INITIAL SUBMITTAL OF THE SCENARIOS

FOR THE PRAIRIE ISLAND INITIAL EXAMINATION

THE WEEKS OF SEPTEMBER 10 AND 17, 2001

Facility: ***Prairie Island*** Scenario No.: ***1*** Op-Test No.:

Examiners: Operators:

Initial Conditions:

- 77%, BOC, RCS boron = 1442
- Xe burning out
- Unit 2 at 100%

Turnover:

22 Cooling Water Pump, 13 Charging Pump, 123 Air Compressor, and Breaker 16-10 out of service. Pre-existing stable 8 GPD SG tube leak. Adding 3 gallons of boric acid every 10 minutes as xenon burns out. Hold power at 77% for Power Marketing.

Event No.	Malf. No.	Event Type*	Event Description
1		C (RO)	Running Charging Pump trips.
2		I (RO)	Blue PRZR Level Inst Fails Low and a containment isolation valve fails to isolate requiring alternative isolation. (LCO action entry)
3		R (RO) N (BOP)	EH filter high D/P resulting in intercept valve closure, requiring controlled power change to 50% and ultimately manual reactor trip.
4		M (ALL)	Turbine Valves CV-3, SV-1 and 11 MSIV Fail Open resulting in uncontrolled depressurization of 11 SG. 12 SG Faulted inside CTMT requiring implementation of ECA2.1.
5		C (BOP)	12 AFW pump fails to auto start, requiring manual start following EOP entry.

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

Simulator Exercise Guide

File Number: 1 **Rev: 0**	**Title: 2001 NRC Exam Scenario**
Lesson Plan: N/A	**Duration: 2.0 hours**
Author: Joe Loesch	**Approved by:** [signature] **Date:** 7/20/01

OBJECTIVES:

1. Diagnose and take corrective actions for a trip of a running charging pump per C47.
2. Diagnose and take corrective actions for a low failure of a PZR level instrument channel per C47, C51, and Tech Specs.
3. Diagnose and take corrective actions for a containment isolation valve failure per Tech Specs and C19.
4. Diagnose and take corrective action for a clogged EH oil filter per C47 and malfunction of the turbine control system per C23 AOP2.
5. Perform a load reduction per 1C1.4 AOP1.
6. Diagnose and take corrective action for a failure of an Aux Feedwater Pump to auto start per C47.
7. Diagnose and take corrective action for uncontrolled depressurization of both SG's per ECA-2.1.

RELATED PRA INFORMATION (See PITC 2.3):

Initiating Event with Core Damage Frequency:

Normal Transient (1.4%)

Important Components:

11 and 12 AFW Pumps

Important Operator Actions with Task Number:

None

QUANTITATIVE ATTRIBUTES

Reactivity Changes:

1. Reduce power to less than 50% due to Intercept Valve Malfunction.

Normal / Abnormal Events:

1. 1C23 AOP2; Malfunction of Turbine EH Control System.
2. 1C1.4 AOP1; Rapid Power Reduction

Instrument/Component Malfunctions:

Before EOP Entry:
1. 11 Charging Pump trips.
2. Pressurizer level controlling channel fails low.
3. CV-31326 fails open (Containment Isolation)
4. Reheat Intercept valves fail closed.

After EOP Entry:
1. MSIV Auto closure failure
2. 12 AFW pump auto start failure

Major Transients:

1. E-0; Reactor Trip or Safety Injection
2. E-2; Faulted SG Isolation
3. ECA 2.1; Uncontrolled depressurization of both SGs

Technical Specifications:

1. Enter a 1-hour LCO for failure of a containment isolation valve to close per T.S.3.6.
2. Enter a 6-hour LCO for the failed PRZR level channel until bistables are tripped per T.S.3.5.

Critical Tasks:

1. Establish and maintain the minimum required FW flow to the SGs prior to meeting RCS bleed and feed criteria per FR-H.1.
2. Control AFW flow to not less than 40 GPM per SG in order to minimize RCS cooldown rate before an integrity orange path develops.

SCENARIO OVERVIEW

Initial Conditions:

- 22 Cooling Water Pump, 13 Charging Pump, 123 Air Compressor, and Breaker 16-10 out of service. Pre-existing stable 8 GPD SG tube leak. Adding 3 gallons of boric acid every 10 minutes as xenon burns out. Hold power at 77% for Power Marketing.

Sequence of Events:

Event 1: 11 Charging Pump Trips

- 11 Charging Pump Trips due to an electrical fault
- The running charging pump's speed (12) will be raised in manual to restore seal injection.
- 12 Charging Pump will be placed in automatic operation.
- Two of the three Charging Pumps are inoperable which was formerly a Tech Spec LCO action. The SS should recognize that it is no longer Tech spec related.

Event 2: Pressurizer level channel failed low – Loss of Letdown to VCT

- Blue channel pressurizer level fails to 0.
- Letdown isolates, but the orifice isolation valve (Containment Isolation) fails to close as expected requiring excess letdown and entry into a 1 hour LCO action for Containment Integrity until an alternative isolation is established.
- Pressurizer level control system will be returned to automatic operation.
- A 6-hour LCO per T.S.3.5: Table T.S.3.5-2A will be declared.
- The protection bistable is tripped.

Event 3: EH Filter clogging – 1A and 2B Reheat Intercept Valves fail closed

- The inservice filter becomes clogged, resulting in a high filter differential pressure.
- The standby pump is started
- Contaminants in the EH oil system results in 1A, and 2B reheat intercept valves failing closed.
- A reduction in power to 50% is required.

Event 4: 1B Reheat Intercept Valves fail closed

- Two valves have CLOSED such that flow is lost to one of the LP turbines.
- A manual reactor trip is required.

Event 5: **Uncontrolled Depressurization of Both SGs**

- Contaminants in the EH oil system result in additional turbine valve malfunctions:
  ⇒ Control valve CV-3 fails as is.
  ⇒ Turbine stop valve SV-1 sticks open.
- 11 SG MSIV fails to close.
- Following the unit trip, a steam line rupture on 12 SG develops in containment.
- 11 TDAFW pump overspeeds upon starting
- 12 MDAFW pump fails to start automatically, thus requiring a manual start.
- The result is an uncontrolled depressurization of both SGs.
- Operation per ECA-2.1 reduces AFW flow to 40 gpm per SG.
- SI is terminated when the criteria are met.

PRE-EXERCISE BRIEF

1. Brief the crew per Appendix E, Part E of NUREG 1021.

INSTRUCTOR GUIDE

1. **Initialize** the simulator to IC-24 AND **verify** the following conditions:

   a) RCS boron display = 1442 ppm.
   b) BOC ΔI displayed.
   c) Bank D step counters at 193, all others 228.
   d) All charts advanced and cleared of previous trends.
   e) ERCS is on-line and functional with alarms acknowledged/cleared.
   f) TPM is on NIS power.

2. **Enter** the pre-existing malfunctions ***(Relative Order of 0)***.

3. **Perform** the following to simulate a 8 GPD tube leak in 12 Steam Generator:

   a) **Set-up** for continuous leakage monitoring on the C-panel ERCS terminal U1SDCON1-C using TOC **XT24**.

   b) **Sign-off** sections **2.4, 2.5** AND **Section A** of **Table 1** in 1C4 AOP2.

   c) **Fill-in** the following data in Table 1 of 1C4 AOP2:

	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H
Date/Time	**1R-15 Counts (CPM) 1U0018A**	**Leak rate from Chemist (GPD)**	**Conversion Factor (CPM/GPD)**	**1R-15 Counts for 30 GPD Leak**	**1R-15 Counts for 75 GPD leak**	**1R-15 Leak rate (GPD)**	**1R-15 Leak rate ROC (GPD/HR)**	**Air Ejector flow (cfm)**
Current Date / Current time minus 1 hour	***70***	***8***	***8.75***	***263***	***656***	***N/A***	***N/A***	***5.1***

NOTE:	**Changing the conversion factor will have an affect on the rolling average and rate-of-change calculations for a short period of time.**

   d) **Update** the conversion constant **1K0015** for CPM/GPD in ERCS:

   Step 1 **Place** the ERCS console in OVERRIDE.
   Step 2 At the 'SELECT FUNC. KEY or TURN-ON CODE' prompt, **type** 'SUB'.
   Step 3 At the 'ENTER POINT ID' prompt, **type** '1K0015'
   Step 4 At the 'ENTER SUBSTITUTE VALUE' prompt, **type** the conversion value (8.75).
   Step 5 **Return** the ERCS console to NORMAL mode.

4. **Place** 13 Charging Pump in "PULLOUT" using **CS-46294** AND **hang** an information card on the control switch.

5. **Place** 123 Air Compressor in "PULLOUT" using **CS-46098** AND **hang** an information card on the control switch.

6. **Place** Breaker 16-10 in "PULLOUT" using **CS-46914** AND **hang** an information card on the control switch.

7. **Perform** the following to align 121 CL Pump to Loop B Cooling Water Header:

   a) **Hang** information cards on the following switches:

   - **CS-46046** (MV-32034) 121 CLG WTR HDR VLV A
   - **CS-46118** (MV-32035) 121 CLG WTR HDR VLV B
   - **CS-46519** (MV-32036) 121 CLG WTR HDR VLV C
   - **CS-46509** (MV-32037) 121 CLG WTR HDR VLV D

   b) **Place** 22 DD CLG WTR PUMP in "PULLOUT" using **CS-46523** AND **hang** an information card on the control switch.

   a) **Post** "DSL CLG WTR PUMP OOS" signs on control panels.

8. IF desired, **verify** all conditions are stable THEN **perform** a snapshot of the simulator to an unused IC.

9. **Conduct** shift turnover:

   a) **Allow** 2 - 3 minutes for control board walkdown and familiarization prior to initiating the first event.

10. **Enter** the trip of 11 Charging Pump ***(Relative Order of 1, Trigger 1)***

    a) IF directed to investigate the breaker/pump as the Aux Building Operator, THEN **inform** the crew that there is no visible damage to 11 Charging Pump but the pump is hot, there is an electrical smoke stench near the pump (no sign of fire), and the breaker (1K2-B4) is tripped.

    b) IF directed to investigate the pump as maintenance, THEN **inform** the crew that you will investigate and generate a Work Order.

    c) **Continue** with the next event at the discretion of the lead examiner.

11. **Enter** the blue pressurizer level channel failure ***(Relative Order of 2, Trigger 2)***.

NOTE:	The lead examiner should decide if tripping of the bistable is necessary. IF not, THEN **inform** the crew that an I&C technician will not be available to trip the bistable for about 2 hours.

    a) IF directed, THEN **trip** the bistable ***(Relative Order of 3, trigger 3)***.

    b) IF directed, THEN **isolate** AND **vent** air supply ***(Relative Order of 3a, trigger 23)*** OR **remove** 15A fuses ***(Relative Order of 3b, triggers 23 & 24)*** for CV-31339.

    c) **Generate** work orders as directed.

    d) **Continue** with the next event at the discretion of the lead examiner.

12. **Enter** the clogging of 11 EH oil filter:

    a) Actuate the high d/p alarm ***(Relative Order of 4, Trigger #4).***

    b) IF 11 EH oil pump is stopped, THEN **clear** the high d/p alarm.
    (Relative Order of 5)

    c) IF requested to check local d/p indication, THEN **report** there is no local indication.

    d) IF asked to investigate the reason for the high filter differential pressure, THEN **report** that sand was found in the bottom of the drum used to make up to the EH oil reservoir last shift.

    e) WHEN the crew has entered C23 AOP2 AND has received the information from the turbine building operator, THEN **enter** the closure of 1A & 2B intercept valves ***(Relative Order of 6, Trigger #6).***

    f) WHEN the crew has stabilized power below 50% AND, at the discretion of the lead examiner, **continue** with the next event.

NOTE:	IF 11 EH oil pump is restarted later in this scenario, THEN **re-enter** the hi d/p alarm ***(Relative Order of 4)***.

13. **Enter** the clogging of 12 EH oil filter by **actuating** the high d/p alarm, closure of 1B intercept valve, and failure of CV-3 ***(Relative Order of 7, Trigger #7).***

NOTE:	The crew should trip the reactor then the turbine, due to two intercept valves for the same LP turbine being closed per C23 AOP2.

NOTE:	When the reactor is tripped, the steam break on 12 SG is automatically triggered.

NOTE:	The following step ensures that the simulator will not automatically go to freeze if a simulator-operating limit is reached. This condition, if reached, has no bearing on the outcome of the scenario from the candidate's point of view.

14. **Place** the simulator over limit (SOL) switch in the OVERRIDE position.

15. During E-0, E-2, and ECA-2.1.

    a) IF ordered to investigate and/or locally start 11 TD AFWP, THEN **report** that the overspeed latching lever is tripped and will not reset.

    b) IF ordered to trip the turbine from the turbine pedestal, THEN **wait** 1 minute and **report** the handle is already in the tripped position.

    c) IF ordered to locally close 11 SG MSIV, THEN **wait** 4 minutes and **report** that local air receiver for 11 SG MSIV has been depressurized but the MSIV will not close (CV-31098).

    d) **Isolate** MSR's during E-0 when directed ***(Relative Order of 8, Trigger 8)***.

e) **Energize** the accumulator outlet valve MCC breakers when directed.
(Relative Order of 9, Trigger 9)

16. WHEN both the RHR and SI pumps have been shutdown in ECA-2.1, AND at the discretion of the Lead Examiner, **place** the simulator in freeze.

17. Do NOT reset the simulator until the Lead Examiner has consented.

Title: **2001 NRC Exam Scenario**	File Number: 1 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
11 Charging Pump Trips	004 A2.07	3.4/3.7

Time	S/U	Position	Expected Response
			C47015:0103 - 11 Charging Pump Overload Trip
		RO	• **Increase** 12 Charging Pump speed in manual to restore seal injection to 6-10 gpm.
		ALL	• **Determine** reason for charging pump trip.
		SS	• **Determine** Tech Specs no longer applicable.
		SS/BOP	• **Initiate** Work Order.
		SS/BOP	• **Make** appropriate log entries.

Evaluator Note:

- LCO is for 2 of 3 charging pumps inoperable.

Comments:

Title: **2001 NRC Exam Scenario**	File Number: 1 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Pressurizer level channel failed low – Loss of Letdown to VCT	004 A2.02	3.9/4.2

Time	S/U	Position	Expected Response
			C51.3 Pressurizer Level 1L-428 - Low
		RO	• **Place** charging pump speed control in "MANUAL" AND adjust pressurizer level to setpoint. • **Select** position 2-1 on Pressurizer Level Control Selector Switch. • **Restore** pressurizer heaters.
		BOP	• **Place** excess letdown in service per C12.1.
		RO	• **Restore** charging pump speed to auto.
		BOP	• **Trip** and **concurrently verify** bistable 1LC-428-A. (May be directed)
		BOP/SS	• **Initiate** work order on the failed channel.
		BOP/SS	• **Make** appropriate log entries.
		SS	• **Refer** to Tech Specs T.S.3.5: Table T.S.3.5-2A. (6 hour LCO action until B/S tripped)
			1C19.1 Containment System Integrity
		SS	• **Refer** to Tech Specs T.S.3.6 (1 hour LCO action until alternative isolation established)
		SS	• If CV-31326 fails to CLOSE, take the action specified for CV-31339.
		SS	• Isolate and vent air supply or remove 15A fuses for CV-31339.

Evaluator Note:

- Move to next event at the discretion of the lead examiner.

Comments:

Title: **2001 NRC Exam Scenario**	File Number: 1 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
EH Filter clogging – 1A and 2B Reheat Intercept Valves fail closed	045 A2.17	2.7/2.9

Time	S/U	Position	Expected Response
			C47007:0206 – 11 EH Oil Filter High D/P
		BOP	• **Shift** to standby EH pump per 1C23. • **Refer** to 1C23 AOP2 "MALFUNCTION OF TURBINE EH CONTROL SYSTEM"
			1C23 AOP2 – Malfunction Of Turbine EH Control System
		BOP	• **Direct** outplant to locally check operation of the EH oil system. • IF two valves from diagonally opposite MSR's have CLOSED, THEN **reduce** turbine load to 50% per 1C1.4 AOP1, Rapid Power Reduction – Unit 1.
			1C1.4 AOP1
		BOP/RO	• **Place** or **verify** control systems in automatic or **control** in manual per C7:
			• **Reduce** turbine load to the desired value using the following method:
		BOP	– **Select** the desired rate on load rate on the Turbine EH Control Panel. – **Verify** the turbine is in "IMPIN"
		RO	– **Set** the desired turbine load on the SETTER display on the Turbine EH Control Panel using the reference control pushbuttons. – **Depress** the turbine control **GO** pushbutton.
		RO	• **Borate** the RCS as necessary to maintain control rods above the insertion limit and control delta I within limits.
		BOP/RO	• **Perform** recovery actions per 1C1.4 AOP1.

Evaluator Note:

- The HDT pumps may trip on low HDT level. If so, the crew should respond using the appropriate ARPs.
- Once the lead examiner is satisfied with the reactivity change, then move on to the next event.

Comments:

Title: **2001 NRC Exam Scenario**	File Number: 1 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
1B Reheat Intercept Valves fail closed	EPE 007 EA1.08	4.4 / 4.3

Time	S/U	Position	Expected Response
			1C23 AOP2 - Malfunction Of Turbine EH Control System
		ALL	• IF two valves have CLOSED such that flow is lost to one of the LP turbines, THEN **trip** the reactor AND **go to** 1E-0, Reactor Trip or Safety Injection.
			1E-0
		ALL	• **Verify** Reactor Trip. • **Verify** turbine trip (will not be successful) – **Attempt** manual trip. – **Attempt** to close turbine CVs (CV-3 sticks open). – **Shut** MSIVs (11 SG MSIV will not close) – **Dispatch** operator to attempt local turbine trip. • **Verify** Safeguards buses energized. • **Check** if SI is Actuated. • **Verify** Safeguard component alignment – **Manually** start 12 MDAFW pump. ***(Critical Task)***[1] • **Check** if Main Steamlines are isolated. (They are not) • **Check** Containment Pressure. • **Perform** the following: – **Announce** Rx trip and SI, notify SEC. – **Close** MV-32115, CC to SFP Cooling. – **Ensure** communication with NRC is established within 1 hour. – **Open** turbine HP drains. – **Direct** TBO to stop the TB roof exhausters and isolate the MSRs per Att. J. • **Verify** SI Flow. • **Verify** Total AFW Flow – Greater than 200 gpm. • **Verify** AFW Pumps discharge Pressure – Greater than 900 psig. • **Verify** status of equipment in Auto Action guide (Table E0-1). • **Place** steam dump in "Steam Pressure" mode. • **Check** RCS Temperature. • **Check** RCP Cooling. • **Check** PRZR PORVs and Spray Valves. • **Check** if RCPs should be stopped. • **Check** if SGs are Not faulted – **Diagnose** faulted SGs and **transition** to E-2.

Evaluator Note:

1. Establish and maintain the minimum required FW flow to the SGs prior to meeting RCS bleed and feed criteria per FR-H.1. (If the MDAFW pump trips on low discharge pressure, it can be restarted to satisfy the critical task)

Comments:

Title: **2001 NRC Exam Scenario**	File Number: 1 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Uncontrolled Depressurization of Both SGs	West: E12 EK1.2	3.5 / 3.8

Time	S/U	Position	Expected Response
			1E-2
		ALL	• **Determine** that both SG's are faulted and **transition** to ECA-2.1.
			1ECA-2.1
		ALL	• **Check** secondary pressure boundary. – **Verify** 12 MSIV, FRVs, FRV B/Ps, SGBD and FW CI valves closed. – **Close** steam supply valves to TD AFW pump. – **Verify** SG PORVs are closed. • **Control** feed flow to minimize RCS cooldown. – **Check** cooldown rate in RCS cold legs – Less than 100°F/hr. ▪ **Decrease** AFW flow to 40 GPM per SG. ***(Critical Task)***[1] • **Check** if RCPs should be stopped. • **Check** PRZR PORVs and Block Valves. • **Check** secondary radiation. • **Check** if RHR pumps should be stopped – **Reset** SI. – **Stop** RHR pumps. • **Check** if Containment Spray should be stopped. • **Check** RWST Level – Greater Than 33%. • **Reset** Containment Isolation. • **Establish** Instrument Air to Containment. • **Check** if SI Accumulators should be isolated (Isolate if <390°) • **Check** Power Supply to Charging Pumps – OFFSITE POWER • **Establish** Charging Flow • **Check** for SI termination criteria.[2] • **Stop** SI pumps • **Align** SI suction from BAST to RWST • **Verify** SI flow is NOT required.[3]

Evaluator Notes:

1. Control AFW flow to not less than 40 GPM per SG in order to minimize RCS cooldown rate before an orange path develops for the integrity CSF. If the crew had previously diagnosed only one faulted SG and isolated FW flow to that SG, they should NOT reinitiate FW flow unless needed for RCS cooldown. If cooldown rate is less than 100 °F/hr, then AFW should not be reduce and the task is no longer critical.
2. If termination criteria are not met then the crew should remain in ECA-2.1 and control RCS cooldown while waiting for termination criteria to be met. They should also continue attempts to isolate 11 MSIV.
3. The scenario can be terminated once the crew has verified that SI is not required.

- The crew may decide to transition to FR-H.1 due to a red path in heat sink, but should immediately return to ECA2.1 since AFW flow is reduced due to operator action.

Comments:

Simulator Input Summary

Relative Order	System or Panel Drawing	TYPE	CODE	Severity or Value	Event Trigger	TIMING	DESCRIPTION
0		MALF	SG01B	.00011			8 GPD SG tube leak in 12 SG
0	SIMCL01C	Remote Function	CL109	Bus 26			121 CL Pump Source
0	SIMCL01C	Override DI	DI-46046C CLOSE	On			Close MV-32034
0	SIMCL01C	Override DI	DI-46118C CLOSE	On			Close MV-32035
0	SIMCL01C	Override DI	DI-46519O OPEN	On			Open MV-32036
0	SIMCL01C	Override DI	DI-46509O OPEN	On			Open MV-32037
0	SIMCL01C	Override DO	LO-46046G	Off			Simulate 1AB1-B1 open
0	SIMCL01C	Override DO	LO-46046R	Off			Simulate 1AB1-B1 open
0	SIMCL01C	Override DO	LO-46118G	Off			Simulate 1AB2-A1 open
0	SIMCL01C	Override DO	LO-46118R	Off			Simulate 1AB2-A1 open
0	SIMCL01C	Override DO	LO-46519G	Off			Simulate 1AB1-B2 open
0	SIMCL01C	Override DO	LO-46519R	Off			Simulate 1AB1-B2 open
0	SIMCL01C	Override DO	LO-46509G	Off			Simulate 1AB2-A2 open
0	SIMCL01C	Override DO	LO-46509R	Off			Simulate 1AB2-A2 open
0	B1-B2	ANN MALF	47015:0105W	CRY WOLF			13 Charging Pump TOOS
0	SIMMS01B	MALF	TC01A				Turbine Valve SV-1 Fails Open
0	SIMRP02	MALF	RP06				MSIV Auto closure failure
0	D1-D11	OVRD DI	46158C	OFF			11 MSIV Fails Open
0	SIMFW08	MALF	FW34B				12 AFW pump auto start failure
0	SIMMS01A	MALF	MS01B	33	13		12 SG Faulted inside CTMT
0	EVENT TRIGGER	EVENT ACTION	rdc0001a<20		13		Enter trigger #13 when RPI for E3 falls below 20 steps
0	SIMFW08	MALF	FW33		14		11 TD AFW pump overspeed Trip
0	EVENT TRIGGER	EVENT ACTION	fwxnafw (1)>0.9		14		Enter trigger #14 when 11 TD AFW reaches 90% rated speed

Simulator Input Summary (continued)

Relative Order	System or Panel Drawing	TYPE	CODE	Severity or Value	Event Trigger	TIMING	DESCRIPTION
1	SIMVC01B	MALF	VC04A		1		Positive Displacement Charging Pump #11 Trip
2	SIMRP03A	SYS OVRD	RX206	0	2		Blue PRZR Level Inst Fails Low
2	SIMVC01A	Override DO	LO-46171G	OFF	2		L/D Orifice Isol fail open
2	SIMVC01A	Override DO	LO-46171R	ON	2		L/D Orifice Isol fail open
3	SIMRP03A	REMOTE	RP119	TRIP	3		1LC-428A HI Level Trip
3a	SIMVC01A	Override DI	DI-46166C	ON	23		Close CV-31339
3b	SIMVC01A	Override DO	LO-46166G	OFF	24		Remove power to CV-31339
3b	SIMVC01A	Override DO	LO-46166R	OFF	24		Remove power to CV-31339
4	E1-E11	ANN MALF	47007:0206W	CRY WOLF	4		11 EH Filter DP HI
5	SIMMS07	MALF	TC07A		5		1A Turb Reheat Intrcpt Vlv Fails Closed
5	SIMMS07	MALF	TC07D		5	15 sec delay	2B Turb Reheat Intrcpt Vlv Fails Closed
6	E1-E11	ANN MALF	47007:0206W	DELETE			11 EH Filter DP HI
7	E1-E11	ANN MALF	47007:0207W	CRY WOLF	7		12 EH Filter DP HI
7	SIMMS07	MALF	TC07B		7	15 sec delay	1B Turb Reheat Intrcpt Vlv Fails Closed
7	SIMTC01	MALF	TC14C		7		CV-3 Fails as is
8	SIMMS03A	REMOTE	MS108	CLOSED	8	30 sec delay	Close RS-1-1
8	SIMMS03C	REMOTE	MS109	CLOSED	8	90 sec delay	Close RS-1-2
8	SIMMS03B	REMOTE	MS110	CLOSED	8	150 sec delay	Close RS-1-3
8	SIMMS03D	REMOTE	MS111	CLOSED	8	210 sec delay	Close RS-1-4
9	SIMSI01	REMOTE	SI112	NRML	9		Close 11 Accumulator MV Breaker
9	SIMSI01	REMOTE	SI113	NRML	9	60 sec delay	Close 12 Accumulator MV Breaker

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:

DAY/NIGHT SHIFT: N

CAT 1 VENT OPENINGS: 0 sqft

SYSTEM CONDITION: GREEN

1. SAFEGUARDS EQUIPMENT OOS/LCO'S

- 22 Cooling Water Pump OOS at 0400 yesterday. 121 Cooling Water Pump aligned to Loop B Header but not qualified as a safeguard replacement (operating outside design pump curves) – 7 day LCO action statement per T.S. 3.3.D.2.a.

2. RAD MONITORS OOS

None

3. ANNUNCIATORS OOS

None

4. OUTSTANDING SP'S

None

5. FIRE DET / PROT EQP IMPAIRMENTS

None

6. OTHER EQUIPMENT OOS / STATUS

- 123 Air compressor out for 5000 hour SP.
- 13 Charging Pump TOOS for desurger work.
- Breaker 16-10 OOS. Replacing parts per Tech Bulletin.
- 8 GPD tube leak in 12 SG. Stable for last two months. 1C4 AOP2 section 2.5 "Increased Monitoring" in effect. SS review of leak rate trend due in 4 hours.

7. MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE

- 11 MFP oil cooler leak repaired

8. OPERATIONAL PLANS FOR COMING SHIFT

- Maintain current power per Power Marketers
- Xenon is burning out (Was at 50% for 9 hours).
- Adding 3 gallons of boric acid every 15-20 minutes as Xenon burns out.

9. NEW PROCEDURES / INSTRUCTIONS

WATCHSTANDERS LPEO: Flanders **PEO:** Lapcinski

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

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

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

→ PEO: _____ **Time:** _____

Spare

Facility: ***Prairie Island*** Scenario No.: ***2*** Op-Test No.:

Examiners: Operators:

Initial Conditions:

- MOC, Startup in progress
- Generator on line, ready to increase power to 15% for R-M transfer
- Unit 2 at 100%

Turnover:

22 Cooling Water Pump, 13 Charging Pump, 123 Air Compressor, and Breaker 16-10 out of service. Pre-existing stable 8 GPD SG tube leak. Was shutdown for 6 days (Forced outage) after 4 months of full power operation.

Event No.	Malf. No.	Event Type*	Event Description
1		R (RO)	Increase power to 15%
2		N (BOP)	Transfer busses from R to M transformer
3		I (RO)	Steam Generator Pressure channel fails high
4		C (ALL)	RCS to CC leak in thermal barrier heat exchanger.
5		C (BOP)	Inadvertent auto start of 11 TDAFWP leading to steam leak in Turbine building requiring isolation of steam to 11 TDAFW pump. (LCO action entry)
6		M (ALL)	Inadvertent SI requiring entry into E-0. Loss of all feedwater requiring entry into FR-H.1
7		C (RO)	MSIV's fail to auto isolate with a failure of the steam dumps open requiring manual closure of the MSIV's.

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

Simulator Exercise Guide

File Number: 2 **Rev: 0**	**Title: 2001 NRC Exam Scenario**
Lesson Plan: N/A	**Duration: 1.8 hours**
Author: Joe Loesch	**Approved by:** [signature] **Date:** 7/20/01

OBJECTIVES:

1. Perform a power increase to 15% per 1C1.2 section 5.14.
2. Transfer non-safeguards busses 11, 12, 13, and 14 from the Reserve to the Main source per 1C1.2.
3. Diagnose and take corrective action for a high failure of a steam generator pressure channel per C47, C 51, and Tech Specs.
4. Diagnose and take corrective action for a RCS to CC leak in the thermal barrier heat exchanger per C47, and 1C14 AOP 2.
5. Diagnose and take corrective action for an inadvertent TDAFW pump start and steam leak in Turbine building requiring isolation of steam to 11 TDAFW pump per C47, F-9, and Tech Specs.
6. Diagnose and take corrective action for an Inadvertent Safety Injection per E-0.
7. Diagnose and take corrective action for a failure of the steam dump system along with auto MSIV closure failure per E-0.
8. Diagnose and take corrective action for a Loss of Heat Sink per FR-H.1.

RELATED PRA INFORMATION (See PITC 2.3):

Initiating Event with Core Damage Frequency:

Loss of MFW (4.4%)

Important Components:

11, 12 AFW Pumps

Important Operator Actions with Task Number:

Restore MFW following a Reactor Trip CRO 059.ATI.02

QUANTITATIVE ATTRIBUTES

Instrument/Component Malfunctions:

Before EOP Entry:
1. SG Pressure Channel PT-478 fails high.
2. Inadvertent Auto start of 11 TDAFW pump with subsequent steam leak the steam supply line.
3. RCS to CC Leak in the Thermal Barrier Heat Exchanger.

After EOP Entry:
1. Bus 16 Lockout
2. Steam Dump Valves fail Open
3. Main Steam Isolation valves fail to close automatically

Abnormal Events:

1. F-9; High Energy Line Leak
2. 1C14 AOP2; RCS to CC Leak

Major Transients:

1. E-0; Reactor Trip or Safety Injection.
2. FR-H.1; Loss of all Feedwater

Technical Specifications:

1. T.S. Table 3.5-2B; SG Pressure channel declared inoperable, 6 hours LCO to trip bistables.
2. T.S. 3.4.B.2 TDAFW Pump declared inoperable, pre-existing LCO action in effect for 22 Diesel Driven Cooling Water pump requires entry into 1 hour LCO action statement per T.S. 3.0.C.

Critical Tasks:

1. Manually isolate steam flow from the steam generators before an integrity orange path develops.
2. Establish feedwater flow into at least 1 SG before RCS bleed and feed is required.

SCENARIO OVERVIEW

Initial Conditions:

- 22 Cooling Water Pump, 13 Charging Pump, 123 Air Compressor, and Breaker 16-10 out of service. Pre-existing stable 8 GPD SG tube leak. Was shutdown for 6 days (Forced outage) after 4 months of full power operation.

Sequence of Events:

Event 1: Normal Power Increase

- Normal power increase from 8 to 15%.
- Transfer of non-safeguards busses 11, 12, 13, and 14 from the Reserve to the Main source.

Event 2: Steam Generator Pressure Channel Failure

- 12 Steam Generator Pressure Channel 1P-478 (Blue Channel) fails high.
- 12 SG PORV fails open and must be manually closed.
- The channel will be declared inoperable per T.S. Table 3.5-2B.
- Bistables will be tripped per 1C51.3.

Event 3: RCS To CC Leak

- A RCS to CC leak occurs in the thermal barrier heat exchanger requiring entry into 1C14 AOP 2.
- Closing the Control Valve from the thermal barrier heat exchanger will isolate the RCS leak.

Event 4: Inadvertent auto start of 11 TDAFWP and steam leak in Turbine building

- 11 TDAFWP starts inadvertently requiring the operator to manually stop the pump.
- A steam leak occurs in the turbine building in the common steam supply line to the Turbine Driven AFW pump.
- A local evacuation will be required.
- Closing both steam supplies to the AFW pumps will isolate the steam leak.
- The TDAFW pump will be declared inoperable and an LCO entered per T.S. 3.4.B.2.a and T.S.3.0.C.

Event 5: Inadvertent Safety Injection

- An inadvertent Safety Injection Signal occurs requiring entry into E-0.
- A failure in the Steam Dump control circuit along with a failure in the MSIVs to auto isolate results in a loss of SG inventory.
- Transition out of E-0 will occur during step 11 of E-0.

Event 6: Loss of all Auxiliary Feedwater

- A lockout of Bus 16 occurs which results in a loss of all AFW requiring entry into FR-H.1
- Resetting the Safety Injection signal and establishing Main Feedwater flow to the Steam Generators via the FRV bypass valves will restore Feedwater.

PRE-EXERCISE BRIEF

1. Approximately ½ hour before the scheduled start of this scenario:

   a) **Provide** the crew with the turnover sheet.

   b) **Provide** the crew with a consumable copy of 1C1.2 signed off up to section 5.14. (See step 1 of instructor guide).

   c) **Brief** the crew on the initial conditions of this scenario AND **allow** the crew to conduct a pre-job brief for the power increase.

2. **Brief** the crew per Appendix E, Part E of NUREG 1021.

INSTRUCTOR GUIDE

1. **Initialize** to IC-16 AND **verify** the following conditions:

   a. RCS boron display = 1154ppm
   b. MOC ΔI displayed.
   c. ERCS is on-line and functional with alarms acknowledged/cleared.

2. **Sign off** all steps in 1C1.2 up to section 5.14 AND **enter** the following values in Appendix B:

   a. Time to accelerate o synch → **10** minutes.

   b. Maximum recommended acceleration rate → 1800 rpm / **10** minutes = **180** rpm/min.

   c. Time to hold at 15% → **28** minutes.

   d. Time to increase load to 100% → **85** minutes.

   e. Maximum recommended loading rate → 85% / **85** minutes = **1.0** %/min

3. **Place** ERCS quickplot "SGWR" on U1SDCON2-C (E-panel).

4. **Reduce** turbine load to approximately 8% (~25 Mwe) by performing the following:

   a. **Place CS-46338,** STEAM DUMP MODE, in "STEAM PRESS".

   b. **Set** the SETTER display to 5.2 on the Turbine EH control Panel.

   c. **Depress** the turbine control **GO** pushbutton.

   d. **Maintain** Control Rods at their original level to keep Tave elevated and allow Steam Dumps to open slightly.

   e. WHEN generator output indicates 25 Mwe, THEN **depress** the turbine control **HOLD** pushbutton (reference should be at 5.2).

   f. **Place** turbine control in **"IMPOUT".**

   g. **Place** ERCS TPM in **"NIS"** power.

5. **Verify** non-safeguards busses 11, 12, 13, & 14 are on the "R" source.

6. **Verify** the following annunciators OFF:

   a. **47014-0302** INTERMEDIATE RANGE BLOCKED
   b. **47014-0402** POWER RANGE LO SETTING TRIP BLOCKED
   c. **47014-0501** P-10 NUCLEAR AT POWER PERMISSIVE

7. **Perform** the following to simulate a 8 GPD tube leak in 12 Steam Generator:

   a. **Set-up** for continuous leakage monitoring on the C-panel ERCS terminal U1SDCON1-C using TOC **XT24**.

   b. **Sign-off** sections **2.4, 2.5** AND **Section A** of **Table 1** in 1C4 AOP2.

c. **Fill-in** the following data in Table 1 of 1C4 AOP2:

	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H
Date/Time	1R-15 Counts (CPM) 1U0018A	Leak rate from Chemist (GPD)	Conversion Factor (CPM/GPD)	1R-15 Counts for 30 GPD Leak	1R-15 Counts for 75 GPD leak	1R-15 Leak rate (GPD)	1R-15 Leak rate ROC (GPD/HR)	Air Ejector flow (cfm)
Current Date / Current time minus 1 hour	*70*	*8*	*8.75*	*263*	*656*	*N/A*	*N/A*	*5.1*

NOTE:	**Changing the conversion factor will have an affect on the rolling average and rate-of-change calculations for a short period of time.**

d. **Update** the conversion constant **1K0015** for CPM/GPD in ERCS:

Step 1 **Place** the ERCS console in OVERRIDE.
Step 2 At the 'SELECT FUNC. KEY or TURN-ON CODE' prompt, **type** 'SUB'.
Step 3 At the 'ENTER POINT ID' prompt, **type** '1K0015'
Step 4 At the 'ENTER SUBSTITUTE VALUE' prompt, **type** the conversion value (8.75).
Step 5 **Return** the ERCS console to NORMAL mode.

8. **Place** 13 Charging Pump in "PULLOUT" using **CS-46294** AND **hang** an information card on the control switch.

9. **Place** 123 Air Compressor in "PULLOUT" using **CS-46098** AND **hang** an information card on the control switch.

10. **Place** Breaker 16-10 in "PULLOUT" using **CS-46914** AND **hang** an information card on the control switch.

11. **Perform** the following to align 121 CL Pump to Loop B Cooling Water Header:

    a. **Hang** information cards on the following switches:

    - **CS-46046** (MV-32034) 121 CLG WTR HDR VLV A
    - **CS-46118** (MV-32035) 121 CLG WTR HDR VLV B
    - **CS-46519** (MV-32036) 121 CLG WTR HDR VLV C
    - **CS-46509** (MV-32037) 121 CLG WTR HDR VLV D

    b. **Place** 22 DD CLG WTR PUMP in "PULLOUT" using **CS-46523** AND **hang** an information card on the control switch.

    c. **Post** "DSL CLG WTR PUMP OOS" signs on control panels.

12. IF desired, **verify** all conditions are stable THEN **perform** a snapshot of the simulator to an unused IC.

13. **Advance** all charts to clear previous trends.

14. **Conduct** turnover with the crew.

15. **Allow** the crew to increase power to 15 percent and conduct the R to M transfer.

NOTE:	IF necessary for the RO to perform the actions associated with the SG pressure channel failure (per lead examiners direction), THEN **distract** the BOP operator by calling the leads desk as an RPS technician and ask the BOP operator to check the CR reading on 1R30. Enter the event once the BOP operator steps behind the board.

16. WHEN the crew completes transfer of the Steam Dump System to TAVE control, THEN **enter** the blue SG Pressure channel failure high on 12 Steam Generator. ***(Relative Order of 1, Trigger 1)***

NOTE:	The lead examiner should decide if tripping of the bistables is necessary. IF not, THEN **inform** the crew that an I&C technician will not be available to trip the bistables for about 2 hours.

    a. If directed, Then **trip** the bistables. ***(Relative Order of 2)***

    b. **Continue** with the next event at the discretion of the lead examiner.

17. **Enter** the RCS to CC leak in the thermal barrier heat exchanger. ***(Relative Order of 3, Trigger 3)***

    a. **Continue** with the next event at the discretion of the lead examiner.

18. **Enter** the inadvertent start of 11 TDAFWP ***(Relative Order of 4, Trigger 4)***

NOTE:	It is possible that the crew may decide to stop the TDAFWP by closing the steam supply valves. If it appears that this is going to occur, move on to the next event before the steam supplies are isolated.

a. IF asked to investigate the pump locally, THEN **report**:
"There is nothing out of the ordinary in the AFWP room, however there is a steam leak from the steam supply line to the TDAFWP somewhere in the locked box outside of the AFWP room"

b. **Continue** with the next event immediately following the stop of 11 TDAFW pump.

19. **Enter** the steam leak in the Turbine Building. ***(Relative Order of 5, Trigger 5)***

a. 60 seconds after entering the steam leak, **call** the control room as the Turbine Building Operator AND **state:**
"There is a large amount of steam on the Unit 1 Turbine Building 695' level near the AFW Pump room behind the CARDOX tank."

b. IF the turbine building operator is called concerning the status of the steam leak following isolation, THEN **report**:
"The steam leak has stopped."

c. **Continue** with the next event at the discretion of the lead examiner.

NOTE:	The crew may decide to manually trip the reactor during the steam leak, however, this will not isolate the leak.

20. IF the crew does not manually trip the reactor, THEN **Enter** the inadvertent SI with loss of Bus 16, Steam Dump, and MSIV failure. ***(Relative Order of 6, Trigger 13)***

a. WHEN a red path on heatsink is indicated on ERCS, THEN **delete** the MSIV control switch failure. ***(Relative Order of 7)***

b. IF the crew already attempted manual MSIV closure, THEN **delete** the MSIV auto closure failure. ***(Relative Order of 8)***

c. IF requested, THEN **provide** the following information OR **perform** the following actions:

- IF requested to cross-connect MDAFW pumps THEN **perform** the following:

  a) **Perform** section 5.7of 1C28.1 up to the point of opening the MD AFW pump manual discharge valves **AF-13-1** and **2AF-13-1.**

  b) **Report** that you are unable to open **2AF-13-1** because the stem has broken off the valve.

- IF asked to address the bus 16 lockout, THEN **state**:
"Unit two operators will address the bus 16 lockout"

21. When Main Feedwater has been established in FR-H.1, And at the discretion of the Lead Examiner, **place** the simulator in freeze.

22. Do NOT reset the simulator until the Lead Examiner has consented.

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Normal Power Increase	2.2.2	4.0 / 3.5

Time	S/U	Position	Expected Response
			C1.2 Section 5.14
		RO	• **Start** increasing reactor power to 15%.
		RO	• **Turn** both power range low setting high flux trip block switches to "BLOCK" and **release**.
		RO	• **Turn** both intermediate range high flux trip block switches to "BLOCK" and **release**.
		BOP/SS	• **Record** the time reactor power reaches 15%.
		BOP	• For each non-safeguards bus, **CLOSE** the 1M Transformer breaker and **observe** the load transfer on the ammeter, THEN **OPEN** the corresponding 1R Transformer breaker.
		BOP	• **Transfer** the Steam Dump System to TAVG control.

Evaluator Note:

Comments:

Title: **2001 NRC Exam Scenario**	File Number: 2 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Steam Generator Pressure Channel Failure	**016 A2.01**	**3.0 / 3.1**

Time	S/U	Position	Expected Response
			C47011:0405 FW System Trouble
		BOP	• **Verify** SGWLC is operating properly in automatic. • **Identify** failed channel and **refer** to C51. • **Contact** I&C and System Engineer to determine cause.
			C51.3 P-478 High
		BOP	• **Take** manual control and **close** 12 SG PORV.
		SS	• **Refer** to T.S.3.5 (6 hr LCO for bistable tripping)
		BOP	• **Trip** and **concurrently verify** bistables.
		BOP/SS	• **Initiate** a work order on the failed channel.
		BOP/SS	• **Make** appropriate log entries.
		ALL	• **Consider** effects on input to TPM output.

Evaluator Note:
- Move to next event at the discretion of the lead examiner.

Comments:

Title: **2001 NRC Exam Scenario**	File Number: **2** Rev: **0**

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
RCS To CC Leak	**APE 026 AA2.01**	**2.9 / 3.5**

Time	S/U	Position	Expected Response
			C47022:0109 HI RADIATION TRAIN A
		BOP	• **Determine** the initiating alarm (1R-39) AND **respond** to the alarm as specified in C47047. • C47047 → **Refer** to appropriate actions as described in 1C14 AOP2, LEAKAGE INTO THE COMPONENT COOLING SYSTEM.
			1C14 AOP 2 LEAKAGE INTO THE COMPONENT COOLING SYSTEM
		BOP	• **Check** radiation monitor **1R-39**. High radiation indicates contaminated water leakage into the Component Cooling System. **Refer** to Section 1C4 AOP1, Reactor Coolant Leak, for manual actions in the case of a reactor coolant leak into the Component Cooling System. **Refer** to Table 1 for other possible sources of contaminated water. • **Check** RCP CC outlet flow and temperatures. IF low or temperature is higher than normal, THEN **CLOSE** the affected RCP thermal barrier heat exchanger CC return valve: - 11 RCP**CV-31245**, 11 RCP THERM BARRIER CLNT OUTL - 12 RCP**CV-31246**, 12 RCP THERM BARRIER CLNT OUTL • **Remove** the leaking heat exchanger from service AND **isolate** the heat exchanger from component cooling by closing the inlet and outlet valves.
		SS	• **Notify** Radiation Protection of potential radioactive contamination of the CC System
		SS/BOP	• **Make** necessary repairs and return the Component Cooling System to normal per 1C14, Component Cooling System.

Evaluator Note:
- 1C4 AOP1 may be entered, however, the leak will eventually be isolated per 1C14 AOP2.
- Once the Thermal Barrier HX return valve is closed, the leak is isolated. The next event can be entered. (The inlet to the HX is isolated by a check valve)

Comments:

Title: **2001 NRC Exam Scenario**	File Number: **2** Rev: **0**

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Inadvertent auto start of 11 TDAFWP leading to steam leak in Turbine building requiring isolation of steam to 11 TDAFW pump	APE 040 AA1.04	4.3 / 4.3

Time	S/U	Position	Expected Response
			11 TDAFWP Inadvertent Auto Start
		BOP	• **Identify** running pump.
			• **Determine** reason for pump start.
			• **Stop** pump using control switch
			C47022:0611 Fire Detection Panel FP121 Fire Alarm
		BOP	• **Determine** alarming zones. • **Notify** Turb. Bldg. Operator of affected locations including zone #'s.
			F-9 High Energy Line Break/Leak
		BOP/SS	• IF information from person reporting the HELB is determined by Control Room personnel to warrant an evacuation, THEN **evacuate** personnel from area of the HELB. - **Determine** assembly points - **Sound** the EVACUATION ALARM. - **Announce** over the plant page. - **Sound** the EVACUATION ALARM again. - **Repeat** the announcement. - **Direct** security (4318) to conduct Personnel Accountability using F3-10 as guidance.
		BOP	• **Perform** appropriate Control Room actions necessary to stop or mitigate the release (i.e., CLOSE steam supply MV's to TDAFW pump.)
		BOP	• **Operate** ventilation supply and exhaust fans as necessary to provide cooling and evacuation of steam and heat. (i.e. Turn on all TB roof exhausters)
		SS	• **Declare** 11 TDAFW Pump inoperable per T.S. 3.4.B.2.a. and enter 1-hour LCO action per T.S.3.0.C.

Evaluator Note:
- **Evacuation** and **Mitigation** should be performed simultaneously to the extent possible.
- Move to next event at the discretion of the lead examiner.

Comments:

Title: **2001 NRC Exam Scenario**	File Number: 2 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Inadvertent Safety Injection	013 A2.06	3.7 / 4.0

Time	S/U	Position	Expected Response
			E-0 - Reactor Trip or Safety Injection
		ALL	• **Verify** Reactor Trip • **Verify** turbine trip. • **Verify** safeguards buses energized. – Enter 1C20.5 AOP2 to re-energize bus 16 (Should be directed to unit 2 operators) • **Check** if SI is actuated • **Verify** Safeguards component alignment • **Check** if Main Steam Lines are Isolated - Manually **Close** MSIV's ***(Critical Task)***[1] • **Check** Containment Pressure • **Perform** the following: - **Announce** Rx trip and SI, notify SM/SEC. - **Close** MV-32115, CC to SFP Cooling. (No power available) - **Ensure** communication with NRC is established within 1 hour. - **Open** turbine HP drains. (BOP) - **Direct** outplant to stop the TB roof exhausters and isolate the MSRs per Att. J. (BOP) • **Verify** SI Flow • **Verify** Total AFW Flow – Greater Than 200 gpm. - **Transition** to FR-H.1.

Evaluator Note:

1. Manually isolate steam flow from the steam generators before an integrity orange path develops. (May be accomplished by other means such as manually isolating each steam dump CV)

Comments:

Title: **2001 NRC Exam Scenario**	File Number: **2** Rev: **0**

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Loss of all Auxiliary Feedwater	**E05 EA1.3**	**3.8 / 4.2**

Time	S/U	Position	Expected Response
			FR-H.1
		ALL	• **Verify** RCS pressure > SG pressure, and Thot >350°F • **Check** for secondary heat sink. • **Attempt** to restore AFW flow (No success path): - **Attempt** restart from control room. (no power) - **Dispatch** an operator to attempt to restore AFW flow locally. - **Attempt** cross-tie of AFW from Unit 2 to Unit 1. (valve fails) • **Stop** both RCPs. • **Establish** Main FW flow to at least 1 steam generator: ***(Critical Task)***[1] - **Reset** SI - **Place** condensate system in service, 1 pump running. - **Check** FW CI valves open, if not **reset** CI and **open** them. - **Depress** both A and B FW bypass reset pushbuttons. - **Start** one main FW pump. - **Control** flow with FW bypass valves to at least 1 SG.[2]

Evaluator Note:

1. Establish feedwater flow into at least 1 SG before RCS bleed and feed is required.
2. The scenario should be terminated when 200 gpm (100,000 lbm/hr) flow is established to the SG(s).

Comments:

Simulator Input Summary

Relative Order	System or Panel Drawing	TYPE	CODE	Severity or Value	Event Trigger	TIMING	DESCRIPTION
0		MALF	SG01B	.00011			8 GPD SG tube leak in 12 SG
0	SIMCL01C	Remote Function	CL109	Bus 26			121 CL Pump Source
0	SIMCL01C	Override DI	DI-46046C CLOSE	On			Close MV-32034
0	SIMCL01C	Override DI	DI-46118C CLOSE	On			Close MV-32035
0	SIMCL01C	Override DI	DI-46519O OPEN	On			Open MV-32036
0	SIMCL01C	Override DI	DI-46509O OPEN	On			Open MV-32037
0	SIMCL01C	Override DO	LO-46046G	Off			Simulate 1AB1-B1 open
0	SIMCL01C	Override DO	LO-46046R	Off			Simulate 1AB1-B1 open
0	SIMCL01C	Override DO	LO-46118G	Off			Simulate 1AB2-A1 open
0	SIMCL01C	Override DO	LO-46118R	Off			Simulate 1AB2-A1 open
0	SIMCL01C	Override DO	LO-46519G	Off			Simulate 1AB1-B2 open
0	SIMCL01C	Override DO	LO-46519R	Off			Simulate 1AB1-B2 open
0	SIMCL01C	Override DO	LO-46509G	Off			Simulate 1AB2-A2 open
0	SIMCL01C	Override DO	LO-46509R	Off			Simulate 1AB2-A2 open
0	B1-B2	ANN MALF	47015:0105W	CRY WOLF			13 Charging Pump TOOS
0	Event Trigger	Event Action	rdc0001a<20		13		Enter trigger #13 when reactor trips
0	SIMMS01B	Malfunction	RP06	Insert			MSIVs Fail to Auto isolate
0	D1-D11	DI Override	DI-46158C CLOSE	OFF			MSIV CS override open
0	D1-D11	DI Override	DI-46159C CLOSE	OFF			MSIV CS override open
1	SIMMS01A	System Override	RX216	1400	1		12 SG Pressure (PT-478) fails high
2	SIMRP03H	Remote Function	RP157	Trip			B/S 1PC-478-A
2	SIMRP03H	Remote Function	RP136	Trip			B/S 1PC-478-B
3	SIMRC05A	Malfunction	VC21A	1.8	3		RCS to CC thermal barrier HX leak
4	SIMFW08	DI Override	DI-46424ST	ON	4		11 TDAFWP inadvertent start
4	SIMFW08	DI Override	DI-46438A	OFF	4		11 TDAFWP inadvertent start

Simulator Input Summary (Continued)

Relative Order	System or Panel Drawing	TYPE	CODE	Severity or Value	Event Trigger	TIMING	DESCRIPTION
5	SIMMS01A	Malfunction	MS10	10	5		Main Steam Line Break on common supply line to TDAFW Pump
6	SIMRP02	Malfunction	RP04A	Insert	13		SI Train "A" Actuation
6	SIMRP02	Malfunction	RP04B	Insert	13		SI Train "B" Actuation
6	SIMMS01B	Remote Function	MS107	100	13		Manual Control Of Steam Dump CV-31100
6	SIMMS01A	Remote Function	MS129	100	13		Manual Control Of Steam Dump CV-31086
6	SIMMS01A	Remote Function	MS130	100	13		Manual Control Of Steam Dump CV-31085
6	SIMMS01B	Remote Function	MS131	100	13		Manual Control Of Steam Dump CV-31090
6	SIMMS01B	Remote Function	MS132	100	13		Manual Control Of Steam Dump CV-31091
6	SIMED04	Malfunction	ED09F	Insert	13		Bus 16 Lockout
6	SIMMS01B	Remote Function	MS133	Isolated	13		IA Supply to CV-31100
6	SIMMS01A	Remote Function	MS134	Isolated	13		IA Supply to CV-31086
6	SIMMS01A	Remote Function	MS135	Isolated	13		IA Supply to CV-31085
6	SIMMS01B	Remote Function	MS136	Isolated	13		IA Supply to CV-31090
6	SIMMS01B	Remote Function	MS137	Isolated	13		IA Supply to CV-31091
7	D1-D11	DI Override	DI-46158C CLOSE	Delete			Delete MSIV CS override
7	D1-D11	DI Override	DI-46159C CLOSE	Delete			Delete MSIV CS override
8	SIMMS01B	Malfunction	RP06	Delete			Delete MSIV Auto isolate failure

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE:
SHIFT: N

DAY/NIGHT

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

1. SAFEGUARDS EQUIPMENT OOS/LCO'S

- 22 Cooling Water Pump declared OOS today at 0400 (5% power). 121 Cooling Water Pump aligned to Loop B Header but not qualified as a safeguard replacement (operating outside design pump curves) – 7 day LCO action statement per T.S. 3.3.D.2.a.

2. RAD MONITORS OOS

None

3. ANNUNCIATORS OOS

None

4. OUTSTANDING SP'S

None

5. FIRE DET / PROT EQP IMPAIRMENTS

None

6. OTHER EQUIPMENT OOS / STATUS

- 123 Air compressor out for 5000 hour SP.
- 13 Charging Pump TOOS for desurger work.
- Breaker 16-10 OOS. Replacing parts per Tech Bulletin.
- 8 GPD tube leak in 12 SG. Stable for last two months. 1C4 AOP2 section 2.5 "Increased Monitoring" in effect. SS review of leak rate trend due in 4 hours.

7. MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE

- Steam leak on 1A MSR repaired. (Unit had been shutdown for 6 days)
- 11 MFP oil cooler leak repaired

8. OPERATIONAL PLANS FOR COMING SHIFT

- 8% power Startup in progress. Continue with C1.2 at section 5.14

9. NEW PROCEDURES / INSTRUCTIONS

- All Surveillance procedures listed in C1.2 section 5.14 are NA for this startup.

WATCHSTANDERS LPEO: Flanders **PEO:** Lapcinski

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

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

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

→ PEO: _____ **Time:** _____

Facility: ***Prairie Island*** Scenario No.: ***3*** Op-Test No.:

Examiners: Operators:

Initial Conditions:

- MOC, 100% power
- Unit 2 at 100%

Turnover:

22 Cooling Water Pump, 13 Charging Pump, 123 Air Compressor, and Breaker 16-10 out of service. Pre-existing stable 8 GPD SG tube leak. Adding 10 gallons water 7-8 times a shift for Tave control.

Event No.	Malf. No.	Event Type*	Event Description
1		C (BOP)	Swap running CC Pumps with failure of CC HX Cooling Water inlet valve to auto open requiring manual operation to open valve. (LCO action entry)
2		I (RO)	Turbine 1st stage pressure channel (PT-485) failed low
3		R (RO) N (BOP)	Loss of main generator bus duct cooling requiring power reduction.
4		C (RO)	Failure of an RCCA bank to move. (LCO action entry)
5		M (ALL)	Loss of all AC per E-0 and ECA-0.0
6		C (RO)	Cooling Water Pump fails to auto start requiring manual operation.

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

Simulator Exercise Guide

File Number: 3 **Rev: 0**	**Title: 2001 NRC Exam Scenario**
Lesson Plan: N/A	**Duration: 2.0 hours**
Author: Joe Loesch	**Approved by:** D Smith **Date:** 7/20/01

OBJECTIVES:

1. Swap running CC pumps and respond to a failure of the CC HX Cooling water inlet valve to open per 1C14.
2. Diagnose and take corrective action for a turbine 1st stage pressure channel (PT-485) failed low per C47 and C51.
3. Diagnose and take corrective action for a loss of main generator bus duct cooling per C47 and C22.5 AOP1.
4. Diagnose and take corrective action for a failure of an RCCA bank to move per 1C5 AOP6 and Tech Specs.
5. Diagnose and take corrective action for a loss of all AC per E-0 and ECA-0.0.
6. Diagnose and take corrective action for a loss of cooling water per C35 AOP2.

RELATED PRA INFORMATION (See PITC 2.3):

Initiating Event with Core Damage Frequency:

Loss of Offsite Power (LOOP) (34.2%)

Important Components:

12, 121, 22 CL pumps
D1, D2 Diesel Generators
4160V Bus 15, 16

Important Operator Actions with Task Number:

Cross-tie 4KV buses during station blackout

QUANTITATIVE ATTRIBUTES

Reactivity Changes:

1. Reduce power to less than 9000 amps due to loss of bus duct cooling.

Normal / Abnormal Events:

1. 1C14 – Swap running Component Cooling Pumps
2. C22.5 AOP1 – Loss of Bus Duct Cooling
3. 1C1.4 AOP1 - Rapid Power Reduction
4. 1C5 AOP6 – Failure of an RCCA Bank to Move
5. C35 AOP2 – Loss of Pumping Capacity or Header Without SI.

Instrument/Component Malfunctions:

Before EOP Entry:
1. MV-32145 (CC HX cooling water inlet) fails to open.
2. Turbine 1st Stage Pressure Channel (PT-485) Fails Low.
3. Loss of Main Generator Bus Duct Cooling.
4. Failure of an RCCA Bank to Move.

After EOP Entry:
1. 121 Cooling Water Pump fails to start.

Major Transients:

1. E-0 – Reactor Trip or Safety Injection
2. ECA-0.0 – Loss of All Safeguards AC Power

Technical Specifications:

1. 1-hour LCO action entered for 22 CL pump inoperable in conjunction with 11 CC HX per T.S.3.0.C.
2. 72-hour LCO action entered per T.S. 3.10.G.6 for inoperable control rods.
3. Apply T.S. 3.10.G.2 to initiate shutdown when unable to repair control rods in LCO time.

Critical Tasks:

1. Reenergize at least one safeguards bus prior to steam generator depressurization in ECA-0.0.
2. Restore cooling water to Header B components prior to D2 Diesel Generator tripping due to loss of cooling water.

SCENARIO OVERVIEW

Initial Conditions:

- 22 Cooling Water Pump, 13 Charging Pump, 123 Air Compressor, and Breaker 16-10 out of service. Pre-existing stable 8 GPD SG tube leak. Adding 10 gallons water 7-8 times a shift for Tave control.

Sequence of Events:

Event 1: Swap Running CC Pumps with failure of CL valve

- The CC system Engineer requests a swap of the running CC pumps for vibration readings.
- 11 CC Pump will be started per section 5.2 of 1C14 but the cooling water inlet motor valve fails to open resulting in 11 CC HX inoperability per Tech Specs.
- 11 CC Pump will be stopped per section 5.3 of 1C14.

Event 2: Turbine 1st Stage Pressure Channel (PT-485) Fails Low

- PT-485 failing low will result in auto rod insertion.
- Control Rods will be taken to "Manual".
- Tave will be restored to Tref using manual rod control.
- Steam Dumps will be placed in the "Steam Pressure" mode.
- One bistable will be removed from service.
- Control Rods will remain in "Manual" for the remainder of the scenario.

Event 3: Loss of Main Generator Bus Duct Cooling

- A trip of the running Bus Duct Cooler Blower with a failure of the standby blower to start results in a loss of all bus duct cooling.
- C22.5 AOP1 "Loss of Generator Bus Duct Cooling" will be entered via C47.
- All efforts to restore bus duct cooling are unsuccessful and a rapid power reduction is necessary to lower generator output to ≤ 9000 amps per C1.4 AOP1.

Event 4: Failure of an RCCA Bank to Move

- Following the power reduction, the controlling rod bank fails to move while the Reactor Operator is attempting to restore Tave to Tref.
- 1C5 AOP6 "Failure of an RCCA Bank to Move" will be entered.
- Turbine load or boron concentration adjustments will be necessary to restore Tave to Tref.
- The affected rods will be declared inoperable and a 72-hour LCO entered per T.S. 3.10.G.6.
- Inability to repair the problem will necessitate a reactor shutdown per T.S. 3.10.G.2 and 1C5 AOP6 step 2.4.8.

Event 5: **Loss of All AC**

- A loss of all offsite AC power, loss of load sequencer, and Bus 15 Lockout will require entry into ECA 0.0 via E-0.
- Power will be restored to Bus 16 via D2 using step 12 RNO of ECA 0.0.

Event 6: **Loss of Cooling Water**

- A failure of 121 Cooling Water Pump to auto start during the loss of all AC will require entry into C35 AOP2 "Loss of Pumping Capacity or Supply Header Without SI" via ECA 0.0 step 4.
- 121 Cooling Water Pump will be started manually to restore cooling water.

PRE-EXERCISE BRIEF

1. **Brief** the crew per Appendix E, Part E of NUREG 1021.

INSTRUCTOR GUIDE

1. **Initialize** the simulator to IC-10 AND **verify** the following conditions:

   a) RCS boron display = 814 ppm.
   b) MOC ΔI displayed.
   c) Bank D step counters at 218, all others 228.
   d) All charts advanced and cleared of previous trends.
   e) ERCS is on-line and functional with alarms acknowledged/cleared.

2. **Enter** the pre-existing malfunctions ***(Relative Order of 0)***.

3. **Perform** the following to simulate a 8 GPD tube leak in 12 Steam Generator:

   a) **Set-up** for continuous leakage monitoring on the C-panel ERCS terminal U1SDCON1-C using TOC **XT24**.

   b) **Sign-off** sections **2.4, 2.5** AND **Section A** of **Table 1** in 1C4 AOP2.

   c) **Fill-in** the following data in Table 1 of 1C4 AOP2:

	Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H
Date/Time	**1R-15 Counts (CPM) 1U0018A**	**Leak rate from Chemist (GPD)**	**Conversion Factor (CPM/GPD)**	**1R-15 Counts for 30 GPD Leak**	**1R-15 Counts for 75 GPD leak**	**1R-15 Leak rate (GPD)**	**1R-15 Leak rate ROC (GPD/HR)**	**Air Ejector flow (cfm)**
Current Date / Current time minus 1 hour	***70***	***8***	***8.75***	***263***	***656***	***N/A***	***N/A***	***5.1***

NOTE: **Changing the conversion factor will have an affect on the rolling average and rate-of-change calculations for a short period of time.**

   d) **Update** the conversion constant **1K0015** for CPM/GPD in ERCS:

   Step 1 **Place** the ERCS console in OVERRIDE.
   Step 2 At the 'SELECT FUNC. KEY or TURN-ON CODE' prompt, **type** 'SUB'.
   Step 3 At the 'ENTER POINT ID' prompt, **type** '1K0015'
   Step 4 At the 'ENTER SUBSTITUTE VALUE' prompt, **type** the conversion value (8.75).
   Step 5 **Return** the ERCS console to NORMAL mode.

4. **Place** 13 Charging Pump in "PULLOUT" using **CS-46294** AND **hang** an information card on the control switch.

5. **Place** 123 Air Compressor in "PULLOUT" using **CS-46098** AND **hang** an information card on the control switch.

6. **Place** Breaker 16-10 in "PULLOUT" using **CS-46914** AND **hang** an information card on the control switch.

7. **Perform** the following to align 121 CL Pump to Loop B Cooling Water Header:

   a) **Hang** information cards on the following switches:

   - **CS-46046** (MV-32034) 121 CLG WTR HDR VLV A
   - **CS-46118** (MV-32035) 121 CLG WTR HDR VLV B
   - **CS-46519** (MV-32036) 121 CLG WTR HDR VLV C
   - **CS-46509** (MV-32037) 121 CLG WTR HDR VLV D

   b) **Place** 22 DD CLG WTR PUMP in "PULLOUT" using **CS-46523** AND **hang** an information card on the control switch.

   a) **Post** "DSL CLG WTR PUMP OOS" signs on control panels.

8. IF desired, **verify** all conditions are stable THEN **perform** a snapshot of the simulator to an unused IC.

9. **Conduct** shift turnover:

10. **Allow** 2 - 3 minutes for control board walkdown and familiarization prior to initiating the first event.

11. **Call** the control room as the CC System Engineer AND **request** swapping of running CC pumps for vibration readings.

   a) IF asked to investigate/open MV-32145 locally, THEN **report** that the motor valve is jammed and cannot be operated.

   b) **Continue** with the next event at the discretion of the lead examiner.

12. **Enter** the turbine first stage pressure channel failure. ***(Relative order of 1, Trigger 1)***.

NOTE:	The lead examiner should decide if tripping of the bistable is necessary. IF not, THEN **inform** the crew that an I&C technician will not be available to trip the bistable for about 2 hours.

   a) If directed, Then **trip** the bistable ***(Relative order of 2, Trigger 2)***.

   b) **Generate** work orders as directed.

   c) **Continue** with the next event at the discretion of the lead examiner.

13. **Enter** the loss of main generator bus duct cooling. ***(Relative order of 3, Trigger 3)***

   a) If asked to investigate the reason for blower trip, Then **report**:

   - There are no alarms on the Bus Duct Cooler Blower Control Panel.
   - Cooling water flow is 55 gpm.
   - You were not able to start the standby blower.
   - The discharge dampers for the inservice blower are OPEN.
   - MCC 1C1 Cell B4 and MCC 1D2 Cell F4 are both tripped OPEN
   - Dampers were inspected satisfactory through the plexiglass window AND there is no air leakage noted.

   b) If asked to CLOSE the tripped MCC breakers, Then **report** that they tripped back OPEN.

NOTE:	The control rod bank failure should be entered before Tave has been stabilized (manual rod motion still required) to allow the RO to identify the failure.

14. When power has been reduced to about 9000 amps, Then **enter** the failure of the control bank to move. ***(Relative order of 4, Trigger 4)***

    a) If asked to as the Rod Control System Engineer to investigate the reason for the bank failure, Then **report**:

    - You were unable to confirm the problem but you suspect that the problem is in the Digital Rod Control Switch (In-Hold-Out) and the problem cannot be fixed at power.

    b) **Continue** with the next event at the discretion of the lead examiner.

15. **Enter** the loss of all offsite AC power, loss of D2, and Bus 15 Lockout. ***(Relative order of 5, Trigger 5)***

    a) IF asked to investigate the D2 failure, THEN **report** there are no local alarms on D2 and nothing looks unusual locally.

    b) IF asked for the status of Unit 2 Safety Injection, THEN **state**:
    "There is no SI on Unit 2"

16. When AC electrical power has been restored to bus 16 in ECA-0.0, AND at the discretion of the Lead Examiner, **place** the simulator in freeze.

17. Do NOT reset the simulator until the Lead Examiner has consented.

Title: **2001 NRC Exam Scenario**	File Number: 3 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Swap Running CC Pumps (If necessary)	008 A4.08	3.1 / 2.8

Time	S/U	Position	Expected Response
			1C14 section 5.2 and 5.3
		BOP	• **Notify** the Aux Building Operator to check local parameters: • **Start** 11 CC Water Pump • **Verify** the associated CC HX cooling water inlet valve OPENS (It fails to open). • **Direct** Local checks of proper pump operation: • IF single pump operation is desired and total Component Cooling Water flow is less than 4000 gpm, THEN **perform** Section 5.3.
		BOP	• **Stop** 11 CC pump: • **CLOSE** the associated CC HX cooling water inlet valve (It will already be closed) • **Make** appropriate log entries.
		SS	• **Enter** appropriate Tech Spec action statement for both 22 CL pump and 11 CC HX OOS. (1-hour LCO action per T.S.3.0.C)

Evaluator Note:
- WHEN the CC pump is stopped, THEN hold the control switch in the "STOP" position until CC System pressure stabilizes above 75 psig. (Prevents auto re-start due to fluctuating pressure)
- Move to next event at the discretion of the lead examiner.

Comments:

Title: **2001 NRC Exam Scenario**	File Number: 3 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Turbine 1st Stage Pressure Channel (PT-485) Fails Low	016 A2.01	3.0 / 3.1

Time	S/U	Position	Expected Response
			C47013-0305 / 1C51.2
		RO	• **Place** rod control in "MANUAL" AND **control** Tave at value appropriate for power level.
		BOP/RO	• **Place** one steam dump interlock bypass switch to "OFF"
		BOP/RO	• **Place** steam dump in steam pressure mode AND **verify** valves closed.
		BOP/RO	• **Verify** zero output on steam dump controller.
		BOP/RO	• **Return** steam dump interlock bypass switch to "ON".
		BOP/RO	• **Verify** SG level control operating properly in automatic.
		BOP/RO	• **Trip** AND **concurrently verify** bistable 1PC-485-A
		BOP/SS	• **Initiate** Work Order to repair instrument.
		BOP/SS	• **Make** necessary log entries.

Evaluator Note:
- Move to next event at the discretion of the lead examiner.

Comments:

Title: 2001 NRC Exam Scenario	File Number: 3 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Loss of Main Generator Bus Duct Cooling	062 A2.09	2.7 / 3.0

Time	S/U	Position	Expected Response
			C47007:0301 and C22.5 AOP1
		BOP	• **Dispatch** an Operator to the bus duct coolers to provide an assessment of the problem. – IF no blower is running, THEN **attempt** to start the standby blower by selecting the other blower using the COOLER BLOWER switch.
		BOP/RO	• IF bus duct cooling cannot be established AND bus duct conductor temperature, **1T2118A [2T2118A]** exceeds 92°C, THEN **reduce** power as expeditiously as possible (4% per minute is recommended) per C1.4 AOP1, Rapid Power Reduction. – Power **SHALL** be reduced such that generator output current is 9,000 amps (9 Kiloamps) or less.
		BOP	• During the load reduction, reduce generator excitation using **CS-46377**, GEN VOLT REG ADJ so that there is no generator reactive load being delivered as read on 41204.
			1C1.4 AOP1
		BOP/RO	• **Place** or **verify** control systems in automatic or **control** in manual per C7:
			• **Reduce** turbine load to the desired value using the following method:
		BOP	– **Select** the desired rate on load rate on the Turbine EH Control Panel. – **Verify** the turbine is in "IMPIN"
		RO	– **Set** the desired turbine load on the SETTER display on the Turbine EH Control Panel using the reference control pushbuttons. – **Depress** the turbine control **GO** pushbutton.
		RO	• **Borate** the RCS as necessary to maintain control rods above the insertion limit and control delta I within limits.
		BOP/RO	• **Perform** recovery actions per 1C1.4 AOP1.

Evaluator Note:
- Move to next event at the discretion of the lead examiner.

Comments:

Title: **2001 NRC Exam Scenario**	File Number: **3** Rev: **0**

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Failure of an RCCA Bank to Move	APE 005 AA2.03	3.5 / 4.4

Time	S/U	Position	Expected Response
			1C5 AOP6
		N/A	• **Transfer CS-46280**, ROD BANK SELECTOR, to "MAN." • **Adjust** control rod position to restore T_{avg} equal to T_{ref} and delta I to the band.
		RO	• IF the control rods can NOT be moved in manual, THEN **adjust** turbine load or boron concentration to restore T_{avg} equal to T_{ref}.
		SS	• **Verify** the control rod insertion and bank overlap limits are maintained and **comply** with delta I target limitations.
		SS	• **Attempt** to effect repairs immediately. **Refer** to Technical Specification T.S.3.10 for time limitations.
		SS	• IF it appears that repairs can NOT be made within the required time OR if difficulty is experienced in controlling the reactor, THEN perform the following: – Simultaneously **borate** and **reduce** turbine load to 10% power. – **Trip** the turbine. – **Trip** the reactor and **go** to 1E-0, Reactor Trip or Safety Injection.

Evaluator Note:

- T.S. 3.10.G.6 directs restoration of rod control to operable within 72 hours or declare affected rods inoperable.
- Move to next event at the discretion of the lead examiner (Once the decision is made on method to shutdown. A Rx trip or boration to 10% are both appropriate).

Comments:

Title: 2001 NRC Exam Scenario	File Number: 3 Rev: 0

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Loss of All AC	EPE 055 EA1.06	4.1 / 4.5

Time	S/U	Position	Expected Response
		ALL	**1E-0**
			• **Verify** Reactor Trip • **Verify** turbine trip. • **Verify** safeguards buses energized. – **Go** to 1ECA-0.0
		ALL	**1ECA-0.0**
			• **Check** if RCS is isolated • **Verify** AFW flow – Greater than 200 gpm • **Perform** Notifications • **Check** Cooling Water Pressure Loop A AND Loop B – Greater than 25 psig.[1] – **Restore** Cooling Water per C35 AOP2. • **Attempt** to restore power to safeguard Bus 16. (No load rejection lights) • **Attempt** to restore power to safeguard Bus 15. (Locked out) • **Check** Bus tie breakers available to power unit 1 safeguards buses. (None available to bus 16) • **Place** equipment switches on Pullout. • **Place** Bus 15 and 16 Voltage Restoration Selector Switches in Manual. • **Attempt** to restore power to safeguard Bus 16 • **Manually start** D2. • **Energize** Safeguards Bus 16 from D2. ***(Critical task)*** [2] – **Go** to step 34.

Evaluator Note:

1. Failure of 121 Cooling Water Pump to auto start requires implementation of C35 AOP2 per RNO of ECA-0.0.
2. Reenergize at least one safeguards bus prior to steam generator depressurization in ECA-0.0.

Comments:

Name: _____ Position: SS BOP RO

Date: _____

Event Description	KA Number	KA Value
Loss of Cooling Water	APE 062 AK3.03	4.0 / 4.2

Time	S/U	Position	Expected Response
			C35 AOP2
		RO	• **Verify** no Safety Injection signal from either unit. IF SI exists, THEN **go** to C35 AOP1, Loss of Pumping Capacity or Supply Header With SI.
		RO	• **Verify** at least two (2) cooling water pumps are running with at least one (1) pump supplying each header. IF not, THEN **start** pump(s) as required. ***(Critical task)*** [1]

Evaluator Note:
1. Restore cooling water to Header B components prior to D2 Diesel Generator tripping due to loss of cooling water.

Comments:

Simulator Input Summary

Relative Order	System or Panel Drawing	TYPE	CODE	Severity or Value	Event Trigger	TIMING	DESCRIPTION
0		MALF	SG01B	.00011			8 GPD SG tube leak in 12 SG
0	SIMCL01C	Remote Function	CL109	Bus 26			121 CL Pump Source
0	SIMCL01C	Override DI	DI-46046C CLOSE	On			Close MV-32034
0	SIMCL01C	Override DI	DI-46118C CLOSE	On			Close MV-32035
0	SIMCL01C	Override DI	DI-46519O OPEN	On			Open MV-32036
0	SIMCL01C	Override DI	DI-46509O OPEN	On			Open MV-32037
0	SIMCL01C	Override DO	LO-46046G	Off			Simulate 1AB1-B1 open
0	SIMCL01C	Override DO	LO-46046R	Off			Simulate 1AB1-B1 open
0	SIMCL01C	Override DO	LO-46118G	Off			Simulate 1AB2-A1 open
0	SIMCL01C	Override DO	LO-46118R	Off			Simulate 1AB2-A1 open
0	SIMCL01C	Override DO	LO-46519G	Off			Simulate 1AB1-B2 open
0	SIMCL01C	Override DO	LO-46519R	Off			Simulate 1AB1-B2 open
0	SIMCL01C	Override DO	LO-46509G	Off			Simulate 1AB2-A2 open
0	SIMCL01C	Override DO	LO-46509R	Off			Simulate 1AB2-A2 open
0	B1-B2	ANN MALF	47015:0105W	CRY WOLF			13 Charging Pump TOOS
0	SIMCL01C	Malfunction	CL03	Insert			121 CL pump fail to auto start
0	SIMCL01A	Remote Function	CL104	Closed			CL header blocked
0	ANN	Remote Function	AN100	ON			Auto silence U2 alarms
1		System Override	RX226	0	1		PT-485 Failed Low
2		Remote Function	RP181	Trip	2		P-7 B/S (1PC-485-A)
3	SIMEG04	Malfunction	EG08A	Insert	3		11 Bus Duct Blower Failure
3	SIMEG04	Malfunction	EG08A	Insert	3		12 Bus Duct Blower Failure
4	SIMRD01	Malfunction	RD01	Insert	4		Controlling rod bank failure
5		Malfunction	ED09E	Insert	5		Bus 15 lockout
5		Malfunction	ED12B	Insert	5		Bus 16 load sequencer fails
5		Malfunction	ED14	Insert	5		Loss of all Offsite AC power
5		Malfunction	DG07B	Insert	5		D2 fails to auto start

RETENTION: 7 Days

UNIT 1 LPEO / PEO TURNOVER LOG

DATE: DAY/NIGHT SHIFT: N

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

1. SAFEGUARDS EQUIPMENT OOS/LCO'S

- 22 Cooling Water Pump OOS at 0400 yesterday. 121 Cooling Water Pump aligned to Loop B Header but not qualified as a safeguard replacement (operating outside design pump curves) – 7 day LCO action statement per T.S. 3.3.D.2.a.

2. RAD MONITORS OOS

None

3. ANNUNCIATORS OOS

None

4. OUTSTANDING SP'S

None

5. FIRE DET / PROT EQP IMPAIRMENTS

None

6. OTHER EQUIPMENT OOS / STATUS

- 123 Air compressor out for 5000 hour SP.
- 13 Charging Pump TOOS for desurger work.
- Breaker 16-10 OOS. Replacing parts per Tech Bulletin.
- 8 GPD tube leak in 12 SG. Stable for last two months. 1C4 AOP2 section 2.5 "Increased Monitoring" in effect. SS review of leak rate trend due in 4 hours.

7. MAJOR EQUIPMENT REPAIRED / RETURNED TO SERVICE

- 11 MFP oil cooler leak repaired

8. OPERATIONAL PLANS FOR COMING SHIFT

- Reactivity – Adding 10 gallons of water 7 to 8 times per shift for Tave control.

9. NEW PROCEDURES / INSTRUCTIONS

None

WATCHSTANDERS LPEO: Flanders **PEO:** Lapcinski

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

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

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

→ PEO: _____ **Time:** _____