



SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND

SEG # 2005 NRC SCENARIO 1

SEG TITLE: RPI FAILURE/TURB LOAD CYCLING/
LOSS OF COOLING WATER PUMP,
LOSS OF TURBINE BUILDING COOLING
WATER HEADER/STEAM LINE BREAK
IN CONTAINMENT #: SCEN 1 REV. # 0

PROGRAM: INITIAL LICENSED OPERATOR #: P8100

COURSE: INITIAL LICENSED OPERATOR #: P8100

TOTAL TIME: 2 HOURS

Developed by:	Travis Ouret <i>Instructor</i>	3/16/05 <i>Date</i>
Reviewed by:	 <i>Instructor</i>	 <i>Date</i>
Validated by:	 <i>Validation Lead Instructor</i>	 <i>Date</i>
Approved by:	 <i>Training Supervision</i>	 <i>Date</i>

Guide Requirements

Goal of Training:

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

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

Learning Objectives:

1. Diagnose and take corrective actions for a failed RPI per C47, SP1319, and C5 AOP5
2. Diagnose and take corrective actions for cycling turbine load per C23 AOP2
3. Respond to a Loss of Cooling Water Header pressure per C47.
4. Diagnose and take corrective actions for a Cooling Water Valve Closure per C47 and 1E-0.
5. Diagnose and take corrective actions for a steam line break inside containment per 1E-0, 1E-2, 1E-1, and 1ES-0.2.

Prerequisites:

None

Training Resources:

1. Full Scope Simulator
2. Operations Management Representative
3. Lead Evaluator
4. Human Performance Evaluator
5. Comment Recorder
6. Booth Operator (Primary Communicator)
7. Backup Communicator

References:

1. C47013:0407
2. C47013:0507
3. C5AOP4
4. C5 AOP5
5. C23 AOP2
6. C47020-0204
7. C47020-0106
8. C47020-0304
9. 1E-0
10. FRZ.1
11. 1E-2
12. 1E-1
13. 1ES-0.2
14. F3-2

None

Commitments:

**Evaluation
Method:**

This is an evaluation scenario for the 2005 ILT NRC Exam, this
scenario is based on P9160S-002 Evaluation #24.

**Operating
Experience:**

None - Evaluation Scenario

**Related PRA
Information:**

Initiating Event with Core Damage Frequency:

Normal transient (4%)

Important Components:

11 and 12 AFW pumps

11 and 12 SI pumps

Important Operator Actions with Task Number:

None

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Failed IRPI
2. Turbine CVs Cycling
3. Loss of 11 Cooling Water Pump
4. Turbine Building Cooling Water Valve Closure

After EOP Entry:

1. 12 AFW pump auto start failure
2. Steam line break inside containment
3. SI system fails to respond to 'S' signal
4. MSIV auto closure failure

Abnormal Events:

1. C5 AOP5; Misaligned Rod, Stuck Rod, RPI Failure
2. C23 AOP2; Malfunction of the EH Control System

Major Transients:

1. Loss Cooling Water to Turbine Building Components
2. Steam line break inside containment

Critical Tasks:

1. Manually start a SI pump prior to transitioning out of E-0.
2. Establish and maintain minimum required FW flow to the SGs prior to transitioning out of E-0.
3. Isolate the faulted steam generator prior to transitioning out of E-2.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This evaluation can be run from IC-32 (IC-A).
 - Reactor Power is 100%, BOC
 - RCS Boron Concentration 1283 ppm.
 - Adding 10 Gallons Reactor Makeup 3-4 times per shift.
2. The following additional equipment is OOS:
 - 11 TD AFW Pump
 - Breaker 16-10

SEQUENCE OF EVENTS:

Event 1: Failed rod position indicator

- Rod G-7 RPI fails to 0 steps causing a rod at bottom alarm.
- Reactor power and T_{avg} remain normal.
- The RPI is declared inoperable.
- Action is taken to verify position of the affected rod.

Event 2: Turbine CV cycling

- As the CVs cycle, turbine load fluctuates—causing primary and secondary system perturbations.
- Action to take manual control of the turbine to stop the fluctuations.

Event 3: Loss of 11 Cooling Water Pump

- 12, 22 and 121 fail to Auto Start
- Action to manually start 121 Cooling Water Pump

Event 4: Turbine Building Cooling Water Valve Closure

- The Cooling Water Supply Valve to the Turbine Building Closes
- Action is taken to Trip the Reactor and Turbine
- Action to manually STOP equipment cooled by Cooling Water

Event 5: Steam line break inside containment

- When the crew trips the reactor a break develops in the steam line from 12 SG.
- The only available AFW pump fails to auto start. A manual start is required.

- Low pressure in 12 SG results in more AFW flow to that SG. This also results in low AFW pump discharge pressure. Throttling of AFW to 12 SG is required to ensure AFW reaches 11 SG and to prevent tripping the pump.
- Containment humidity, temperature, and pressure increase.
- SG pressure decrease and containment pressure increase cause a 'S' signal.
- The SI system does not respond to the 'S' signal. SI pumps must be manually started.
- 12 SG must be isolated by the crew.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

This is an evaluation scenario and as such, tasks are not credited for training and therefore not listed here.

NOTE:

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>INITIAL CONDITIONS (IC-32):</p> <ul style="list-style-type: none"> • Standard IC- A • Mode: 1 • Exposure: BOC • Power: 100% • Boron: (CB): 1283 ppm • Temperature: 560°F • Pressure: 2235 psig • Xenon: At Equilibrium • Rods: Bank D step counters at 218, all others at 228 • Generator: 561 Mwe 		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP a. Perform set up per the "Simulator Setup Checklist" for IC-A, including entering actions items per the "Simulator Input Summary." b. Perform set up attached to this guide		
	2. SIMULATOR SET UP a. Reset the simulator to IC-32. b. Place the simulator in RUN. c. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary", to cause the following pre-existing conditions (Relative Order 0) : 1) 12 MDAFW pump auto start fails 2) 11 and 12 SI pumps fail to auto start 3) MSIVs fail to auto close		
	3. COMPLETE TURNOVER: a. "UNIT 1 LPEO / PEO TURNOVER LOG" 1) Use Standard IC-A Turnover sheet b. Verify crew performs walk down of control boards and the reviews turnover checklists.		

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 1	4. <u>WHEN</u> the crew has assumed the duty and at the discretion of the Lead Evaluator, enter the failed RPI for rod G-7 (Relative Order of 1, Trigger 1). a. <u>IF</u> directed to perform a flux map per SP-1319, <u>THEN</u> reply that you will get started right away. b. Allow the crew to hold a brief.	LEAD / RO	C47013:0407 ROD AT BOTTOM <ul style="list-style-type: none"> Refer to C5 AOP4 (May go directly to C5 AOP5)
		LEAD / RO	C47013:0507 ROD DEVIATION/SEQUENCING <ul style="list-style-type: none"> Verify cause using ERCS "RODS" Initiate SP-1319
		RO	1C5AOP4 Dropped Rod <ul style="list-style-type: none"> Confirm rod NOT dropped and refer to 1C5AOP5
		SS	1C5 AOP5, Misaligned Rod, Stuck Rod, and/or RPI Failure <ul style="list-style-type: none"> Notify Ops Manager and NRC Resident Inspector Diagnose the symptoms are indicative of a failed RPI.
		SS	<ul style="list-style-type: none"> Refer to T.S.3.1.7 Condition A (Verify rod position once per 8 hours) Direct SP-1319 to be performed.
Event 2	5. After the crew has adequately addressed Technical Specifications for the failed RPI and initiated action to verify rod position, and at the discretion of the Lead Evaluator, enter the Turbine Load cycling malfunction. (Relative Order of 2, Trigger 2).	LEAD SS RO	C23 AOP2 Malfunction of EH Control System <ul style="list-style-type: none"> Place turbine in MANUAL Notify System Engineer and/or WIN Team Maintain Tave at Tref and power <100%

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 4	7. When the crew has adequately addressed C47, and at the discretion of the Lead Evaluator, ENTER the closure of the Turbine Cooling Water Header Motor Valve. (Relative Order of 4, Trigger 4) . a. If asked to locally investigate MV-32031, report the valve is closed there is no apparent reason for the valve closing.	LEAD	C47007-0303 Hydrogen and Seal Oil Local Alarm <ul style="list-style-type: none"> Dispatch an Operator to investigate.
		LEAD	C47007-0101 Bus Duct Cooler Cooling Water LO Flow <ul style="list-style-type: none"> Dispatch an Operator to investigate. Monitor bus duct temperature on ERCS
		LEAD	C47020-0304 Turbine Cooling Water Header MV-32031 CLOSED <ul style="list-style-type: none"> Verify position lights on CS-46038, 1 Turbine BLDG CLG WTR SPLY HDR
		LEAD / RO	<ul style="list-style-type: none"> Trip the Reactor and Initiate 1E-0
		LEAD	<ul style="list-style-type: none"> The Reactor Trip breakers fail to open Actuate AMSAC/DSS to trip Reactor Stop the Feedwater Pumps
		LEAD	<ul style="list-style-type: none"> Place Standby Condensate Pump in Manual Stop the running Condensate pumps Place the Standby Heater Drain Pump in Manual Stop the running Heater Drain Pump Place EH Oil Pump switches in PULLOUT

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5	8. <u>WHEN</u> the reactor is tripped, <u>THEN</u> verify that the Steam line break has automatically entered. a. If not, ENTER the Steam line break (Relative Order 0, Trigger 13)	RO/LRO Crew LRO	1E-0, Reactor Trip or Safety Injection <ul style="list-style-type: none"> Perform Immediate actions from memory. <ul style="list-style-type: none"> The Reactor Trip breakers fail to open Actuate AMSAC/DSS to trip Reactor Verify immediate actions.
	9. During 1E-0: a. If requested to locally open the Reactor Trip Breakers, wait two minutes and report the breakers are both stuck in the closed position. b. If requested, report that all category 1 vent doors are closed. c. If requested, report all Turbine Building roof exhausters are stopped. d. If requested to isolate Unit 1 MSR's per Attachment J, perform the following: 1) Bring up the CAEP Window 2) Click on OPEN File 3) Click on Attachment J-E0 .cae 4) Click on Run button 5) After 12.5 minutes, Report that Unit 1 MSR's are isolated per 1E-0 Attachment J. e. <u>IF</u> the LEAD is performing Attachment L, <u>THEN</u> it may be turned over when step 7 of attachment is complete. <u>IF</u> an extra operator is performing attachment L, <u>THEN</u> it may NOT be turned over.	Crew RO CREW	<ul style="list-style-type: none"> Verify component alignment per Attachment L. <ul style="list-style-type: none"> Manually start SI pump(s) (Critical Task)¹ Manually start AFW Pump (Critical Task)² Check AFW status and RCS temperature (steps 6 & 7) <ul style="list-style-type: none"> Maintain >200 gpm total AFW flow, but throttle as necessary to limit cooldown. Maintain AFW discharge pressure > 900 psig Close both MSIV's due to RCS cooldown May also be done by lead during performance of Attachment L. Trip RCP's if trip criteria is met. Diagnose a Faulted SG and transition to E-2.³
			<ol style="list-style-type: none"> Manually start at least one SI pump prior to transitioning out of E-0. Establish and maintain minimum required FW flow to the SGs prior to transitioning out of E-0.
			An orange path in containment may exist, requiring transition to FR-Z.1.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	10. IF containment conditions exist, crew may have to transition to FR-Z.1	Crew	FRZ.1, Response to High Containment Pressure <ul style="list-style-type: none"> • Verify CI valves closed • Verify CS running • Check CFCU's running in SLOW to the Dome • Check CL pressure both loops >65 psig. • Verify MSIV's closed • Identify 12 SG as faulted. • Isolate Feed flow to 12 SG • Transition to 1E-2.
	11. Allow crew to complete actions of 1E-2 as necessary.	Crew	1E-2: Faulted Steam Generator Isolation ¹ <ul style="list-style-type: none"> • Close/verify 12 MSIV is closed • Verify 11 SG NOT faulted • Isolate AFW to 12 SG (Critical Task)² • Verify steam supply to TDAFP from 12 SG closed • Transition to E-1 <p>1. If transition to FR-Z.1 was required, THEN generator would have been isolated in that procedure.</p> <p>2. To fulfill Critical Task requirements, SG must be isolated prior to transition out of E-2.</p>

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	12. Allow crew to complete actions of 1E-1 as necessary.		<p>1E-1: Loss of Reactor or Secondary Coolant</p> <ul style="list-style-type: none"> • Maintain 11 SG AFW > 200 GPM until SG level >5% NR [50% WR], then maintain level 5 –50% NR [50 – 59% WR]. • Reset SI • Reset CI • Establish IA to containment. • Check if SI can be terminated, if so transition to ES-0.2.^{3,4} • Check if SG is still blowing down <p>3. <i>SI termination is listed on the information page of E-1.</i></p> <p>4. <i>The scenario may be terminated when SI is verified as not required.</i></p>

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	13. Allow crew to complete actions of ES-0.2 as necessary.		1ES-0.2: SI Termination <ul style="list-style-type: none"> • Place AMSAC in Pull to Lock • Rest AMSAC • Verify if charging flow is established. • Stop RHR and SI pumps
	14. <u>WHEN</u> the crew verifies SI is not required and / or at the discretion of the Lead Evaluator, place the simulator in freeze. a. Do not reset the simulator until the Lead Evaluator has consented	Crew	Assemble near fire detection panel while evaluators consult
	15. The Classification will be performed by the SS after the conclusion of the Scenario. a. The EAL for this Scenario is NUE on 7A.		

SIMULATOR INPUT SUMMARY

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
0	SIMFW08	Malfunction	FW34B				12 MDAFW pump auto start fails
0	SIMRP02	Malfunction	SI05A				11 SI pumps fail to auto start
0	SIMRP02	Malfunction	SI05B				12 SI pumps fail to auto start
0	SIMRP02	Malfunction	RP06				MSIVs fail to auto close
0	SIMMS01A	Malfunction	MS01B	40	13		12 SG steam line break
0	EVENT TRIGGER	EVENT ACTION	Rdc0001a<20		13		Enter trigger 13 when RPI for E3 <20 steps
0		Malfunction	RP07				Reactor Trip Breakers fail to Open
1	SIMRD02	Malfunction	RD0916		1		G7 RPI fails to 0
2	SIMTC01	Malfunction	TC03	20	2	120 Ramp	Turbine CV Cycling
3		Malfunction	CL01A		3		Trip 11 CL Pump
3		Malfunction	CL03		3		121 CL Pump fails to Auto Start

SIMULATOR INPUT SUMMARY

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
3		Malfunction	CL02A		3		12 CLPump fails to Auto Start
3		Malfunction	CL02B		3		22 CL Pump fails to Auto Start
4		Override DI	DI-46038C Close	ON	4		Close MV-32031
4		Override DI	DI-46038O Open	OFF	4		Close MV-32031
4		Override DO	LO-46038B	ON	4		MV-32031 Blue Light ON

SIMULATOR SETUP CHECKLIST

Before Training

- _____ Setup Simulator per Standard IC-A Checklist
- _____ Protected equipment label placed on 12 AFW Pump
- _____ Procedures to be used during scenario are cleaned of any place keeping marks
 - C47013-0407
 - C47013-0507
 - C5AOP4
 - C5 AOP5
 - C23 AOP2
 - C47007-0101
 - C47007-0303
 - C47020-0106
 - C47020-0304
 - C47020-0204
 - LCO 3.7.8
 - LCO 3.0.3
 - 1E-0
 - FRZ.1
 - 1E-2
 - 1E-1
 - 1ES-0.2
 - F3-2
- _____ Shift Manager procedures are cleaned of any place keeping marks
 - 1E-0
 - 1E-1
 - 1E-2
 - 1ES-0.2
 - FR-Z.1
 - LCO 3.7.8
 - LCO 3.0.3

After Training for the Day

- _____ Headsets turned off and put away
- _____ Procedures cleaned off and put away
- _____ Simulator Reset to IC-10 or next IC to be used
- _____ Simulator placed in DORT if simulator will not be used again that day
- _____ Protected equipment tag removed
- _____ Information Tags removed and put away
- _____ If last scenario of the day, ensure all exam material removed from simulator
and stand down from exam security per form PITC-220, if NRC exam.

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:

DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 64 ft²

SYSTEM CONDITION: GREEN

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS	
11 TD AFW Pump is OOS as of 1200 yesterday for trip throttle valve replacement	
PROTECTED EQUIPMENT	
12 MD AFW Pump	
RAD MONITORS OOS	ANNUNCIATORS OOS
None	None
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
None	None
OTHER EQUIPMENT OOS / STATUS	
Breaker 16-10, the cubicle is damaged and the breaker is removed. 12 BATP is OOS for seal replacement CFCU's are on Cooling Water	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
None	
OPERATIONAL PLANS FOR COMING SHIFT	
Dilute with 10 gal RMU 1 to 2 times per shift for temperature control	
NEW PROCEDURES / INSTRUCTIONS	
None	

WATCHSTANDERS LPEO: OURET, TRAVIS PEO: KEMPKES, JOHN

LPEO Relieved By: _____ Time: _____ Date: _____

PEO Relieved By: _____ Time: _____ Date: _____

CB WALKDOWN → LPEO: _____ Time: _____

→ PEO: _____ Time: _____

	<h2 style="margin: 0;">SIMULATOR EXERCISE GUIDE (SEG)</h2>
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SITE: PRAIRIE ISLAND

SEG # 2005 NRC SCENARIO 2

**SEG TITLE: PZR LVL LOW/IMMINENT LOSS OF
10 BANK XFMR/RCP VIB HI/RCP
SHAFT SHEAR/LOSS OF FW** #: SCEN 2 REV. # 0

PROGRAM: INITIAL LICENSED OPERATOR #: P8100

COURSE: INITIAL LICENSED OPERATOR #: P8100

TOTAL TIME: 2 HOURS

Developed by:	J. Kempkes <i>Instructor</i>	5/5/05 <i>Date</i>
Reviewed by:	 <i>Instructor</i>	 <i>Date</i>
Validated by:	 <i>Validation Lead Instructor</i>	 <i>Date</i>
Approved by:	 <i>Training Supervision</i>	 <i>Date</i>

Guide Requirements

**Goal of
Training:**

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

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

**Learning
Objectives:**

1. Swap running Charging pumps per 1C12.1.
2. Diagnose and perform corrective actions for a pressurizer level channel failure high per 1C51.
3. Diagnose and perform corrective action for an imminent loss of 10 Bank Transformer per 1C20.3 AOP7 and 1C20.5.
4. Diagnose and perform corrective action for RCP hi vibration per C47 and C1.4/C1.4 AOP1.
5. Diagnose and perform corrective action for a RCP shaft shear with automatic turbine trip failure per 1E-0.
6. Diagnose and perform corrective action for a loss of secondary heat sink per C28.1 and FR-H.1.

Prerequisites:

None

**Training
Resources:**

1. Full Scope Simulator
2. Operations Management Representative
3. Lead Evaluator
4. Human Performance Evaluator
5. Comment Recorder
6. Booth Operator (Primary Communicator)
7. Backup Communicator

References:

1. 1C51
2. C47
3. C12.1 AOP3
4. C1.4/C1.4 AOP1
5. 1E-0
6. 1C12.1

Commitments:

None

**Evaluation
Method:**

This is an evaluation scenario for the 2005 ILT NRC Exam, this scenario is based on P9160S-002 Evaluation #27.

**Operating
Experience:**

None – Evaluation Scenario

**Related PRA
Information:**

Initiating Event with Core Damage Frequency:

Loss of secondary heat removal, which contributes 2% to the CDF.

Important Components:

AFW pumps

Important Operator Actions with Task Number:

None

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Pressurizer Level Instrument failure.
2. Imminent failure of 10 bank transformer.
3. RCP high vibration and shaft shear.

After EOP Entry:

1. Bus 12 M to R auto transfer failure.
2. Turbine Trip failure
3. AFW pump trip.

Abnormal Events:

1. C20.3 AOP7 Electric Power System Operating Restrictions and Limitations Loss of 10 Transformer.

Major Transients:

1. RCP Shaft Shear/Turbine Trip Failure
2. Loss of Heat Sink

Critical Tasks:

1. Manually trip the turbine prior to reaching a RED path on Pressurized Thermal Shock.
2. Establish feedwater flow to at least 1 SG before RCS bleed and feed is required.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This Evaluation can be run from the following Requalification Exam Scenario Standard (Specific) IC sets:
 - IC-A 100% power
2. The following equipment is OOS:
 - Breaker 16-10, Bus Tie to Bus 26
 - 11 AFW Pump

SEQUENCE OF EVENTS:

Normal Operation: Swap Running Charging Pumps

- Per report from the field, Crew swaps running Charging pumps from 12 to 13 per 1C12.1

Event 1: Pressurizer level controlling channel failure low

- The charging pump in AUTO goes to maximum speed.
- Letdown is isolated and heaters deenergized
- A new controlling channel is selected.
- Charging pump speed is returned to automatic
- Letdown is restored using excess letdown.

Event 2: 10 Bank Transformer Oil Leak

- The Unit 2 Turbine Building Operators report a large leak from a crack at the base of 10 Transformer.
- Bus 15 is transferred from the 1RY to the CT11 source in anticipation of the loss of the transformer.

Event 3: 12 RCP high vibrations, #1 seal failure and shaft shear

- A vibration of 10.5 mils requires a controlled shutdown.
- The crew starts a power reduction per 1C1.4 or 1C1.4 AOP1.
- The RCP shaft shears causing a loss of RCS flow.
- The turbine fails to trip automatically, thus requiring closure of the control valves OR MSIV isolation.

Event 4: Loss of Secondary Heat Sink

- 11 MFW pump trips because of the turbine trip.
- 12 MFW pump trips because Bus 12 fails to auto transfer 30 seconds after the trip.
- 12 AFW pump locks out causing a loss of secondary heat sink.
- 21 AFW pump cannot be cross-connected.
- Main feedwater or condensate flow can be used to restore feedwater flow to the steam generators per FR-H.1.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

This is an evaluation scenario and as such, tasks are not credited for training and therefore are not listed here.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): <ul style="list-style-type: none"> • Standard IC-A (IC-32- sim setup per standard IC guide) • Mode: 1 • Exposure: BOC • Power: 100% • Boron: (CB): 1283 ppm • Temperature: 560 • Pressure: 2235 • Xenon: Stable • Rods: CBD@228 • Generator: 570 Mwe 		
	1. SIMULATOR SET UP <ol style="list-style-type: none"> Reset the simulator to IC-32. Place the simulator in RUN. 2. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary", to cause the following pre-existing conditions (Relative Order 0): <ol style="list-style-type: none"> Turbine Auto Trip Failure MSIV Auto Trip Failure MD AFW Pump Trip on Start Bus 12 Auto Transfer Failure Turbine Stop Valve Fails to Close 3. Complete the "Simulator Setup Checklist".		
	4. COMPLETE TURNOVER: <ol style="list-style-type: none"> "UNIT 1 LPEO / PEO TURNOVER LOG" Verify crew performs walk down of control boards and the reviews turnover checklists. 	CREW	Review the Unit 1 LPEO / PEO Turnover log Walk down the control boards and ask questions as appropriate.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 0	<p>5. When the crew has assumed the duty and at the discretion of the Lead Evaluator report as the Aux Building Operator, "12 Charging pump belt is frayed and recommend swapping from 12 to 13 charging pump."</p> <p>a. If asked, report the desurger has been verified pressurized per section 5.13.</p> <p>Note: The crew may start 13 Charging pump then secure 12 Charging pump, or stop 12 Charging pump then start 13 Charging pump. Either action is satisfactory.</p>	RO	<p>1C12.1, Section 5.4.1</p> <ul style="list-style-type: none"> • Verify desurger pressurized. • Transfer 11 Charging Pump to MANUAL. • Verify 13 Charging Pump in MANUAL/minimum. • Reduce 11 Chg speed to get ~6.5 gpm seal inj • Verify chg pressure <2400 psig • Start 13 Chg Pump • Adjust seal inj to ~9.5 gpm, <2550 psig charging • Stop 12 Chg Pump • Adjust seal injection back to 8.0 gpm • Transfer 11 Charging Pump to AUTOMATIC <p>OR</p> <p>1C12.1, Section 5.4.2</p> <ul style="list-style-type: none"> • Verify desurger pressurized. • Transfer 11 Charging Pump to MANUAL. • Verify 13 Charging Pump in MANUAL/minimum. • Adjust 12 Chg speed to get ~9.5 gpm seal inj • Stop 12 Chg Pump • Adjust seal injection to 6.0 gpm • Verify Charging pump header < 2400 psig • Start 13 Chg Pump • Adjust seal injection back to 8.0 gpm • Transfer 11 Charging Pump to AUTOMATIC •

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 1	<p>6. When 13 charging pump is running and at the discretion of the Lead Evaluator, enter the malfunction to cause the controlling channel of pressurizer level to fail low. (Relative Order 1, Trigger 1)</p> <p>7. If desired by evaluators, trip the bistable on request. (Relative Order 2, Trigger 2)</p>	<p>RO</p> <p>Lead/ RO</p> <p>Lead/ RO</p> <p>SS</p> <p>Lead</p>	<p>47012-0607, Pressurizer Lo-Lo level</p> <ul style="list-style-type: none"> • Verify all pressurizer heaters deenergized • Verify letdown is isolated <p>47012-0507</p> <ul style="list-style-type: none"> • Verify level low on 1L-428 only • Verify heaters ON • Take manual control of the charging pump speed to maintain level at program. • Refer to C51 <p>C51.3 Pressurizer Level 1L-428 - low</p> <ul style="list-style-type: none"> • Operate heaters manually if desired. • Take manual control of the charging pump speed to maintain level at program. • Select position 2-1 on pressurizer level control selector switch. • Restore pressurizer heaters for normal operation. • Return charging pump back to auto. • Switch pressurizer level recorder to another channel. <p>Refer to T.S.3.3.1 Condition A and Table 3.3.1-1 Function 9 (6 hr LCO for B/S tripping).</p> <p>Trip bistable 1LC-428A.</p> <p>Initiate work order on the failed channel.</p> <p>Make appropriate log entries.</p>

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 2	<p>8. When letdown is in service and charging is restored and at the discretion of the Lead Evaluator, give the Crew an Update as the Unit 2 SS, :</p> <p>"An oil leak is in progress from 10 bank transformer, through a crack at the base on the north side. About fifty gallons of oil is already on the ground."</p> <p>9. IF the Shift Supervisor enters D14.3 AOP1 OIL SPILL, as the Shift Manager direct "Unit 2 will complete D14.3 AOP1."</p> <p>10. IF TSO or Engineering is contacted, recommend isolation of the transformer from the System Control Center once plant loads are shifted to alternate sources using plant procedures. NOTE: IF C20.3 AOP7 is not entered based on the imminent loss, transfer of Bus 15 to CT11 per normal procedures is adequate.</p> <p>11. WHEN realignment of Unit 2 buses is addressed, reply "Bus 25 is already on 2RY and Unit 2 operators will transfer Bus 26 to 2RY per 2C20.5."</p> <p>12. WHEN 1RY source breakers to Bus 15 are in PULLOUT and the evaluators concur, continue with the next event.</p>	<p>SS Lead</p> <p>SS Lead</p> <p>Lead</p> <p>SS</p>	<p>Direct entry to C20.3 AOP7 based on imminent loss of 10 Transformer. C20.3 AOP7</p> <ul style="list-style-type: none"> Verifies auto actions have NOT occurred as transformer has not locked out yet. Contacts Transmission System Operator (TSO) to report oil leak. Contacts Technical Engineering for assistance. Verify/transfer Unit 2 safeguard buses to 2RY. Transfer Bus 15 to CT11 per 1C20.5 section 5.15. <ul style="list-style-type: none"> Bkr 15-7 to MANUAL Sync scope to CT11 Verify voltages matched and synchronized Announce transfer/stand clear Bus 15 Close breaker 15-7 CT11 source and trip breaker 15-3 1RY source within 5 seconds Verify bus voltage on meter and mimic light Sync scope to OFF Bkr 15-7 to AUTO Place 1RY source breakers to buses 15/16 in MANUAL and PULLOUT <p>Technical Specifications</p> <ul style="list-style-type: none"> 3.8.1 Condition A (7 days, plus perform SP 1118 within 1 hour and every 8 hours thereafter)

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 3	<p>13.WHEN 1RY source breakers to Bus 15 are in PULLOUT and at the discretion of the Lead Evaluator Enter the 12 RCP Vibration Alarm and ERCS overrides (Relative Order 3, Trigger #3)</p> <p>14.WHEN directed, report "12 RCP shaft vibration is 10.5 mils and stable."</p> <p>15.IF asked for direction on rate of load decrease or chosen rate is 1%/min or less or if directed by the Lead Examiner, reply as the RCP System Engineer, "12 RCP should be shutdown within the next hour based on current vibration."</p>	<p>RO</p> <p>SS Lead/ RO</p>	<p>47012-0203</p> <ul style="list-style-type: none"> Determine RCP vibration using ERCS GRPDIS "RCPVIBES" Determine shaft vibration requires a controlled shutdown. <p>Unit Power Reduction (option selected by SS) 1C1.4 Power Operation option</p> <ul style="list-style-type: none"> Determine nuclear engineering notification is not required as BOC, >400 ppm boron and no load follow history. Predict reactivity for power change using C1 Figures and Curves for reactivity balance, or Figure C1-32. Conduct prejob brief. Notify the Duty Chemist of the load decrease. Pressurizer heaters to ON Set desired load rate and final load on EH controls. Borate or insert rods to cause Tav_g decrease. Start turbine load reduction in AUTO. Borate and move rods to maintain Tav_g/Tref within 1.5°F, Delta I within band, and rods above the RIL. <p>C1.4 AOP1 Option</p> <ul style="list-style-type: none"> Verify control systems in AUTO Reduce turbine load in AUTO <ul style="list-style-type: none"> Select desired load rate Verify in IMP IN Set desired load on setter Depress GO Borate the RCS to maintain rods above the RIL and Delta I within limits

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 4	<p>16. WHEN 5% power reduction has been achieved and at the discretion of the Lead Evaluator, Enter the 12 RCP Shaft Shear (Relative Order 4, Trigger #4). Then DELETE Relative Order 3 RCP vibration alarms. (Relative Order #3a)</p> <p>NOTE: It is expected that the turbine trip will occur before SI actuates on excessive cooldown. IF SI actuates, additional steps are included in the expected student responses for E-0 actions until transition to FR-H.1 is directed.</p> <p>NOTE: If SG WR level is >50% in either SG when AFW status is checked, E-0 actions will continue until decay heat causes sufficient inventory loss to reach RED path criteria for heat sink.</p> <p>17. During 1E-0:</p> <ol style="list-style-type: none"> If requested, report that all category 1 vent doors are closed. If requested, report all Turbine Building roof exhausters are stopped. If requested to isolate Unit 1 MSR's per Attachment J, perform the following: <ol style="list-style-type: none"> Bring up the CAEP Window Click on OPEN File Click on Attachment J-E0 .cae Click on Run button After 12.5 minutes, Report that Unit 1 MSR's are isolated per 1E-0 Attachment J. 	<p>SS RO</p> <p>Lead</p> <p>Lead RO</p> <p>SS</p> <p>Lead RO</p> <p>SS</p>	<ul style="list-style-type: none"> Direct entry to 1E-0 Verify reactor trip <ul style="list-style-type: none"> Trip/bypass breakers OPEN Flux decreasing RPIs at 0 Rod bottom lights LIT Verify Turbine Trip (critical task) <ul style="list-style-type: none"> Note: turbine will not automatically trip and when manually tripped the left stop valves will not close. The MSIV's will not auto close. Manually trip turbine using CB pushbutton <ul style="list-style-type: none"> Manually close CV's IF NOT, manually close MSIV's Verify both safeguards buses energized Verify SI not actuated or required <ul style="list-style-type: none"> Both SG pressures >530 psig Pzr Press >1830 psig Containment pressure <3.5 psig Transition to 1ES-0.1 Reactor Trip Recovery IF Red Path exists on CSF for Heat Sink, Transition to 1FR-H.1. <p>IF SI has actuated:</p> <ol style="list-style-type: none"> Perform E-0 Att. L (see attached procedure section) Check AFW Status <ul style="list-style-type: none"> Total AFW flow <200 gpm Attempt/verify 12 AFW start (allowable per ARP if SG pressure is <700 psig, but will lock out on restart. If SG pressure high will not be allowed to start.) IF wide range level is <50% on both SGs, transition to FR-H.1.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5	<p>18.During Loss of Heat Sink (1FR-H.1)</p> <p>19.IF asked to check breaker 16-3, report a 51A overcurrent flag is present.</p> <p>20.IF asked to cross connect 21 AFW pump to Unit 1, wait 5 minutes and report 21 AFW pump failed to start.</p>	<p>RO</p> <p>Lead</p>	<ul style="list-style-type: none"> • Verify RCS pressure >SG pressure • Verify hot leg temperature >350°F • Verify secondary heat sink exists <ul style="list-style-type: none"> ○ Either WR SG level >9% ○ Pzr Pressure <2335 psig • Attempt to restore AFW flow <ul style="list-style-type: none"> ○ Close SG Blowdown Isolation valves ○ Determine 12 AFWP locked out ○ Attempt to restore AFW flow <p>47010-0107 12 AFWP LOCKED OUT</p> <ul style="list-style-type: none"> ○ IF SG pressures both >700 psig: <ul style="list-style-type: none"> • Dispatch operator to breaker 16-3 • Notify electrical department • Notify SS that 12 AFWP cannot be started. ○ IF NOT, <ul style="list-style-type: none"> • Verify CST level >5000 gal • Close 12 AFWP discharge valves to 11/12 SGs • 12 AFWP to MANUAL • CS-46425 to TRIP to reset the lockout (verify alarm clears) • CS-46425 to START (will immediately lock out) • Perform actions above for both >700 psig ○ Verify AFW flow <200 gpm ○ Dispatch operator to locally restore AFW ○ Stop 11 RCP

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
(cont)	<p>21.Loss of Heat Sink (cont)</p> <p>NOTE: Critical task is met if MFW or Condensate flow is restored prior to Bleed and Feed cooling required per FR-H.1 Step 2.</p> <p>22. IF directed, locally open MFWP discharge isolation:</p> <ol style="list-style-type: none"> For 11 FWP enter (Relative Order 5, Trigger 5) For 12 FWP enter (Relative Order 6, Trigger 6) 	<p>Lead</p> <p>SS</p> <p>Lead</p> <p>RO</p> <p>Lead</p>	<ul style="list-style-type: none"> • Attempt to restore MFW flow (critical task) <ul style="list-style-type: none"> ○ Reset SI ○ Verify/Start one condensate pump ○ Verify FW Containment Isolation valves open <ul style="list-style-type: none"> • IF NOT, reset CI, verify FRV/BFRV in MANUAL/CLOSED and open valves ○ Establish MFW flow <ul style="list-style-type: none"> • Reset FW bypass isolation • Start either MFWP • Manually open at least one bypass FRV to establish flow >200 gpm on ERCS/clear heat sink RED path • Check SG levels <ul style="list-style-type: none"> ○ Check SG NR levels >5% in either SG OR verify feed flow to at least one SG ○ Return to procedure/step in effect (ES-0.1 or E-0, for No SI/SI) • IF MFW not established, establish Condensate Flow (critical task) <ul style="list-style-type: none"> ○ IF SI pumps running, depressurize RCS to <1950 psig and block automatic SI ○ Depressurize at least one SG to <400 psig <ul style="list-style-type: none"> • Verify Condensate System in service • Dump steam to condenser or use SG PORV at maximum rate • Locally open one MFWP discharge isolation valve • Control flow with FW bypass valve ○ Repeat above step for checking SG level

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 6a	<p>23. Reactor Trip Recovery 1ES-0.1</p> <p>NOTE: IF Safety Injection has actuated, perform tasks of Event 6b instead</p> <p>NOTE: WHEN cold leg temperatures are under control and evaluator concurs, terminate the scenario.</p>	<p>SS Lead</p> <p>RO</p>	<ul style="list-style-type: none"> • Verify reactor trip has been announced • Steam dump to STM PRESS mode or (MSIVs closed) SG PORVs to 71.8% • Check RCS cold leg temperatures stable/trending to 547°F <ul style="list-style-type: none"> ○ IF NOT, stop dumping steam, verify SGB isolation valves closed, and reduce feed flow to just above 200 gpm until NR SG level is >5% in one SG ○ IF cooldown continues, close MSIVs/Bypass valves and reduce SG PORV setpoints to 71.8%
Event 6b	<p>24. Reactor Trip or Safety Injection (Cont) and SI Termination</p> <p>NOTE: Only performed if SI is actuated during previous events.</p>	SS LEAD	<ul style="list-style-type: none"> • Return to procedure/step in effect (1E-0 Step 7) • Check RCS cold leg temperatures stable/trending to 547°F <ul style="list-style-type: none"> ○ IF NOT, stop dumping steam, verify SGB isolation valves closed, and reduce feed flow to just above 200 gpm until NR SG level is >5% in one SG ○ IF cooldown continues, close MSIVs/Bypass valves and reduce SG PORV setpoints to 71.8% • Check PORVs and Spray Valves CLOSED • Verify RCP's stopped • Check SGs not faulted (none depressurizing uncontrollably) • Check SGs not ruptured (radiation monitors normal) • Check RCS intact (containment radiation/pressure/ Sump B level normal) • Verify SI can be terminated

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		SS Lead RO Lead	<ul style="list-style-type: none"> ○ Subcooling >20°F ○ Total FW flow >200 gpm OR >5% NR SG level ○ RCS pressure >2000 psig, stable/increasing ○ Pressurizer level >7% • Transition to 1ES-0.2 SI Termination <p>1ES-0.2 SI TERMINATION</p> <ul style="list-style-type: none"> • Reset SI, CI • Verify instrument air to containment • Block/reset AMSAC/DSS • Establish at least one charging pump running per 1C12.1 • Stop SI and RHR pumps
	25. <u>WHEN</u> both SI Pumps are turned off and / or at the discretion of the Lead Evaluator, place the simulator in freeze. a. Do not reset the simulator until the Lead Evaluator has consented	Crew	Assemble near fire detection panel while evaluators consult
	26. The Classification will be performed by the SS after the conclusion of the Scenario. a. The EAL for this Scenario is NUE on 20A.		

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
0		MFS	TC06				Turbine Auto Trip Failure
0	SIMS01A	MFS	RP06				MSIV Auto Closure Failure
0	SIMS01B	MFS	TC01A				CV-31182 Left Turbine Stop Valve Fails to Close
0	SIMFW08	MALF	FW32				MD AFW pump trip on start
0	SIMED07	MALF	ED02B				Bus 12 1R transformer breaker 12-1 fails to close
1	SIMRP03A	SYS OVRD	RX206	0	1		PRZR level (charging pump speed) controller 24043 (LT-428)
2		Remote	RP119	Trip	2		Trip LC-428A
3	C1-C2	ANN MALF	M47012:0203W	CRY WOLF	3	Delay 200 sec	11 or 12 RCP high vibration alarm

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
3		ERCS PT OVRD	CP-1Y0771A	9.0	3	Start Value 5 Ramp 300 sec	12 RCP frame vibration monitor (horizontal)
3		ERCS PT OVRD	CP-1Y0772A	7.5	3	Start Value 5 Ramp 300 sec	12 RCP frame vibration monitor (vertical)
3		ERCS PT OVRD	CP-1Y0773A	10.5	3	Start Value 8 Ramp 300 sec	12 RCP shaft vibration monitor (horizontal)
3		ERCS PT OVRD	CP-1Y0774A	8.1	3	Start Value 5 Ramp 300 sec	12 RCP shaft vibration monitor (vertical)
3a	C1-C2	ANN MALF	M47012:0203W	DELETE			11 or 12 RCP high vibration alarm
3a		ERCS PT OVRD	CP-1Y0771A	DELETE			12 RCP frame vibration monitor (horizontal)
3a		ERCS PT OVRD	CP-1Y0772A	DELETE			12 RCP frame vibration monitor (vertical)
3a		ERCS PT OVRD	CP-1Y0773A	DELETE			12 RCP shaft vibration monitor (horizontal)
3a		ERCS PT OVRD	CP-1Y0774A	DELETE			12 RCP shaft vibration monitor (vertical)

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
4	SIMRC05B	MALF	RC03B		4	Delay 7 Seconds	12 RCP shaft shear (free wheel impeller)
4			TC-14C		4		CV-3 Fails as is
4			FW27B		4		FCV 476 Fails Closed on Trip
5		RF	FW126	Local	5		11 FWP Discharge Valve Control Switch
5		RF	FW129	Open	5		11 FWP Discharge Valve Open Pushbutton
6		RF	FW127	Local	6		12 FWP Discharge Valve Control Switch
6		RF	FW131	Open	6		12 FWP Discharge Valve Open Pushbutton

SIMULATOR SETUP CHECKLIST Standard IC-A

Before Training

- _____ Simulator Setup Checklist for IC-A completed
- _____ Procedures to be used during scenario are cleaned of any place keeping marks
 - C47012-0203, 11 or 12 RCP Hi Vibration
 - C47012-0507, PRZR Level Deviation
 - C47012-0607, PRZR Lo-Lo Level Heater Off and Letdown Secured
 - 1C12.1, Letdown, Charging, and Seal Water Injection - Unit 1
 - 1C51.3, Pressurizer Level IL-428 - Low
 - 1E-0, Reactor Trip or Safety Injection
 - 1FR-H.1, Response to Loss of Secondary Heat Sink
 - F3-2, Classifications of Emergencies
 - T.S. LCO 3.3.1 Condition A, and Table 3.3.1-1 Function 9
 - T.S. LCO 3.4.14
 - T.S. LCO 3.8.1 Condition A
 - C20.3 AOP7
 - 1C1.4
 - 1C1.4 AOP1
 - C51.3
 - 1ES-0.1
 - C47010-0107

After Training for the Day

- _____ Information Tags removed and put away
- _____ Signs/placards removed and put away unless normal simulator configuration
- _____ Instructor station returned to normal with all books, paper, and etc. put away
- _____ Headsets turned off and put away
- _____ 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

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:

DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 64 ft²

SYSTEM CONDITION: GREEN

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS	
11 TD AFW Pump is OOS as of 1200 yesterday for trip throttle valve replacement	
PROTECTED EQUIPMENT	
12 MD AFW Pump	
RAD MONITORS OOS	ANNUNCIATORS OOS
None	None
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
None	None
OTHER EQUIPMENT OOS / STATUS	
Breaker 16-10, the cubicle is damaged and the breaker is removed. 12 BATP is OOS for seal replacement	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
None	
OPERATIONAL PLANS FOR COMING SHIFT	
Dilute with 10 gal RMU 1 to 2 times per shift for temperature control	
NEW PROCEDURES / INSTRUCTIONS	
None	

WATCHSTANDERS LPEO: OURET, TRAVIS

PEO: KEMPKE, JOHN

LPEO Relieved By: _____ **Time:** _____ **Date:** _____

Time: _____ Date: _____

Date:

PEO Relieved By: _____ **Time:** _____ **Date:** _____

Time: _____ Date: _____

Date: _____

CB WALKDOWN → LPEO: _____ **Time:** _____

Time: _____

→ PEO: _____ Time: _____

Time: _____



SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND

SEG # 2005 NRC EXAM SCENARIO 4

SEG TITLE: HEATER DRAIN TANK LEVEL
TRANSMITTER FAILURE, PRESSURIZER
PORV LEAKAGE, LETDOWN HX LEAK,
LOSS OF ALL AC POWER #: SCEN 4 REV. # 0

PROGRAM: INITIAL LICENSED OPERATOR #: P8100

COURSE: INITIAL LICENSED OPERATOR #: P8100

TOTAL TIME: 2 HOURS

Developed by:	Travis Ouret	3/9/05
	<i>Instructor</i>	<i>Date</i>
Reviewed by:	<i>Instructor</i>	<i>Date</i>
	(See page 10, Simulator Development Checklist.)	
Validated by:	<i>Validation Lead Instructor</i>	<i>Date</i>
	(See page 11, Simulator Validation Checklist.)	
Approved by:	<i>Training Supervision</i>	<i>Date</i>

Guide Requirements

Goal of Training:

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

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

Learning Objectives:

1. Respond to Heater Drain Tank Level Transmitter Failure (Low) per C47.
 2. Diagnose and respond to a leak in the Letdown Heat Exchanger to Component Cooling per 1C4 AOP1 and 1C14 AOP2.
 3. Diagnose and respond to a Pressurizer PORV Leaking per C47 and Tech Specs.
 4. Restore safeguards power to Bus 15 via the Bus Tie Breakers from Bus 25 per ECA-0.0.
-

Prerequisites:

None

Training Resources:

1. Full Scope Simulator
 2. Operations Management Representative
 3. Lead Evaluator
 4. Human Performance Evaluator
 5. Comment Recorder
 6. Booth Operator (Primary Communicator)
 7. Backup Communicator
-

References:

1. C47003-0503
 2. C47022-0109
 3. C47047-1R-39
 4. 1C14 AOP2
 5. 1C12.1 AOP3
 6. LCO 3.4.14
 7. C47012-0506
 8. LCO 3.4.11
 9. 1E-0
 10. 1ECA-0.0
 11. 1ECA-0.1
 12. 1ECA-0.2
-

None

Commitments:

Evaluation Method:

This is an evaluation scenario for the 2005 ILT NRC Exam, this scenario is based on the 2000 SRO NRC EXAM EVALUATION D, ATT SRO-00-D. It has been modified for use as 2005 NRC EXAM SCENARIO 4

Operating Experience:

None – Evaluation Scenario

Related PRA Information:

Initiating Event with Core Damage Frequency:

Loss of Power with SBO (23.9%)

Important Components:

11 AFW pump

D1 and D2 Emergency Diesel Generators

4169V Busses 15 and 16

Important Operator Actions with Task Number:

None

Other

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Heater Drain Tank Level Transmitter Fails Low
2. Letdown Heat Exchanger to Component Cooling Leak
3. Pressurizer PORV Leakage

After EOP Entry:

1. Loss of All AC Power, restore Safeguards Bus Tie Breakers
2. Failure of Safeguards Bus Tie Breaker to Close
3. LOCA via RCP Seals in 1ECA0.0

Abnormal Events:

1. Pressurizer PORV Leakage
2. 1C14 AOP2 Letdown Heat Exchanger to Component Cooling Leak

Major Transients:

1. 1E-0, Reactor Trip or Safety Injection
2. 1ECA-0.0, Loss of All Safeguards AC Power
3. 1ECA-0.2, Loss of all Safeguards AC Power Recovery with SI Required
4. 1ECA-0.1, Loss of all Safeguards AC Power Recovery without SI Required

Critical Tasks:

1. Maintain / return power to within license limits during secondary transient.
2. Determine LCO 3.4.11 Condition A cannot be satisfied in 1 hour and enter / discuss Condition D shutdown requirement.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This evaluation can be run from IC-10.
 - Reactor Power is 100%, MOC
 - RCS Boron Concentration 721 ppm.
 - Adding 10 Gallons RMU 3-4 times per shift for Temperature Control.
2. The following additional equipment is OOS:
 - D1 OOS for fuel injector replacement, estimated return to service is 8 hours.

SEQUENCE OF EVENTS:

Event 1: Heater Drain Tank Level Transmitter Fails Low

- A failure of the HDT Level transmitter results in MW decreasing and Reactor Power to Increasing.
- The HDT pump running in AUTO will go to minimum speed.
- The Crew will respond per C47.

Event 2: RCS Leakage in the Letdown Heat Exchanger to Component Cooling

- CC Surge Tank level increases and 1R-39 alarms on inleakage.
- The Crew will respond per C47, 1C4 AOP1 and 1C14 AOP2.
- Letdown Heat Exchanger is isolated and excess Letdown placed in service.
- The leak exceeds Tech Spec limits for RCS Leakage requiring isolation within 4 hours.

Event 3: Pressurizer PORV leakage.

- Determine which PORV is leaking.
- Attempt to isolate the PORV by closing the associated Block Valve.
- The Block valve will not close.
- Enter Tech Spec 3.4.11 Condition D, requiring a Unit shutdown to Mode 3 within 6 hours.

Event 4: Loss of All AC Power on Unit 1 with Cross-Tie Recovery

- Offsite power is lost.
- D1 is OOS and Bus 16 locks out.
- The Unit 2 to Unit 1 Bus Tie Breaker has an internal fault, resulting in the breaker tripping open if the breaker is closed.
- Plant Electricians will repair the breaker and power is restored on the Unit 2 bus tie to Bus 15.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

This is an evaluation scenario and as such, tasks are not credited for training and therefore are not listed here.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC-10): <ul style="list-style-type: none"> • Standard IC-10 • Mode: 1 • Exposure: MOC • Power: 100% • Boron: (CB): 721 ppm • Temperature: 560°F • Pressure: 2235 psig • Xenon: At Equilibrium • Rods: Bank D step counters at 218, all others at 228 • Generator: 561 Mwe 		
	<ol style="list-style-type: none"> 1. SIMULATOR SET UP <ol style="list-style-type: none"> a. Reset the simulator to IC-10. b. Place the simulator in RUN. 2. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary", to cause the following pre-existing conditions (Relative Order 0): <ol style="list-style-type: none"> a. D1 OOS Annunciators b. Breaker 25-17 closure failure 3. Remove D1 from service <ol style="list-style-type: none"> a. Place CS-46935, D1 Diesel Generator Control Switch in Pullout, and attach a HOLD Card b. Place CS-46950, BUS15 SOURCE FROM D1 DSL GEN, Control Switch in Pullout, and attach a HOLD Card c. Place CS-46948, BKR 15-2 MAN / AUTO 		

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>CLOSURE SEL SW, in Manual, and attach a HOLD Card.</p> <p>d. Hang "D1 Out of Service" signs on Control Board.</p> <p>4. Complete the "Simulator Setup Checklist".</p>		
	<p>5. COMPLETE TURNOVER:</p> <p>a. "UNIT 1 LPEO / PEO TURNOVER LOG"</p> <p>b. Verify crew performs walk down of control boards and the reviews turnover checklists.</p>	CREW	<p>Review the Unit 1 LPEO / PEO Turnover log</p> <p>Walk down the control boards and ask questions as appropriate.</p>
Event 1	<p>6. When the crew has the duty and at the discretion of the Lead Evaluator, ENTER the malfunction to cause the Heater Drain Tank Level Transmitter to fail Low. (Relative Order 1, Trigger 1).</p> <p>a. If asked to investigate as the Turbine Building Operator, report, All local indications of the HDT pumps are normal.</p> <p>Note: The HDT pump in AUTO will go to minimum speed, eventually the Hi level alarm will come in. The event may be noticed by Increase in Reactor Power and decrease in MW.</p>	LEAD RO	<p>C47003-0503, Heater Drain Tank High Level</p> <ul style="list-style-type: none"> • Verify High level • Reduce Reactor power to maintain Tave and Tref (CRITICAL TASK 1)

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 2	<p>7. When the Crew has diagnosed the level transmitter failure and/ or at the discretion of the lead evaluator, ENTER the leak in the Letdown Heat Exchanger. (Relative Order 2, Trigger 2).</p> <p>a. When directed to CLOSE CC-12-4 and CC-12-3, then DELETE Malfunction VC08, (Relative order 2a)</p> <p>Note: The leakage is approximately 30 gpm which is greater than Tech Spec limits.</p> <p>NOTE: THIS EVENT WAS NOT USED DURING THE EXAMINATION.</p>	<p>LEAD</p> <p>LEAD</p> <p>LEAD</p> <p>CREW</p> <p>CREW</p> <p>LEAD</p> <p>RO RO</p>	<p>Observe Increasing CC Surge Tank Level</p> <p>C47022-0109 Hi Radiation Train A Panel Alarm</p> <ul style="list-style-type: none"> Determine 1R-39 in Alarm by observing Rad Monitor panel. <p>C47047-1R-39</p> <ul style="list-style-type: none"> Verify 11 CC Surge Tank Vent valve, MV-32088, CLOSES Refer to 1C14 AOP2, Leakage into the Component Cooling System. When leaking HX is found, leave it isolated. <p>1C14 AOP2, Leakage into the Component Cooling System</p> <ul style="list-style-type: none"> Check 1R-39 for High Radiation Check RCP CC outlet flow and temperatures <ul style="list-style-type: none"> Flows and Temps Normal Refer to Table 1. Remove Letdown from service per 1C12.1 Isolate Letdown HX by CLOSING the following valves: <ul style="list-style-type: none"> CV-31203, LTDN PRESS CONT, using 1HC-125A CC-12-4, 11 LTDN HX CC INLT

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD/ SS	<ul style="list-style-type: none"> ○ CC-12-3, 11 LTDN HX CC OUTLT • Notify Rad Protection of potential radioactive contamination of the CC system.
		RO	<p>1C12.1 AOP3, Loss of Letdown Flow to the VCT</p> <ul style="list-style-type: none"> • Close the Letdown Orifice Isolation Valves are CLOSED. <ul style="list-style-type: none"> ○ CV-31325, LETDOWN ORFICE ISOL 40 GPM using CS-46170 ○ CV-31326, LETDOWN ORFICE ISOL 40 GPM using CS-46171 ○ CV-31327, LETDOWN ORFICE ISOL 80 GPM using CS-46174
		RO	<ul style="list-style-type: none"> • CLOSE the letdown isolation valves. <ul style="list-style-type: none"> ○ CV-31226, LETDOWN LINE ISOL using CS-46165 ○ CV-31255, LETDOWN LINE ISOL using CS-46133
		RO RO	<ul style="list-style-type: none"> • Place operating Charging pumps in MANUAL • If 2 Charging pumps are running then STOP one pump as follows: <ul style="list-style-type: none"> ○ Reduce Speed of one Charging pump while Closing 1HC-142, CHG LINE FLOW CONT, and maintaining seal injection 6-10 gpm to each RCP.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		RO	<ul style="list-style-type: none"> ○ Adjust 1HC-142, CHG LINE FLOW CONT until seal injection flow approx 9.5 gpm. ○ STOP the Charging pump.
		RO	<ul style="list-style-type: none"> • Adjust speed of inservice charging pump and 1HC-142 to maintain seal injection flow 6-10 gpm. Continue until 1HC-142 is closed.
		RO	<ul style="list-style-type: none"> • Place 1HC-135A, LTDN PRESS CONT in MANUAL and OPEN to about 50%
		RO	<ul style="list-style-type: none"> • Initiate CC flow through Excess Letdown Heat Exchanger by OPENING MV-32095, 11 Excess LTDN HX CC INLT/OUTL
		RO	<ul style="list-style-type: none"> • Position CV-31333, EXCESS LTDN DIVERT TO RCDT, to the V.C. TK position, using CS-46169
		RO	<ul style="list-style-type: none"> • OPEN CV-31330, EXCESS LTDN HX INLT
		RO	<ul style="list-style-type: none"> • Slowly OPEN CV-31210, EXCESS LTDN FLOW CONT
		RO	<ul style="list-style-type: none"> • Monitor Pressurizer Level and adjust Excess Letdown flow as necessary
		LEAD	<ul style="list-style-type: none"> • Notify Duty RP Tech to implement radiation surveys per PINGP 1483, Special Survey Checklist – Mixed Bed OOS.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		SS	TECH SPECS <ul style="list-style-type: none"> LCO 3.4.14, RCS Leakage Condition A Action to reduce Leakage to within limits within 4 hours or be in Mode 3 within 6 hours and Identify Leakage within 54 hours.
Event 3	8. When the Crew has isolated the Letdown Heat Exchanger and addressed the Tech Spec and / or at the discretion of the Lead Evaluator, ENTER the malfunction to cause Pressurizer PORV leakage. (Relative Order 3, Trigger 3). <ol style="list-style-type: none"> If directed to prepare a team to enter Containment, REPORT a team will be assembled and briefed in 2 hours. 	RO RO SS	C47012-0506, PRZR Power Relief Line Hi Temp <ul style="list-style-type: none"> Determine PORV PCV-430 is leaking based on: Relief line temperatures Acoustic Monitors Close Block Valve for PCV-430 TECH SPECS <ul style="list-style-type: none"> LCO 3.4.11, Each PORV and associated Block valve shall be OPERABLE. Determine Condition A is not met and close block valve within 1 hour Determine Condition D is not met; acknowledge a Unit shutdown is required within 6 hours. (CRITICAL TASK 2)

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SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD LEAD	<ul style="list-style-type: none"> ○ Place the following in PULLOUT <ul style="list-style-type: none"> ▪ 1R Source ▪ CT11 Source ▪ D1 DG Source ○ Check Unit 1 SI pump Breaker OPEN <ul style="list-style-type: none"> ▪ Manually OPEN Breakers ○ Close 4KV bus tie breakers for available bus: <ul style="list-style-type: none"> ▪ Unit 2 bus tie breaker <ul style="list-style-type: none"> • Bus Tie Breaker fails to close • Locally Isolate RCP Seals • Place the following in PULLOUT <ul style="list-style-type: none"> ○ MD AFW pump ○ Group A & B PRZR heaters ○ RHR pumps ○ SI Pumps ○ CS Pumps ○ Containment FCU – OFF ○ CC Pumps ○ Control Room Chillers ○ 121 and 122 Air Compressors
		LEAD	<ul style="list-style-type: none"> • Attempt to restore power from Unit 1 – No Source is available

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD	<ul style="list-style-type: none"> Attempt to restore power from Unit 2 – Bus Tie is Available
		LEAD	<ul style="list-style-type: none"> Energize bus 15 from Unit 2 Bus 25 Check is at Least One Safeguards Bus Energized <ul style="list-style-type: none"> Bus 15 should be restored using the Bus tie Breakers Verify the following loaded on Safeguards Bus <ul style="list-style-type: none"> Bus 111 and 112 Battery Charger Instrument busses 111 and 113 Start one Air Compressor
		CREW	<ul style="list-style-type: none"> Transition to 1ECA-0.2, Loss of all Safeguards AC Power Recovery with SI Required OR Transition to 1ECA-0.1, Loss of all Safeguards AC Power Recovery with SI Not Required
		LEAD	1ECA-0.1, Loss of all Safeguards AC Power Recovery with SI NOT Required <ul style="list-style-type: none"> Check RCP Seal Isolated Check Containment Isolation - NOT Actuated Establish Instrument Air to Containment Start one Air Compressor

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD	<ul style="list-style-type: none"> Start one CC Pump
		RO	<ul style="list-style-type: none"> Start one Charging pump
		LEAD	<ul style="list-style-type: none"> Start Containment FCU's Start Control Room Chiller and fans Check Cooling Water Pressure greater than 75 psig
		RO	<ul style="list-style-type: none"> Establish 30 GPM Charging Flow Verify SI Not required <ul style="list-style-type: none"> Subcooling greater than 20F Pressurizer level greater than 7%
		RO	<p>1ECA-0.2, Loss of all Safeguards AC Power Recovery with SI Required</p> <ul style="list-style-type: none"> Reset SI Check RWST Greater THAN 33% Verify SI Valve Alignment RCP Thermal Barrier CC status <ul style="list-style-type: none"> Previously Closed
		LEAD	<ul style="list-style-type: none"> Manually Start the Following <ul style="list-style-type: none"> 11 SI Pump 11 CC Pump
		RO	

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
0		Annun	M47024:1003W	CW			D1 Loss of Voltage
0		Annun	M47024:1103W	CW			D1 Local Control
0		DI	DI-46943C	OFF			BKR 25-17 Control Switch to OFF
1		Malfunction	FW30		1		Heater Drain Tank Level Transmitter Fails LOW
2		Malfunction	VC08		2		Letdown Heat Exchanger Tube Rupture into CC System
2a		Malfunction	VC08	DELETE			Letdown Heat Exchanger Tube Rupture into CC System
3		Malfunction	RC22A	50	3	Ramp 10 Min	PORV PCV-430 Leakage
3		Override DI	DI-46264C Close	OFF	3		PORV Block Valve Switch
4		Malfunction	ED14		4		Loss of all Offsite Power
4		Malfunction	ED09F		4	60 Seconds	Loss of 4160V Bus 16

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
5		Remote	FW136	0	5		Close MV-32381
5		Remote	FW137	0	5		Close MV-32382
5		Remote	FW157	CLOSE	5	120 Seconds	Close AF-13-4
5		Remote	FW156	OPEN	5	130 Seconds	Open AF-13-1 and 2AF-13-1
5		Remote	FW133	START	5	140 Seconds	Start 21 MDAFW Pump
6		Remote	VC120	0	6		Locally CLOSE MV-32166. Seal Return Isol Valvew
6		Remote	VC100	0	6		Close VC-14-1, 11 RCP Seal Injection Throttle Valve
6		Remote	VC101	0	6		Close VC-14-2, 12 RCP Seal Injection Throttle Valve
6		Remote	CC106	0	6		Close CC-16-3, 11 RCP Bearing Cooling Water Return
6		Remote	CC107	0	6		Close CC-16-2, 12 RCP Bearing Cooling Water Return

Simulator Scenario Development Checklist

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

- | | | |
|---|-----|----|
| 5. The scenario contains objectives for the desired tasks and relevant human performance tools. | Yes | No |
| 1. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both. | Yes | No |
| 2. Plant PRA initiating events, important equipment, and important tasks are identified. | Yes | No |
| 3. Turnover information includes a Daily At Power Risk Assessment provided by the PRA group. | Yes | No |
| 4. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given. | Yes | No |
| 5. The scenario guide includes responses for all communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices. | Yes | No |
| 6. The scenario includes related industry experience. | Yes | No |
| 7. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance. | Yes | No |

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

Simulator Exercise Validation Checklist

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

- | | | |
|--|-----|----|
| 1. The desired initial condition(s) could be achieved. | Yes | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario. | Yes | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario. | Yes | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response. | Yes | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? | Yes | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence. | Yes | No |

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

DR = Discrepancy Report

DR: _____ DR: _____ DR: _____ DR: _____

Comments: _____

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

SIMULATOR SETUP CHECKLIST

Before Training

- _____ Simulator in "Training Load"
- _____ Step counters "ON"
- _____ Alarm sound "ON"
- _____ Recorder power "ON"
- _____ Simulator Reset to correct IC (malfunctions, remotes, and overrides for Relative Order 0 conditions and conditions actuated by event triggers entered per "Simulator Input Summary")
- _____ High Flux at Shutdown alarm placards updated to: 5000 cps-
- _____ Control Valve position placard on Turbine Panel updated to: CV-1 @ 35, CV-2 @ 100, CV-3 @ 100, and CV-4 @ 100
- _____ Feedwater Reg Valve placard updated to: A @ 72/73, B @ 72/73
- _____ MOC Δ I sheet displayed on C panel
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 30, and reset
- _____ Placard on CVCS Letdown panel updated: boron: 721
- _____ Turbine reference/setter positions: 850/850
- _____ Reactivity Guidance placard updated to: BA: 3 gal, RMU: 67 gal
- _____ Chart recorders operating and forwarded (Paperless 'messages' not flashing red)
- _____ ERCS driven recorders are on-scale
- _____ All ERCS terminals operating
- _____ ERCS alarm screen up and reset
- _____ ERCS Group Displays update rate entered (5 seconds)
- _____ ERCS TPM screen displayed, CALM and Auto selected
- _____ Δ I displayed on ERCS single point display #1 (1U1613A)
- _____ Pens/Paper/Markers available on the simulator
- _____ Turnover sheet/LCO log/PRA sheet/Protected Equipment sheet available
- _____ Procedures to be used during scenario are cleaned of any place keeping marks
 - C47003-0503
 - C47022-0109
 - C47047-1R-39
 - 1C14 AOP2
 - 1C12.1
 - 1C12.1 AOP3
 - LCO 3.4.14, RCS Leakage Condition A
 - C47012-0506
 - LCO 3.4.11, Condition A and D

- 1E-0
- 1ECA-0.0
- 1ECA-0.1
- 1ECA-0.2

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

_____ Magnetic placards in place:

- 11 BA TANK "Lined Up For Service"
- 11 BA PUMP "Lined Up To 11 BA Tank"
- CC TO SFP MV-32115 "In Service"
- Blowdown 46470 "SGB To CDSR"
- Protected equipment signs on:
 - 12 AFW Pump
 - 12 RHR Pump
 - 12 SI Pump
 - 12 CS Pump
 - 12 CC Pump
 - 122 CR Chiller
 - 122 Air Compressor
 - 22 DD CL Pump
 - D2

After Training for the Day

- _____ Information Tags removed and put away
- _____ Signs/placards removed and put away unless normal simulator configuration
- _____ Floor PCs logged off
- _____ All books, note pads, and calculators put away
- _____ Instructor station returned to normal with all books, paper, and etc. put away
- _____ Headsets turned off and put away
- _____ Simulator reset to IC-10 unless another IC will be used for further training
- _____ ERCS computer restored to normal
- _____ Simulator placed in DORT if simulator will not be used again that day
- _____ Recorder power "OFF"

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:

DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 64 ft²

SYSTEM CONDITION: GREEN

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS	
D1 OOS for fuel injector replacement, estimated return to service is 8 hours.	
PROTECTED EQUIPMENT	
12 AFW Pump 12 RHR Pump 12 SI Pump 12 CS Pump 12 CC Pump 122 CR Chiller 122 Air Compressor 22 DD CL Pump D2	
RAD MONITORS OOS	ANNUNCIATORS OOS
None	None
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
None	None
OTHER EQUIPMENT OOS / STATUS	
12 BATP OOS, seal replacement.	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
OPERATIONAL PLANS FOR COMING SHIFT	
Adding 10 gallons of RMU 3-4 times per shift for Temperature Control	
NEW PROCEDURES / INSTRUCTIONS	
None	

WATCHSTANDERS LPEO: OURET, TRAVIS

PEO: KEMPKE, JOHN

LPEO Relieved By: _____

Time: _____

Date: _____

PEO Relieved By: _____

Time: _____

Date: _____

CB WALKDOWN → LPEO: _____

Time: _____

→ PEO: _____

Time: _____



SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND

SEG # 2005 NRC SCENARIO 6

SEG TITLE: LOSS OF REGEN HX/ STEAM HEADER
PRESSURE FAILURE/PLANT FIRE/RCS
LEAK/LBLOCA WITH RHR FAILURE #: SCEN 6 REV. # 0

PROGRAM: INITIAL LICENSED OPERATOR #: P8100

COURSE: INITIAL LICENSED OPERATOR #: P8100

TOTAL TIME: 2 HOURS

Developed by:	<u>J. Kempkes</u>	<u>3/11/05</u>
	<i>Instructor</i>	<i>Date</i>
Reviewed by:	<u></u>	<u></u>
	<i>Instructor</i>	<i>Date</i>
Validated by:	<u></u>	<u></u>
	<i>Validation Lead Instructor</i>	<i>Date</i>
Approved by:	<u></u>	<u></u>
	<i>Training Supervision</i>	<i>Date</i>

Guide Requirements

Goal of Training:

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

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

Learning Objectives:

1. Raise reactor power from 2% to 6% in preparation for turbine roll per 1C1.2.
 2. Respond to a regenerative heat exchanger outlet valve failing CLOSED per 1C12.1 AOP2, Loss of Charging Flow to the Regen HX.
 3. Diagnose and Respond to a Steam Line Header Pressure Instrument failure.
 4. Respond to a fire in the vicinity of the RHR pits per C47, F5 App D and F5 App A.
 5. Respond to an RCS leak in containment per 1C4 AOP1.
 6. Respond to a Large Break LOCA from the Pressurizer Surge Line per 1E-0 and 1E-1.
 7. (If necessary) Respond to a Containment High Pressure condition per 1FR-Z.1.
-

Prerequisites: None

Training Resources:

1. Full Scope Simulator
 2. Operations Management Representative
 3. Lead Evaluator
 4. Human Performance Evaluator
 5. Comment Recorder
 6. Booth Operator (Primary Communicator)
 7. Backup Communicator
-

References:

1. 1C1.2 Startup Operation
 2. 1C12.1 AOP2, Loss of Charging Flow to the Regen HX
 3. F5 Appendix A Fire Strategies
 4. F5 Appendix D Effect of Fire Outside the Control Room
 5. 1C4 AOP1 RCS Leak
 6. 1E-0 Reactor Trip or Safety Injection
 7. 1E-1 Loss of Reactor or Secondary Coolant
-

Commitments:	None
Evaluation Method:	This is an evaluation scenario for the 2005 ILT NRC Exam, this is a new scenario.
Operating Experience:	None – Evaluation Scenario
Related PRA Information:	<u>Initiating Event with Core Damage Frequency:</u> Large Break LOCA 1.2% <u>Important Components:</u> 12 AFWP RHR Pumps

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Loss of Charging to Regen HX
2. Steam Header Pressure Fails Low
3. RCS Leak

After EOP Entry:

1. 12 RHR Pump Start Failure/11 RHR Pump Lockout on Start

Abnormal Events:

1. Regen HX Outlet Valve Fails Closed
2. Fire in Aux Building
3. RCS Leak

Major Transients:

1. Large Break LOCA

Critical Tasks:

1. Direct a power reduction to MODE 3 within 1 hour of determining RCS leakage is in excess of 10 gpm.
2. Start at least one RHR pump prior to reaching a RED condition on the Core Cooling CSF.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. Conditions based on IC-6, except reactor power is reduced to between .5 and 2% (IC starts at 6% prior to turbine roll). Procedure 1C1.2 is in progress with the step 5.12 SM Hold having just been signed off.
2. 11 and 22 Component Cooling pumps are in service.

SEQUENCE OF EVENTS:

Event 1: Raise Reactor Power to approximately 6%

1. Rods are withdrawn to raise Tav_g and increase steam flow through the steam dumps.

Event 2: Regen HX Charging Line Outlet CV fails CLOSED

- CV-31328 fails CLOSED, causing greatly reduced charging flow and high charging pressure/charging relief lift.
- Letdown is isolated and excess letdown placed in service per 1C12.1 AOP2.

Event 3: Steam Header Pressure fails low

- Action to place Steam Dumps in Manual or reduce the setpoint of the PORVs
- Reactivity transient will occur

Event 4: Fire in the Auxiliary Building

- Fire Detection Zone 8 alarms (695' Aux Building)
- Fire is in the vicinity of Unit 1 RHR Pits.
- 12 CC pump is started and 12 AFWP placed in LOCAL per F5 App D.

Event 5: RCS Leak

- An 11 gpm (approx) RCS leak develops on the Pressurizer Surge Line.
- Previous malfunctions prevent start of additional charging pumps, so excess letdown flow is reduced or stopped.
- Leak is NOT isolable and is determined to be located in containment.
- Technical Specifications require unit shutdown.

Event 6: Large Break LOCA

- The pressurizer surge line shears causing a LBLOCA.
- Neither RHR pump autostarts on the SI.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

This is an evaluation scenario and as such, tasks are not credited for training and therefore are not listed here.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>INITIAL CONDITIONS (IC):</p> <ol style="list-style-type: none"> 1. Initialize simulator to IC-6 (or exam IC) and allow ERCS to come up. <ol style="list-style-type: none"> a. IF using IC-6, perform the following: <ol style="list-style-type: none"> 1) Insert rods to reduce reactor power to between 0.5 and 2% and stable. 2) Enter malfunctions and triggers. • Mode: 2 • Exposure: ZBC • Power: 2% • Boron: (CB): 1850 ppm • Temperature: 552 • Pressure: 2235 • Xenon: Zero • Rods: As required • Generator: Offline 	(RO/LO /SRO)	
	<ol style="list-style-type: none"> 2. SIMULATOR SET UP <ol style="list-style-type: none"> a. Reset the simulator to IC-6. b. Place the simulator in RUN. 3. Enter the malfunctions, remotes, and overrides, as specified by the "Simulator Input Summary", to cause the following pre-existing conditions (Relative Order 0): <ol style="list-style-type: none"> a. 11 RHR pump locks out b. 12 RHR pump fails to Auto Start 4. Pull out 1C1.2 and sign through step 5.12 SM Hold. 5. Complete the "Simulator Setup Checklist". 		

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	6. COMPLETE TURNOVER: a. "UNIT 1 LPEO / PEO TURNOVER LOG" (should be provided with the scenario IC) b. Verify crew performs walk down of control boards and the reviews turnover checklists.	CREW	Review the following with the offgoing operator: <ul style="list-style-type: none">• Unit 1 LPEO / PEO Turnover log Walk down the control boards and ask questions as appropriate.

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SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			IF VCT<17%, verify auto makeup has initiated. CLOSE letdown orifice isolation valves. CLOSE letdown isolation valves Place charging pumps in MANUAL speed control. Place Excess letdown in service.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 3	<p>10. <u>WHEN</u> the crew has placed Excess Letdown in service and / or at the discretion of the Lead Evaluator, enter the Steam Header Pressure PT-484 Instrument failure low. (Relative Order 3, Trigger 3)</p> <p>a. If asked as I&C to trouble shoot the failed Instrument, report an I&C Technician will be in the Control Room in 1 hour.</p> <p>NOTE: There are no alarms associated with this malfunction. The operators will see the Steam Dumps close, RCS Temp increasing and Reactor power decreasing.</p>	<p>Crew LEAD</p> <p>LEAD RO RO</p>	<p><u>Plant Stabilization Actions</u></p> <p>Control the Steam Dump in Manual OR Adjust the PORV setpoint to 1005 psig Control Reactor Power Control Tave</p>
Event 4	<p>11. <u>WHEN</u> the crew has stabilized Reactor Power and Tave and / or at the discretion of the Lead Evaluator, enter the Zone 8 Fire Alarm (Relative Order 4, Trigger 4)</p> <p>WHEN called as Aux Building Operator, wait 2 minutes then call back and report a fire in progress on the north end of 11 RHR pit, involving consumables and staged equipment, and could not be extinguished with one portable extinguisher.</p> <p>Two minutes after the Fire page, come up on the radio as the Fire Brigade Chief and receive a turnover on the fire report.</p> <p>Inform the SS that "Unit 2 will perform classification and notification."</p> <p>When directed to open breakers per C47022-0611 Attachment A for Zone 8, enter (Relative Order 4c, Trigger 10), then report the breakers are open.</p>	<p>LEAD</p> <p>SS Lead</p>	<p><u>47022-0601 FIRE ALARM</u></p> <p>Determine fire alarm is in ZONE 8 Aux Bldg 695' Page Aux Building Operator Actuate the fire alarm Announce the fire and simulate fire brigade auto paging Notify the Red Wing Fire Department Establish radio communication with the Fire Brigade Chief Consult Att A of ARP Start 12 CC pump per F5 App D Direct local control of 12 AFWP per F5 App D Reset fire panel Verify auto starts of fire pumps Notify Security of RWFD arrival Notify Fire Protection/Industrial Safety Consult Technical Specifications for inoperability of 12</p>

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>WHEN directed, place 12 AFWP in LOCAL (Relative Order 4a, Trigger 5)</p> <p>WHEN 12 CC pump is started AND local control of 12 AFWP is completed, report "Fire is OUT and damage is limited to material in storage area."</p> <p>As the Unit 2 SS report, "Unit 2 will take over the actions for the fire."</p> <p>One minute later, DELETE the fire alarm malfunction (Relative Order 4b)</p>	SS	AFWP while in LOCAL (3.7.5 Cond B, 72 hours)

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5	<p>12. <u>WHEN</u> the crew has assumed the Tech Spec for 12 AFW pump and / or at the discretion of the Lead Evaluator, enter the 11 gpm RCS Leak (Relative Order 5, Trigger 6)</p> <p>Note: The high radiation alarm takes 5 minutes to come in.</p> <p>13. When the Crew has entered LCO 3.4.14 Condition A, report as the Event Team Leader, a Containment Entry has been made and the leak is coming from a crack on the Pressurizer Surge Line.</p>	<p>RO</p> <p>SS</p> <p>LEAD/SS</p> <p>LEAD</p> <p>RO</p> <p>LEAD</p>	<p>Note lowering pressurizer level and adjust charging or excess letdown flow to stabilize.</p> <p><u>47012-0508 Pressurizer Hi/Lo Pressure</u></p> <p>Check pressure low.</p> <p>Verify all pressurizer heaters ON</p> <p>Verify both pressurizer PORVs closed</p> <p>Verify aux spray valve closed</p> <p>Verify pressurizer pressure control operating in AUTO</p> <p>Refer to TS 3.4.1 (DNB) if <2190 psig RCS pressure</p> <p>Initiate RCS leakrate using ERCS 'LEAK' program</p> <p><u>47022-0108 Train B High Radiation</u></p> <p>Determine alarm is 1R-11/1R-12</p> <p><u>1C4 AOP1 RCS LEAK</u></p> <p>*Continuous action* Verify RCS inventory can be maintained by available charging flow. IF NOT, trip the reactor, initiate SI and exit C4 AOP1.</p> <p>Determine location of leak using Figure 1. (Containment radiation monitors and humidity will change)</p> <p>Remove excess letdown from service and recalculate leakrate.</p> <p>Close CV-31198 Charging FCV and recalculate leakrate</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD	Isolate charging to the RCP seals: <ul style="list-style-type: none"> • Verify both RCP TBHX CC valves open • Stop the running charging pump and recalculate leakrate • Restore seal injection by restarting charging pump once determined leak not isolated
		SS	<ul style="list-style-type: none"> • When the leak location is unidentified: <ul style="list-style-type: none"> ○ Refer to LCO 3.4.14 Condition A for total leakage not within limit of 10 gpm. ○ Action to reduce leakage less than 10 gpm within 4 hours. • When the leak location is identified: <ul style="list-style-type: none"> ○ Refer to LCO 3.4.14 Condition D ○ Action to direct/recognize a power reduction to Mode 3 is required within 6 hours. ○ (CRITICAL TASK) • Notify Operations Manager and Resident Inspector of entry to C4 AOP1

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SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	(E-0 continued)	RO	<ul style="list-style-type: none"> • Check/verify RCP's stopped • Check SG's not faulted <ul style="list-style-type: none"> ◦ RO should use steam tables, SS may use ERCS plot 'SGTEMP' • Check SG's not ruptured <ul style="list-style-type: none"> ◦ R-15, R-19, R-51, R-52 normal • Check RCS intact <ul style="list-style-type: none"> ◦ Containment radiation R-2, 7, 11, 12 high ◦ Containment pressure abnormal
		SS	<ul style="list-style-type: none"> • Transition to 1E-1
	17. E-1 Loss of Reactor or Secondary Coolant 18. If asked as Unit 2, report Unit 2 will unload diesel generators as required.	RO Lead	<ul style="list-style-type: none"> • Verify RCP's stopped • Verify SGs not faulted • Control AFW flow to maintain 50-59% WR SG
		RO Lead	<ul style="list-style-type: none"> • Check secondary radiation NORMAL • Check Pzr PORV's/blocks closed • Reset SI • Reset CI • Open Instrument Air to Ctmt valves
		RO	<ul style="list-style-type: none"> • Verify offsite power to safeguards buses • Establish at least 1 charging pump running • Verify SI cannot be terminated • Verify SI pump cannot be stopped
		SS	<ul style="list-style-type: none"> • Verify RCS and SG pressures stable (no loop) • Stop unloaded DG's (D1/D2) NOTE: May be done by Unit 2 operators

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	19. <u>WHEN</u> the crew verifies SI can not be stopped and /or at the discretion of the Lead Evaluator, place the simulator in freeze. a. Do not reset the simulator until the Lead Evaluator has consented	Crew	Assemble near fire detection panel while evaluators consult
	20. The Classification will be performed by the SS after the conclusion of the Scenario. a. The EAL for this Scenario is SAE on 2C.		

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
0	SIMRH01	MALF	RH01A				11 RHR pump lockout on start
0	SIMRH01	MALF	RH02B				12 RHR pump fails to start in AUTO
2	C1-C26	OVRD DI	DI-46296O OPEN	OFF	2		Regen HX outlet valve CV-31328 fails CLOSED
3	D1-D5	REMOTE	RX225	1	3		Steam Header Pressure Fails LOW (PT-484)
4	FDP-4	REMOTE	CH121	8	4		Zone 8 Fire Alarm
4a	SIMFW08	OVRD DI	DI-51517 LOCAL	ON	5		12 AFWP local control
4b	FDP-4	REMOTE	CH121	DELETE			Zone 8 Fire Alarm
4c		OVRD DO	LO-46203R	OFF	10		MV-32 breaker OFF

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
4c		OVRD DO	LO-46027G	OFF	10		MV-32 breaker OFF
4c		OVRD DO	LO-46027R	OFF	10		MV-32 breaker OFF
4c		OVRD DO	LO-46204G	OFF	10		MV-32 breaker OFF
4c		OVRD DO	LO-46205G	OFF	10		MV-32 breaker OFF
4c		OVRD DO	LO-46316R	OFF	10		MV-32 breaker OFF
4c		OVRD DO	LO-46317R	OFF	10		MV-32 breaker OFF
5	SIMRC03	MALF	RC10	0.011	6		RCS Leak 11 GPM- Surge Line
6	SIMRC03	MALF	RC10	100			Pzr Surge Line Shear
7	SIMFW08	OVRD DI	DI-5151802 START	ON	7		Local start 12 AFWP

SIMULATOR SETUP CHECKLIST

Before Training

- _____ Simulator in "Training Load"
- _____ Step counters "ON"
- _____ Alarm sound "ON"
- _____ Recorder power "ON"
- _____ Simulator Reset to correct IC (malfunctions, remotes, and overrides for Relative Order 0 conditions and conditions actuated by event triggers entered per "Simulator Input Summary")
- _____ High Flux at Shutdown alarm placards updated to: 5000 cps-
- _____ Control Valve position placard on Turbine Panel updated to: CV-1 @ 0, CV-2 @ 0, CV-3 @ 0, and CV-4 @ 0
- _____ Feedwater Reg Valve placard updated to: A @ 0/0, B @ 0/0
- _____ ZBC ΔI sheet displayed on C panel
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset
- _____ Placard on CVCS Letdown panel updated: boron: 1850
- _____ Turbine reference/setter positions: 0/0
- _____ Reactivity Guidance placard updated to: BA: 3 gal, RMU: 67 gal
- _____ Chart recorders operating and forwarded (Paperless 'messages' not flashing red)
- _____ ERCS driven recorders are on-scale
- _____ All ERCS terminals operating
- _____ ERCS alarm screen up and reset
- _____ ERCS Group Displays update rate entered (5 seconds)
- _____ ERCS TPM screen displayed, NIS selected
- _____ ΔI displayed on ERCS single point display #1 (1U1613A)
- _____ Pens/Paper/Markers available on the simulator
- _____ Turnover sheet/LCO log/PRA sheet/Protected Equipment sheet available
- _____ Procedures to be used during scenario are cleaned of any place keeping marks
- 47015-0205
- 47015-0408
- 47015-0509
- 47022-0601
- Tech Spec 3.7.5 Condition B
- Tech Spec 3.4.14
- 47022-0611
- 47012-0508

47022-0108

1C1.2 Startup Operation

1C12.1 AOP2, Loss of Charging Flow to the Regen HX

F5 Appendix A Fire Strategies

F5 Appendix D Effect of Fire Outside the Control Room

1C4 AOP1 RCS Leak

1E-0 Reactor Trip or Safety Injection

1E-1 Loss of Reactor or Secondary Coolant

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

_____ Magnetic placards in place:

- 11 BA TANK "Lined Up For Service"
- 11 BA PUMP "Lined Up To 11 BA Tank"
- CC TO SFP MV-32115 "In Service"
- Blowdown 46470 "SGB To CDSR"

After Training for the Day

_____ Information Tags removed and put away

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

_____ Floor PCs logged off

_____ All books, note pads, and calculators put away

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

_____ Headsets turned off and put away

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

_____ ERCS computer restored to normal

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

_____ Recorder power "OFF"

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:

DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 64 ft²

SYSTEM CONDITION: GREEN

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS	
None	
PROTECTED EQUIPMENT	
None	
RAD MONITORS OOS	ANNUNCIATORS OOS
None	None
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
None	None
OTHER EQUIPMENT OOS / STATUS	
12 BATP OOS, seal replacement	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
None	
OPERATIONAL PLANS FOR COMING SHIFT	
Start up in progress, continue with 1C1.2 at step 5.12. Increase power to 6% for Turbine roll. Xenon is starting to build in, diluting 25 gallons every 20 minutes to maintain power.	
NEW PROCEDURES / INSTRUCTIONS	
None	

WATCHSTANDERS LPEO: OURET, TRAVIS

PEO: KEMPKE, JOHN

LPEO Relieved By: _____ Time: _____ Date: _____

PEO Relieved By: _____ Time: _____ Date: _____

CB WALKDOWN → LPEO: _____ Time: _____

→ PEO: _____ Time: _____



SIMULATOR EXERCISE GUIDE (SEG)

SITE: PRAIRIE ISLAND

SEG # 2005 NRC SCENARIO 7

SEG TITLE: RAISE REACTOR POWER, 12 AFW
 PUMP LOCKOUT, LOSS OF CONTROL
 ROOM CHILLERS, SG TUBE LEAK,
 SGTR WITH LOSS OF COOLING WATER #: SCEN 7 REV. # 0

PROGRAM: INITIAL LICENSED OPERATOR #: P8100

COURSE: INITIAL LICENSED OPERATOR #: P8100

TOTAL TIME: 1.5 HOURS

Developed by:	J. Kempkes <i>Instructor</i>	3/14/05 <i>Date</i>
Reviewed by:	<i>Instructor</i> (See page 10, Simulator Development Checklist.)	<i>Date</i>
Validated by:	<i>Validation Lead Instructor</i> (See page 11, Simulator Validation Checklist.)	<i>Date</i>
Approved by:	<i>Training Supervision</i>	<i>Date</i>

Guide Requirements

Goal of Training:

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

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

Learning Objectives:

1. Raise reactor power to the POAH per 1C1.2.
2. Respond to loss of 12 AFW pump at lower power per C47.
3. Respond to loss of CR Chillers per C37 and Tech Specs.
4. Diagnose and respond to tube leakage into 11 SG per 1C4 AOP2 and C47.
5. Respond to a Steam Generator Tube Rupture with Loss of Offsite Power/Bus 15 lockout per 1E-0 and 1E-3.
6. Respond to a loss of Train B Cooling Water Header per C47 and C35 AOP1.

Prerequisites: None

Training Resources:

1. Full Scope Simulator
2. Operations Management Representative
3. Lead Evaluator
4. Human Performance Evaluator
5. Comment Recorder
6. Booth Operator (Primary Communicator)
7. Backup Communicator

References:

1. C47
2. 1C14 AOP2
3. 1C4 AOP2
4. 1E-0
5. 1ES-0.1
6. 1E-3
7. C35 AOP1

Commitments:

None

**Evaluation
Method:**

This is an evaluation scenario for the 2005 ILT NRC Exam, this is a new scenario.

**Operating
Experience:**

None – Evaluation Scenario

**Related PRA
Information:**

Initiating Event with Core Damage Frequency:

Steam Generator Tube Rupture (18%)

Loss of Cooling Water (2%)

Important Components:

121 Cooling Water Pump

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. 12 AFW Pump Lockout
2. 11 SG Tube Leak

After EOP Entry:

1. Loss of Offsite Power
2. Lockout of Safeguards 4160V Bus 15
3. Failure of 22 Cooling Water Pump

Abnormal Events:

1. Loss of Control Room Chillers
2. SG Tube Leak

Major Transients:

1. Loss of Offsite Power
2. Steam Generator Tube Rupture

Critical Tasks:

1. Recognize Tech Spec 3.0.3 entry for both Units due to inoperable Control Room Chillers.
2. Cooldown and depressurize the RCS and terminate SI prior to 11 SG going water solid.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. Initialize the simulator to IC-26:
 - Startup in progress per 1C1.2 at step 5.9.17, reactor power 10^{-8} A, Appendix C1B was just completed
 - Next step is to increase power to the POAH
2. No equipment is OOS:

SEQUENCE OF EVENTS:

Event 1: Raise Reactor Power to the POAH

- Per 1C1.2

Event 2: Lockout of 12 AFW pump

- 12 AFW pump locks out requiring action to start 11 TD AFW pump

Event3: Loss of Control Room Chillers

- Loss of 121 CR Chiller with 122 CR Chiller failure to auto start
- Action to shutdown IAW LCO 3.0.3.
- Chiller restored prior to commencing unit shutdown

Event 4: Steam Generator Tube Leak

- A 50 gpd tube leak develops on 11 SG.
- R-19 is used due to MSIV's being Closed.
- Leakage is estimated per Duty Chemist.
- Action Level 2 is entered (>30, <75 gpd leakage)

Event 5: Loss of Offsite Power with Bus 15 Lockout and Loss of Cooling Water

- Offsite power is lost and Bus 15 locks out.
- 22 DDCLP fails to start.

Event 6: Steam Generator Tube Rupture

- After transfer to 1ES-0.1 Reactor Trip Recovery, a SGTR occurs on 11 SG.
- 1E-0 is reentered following manual or automatic SI actuation.
- Loop A CL Pressure is lost on SI.
- 121 Cooling Water Pump must be aligned to Loop A.
- 1E-3 is used to isolate 11 SG and terminate SI.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

This is an evaluation scenario and as such, tasks are not credited for training and therefore are not listed here.

SCENARIO TIME-LINE:

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC-26): <ul style="list-style-type: none">• IC-26• Mode: 2• Exposure: ZBC• Power: 10⁻⁸A• Boron: (CB): 1850 ppm• Temperature: 549 F• Pressure: 2235• Xenon: 0• Rods: Manual• Generator: Offline		
	1. SIMULATOR SET UP <ul style="list-style-type: none">a. Reset the simulator to IC-26.b. Place the simulator in RUN. 2. Enter the malfunctions, remotes, and overrides, as specified by the “Simulator Input Summary”, to cause the following pre-existing conditions (Relative Order 0) : <ul style="list-style-type: none">a. 122 CR Chiller auto start failure. 3. Pull out 1C1.2 and sign off step up to and including 5.9.16.		
	4. Complete the “Simulator Setup Checklist”.		
	5. COMPLETE TURNOVER: <ul style="list-style-type: none">a. “UNIT 1 LPEO / PEO TURNOVER LOG”b. Verify crew performs walk down of control boards and the reviews turnover checklists.	CREW	Review the following with the offgoing operator: <ul style="list-style-type: none">• Unit 1 LPEO / PEO Turnover log Walk down the control boards and ask questions as appropriate.

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SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 4	<p>9. WHEN the Crew exits LCO 3.0.3 and / or at the discretion of the Lead Evaluator, THEN enter the Steam Generator Tube Leak (Relative Order 3, Trigger 3).</p> <p>a. Call as the Duty Chemist and report daily SG sample has been taken and 11 Steam Generator Cation Column was frisked. The 11 SG Cation Column has higher than normal activity.</p> <p>b. If asked for additional sample, report the backup sample shows Primary to Secondary Leakage on 11 Steam Generator is 80 gpd</p> <p>c. When C4 AOP2 is entered, as the Duty Chemist, Report Primary to Secondary Leakage on 11 Steam Generator is 80 gpd.</p> <p>d. As the Ops Manager and / or NRC Resident acknowledge entry into the AOP.</p> <p>e. When asked, report AR-8-2 is open and AR-8-1 is closed.</p>	<p>LEAD</p> <p>LEAD</p> <p>LEAD</p>	<p>1C4 AOP2 Steam Generator Tube Leak</p> <ul style="list-style-type: none"> • Monitor R-19 (maybe isolated if Blowdown is not reset) • Direct Duty Chemist to obtain Samples • Notify Ops Manager and NRC Resident Inspector • Direct Duty Chemist to determine Leak Rate • Verify no Blowdown to the river • Determine Action Level 2 is appropriate based on no R-15 data

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5	<p>10. After the Crew determines Action Level 2 is appropriate and / or at the discretion of the Lead Evaluator, THEN enter the Loss of Offsite Power with Bus 15 Lockout and Loss of Cooling Water (Relative Order 4, Trigger 4).</p> <p>a. If asked to investigate Bus 15 Lockout, Report Bus 15 has a 50G Flag</p> <p>b. If asked to investigate 22 Cooling Water pump, report, 22 Cooling Water Pump has an air leak and will not be able to be started.</p>	RO LEAD	<p>1E-0, Reactor Trip or Safety Injection</p> <ul style="list-style-type: none"> • Verify Reactor Trip • Verify Turbine Trip • Verify Both Safeguards Busses energized • Check if SI is actuated • Transition to 1ES-0.1, Reactor Trip Recovery
Event 6	<p>11. 1E-0 Implementation</p> <p>a. If requested, report that all category 1 vent doors are closed.</p> <p>b. If requested, report all Turbine Building roof exhausters are stopped.</p> <p>c. If requested to isolate Unit 1 MSR's per Attachment J, perform the following:</p> <ol style="list-style-type: none"> 1) Bring up the CAEP Window 2) Click on OPEN File 3) Click on Attachment J-E0 .cae 4) Click on Run button 5) After 12.5 minutes, Report that Unit 1 MSR's are isolated per 1E-0 Attachment J 	SS RO LEAD	<p>1ES-0.1, Reactor Trip Recovery</p> <ul style="list-style-type: none"> • Announce Unit 1 Reactor Trip • Transfer Steam Dump to Pressure Mode • Check RCS Temperature stable at 547F • Check Cooling Water Header Pressures greater than 75 psig
	<p>12. When the Crew transitions to 1ES-0.1, and at the discretion of the Lead Evaluator, ENTER the Steam Generator Tube Rupture. (Relative Order 5, Trigger 5).</p>	RO LEAD / RO	<ul style="list-style-type: none"> • Check Feedwater Status <ul style="list-style-type: none"> ○ RCS Temp ○ MFRV Closes ○ Total AFW Flow greater than 200gpm • Verify all rods inserted • Check Pressurizer level greater than 15% • Verify Charging and Letdown in service • Check Pressurizer pressure greater than 1830psig • Manually actuate SI and transition to 1E-0, Reactor Trip or Safety Injection. <p>NOTE: The transition to 1E-0 can be made at step 9 on PZR Pressure or from the Info Page based on PZR level less than 5%.</p>

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>13. 1E-0 implementation, continued.</p> <p>NOTE: The Lead will be investigating the loss of Cooling Water Header pressure while the RO Continues with the EOP</p>	<p>RO LEAD</p> <p>RO LEAD</p> <p>RO</p> <p>RO</p>	<p>1E-0, Reactor Trip or Safety Injection</p> <ul style="list-style-type: none"> • Verify Reactor Trip • Verify Turbine Trip • Verify Both Safeguards Busses energized • Check if SI is actuated • Perform Attachment L <ul style="list-style-type: none"> ○ Cooling Water Pressure will be low ○ Enter C35 AOP1, Loss of Pumping Capacity or Supply Header with SI. • Check Total AFW flow greater than 200 gpm • Check RCS temperature stable or trending to 547F • Check PZR PORV's Closed • Check PZR Spray valves Closed • Check if RCPS should be stopped. • Check if SG are not Faulted • Check if SG Tubes are not ruptured <ul style="list-style-type: none"> ○ Transition to 1E-3, Steam Generator Tube Rupture

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	14. C35 AOP 1 implementation	LEAD	C35 AOP1, Loss of Pumping Capacity or Supply Header with SI <ul style="list-style-type: none"> • Place 121 Cooling Water Pump in PULLOUT • Reset SI • Close MV-32034, 121 CLG WTR HDR VLV A • OR • Close MV-32035, 121 CLG WTR HDR VLV B Verify the following due to no power: <ul style="list-style-type: none"> • Open MV-32036, 121 CLG WTR HDR VLV C • Open MV-32037, 121 CLG WTR HDR VLV D • Start 121 Cooling Water Pump <p style="text-align: center;">CRITICAL TASK</p>
	15. 1E-3 implementation	LEAD / RO	1E-3, Steam Generator Tube Rupture <ul style="list-style-type: none"> • Check if RCPs should be stopped • Identify Ruptured SG <ul style="list-style-type: none"> ◦ Determine 11 SG is Ruptured • Isolate Flow from 11 SG <ul style="list-style-type: none"> ◦ Verify PORV setpoint is 75% ◦ Check PORV Closed ◦ Closed Steam Supply from 11 SG to TD AFW pump ◦ Verify 11 SG blowdown valves are closed • Close 11 SG MSIV and Bypass • Stop Feed flow to 11 SG • Reset SI • Check 11 SG pressure greater than 210psig • Initiate RCS Cooldown • Dump steam from 12 SG PORV

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		LEAD / RO	<ul style="list-style-type: none"> • Stop Cooldown when reach required CETC temp • Check 12 SG Level – Control level 5-50% • Check PZR PORVS Closed • Check Block valves – at least one open • Reset SI • Reset Containment Isolation • Establish Instrument Air to Containment • Stop both RHR Pumps • Check Charging Pumps – at least one running • Align Charging to RWST • Establish Max Charging flow • Check 11 SG pressure stable or increasing • Check RCS Subcooling – greater than 40F • Depressurize RCS using PORV • Check if SI flow should be terminated <ul style="list-style-type: none"> ○ RCS Subcooling – greater than 20 ○ Total feed flow – greater than 200 gpm ○ RCS pressure stable or increasing ○ PZR level – greater than 7% • Stop Both SI Pumps <p style="text-align: center;">CRITICAL TASK</p>
	<p>16. <u>WHEN</u> the crew stops the SI Pump in 1E-3 and / or at the discretion of the Lead Evaluator, place the simulator in freeze.</p> <p>a. Do not reset the simulator until the Lead Evaluator has consented</p>		Assemble near fire detection panel while evaluators consult

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	17. The Classification will be performed by the SS after the conclusion of the Scenario. a. The EAL for this Scenario is SAE on 4E		

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
0		Override DI	DI-46076 ST START	OFF			122 CR Chiller Auto Start Failure
1		Malfunction	FW32		1		12 AFW Pump Lockout
2			M47022:0302	Cry Wolf	2		121 CR Chiller Trip
2		Override DI	DI-46068 PTL	ON	2		121 CR Chiller Breaker Trip
2a		Override DI	DI-46076 ST START	DELETE			122 CR Chiller Auto Start Failure
3		Malfunction	SG01A	.001	3		11 SG Tube Leak 50 gpd
4		Malfunction	ED14		4		Loss of Offsite Power
4		Malfunction	ED09E		4		Bus 15 Lockout
4		Override DI	DI-46523P PTL	ON	4		22 CL Pump Failure

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
5		Malfunction	SG02A	10	5	120 Sec Ramp	Steam Generator Tube Rupture- 11 SG, 300 gpm
6		Remote	MS-138	CLOSE	6		MV-32016 close without power

SIMULATOR SETUP CHECKLIST

Before Training

- _____ Simulator in "Training Load"
- _____ Step counters "ON"
- _____ Alarm sound "ON"
- _____ Recorder power "ON"
- _____ Simulator Reset to correct IC (malfunctions, remotes, and overrides for Relative Order 0 conditions and conditions actuated by event triggers entered per "Simulator Input Summary")
- _____ High Flux at Shutdown alarm placards updated to: 5000 cps-
- _____ Control Valve position placard on Turbine Panel updated to: CV-1 @ 0, CV-2 @ 0, CV-3 @ 0, and CV-4 @ 0
- _____ Feedwater Reg Valve placard updated to: A @ 0/0, B @ 0/0
- _____ ZBC ΔI sheet displayed on C panel
- _____ Boric Acid/RMU integrators set to: BA: 3, RMU: 10, and reset
- _____ Placard on CVCS Letdown panel updated: boron: 1850
- _____ Turbine reference/setter positions: 0/0
- _____ Reactivity Guidance placard updated to: BA: 3 gal, RMU: 67 gal
- _____ Chart recorders operating and forwarded (Paperless 'messages' not flashing red)
- _____ ERCS driven recorders are on-scale
- _____ All ERCS terminals operating
- _____ ERCS alarm screen up and reset
- _____ ERCS Group Displays update rate entered (5 seconds)
- _____ ERCS TPM screen displayed, NIS selected
- _____ ΔI displayed on ERCS single point display #1 (1U1613A)
- _____ Pens/Paper/Markers available on the simulator
- _____ Turnover sheet/LCO log/PRA sheet/Protected Equipment sheet available
- _____ Procedures to be used during scenario are cleaned of any place keeping marks
 - 1C1.2
 - C47010-0107
 - LCO 3.7.5 Condition B
 - LCO 3.0.4
 - 1C28.1
 - C37.11 AOP 1
 - C37.9 AOP 1

- C37.9 AOP 2
- LCO 3.7.11 Condition A.
- LCO 3.0.3
- C47022-0108
- C47048 1R-19
- 1C4 AOP2
- 1C28 AOP4
- 1E-0
- 1ES-0.1
- C35 AOP1
- 1E-3

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

_____ Magnetic placards in place:

- 11 BA TANK "Lined Up For Service"
- 11 BA PUMP "Lined Up To 11 BA Tank"
- CC TO SFP MV-32115 "In Service"
- Blowdown 46470 "SGB To CDSR"
- Protected equipment signs on:

After Training for the Day

- _____ Information Tags removed and put away
- _____ Signs/placards removed and put away unless normal simulator configuration
- _____ Floor PCs logged off
- _____ All books, note pads, and calculators put away
- _____ Instructor station returned to normal with all books, paper, and etc. put away
- _____ Headsets turned off and put away
- _____ Simulator reset to IC-10 unless another IC will be used for further training
- _____ ERCS computer restored to normal
- _____ Simulator placed in DORT if simulator will not be used again that day
- _____ Recorder power "OFF"

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:

DAY/NIGHT SHIFT: Day

CAT 1 VENT OPENINGS: 64 ft²

SYSTEM CONDITION: GREEN

SAFEGUARDS EQUIPMENT OOS/TECH SPEC REQUIRED ACTION STATEMENTS	
None	
PROTECTED EQUIPMENT	
None	
RAD MONITORS OOS	ANNUNCIATORS OOS
None	None
OUTSTANDING SP'S	FIRE DET / PROT EQP IMPAIRMENTS
None	None
OTHER EQUIPMENT OOS / STATUS	
None	
MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE	
None	
OPERATIONAL PLANS FOR COMING SHIFT	
Continue with Unit Startup. Raise Power to the POAH per 1C1.2.	
NEW PROCEDURES / INSTRUCTIONS	
None	

WATCHSTANDERS LPEO: OURET, TRAVIS

PEO: KEMPKE, JOHN

LPEO Relieved By: _____ Time: _____ Date: _____

PEO Relieved By: _____ Time: _____ Date: _____

CB WALKDOWN → LPEO: _____ Time: _____

→ PEO: _____ Time: _____

Facility: Prairie Island U1/U2 Scenario No.: 1 Op-Test No.: 2005301

Examiners: D. McNeil Operators: _____
D. Reeser _____
C. Zoia _____

Initial Conditions: Initial Conditions: 100% Power, BOC, Standard IC "A"

Turnover: Turnover: Breaker 16-10 and 11 TD AFW Pump OOS.

Event No.	Malf. No.	Event Type*	Event Description
1	RD0916	I	Failed RPI Rod G7 (AOP)
2	TC03	C/R	Turbine Control Valve Cycling (AOP) (Reactivity for RO)
3	CL01A	C	11 Cooling Water Pump Trip
3a	CL03	C	121 Cooling Water Pump Fails to Autostart
3c	CL02A	C	12 & 22 Cooling Water Pumps Fail to Autostart
4	DI-46038C Close	C	Isolation of CL to Unit 1 Turbine Building
5	RP07	C	Rx Trip Breakers Mechanically Stuck
6	MS01B	M	12 SG Steamline Break in Containment (Inserts on Rx Trip)
7a	FW34B	C	12 AFWP Auto Start Failure
7b	SI05A/B	C	Both SI Pumps Fail to Autostart
7c	RP06	C	MSIVs Fail to Auto Close
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Facility: <u>Prairie Island U1/U2</u>	Scenario No.: <u>2</u>	Op-Test No.: <u>2005301</u>
Examiners: <u>D. McNeil</u> Operators: _____ <u>D. Reeser</u> _____ <u>C. Zoia</u> _____		
Initial Conditions: <u>100% Power, BOC, Standard IC "A"</u>		
Turnover: <u>Breaker 16-10 and 11 TD AFW Pump OOS. Start 13 Charging Pump and stop 12 Charging Pump in preparation for isolation of 12 Charging</u>		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N	Swap from 11-12 Chg to 11-13 Chg in service
2	RX206	I	PRZR Level controlling channel fails Low
3	N/A	C	10-Bank Oil Leakage reported, requiring transfer of one safeguards 4160V bus to alternate source in anticipation of loss (AOP)
4	47012-0203	C	High Vibration on 12 RCP (AOP) (Power reduction required)
5	RC03B	M	12 RCP Shaft Shear
6	TC06	C	Turbine Auto Trip Failure (Note: Events 5-8 required to reduce SG inventory enough to cause loss of heat sink post trip)
6	RP06	C	MSIV Auto Closure Failure
6	TC01A	C	Turbine Left Stop Valve Closure Failure
6	TC14C	C	Turbine CV-3 Fails As Is
7	FW27B	C	FCV 476 (12 Main Feed Reg) Fails Closed on Trip
8	ED02B	C	Bus 12 Auto Transfer Failure
9	FW32	M	MD AFW Pump Trip on Start- Loss of Heat Sink

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Prairie Island U1/U2 Scenario No.: 6 Op-Test No.: 2005301

Examiners: D. McNeil Operators: _____
D. Reeser _____
C. Zoia _____

Initial Conditions: 2% Power Prior to Turbine Roll in 1C1.2 Startup

Turnover: No Equipment OOS, Raise power to 6% per 1C1.2

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R	Raise power to 6% per 1C1.2
2	DI-46296O Off	C	Regen HX Charging Line Outlet FCV fails CLOSED (AOP)
3	RX 225	I	Steam Header Pressure fails LOW
4	CH121 8	N	Fire in the Aux Building (requires hot short actions for CC, AFW)
5	RC10	C	Pressurizer Surge Line Leakage 11 gpm (AOP)
6	RC10	M	Large Break LOCA- Surge Line Shear
6a	RH01A	C	11 RHR Pump Lockout on Start
6b	RH02B	C	12 RHR Pump Fails to Start in Auto

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: <u>Prairie Island U1/U2</u>		Scenario No.: <u>7</u>	Op-Test No.: <u>2005301</u>
Examiners: <u>D. McNeil</u>		Operators: _____	
<u>D. Reeser</u>		_____	
<u>C. Zoia</u>		_____	
Initial Conditions: <u>Critical following App C1B startup, 10⁻⁸A, critical data taken</u>			

Turnover: <u>No equipment OOS</u>			

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	R	Raise reactor power to .5-2% per 1C1.2 Unit Startup.
2	FW32	C	12 AFWP Lockout
3	DI-46068	C	121 CR Chiller Breaker Trip
3	DI-46076	C	122 CR Chiller Auto start failure
3	47022-0302	C	121 CR Chiller Tripped annunciator
4	SG01A	C	Steam Generator Tube Leak (AOP)
5	ED14	M	Loss of Offsite Power (Rx Trip)
5	ED09E	C	Bus 15 Lockout
6	DI-46523	C	22 Diesel Cooling Water Pump start failure
7	SG02A	M	11 SG Steam Generator Tube Rupture (SI) (Causes Loop B CL isolation and loss of pressure)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Facility: Prairie Island U1/U2 Scenario No.: 4(spare) Op-Test No.: 2005301

Examiners: D. McNeil Operators: _____
D. Reeser _____
C. Zoia _____

Initial Conditions: Initial Conditions: 100% Power, MOC, Standard IC, RCS Boron Concentration 721 ppm. Adding 10 Gallons RMU 3-4 times per shift for Temperature Control.

Turnover: D1 OOS for fuel injector replacement, estimated return to service is 8 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	FW30	I	Heater Drain Tank Level Transmitter Failure
2	RC22A	C	Pressurizer PORV Leakage
3	VC08	C	Letdown HX Leak
4	ED14	M	Loss of All AC Power

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor