event 4	12 GENERATOR BUS DUCT COOLER BLOWER FAILURE
	6	Insert malfunction SG02B to 12.00000 on event 6	STEAM GENERATOR #12 TUBE RUPTURE
	6	Insert override DI-46460 to False on event 6	BYP-INTLK
	6	Insert override DI-46461 to False on event 6	BYP-INTLK
	6	Insert override DI-46460OFF to True on event 6	OFF-RESET
	6	Insert override DI-46461OFF to True on event 6	OFF-RESET
	7	Insert remote CH142 to CLOSE on event 7	CONT RM CHLRS SUCT/DISCH TIE ISOL CV-31837,8

Retention: Life of Plant

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SIMULATOR SETUP CHECKLIST

Before Scenario

- _____ Simulator Status:
- | | |
|---------------------------|---|
| _____ 1. "Training Load" | _____ 2. Step counters "ON" |
| _____ 3. Alarm sound "ON" | _____ 4. Steps 1 – 5 on page 6 complete |
| _____ 5. Speed: "REAL" | _____ 6. IC-265 or IC-10 running |
- _____ Delete the memory on the Yokogawa Model DX1000 recorders by cycling the Recorder Power OFF pushbutton in the simulator instructor's booth.
- _____ Verify Schedule File/Summary matches Simulator Input Summary page in the SEG.
- _____ Verify that control rod step counters on C panel and ERCS RBU matches the IC conditions.
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset.
- _____ MOC ΔI sheet displayed on C panel.
- _____ MOC Reactivity Briefing sheet available at Reactor Operator Desk.
- _____ Turnover sheet/PRA sheet available.
- _____ If it is the first scenario of the day, then perform a shutdown and restart of the floor PCs that are connected to the LAN.
- _____ Log in on floor PCs using user ID: <pitrgsim> (password is the same as user ID).
- _____ Electronic PINGP 577 forms closed on LAN connected PCs.
- _____ Board-mounted EAL Tables are cleaned.
- _____ EOOS running on PC and updated as follows to reflect equipment OOS:
- _____ 1. 11 Safety Injection Pump
- _____ Update Control Board Placards:
- | | |
|--|--|
| _____ 1. NRC Current Authentication Code call date updated to current date. | |
| _____ 2. High Flux At Shutdown Alarm Setpoint placards: 5900 cps. | |
| _____ 3. Feedwater regulating valve position placard set to current values. | |
| _____ 4. Recommended SG Blowdown flow set to current values. | |
| _____ 5. RCS boron on the CVCS panel placard: 853 ppm. | |
| _____ 6. Turbine reference/setter values on the CVCS panel set to current (Target/Demand on-line positions). | |
| _____ 7. Shift Reactivity Guidance placard: BA: 2.7 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. 12 BA PUMP "Lined Up to 11 BA Tank" | |
| _____ 4. CC to SFP MV-32117 "In Service" | |
| _____ 5. Blowdown 46470 "SGB To CDSR" | |
| _____ 6. HU Flag above 12 RHR HX CC inlet MV-32094 for "1C14 Limitation" | |
| _____ 7. "H ₂ IN VCT SPACE" at VCT | |
- _____ Pink Status Control Tags in place:

PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

- | | |
|--------------------------------------|----------------------------------|
| ___ 1. CS-46540, 22 CC WTR PUMP | ___ 5. CS-46185, 12 RHR PUMP |
| ___ 2. CS-46572, CC TO SFP MV-32117 | ___ 6. CS-46179, 12 SI PUMP |
| ___ 3. CS-46930, D2 DIESEL GENERATOR | ___ 7. CS-46037, 12 CC WTR PUMP |
| ___ 4. CS-46425, 12 MDAFWP | ___ 8. CS-46523, 22 CLG WTR PUMP |

___ Yellow Caution Tags in place:

- ___ 1. CS-46064, CC TO SFP MV-32115, in CLOSED
- ___ 2. CS-46178, 11 SI PUMP, in PULLOUT

___ ERCS driven recorders are on-scale (RCS temperature scaled 555° F to 565° 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	1Q0340A	1V4501A

___ ERCS TPM set (Calorimetric - Auto Scaling - LEFM).

___ Verify that copy machine and printers are loaded with paper.

___ Pens/Paper/Markers available on the simulator.

___ Verify 121 IA Compressor is in PREFERRED and 122 IA Compressor is in 1st STANDBY, and 123 IA Compressor is in 2nd STANDBY.

___ Verify R11/R12 are lined up correctly (at the R11/R12 local panel):

- ___ 1. Sample pump is running.
- ___ 2. Alarms are reset.
- ___ 3. CS-8006106, Sample Inlet Switch, is selected to CNTMT.
- ___ 4. CS-8006107, Sample Outlet Switch, is selected to Aux Bldg Stack.

___ 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 VPL set ~ 0.1 to 0.2 above current valve position (not on limiter).

___ DEHC alarms cleared.

___ N51 & N52 Display Sheets for 100% power are in place as necessary.

___ Procedure 1C51 marked up for PT-485 failure.

___ Headsets turned on as necessary.

___ Procedure checklist completed. See following page.

___ Peer Check performed for simulator setup.

PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1**PROCEDURE CHECKLIST**

The following procedures will be used during this session. Verify the procedures are free of place keeping marks before starting the session and after the session are complete:

Before	After
	1C1.4 AOP1, RAPID POWER REDUCTION UNIT 1
	1C12.5, UNIT 1 BORON CONCENTRATION CONTROL
	1C20.5, UNIT 1 – 4.16KV SYSTEM
	1C51.1, Tavg Loop 1B 1T-401 – High
	1C51.2, Turbine 1 st Stage Pressure 1P-485 - Low
	1C5 AOP4, DROPPED RCCA
	1C5 AOP5, MISALIGNED ROD, STUCK ROD, AND/OR RPI FAILURE OR DRIFT
	1E-0, REACTOR TRIP OR SAFETY INJECTION
	1E-3, STEAM GENERATOR TUBE RUPTURE
	C22.5 AOP1, LOSS OF GENERATOR BUS DUCT COOLING
	C47003-0503, 11 HEATER DRAIN TANK HI LVL
	C47007-0301, BUS DUCT COOLING SYSTEM HI TEMP
	C47007-0302, BUS DUCT COOLING BLOWERS NOT RUNNING
	C47012-0104, RCS HI TAVG
	C47012-0304, RCS TAVG DEVIATION
	C47012-0404, OVERPOWER ΔT CH ALERT
	C47012-0504, OVERTEMP ΔT CH ALERT
	C47012-0507, PRZR LVL DEVIATION
	C47012-0604, RCS DT DEVIATION
	C47013-0105, OPΔT ROD STOP TURBINE RUNBACK CH ALERT
	C47013-0205, OTΔT ROD STOP TURBINE RUNBACK CH ALERT
	C47013-0407, ROD AT BOTTOM
	C47013-0507, COMPUTER ALARM ROD DEVIATION/SEQUENCING
	C7, REACTOR CONTROL SYSTEM
	EAL BOARDS
	EOP INFORMATION BOOK
	F3-2 EAL STICKER BOOK checked for missing stickers
	F3-2.1, EMERGENCY ACTION LEVEL TECHNICAL BASES
	REACTIVITY BRIEFING BINDER - MOC
	SWI O-28, NOTIFICATION OF OPERATIONS MANAGER & NRC RESIDENT INSPECTOR
	SWI O-50, REACTIVITY MANAGEMENT
	T.S. LCO 3.1.7
	T.S. LCO 3.3.1
	T.S. LCO 3.3.2
	TLCO 3.3.3

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1**Post-Scenario Checklist**

- _____ LAN connected computers are cleared of information added during the scenario.
- _____ Computer generated PINGP 577 cleared.
- _____ Procedure checklist completed. See previous page.
- _____ Remove Pink Status Control Tags from the following equipment:
 - ___ 1. CS-46930, D2 DIESEL GENERATOR
 - ___ 2. CS-46425, 12 MDAPWP
 - ___ 3. CS-46185, 12 RHR PUMP
 - ___ 4. CS-46179, 12 SI PUMP
 - ___ 5. CS-46037, 12 CC WTR PUMP
 - ___ 6. CS-46523, 22 CLG WTR PUMP
- _____ Magnetic placards removed:
 - ___ 1. NONE
- _____ Remove Yellow Caution Tags from the following equipment:
 - ___ 1. CS-46178, 11 SI 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	
<p>1. 11 SI PUMP is OOS for corrective maintenance.</p> <ul style="list-style-type: none"> • T.S. 3.5.2 Condition A was entered with 48 hours remaining. <p>2. PT-485, Turbine First Stage Pressure, is failed LOW.</p> <ul style="list-style-type: none"> • T.S. 3.3.1 Condition A and R entered. • P7 was verified to be in required state for existing unit conditions. • TRM 3.3.4 Condition A was entered. • A WR was initiated to repair PT-485. • B/S 1PC-485A is tripped. 	
PROTECTED EQUIPMENT	
D2 DIESEL GENERATOR	12 CC PUMP
12 MDAFWP	22 CLG WATER PUMP
12 RHR PUMP	22 CC PUMP
12 SI PUMP	121 SFP HX
RAD MONITORS OOS	ANNUNCIATORS OOS
NONE	NONE
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
NONE	NONE
OTHER EQUIPMENT OOS / STATUS	
<ul style="list-style-type: none"> • Station Air is supplementing Instrument Air per Section 5.1.3 of C34, Station Air System. • Bus 15 and 16 are powered from CT11. A designated operator is stationed at the G-Panel to monitor Bus Phase Currents and perform actions of "Bus 15 Sequencer Channel Alert" and "Bus 16 Sequencer Channel Alert" Alarm Response Procedures. 	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
BKR 15-3, BUS 15 1RY SOURCE BREAKER, RTS	
OPERATIONAL PLANS FOR COMING SHIFT	
<ul style="list-style-type: none"> • Maintain Rod Control in Manual and Steam Dump in Steam Pressure Mode. • Xenon is at equilibrium. Maintain 100% power. • Transfer power on Bus 15 to 1RY per Step 5.16 of 1C20.5. • Dilute 10 gallons 1-2 times per shift for temperature control. 	
NEW PROCEDURES / INSTRUCTIONS	
NONE	

Retention: Life of Plant

Retain in: Training Program File

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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.

Retention: Life of Plant

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1**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 conditions agreed with the reference plant with respect to reactor status, plant configuration, and system operation. | Yes
X | No |
| 2. The simulator operated in real time during conduct of validation. | Yes
X | No |
| 3. The simulator demonstrated expected plant response to operator input and to normal, transient, and accident conditions. | Yes
X | No |
| 4. The simulator permitted use of the reference plant's procedures. The scenario was completed without procedural exceptions, simulator performance exceptions, or deviation from the scenario sequence. | Yes
X | No |
| 5. The simulator did not "fail to cause" or "unexpectedly cause" any first principle alarm or primary automatic action. | Yes
X | No |
| 6. Observable changes in parameters relevant to the scenario corresponded in trend and direction to reference plant's expected response. | Yes
X | No |
| 7. All malfunctions and other instructor interface items were functional and demonstrated the expected reference plant's response to the initiating cause. | Yes
X | No |
| 8. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes
X | No |
| 9. The scenario satisfies the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence. | Yes
X | No |
| 10. Simulator fidelity has been demonstrated to be adequate for this scenario. | Yes
X | No |

Discrepancies noted (Check "none" or list items found) ☒ None

SMAR = Simulator Action Request

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

Retention: Life of Plant

Retain in: Training Program File

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PI-ILT-NRC-1405S, 2014 ILT NRC SIMULATOR EVALUATION #5, REV. 1

Comments: _____

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

Validation Personnel		
Name	Job Title / Qualification	Validation Position
Chris Gregson	Operations SRO	Shift Supervisor
Shawn Sarrasin	Operations Instructor	LEAD
Fred Collins	Operations Instructor	RO

Retention: Life of Plant

Retain in: Training Program File

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