Facility: __Point Beach_____ Scenario No.: ___1___ Op-Test No.: 2009-01

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: ___Unit 1 EOL 75% power following a load reduction for load control. __ _1P-29 TDAFW OOS 4 hours ago for turbine bearing replacement. 1P-2B Charging Pump is OOS due to repairs on the variable frequency drive system. Fan 1W-45 B Bus Duct Cooling fan is OOS due to motor failure.

Turnover: OP 1C, "Startup to Power Operation Unit 1" is in effect at step 5.133. Pressurizer Backup Heater group B is energized and an additional letdown orifice is in service. Protected equipment includes 1P-2A Charging Pump, 1P-2C Charging Pump, P-38A MDAFW Pump and P-38B MDAFW Pump. TSAC 3.7.5.B to restore 1P-29 to OPERABLE in 72 hours was entered 4 hours ago. The goal of the shift is to maintain current plant conditions.

Event No.	Malf. No.	Event Type*	Event Description
1		C-BOP C-SRO TS-SRO	1P-11A CCW pump trip with failure of 1P-11B auto start
2		I-RO I-SRO	VCT level transmitter 112 fails low
3		C-BOP TS-SRO	Trip of Accident Fan W1B1
4		R-RO N-BOP N-SRO	B SGFP high bearing temp and associated power reduction
5		M-ALL	B S/G feed line rupture inside containment requiring plant trip and subsequent entry into CSP-H.1. (P-38A MDAFW Pump fails to auto start and trips after start. P-38B MDAFW Pump fails to start)
6		C-RO	Rx Trip buttons fail on panel 1C04

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

SIMULATOR EXERCISE GUIDE (SEG)

SITE: POINT BEACH **SEG # PBN-LOI-NRC-001E**

SEG TITLE: 2009 NRC EXAM SCENARIO #1 **REV. # 0**

PROGRAM: INITIAL LICENSE TRAINING **#: PB-ILT**

COURSE: **#:**

TOTAL TIME: 2.0

Additional signatures may be added as desired.

Developed by:	**Andrew Zommers**	
	Instructor	*Date*
Reviewed by:	**Sam Hall**	
	Instructor *(Simulator Scenario Development Checklist.)*	*Date*
Validated by:		
	Validation Lead Instructor *(Simulator Scenario Validation Checklist.)*	*Date*
Validated by:	**Tom Larson**	
	Operations Department Representative	*Date*
Approved by:	**Randy Amundson**	
	Training Supervision	*Date*

Guide Requirements

Goal of Training:	To have the crew successfully respond to a failure of a CCW pump, VCT level transmitter failure, Accident Fan trip, Loss of a SG Feed Pump, feed line rupture in containment, failure of MDAFW pumps and reactor trip buttons in the Control Room. Embedded within these events is the expectation to properly utilize Technical Specifications.
Learning Objectives:	None
Prerequisites:	**1.** Simulator available **2.** Students enrolled in Initial License Program
Training Resources:	**1.** Floor Instructor as Shift Manager **2.** Floor Instructor as Shift Technical Advisor **3.** Simulator Booth Operator **4.** Communicator **5.** NRC Examiners
References:	**1.** OP 1C Startup to Power Operation Unit 1 **2.** AOP 1D CVCS Malfunction Unit 1 **3.** AOP 2A Secondary Coolant Leak Unit 1 **4.** AOP 2B Feedwater System Malfunction Unit 1 **5.** AOP 17A Rapid Load Reduction Unit 1 **6.** AOP 9B Component Cooling System Malfunction Unit 1 **7.** EOP 0 Reactor Trip or Safety Injection **8.** EOP 2 Faulted Steam Generator Isolation Unit 1 **9.** CSP-H.1 Loss of Heat Sink Unit 1 **10.** Technical Specifications **11.** Technical Requirements manual **12.** Alarm Response Book
Commitments:	None
Evaluation Method:	Simulator performance will be evaluated by NRC Examiners IAW NUREG-1021
Operating Experience:	None

Related PRA Information:

Initiating Event with Core Damage Frequency:

Feedline Rupture in Containment CDF 9.8E-07

Important Components:

Important Operator Actions with Task Number:

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Loss of 1P11A CCW Pump with 1P11B failure to auto start
2. VCT Level transmitter LT-112 fails LOW
3. Loss of 1W1B Accident Fan
4. High bearing temperature on SGFP P-28B
5. 'B' Feed line rupture inside containment

After EOP Entry:

1. Failure of reactor trip buttons in control
2. Failure of P38A MDAFW Pump to start
3. Failure of P38B MDAFW Pump, trips after start

Abnormal Events:

1. CCW Pump failure
2. SGFP failure

Major Transients:

1. 'B' Feed line rupture inside containment with transition to CSP-H.1

Critical Tasks:

1. **RT-7, When a reactor trip is procedurally called for, initiate a manual reactor trip prior to 5 psig in containment**
2. **FR-H.1 A Restore feedwater flow into at least one steam generator before RCS bleed and feed is required**.

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard (Specific) IC sets:
   - IC-102, created from IC-03
2. The following equipment is OOS:
   - 1W45B Bus Duct Cooling Fan
   - 1P-29 TDAFW Pump
   - 1P-2B Charging Pump
   - P-38A and P-38B MDAFW Pumps are protected equipment
   - 1P-2A and 1P-2C Charging Pumps are protected equipment
   - 1W-45A Bus Duct Cooling Fan is protected equipment

SEQUENCE OF EVENTS:

Event 1: Failure of 1P11A CCW Pump with 1P-11B failure to auto start

- Crew responds to loss of CCW and manually starts standby CCW pump
- Crew Enters AOP-9B to address malfunction
- SRO addresses Technical Specifications

Event 2: Failure of 1LT-112 VCT Level Transmitter LOW

- Crew responds to loss of transmitter by stopping auto make up
- Crew Enters AOP-1D to address malfunction
- SRO addresses Technical Requirements Manual

Event 3: Accident Fan 1W1B trips

- Crew addresses loss of 1W1B Accident Fan
- Crew starts the standby Accident Fan

- SRO addresses Technical Specifications

Event 4: 1P-28B Main Feed Pump high bearing temperature

- Crew addresses high SGFP bearing temp per AOP-2B
- Crew starts reducing power per AOP-17A to <60% turbine load

Event 5: 'B' feed line ruptures inside containment

- Crew enters AOP 2A to address feed rupture
- SRO addresses Technical Specifications
- Crew trips reactor based on containment pressure nearing 2 psig
- Crew enters EOP 0 and performs immediate actions
- Transition is made to CSP-H.1 Loss of Heat Sink

Event 6: Reactor trip buttons fail to operate in Control Room

- RO directs the BOP to de-energize 1B01 and 1B02 to trip the reactor
- RO directs BOP to restore busses and loads as time permits

Event 7: P38A and P38B MDAFW pumps fail to operate as designed

- BOP informs SRO both MDAFW pumps are not operating
- BOP may try to start P-38A

NOTE: Modify this table as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: Standard IC-102 Unit 1 • Mode: 1 • Burnup: 14200 MWD/MTU • Power: 75% • Boron: 88 ppm (EOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 181 steps • Generator: ≈410 Mwe Unit 2 • Mode: 1 • Burnup: 4500 MWD/MTU • Power: 26% • Boron: 1109 ppm (MOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 158 steps • Generator: ≈ 136 Mwe		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		1W-45B Bus Duct Cooling Fan 1P-29 TDAFW Pump (OOS tag) 1P-2B Charging Pump (OOS tag) Protected equipment tags on P-38A and P-38B Protected equipment tags on 1P-2A and 1P-2C.
	2. Simulator Pre-brief: a. Inform the crew that this session will be performed in the evaluation mode per NUREG 10201. b. If required, inform the crew of differences between the simulator and actual plant equipment. c. Crew positions		
	3. COMPLETE TURNOVER: a. Review applicable current Unit Status. b. Review relevant At-Power Risk status. c. Review current LCOs not met and Action Requirements. d. Verify crew performs walk down of control boards and reviews turnover checklists. e. Crew takes the shift.		TSAC 3.7.5.B applicable with 1P-29 OOS.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 1</u>: Failure of 1P11A CCW Pump with 1P-11B failure to auto start	BOP/SRO	BOP identifies the 'A' CCW Pump failure with the 'B' CCW Pump not auto starting. BOP requests from the SRO to start 'B' CCW Pump manually.
	<u>Communications:</u> If asked, the PAB AO reports the 'A' CCW Pump inboard motor bearing is hot to the touch.	Crew	BOP or RO address ARB's as applicable. Enter AOP 9B CCW malfunction to address the lost CCW Pump. BOP will verify adequate tank level and start 1P-11B CCW Pump.
	If asked, the PAB AO will report nothing unusual with the 'B' CCW Pump discharge pressure indicator, it reads 125 psig locally.		Crew will address surge tank level which will require no action.
	If asked, the TH AO will report the 'A' CCW Pump breaker has tripped on overcurrent.	SRO	Crew will address system leakage requiring no action. Chemistry will be requested to analyze CCW.
	<u>NOTE:</u> Crew may elect to place 1P-11A in pullout to clear 'Motor Breaker Trip' alarm.	BOP/RO	OS1 will ask the SM to call DCS and Emergency Plan. Send AO's out locally to the pump/breaker and discharge pressure indicator to find any problems.
	End of evolution: Proceed to next event at Lead Examiner discretion.	SRO	Address LCO 3.7.7 CCW and enter 72 hour TSAC 3.7.7.A

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 2:</u> Failure of 1LT-112 VCT Level Transmitter LOW	RO/SRO	RO identifies LT-112 failed low due to auto make up occurring and not required. Requests from the SRO to take make up to off.
	NOTE: Crew may go to AOP-24 to address instrument failure. If AOP-24 is used go to next page of the SEG.	Crew	Crew enters AOP-1D CVCS Malfunction to address the level transmitter failure.
		RO	RO determines no RCS leak in progress
		SRO	Determines malfunction to be LT-112 and goes to step 58
	<u>Communications:</u> If asked, the APB AO reports nothing abnormal locally with LT-112.	RO	VCT Divert valve to VCT. Make up controls to STOP.
	<u>Communications:</u> If SM is contacted regarding DCS and I&C reply the notifications are taking place.	SRO/RO	VCT level control in manual should be discussed.
		SRO	SRO addresses Technical Requirements Manual for the failed transmitter. There are no implications due to LT-141 still being operable.
	End of evolution: Proceed to next event at Lead Examiner discretion.		OS1 will ask the SM to Inform DCS and I&C Duty and Call.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Failure of 1LT-112 VCT Level Transmitter LOW (cont'd)	SRO	Crew enters AOP-24 for instrument failure.
		RO	Identify failed instrument.
		RO	Check if failed instrument is controlling, the RO should determine LT-112 is controlling.
			Establish manual control as desired. RO takes VCT Divert valve to VCT and make up controls to STOP.
			Return affected parameters to normal
		SRO	Determine if failed instrument affects RTO, which LT-112 does not.
			Remove instrument from service, which cannot be done for LT-112.
			Return controls to automatic, which cannot be done. VCT level control in manual should be discussed
	End of evolution: Proceed to next event at Lead Examiner discretion.		Check for TS or TRM applicability. Address Technical Requirements Manual for the failed transmitter. There are no implications due to LT-141 still being operable.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 3:</u> Trip of Accident Fan 1W1B **NOTE:** Have an OI-72 marked up and available if crew elects to start 1W-1A1. **NOTE: Next event takes several minutes to bring in an alarm.** **End of evolution:** Proceed to next event at Lead Examiner discretion.	BOP SRO	BOP responds to board alarms for Low Air Flow associated with the 1W1B Accident Fan and Motor Breaker Trip. BOP references ARP(s) for Low Air Flow and/or Motor Breaker Trip to validate alarm(s). SRO may elect to start 1W-1A1 to maintain a normal alignment with 3 Accident Fans running. At a minimum, they should discuss monitoring RCP and Containment conditions if two fans are left operating. SRO addresses TS 3.6.6 and enters TSAC 3.6.6.C for the B Accident Fan, 72 hours.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Event 4: 1P-28B Main Feed Pump high bearing temperature	RO	RO acknowledges the 1TR-2000B Recorder alarm.
			RO/BOP address ARB's as applicable.
		BOP	Goes behind the boards to determine affected component.
	Communication: If asked reply with the following as requested by the control room. The U1 TH AO reports the 1P-28B SGFP inboard motor bearing is hot to the touch and the paint is slightly discolored. Oil temperature was 95˚F at the start of watch and is now 105˚F. There is lower than normal oil flow since rounds were taken. Normal service water flow, oil reservoir level normal, oil pressure is normal, seal water flow/temperature normal and no smoke.		Send out an AO to investigate 1P-28B status.
		SRO	Crew enters AOP-2B Feedwater System Malfunction
		RO	**(CA STEP)** maintain power <100%
		BOP	Check FRV response normal
			Check S/G level <78%
			Check MFP's running
			Check Condensate pumps running
		SRO	Check MFP's normal, crew should determine the RNO column is applicable. Crew ramps Unit to <60% load per AOP 17A.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1P-28B Main Feed Pump high bearing temperature (cont'd)	SRO	Determine power level to be met. Crew determines ramp to <60% turbine load. OS1 asks the SM to notify PSS of load ramp.
		RO	Check control rod system in AUTO.
	NOTE: Acknowledge SRO request to have SM notify PSS.	SRO	Select ramp reduction method and rate.
		RO	**(CA STEP)** Borate to keep rods above insertion limits. **(CA STEP)** Check PZR Pressure normal. **(CA STEP)** Check PZR Level normal.
		BOP	**(CA STEP)** Check S/G level controlling in AUTO.
	End of evolution: Proceed to next event at Lead Examiner discretion.	RO	**(CA STEP)** Maintain RCS T_{ave}.
		BOP	Check SGFP Seal Water pumps operating.
	<u>Event 5:</u> 'B' feed line ruptures inside containment	Crew	Diagnose a secondary leak with containment humidity rising, Sump A level rising, containment pressure rising and no RMS alerts or alarms.
	RT-7, When a reactor trip is procedurally called for, initiate a manual reactor trip prior to 5 psig in containment	SRO	Enter AOP 2A and will eventually trip reactor based on approaching 2 psig inside containment. SRO will direct a plant trip and enter EOP 0.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 6:</u> Reactor trip buttons fail to operate in Control Room	RO	When the Unit trip is called for, the RO recognizes the RX trip breakers do not function on 1C04. RO continues with immediate actions Verify Turbine Trip Verify Safeguards busses energized Check Safety Injection is actuated – most likely will have to manually actuate due to low pressurizer level.
		CREW	**(CA STEP)** Monitor folder page criteria - Should identify adverse containment conditions - Should isolate feed flow to the B S/G
		BOP	Verify Automatic Actions per Attachment A
		RO/BOP	Verify Secondary Heat Sink Available
		CREW	Crew should notice the Heater Drain Tank and Condensate Pumps did NOT trip off at 5# containment pressure. When noted, the HDT pumps can be secured and the Condensate Pumps placed in Pullout.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 7:</u> P-38A and P-38B fail to operate as designed. **<u>Communication:</u> If asked, the TH AO reports nothing abnormal with P38B MDAFW Pump, Motor or associated breaker.** **<u>Communication:</u> If asked, the TH AO reports P-38A MDAFW Pump motor is very hot to the touch and if asked the breaker tripped on overcurrent.** **<u>Communication:</u> STA acknowledges request to monitor CSP status trees for Unit 1.**	BOP SRO	BOP determined the A and B MDAFW Pumps are not operating as designed. BOP and SRO may elect to attempt 1 restart of P-38A MDAFW Pump. SRO should determine entry into CSP-H.1 Loss of Heat Sink is required. BOP should stop performing actions in EOP 0 Attachment A after transition to CSP-H.1.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	P-38A and P-38B fail to operate as designed (cont'd)	CREW	**(CA STEP)** Monitor folder page criteria
		BOP	SRO should direct completion of Attachment C
		RO	Check if Heat Sink is required
			Check if RCS Bleed and Feed is required. Crew should determine there is adequate S/G level and delta T's in the RCS loops.
		RO	Verify S/G sample and Blowdown valves shut
			Check control room indications for cause of loss of AFW
	<u>Communication:</u> ***AO will be contacted to locally align AFW per Attachment B of CSP H.1. Acknowledge the request; however, valve lineups do not affect the scenario and do not need to be performed***	SRO	Check total feed flow greater than 200 GPM. SRO should assign an AO to perform Attachment B for local valve alignments.
		RO	Stop Both RCPs
		RO	Check Condensate Pumps - AT LEAST ONE RUNNING
	<u>NOTE:</u> Crew may or may not have to start a condensate pump based on their actions from the previous failure.	RO/BOP	**(CA STEP)** Maintain hotwell level greater than 5 inches
			Check condensate and feedwater piping intact - Should identify that 'B' feed line is faulted and align 'A' to restore S/G level.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	P-38A and P-38B fail to operate as designed (cont'd)	RO/BOP	Establish feedwater flow path. Crew will reset SI and verify a flow path for 'A' S/G.
			Check main Feed Pumps at least 1 running. With no feed pumps running and the 'B' being OOS, the crew will start 'A' MFP.
	FR-H.1 A Restore feedwater flow into at least one steam generator before RCS bleed and feed is required.		Check SGFP Discharge MOV open.
			Establish S/G levels. Crew will feed the 'A' S/G to restore level.
		SRO	Return to procedure step in effect. SRO directs return to EOP-0 step 6.
	<u>NOTE:</u> EOP 0 Attachment A should be recommenced after exiting CSP-H.1.	RO	Verify RCP Seal cooling
			(CA STEP) Verify RCS Temperature Control
			Check PZR PORV's shut
			Check PZR Sprays shut
			Check if RCP's should remain running
		SRO	Start monitoring Critical Safety Function Status Trees
		RO/BOP	**(CA STEP)** Verify Containment Sump Recirculation not Required

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	P-38A and P-38B fail to operate as designed (cont'd) **<u>NOTE:</u> Lead Evaluator can terminate scenario at any point after entry into EOP-2.**	BOP SRO RO BOP	Check if Secondary System is intact – NO Transition to EOP-2 Check RCS Hot Leg wide range temperatures stable Isolate both MSIV's Check if any S/G is not faulted
	CSP H.1 Attachment C actions	BOP	Verify Safeguards busses energized. Verify Feedwater Isolation. Verify Containment Isolation. Check SI Pumps – Both running. Check RHR Pumps – Both running. Check CCW Pumps – Only 1 running. Verify SW system alignment. Verify Containment Accident Fan Units running. Check Control room ventilation in Accident Mode Check if MSIV's can remain open. Verify Containment Spray is not required. Check 4160 VAC safeguards busses energized by offsite.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A **<u>Communication:</u> When contacted the PAB AO should report that SW-LW-61 and 62 radwaste SW isolation valves are both shut.**	BOP	Verify feedwater isolation. Verify containment isolation Verify AFW actuation. BOP should not perform any actions with 1P-29 TDAFW pump due to it being OOS. Check SI pumps running. Check RHR pumps running. Check only 1 CCW pump running. Verify Service Water System alignment. BOP should contact the PAB to check 2 local valves and isolate loads per Event 8 below. Verify containment accident cooling. Check CR ventilation in accident mode. Check if main steam lines can remain open. Verify proper SI valve alignment.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A (cont'd) **<u>Communication</u>: When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is 72˚F. Wait 2 more minutes and report CWPH temperature at 65˚F.**	BOP	**(CA STEP)** Verify containment spray not required. Verify SI flow. **(CA STEP)** Check CSR temperature. **(CA STEP)** Check AFW Area temperature. **(CA STEP)** Check Computer Room temperature. **(CA STEP)** Check CWPH temperature.

SIMULATOR INPUT SUMMARY

EVENT 1: Failure of 1P11A CCW Pump with 1P-11B failure to auto start

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	MGA	MAL	MAL1MGA005B	-			1W-45B Bus Duct Fan OOS
Preload	SGN	VLV	VLV1SGN015	1-Fail CP Fuse			1P-29 TDAFW Pump OOS (1MS-2019)
Preload	SGN	VLV	VLV1SGN016	1-Fail CP Fuse			1P-29 TDAFW Pump OOS (1MS-2020)
Preload	CVC	BKR	BKR1CVC006	6- Fail CP Fuse			1P-2B Charging Pump OOS
Preload	AFW	VLV	VLVAFW031	1- Fail CP Fuse			1AF-4000 OOS
Preload	AFW	VLV	VLVAFW032	1- Fail CP Fuse			1AF-4001 OOS
PLE	CCW	PMP	PMP1CCW001	2-shaft seizure	1		1P-11A CCW Pump
	CCW	BKR	BKR1CCW002	4-fail to auto close	Preload		1P-11B CCW Pump

SIMULATOR INPUT SUMMARY

Expected Communications

- **If asked, wait one minute and have the PAB AO reports the 'A' CCW Pump inboard motor bearing is hot to the touch**
- **If asked, wait one minute and have the PAB AO will report nothing unusual with the 'B' CCW Pump discharge pressure indicator, it reads 125 psig locally**
- **If asked, wait one minute and have the TH AO will report the 'A' CCW Pump breaker has tripped on overcurrent**

SIMULATOR INPUT SUMMARY

EVENT 2: Failure of 1LT-112 VCT Level Transmitter LOW

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
	CVC	XMT	XMT1CVC019A	0	3	15 sec	VCT LT-112

Expected Communications

- **If asked, wait one minute and have the PAB AO reports nothing abnormal locally with LT-112**

EVENT 3: Loss of 1W-1B1 Accident Fan

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
	CNM	BKR	BKR1CNM002	1-Trip	11		1W-1B1 Fan Trip

Expected Communications

- **If asked, wait one minute and have the TH AO reports breaker for 1W-1B1 is tripped on overcurrent.**

EVENT 4: 1P-28B Main Feed Pump high bearing temperature

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
	CFW	XMT	XMT1CFW038A	225	5	10 min	1P-28B Inboard Motor Bearing

Expected Communications

- **<u>Communication:</u> If asked reply with the following <u>as requested</u> by the control room. The U1 TH AO reports the 1P-28B SGFP inboard motor bearing is hot to the touch and the paint is slightly discolored. Oil temperature was 95˚F at the start of watch and is now 105˚F. There is lower than normal oil flow since rounds were taken. Normal service water flow, oil reservoir level normal, oil pressure is normal, seal water flow/temperature normal and no smoke**

EVENT 5: 'B' feed line ruptures inside containment

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	PPL	BST	BST1PPL056	1-fail as is			1PC945A SI Cont Pres bistable
Preload	PPL	BST	BST1PPL060	1-fail as is			1PC947A SI Cont Pres bistable
PLE	CFW	FLX	FLX1CFW031	5000	9	900 sec	'B' feedline break inside containment

Expected Communications

None

EVENT 6: Reactor trip buttons fail to operate in Control Room

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	PPL	OVR	OVR1PPL033	Off			Reactor trip Button 1C04
Preload	PPL	OVR	OVR1PPL034	Off			Reactor trip Button 1C04

Expected Communications

None

EVENT 7: P38A and P38B MDAFW pumps fail to operate as designed

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	AFW	BKR	BKR1AFW001	1-Trip	15(JCRFTR)	60 sec delay	P-38A MDAFW Pump trips
Preload	AFW	BKR	BKR1AFW002	5-fails as is			P-38B MDAFW Pump fails to start

Expected Communications

- **If asked, the TH AO reports P38A MDAFW Pump, Motor hot to the touch and associated breaker tripped on overcurrent.**
- **If asked, the TH AO reports nothing abnormal with P-38B MDAFW Pump Motor or associated breaker.**
- **AO will be contacted to locally align AFW per Attachment B of CSP H.1. Acknowledge the request; however, valve lineups do not affect the scenario and do not need to be performed.**
- **When contacted the PAB AO should report that SW-LW-61 and 62 radwaste SW isolation valves are both shut.**
- **When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is 72˚F. Wait 2 more minutes and report CWPH temperature at 65˚F.**

VERIFY the simulator setup for training mode scenario (for evaluated scenarios use PBF-6801):

Rod counters reset

Watchstation nametags assigned

All CO station books in proper places

Digital Displays set appropriately

All mimic bus magnets in proper positions

Sim 20 lighting breakers closed

TR-2000 series recorders in Data (auto) / Scan (auto)

Startup Fireworks PC at 1C20 workstation, if required after initial startup of MST

Ensure the Simulator Base Station is set to Simulator Talk Group 1. (Clear screen saver by moving mouse. Simulator Group 1 should be outlined in green)
[Ref. CAP 01039821, Item 4]

Training signs installed

Horns on

Instrument noise on

STA CSFST Sheets available

MCB / instrument rack doors shut, lights off

Radios available and operable

SPDS computers restarted

Scenario specific props (tags, protected equipment magnets, etc.) installed:

- None

Post Scenario Simulator Restoration

P&Ids cleaned and restored

Marked up procedures replaced

Marked up ARBs/ARPs cleaned

Simulator restored to appropriate IC (default is IC2)

- Scenario specific props (tags, protected equipment signs, etc.) removed
- Mimic bus magnets restored to appropriate IC

IF last session of the day, **THEN**

- Depost access doors
- Replace burned out lights
- Replace spent charts
- Shutdown MST

SHIFT TURNOVER INFORMATION

1.0 PLANT CONDITIONS:

	UNIT 1	UNIT 2
Time in core life (MWD/MTU):	*14200*	*4500*
Reactor power (%):	*75%*	*26%*
Boron concentration (ppm):	*88 ppm*	*1109 ppm*
Rod height (CBD @):	*CBD @ 181*	*CBD @ 158*

2.0 TECHNICAL SPECIFICATION ACTION CONDITIONS IN EFFECT:

TSAC	Description	Reason
3.7.5.B	One turbine driven AFW pump system inoperable in MODE 1, 2 or 3 for reasons other than Condition A. Restore turbine driven AFW pump system to OPERABLE status within 72 hours.	1P-29 TDAFW Pump was placed OOS 4 hours ago for bearing replacement on the turbine.

3.0 EQUIPMENT OUT OF SERVICE:

- 1P-29 TDAFW pump OOS for bearing replacement.
- 1AF-4000 and 1AF-4001 TDAFW Discharge MOV's are shut with power removed.
- 1W-45B Bus Duct Cooling fan OOS due to motor failure.
- 1P-2B Charging Pump is OOS for variable frequency drive maintenance.

4.0 PLANNED EVOLUTIONS:

Maintain current power level.

5.0 TURNOVER INFORMATION:

- Unit 1 was reduced to 75% power 3 days ago for system load control.
- Procedure step in effect is OP-1C, Startup to Power Operation Unit 1, step 5.133.
- Pressurizer backup heater Group B is energized and an additional orifice is in service.
- Safety Monitor is Green.
- P-38A and P-38B MDAFW Pumps are protected equipment.
- 1P-2A and 1P-2C Charging Pumps are protected equipment.
- 1W-45A Bus Duct Cooling fan is protected equipment.
- Clock time is **real time** and you have the normal shift complement.
- There is a Maintenance crew and supervisor on site working 1P-29 TDAFW pump.

Attach the following information as necessary:

- Simulator Set-up Checklist (before and after training)
- Pre-evaluation Brief Guide (for evaluations only)
- Post-evaluation Critique (for evaluations only)
- Turnover Log

Historical Record: (Optional) This SEG is being developed for the ILT 2009 NRC Exam.

Simulator Scenario Development Checklist

Mark with an X Yes, No or N/A for any of the following. If the answer is No or N/A, include justification for the answer or the corrective action needed to correct the discrepancy after the item.

		Yes	No	N/A
1.	The scenario contains objectives for the desired tasks and relevant human performance tools.		X	
2.	The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.)			X
3.	The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	X		
4.	Plant PRA initiating events, important equipment, and important tasks are identified.	X		
5.	Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	X		
6.	The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	X		
7.	The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.	X		
8.	The scenario includes related industry experience.			X
9.	Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.			X
10.	Scenario requires an Emergency Preparedness NARS to be completed. (If YES, a NARS answer key validated by EP personnel is attached to the SEG.) Reference CAP 01021167 – 02.			X

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

Simulator Scenario Validation Checklist

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

		Yes	No	N/A
1.	The desired initial condition(s) could be achieved.	X		
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	X		
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	X		
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	X		
5.	During the simulator scenario, observed changes corresponded to expected plant response.	X		
6.	Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request	X		
7.	Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.	X		
8.	NARS form is accurate for the classification and release conditions presented during the scenario. (MET data is variable based on instrument noise) Reference CAP 01021167 – 02.			X

Discrepancies noted (Check "none" or list items found) ☒ None
SMAR = Simulator Action Request
SMAR:_____ SMAR:_____ SMAR:_____ SMAR:_____

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

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

Facility: ___Point Beach_____ Scenario No.: __2_____ Op-Test No.: 2009-01

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: ___Unit 1 MOL 100% power. 1P-29 TDAFW OOS 4 hours ago for turbine bearing replacement. 1P-2B Charging Pump is OOS due to repairs on the variable frequency drive system. Fan 1W-45 B Bus Duct Cooling fan is OOS due to motor failure.

Turnover: Protected equipment includes 1P-2A Charging Pump, 1P-2C Charging Pump, P-38A MDAFW Pump and P-38B MDAFW Pump. TSAC 3.7.5.B to restore 1P-29 to OPERABLE in 72 hours was entered 4 hours ago. The goal of the shift is to maintain current plant conditions.

Event No.	Malf. No.	Event Type*	Event Description
1		C-RO C-SRO	CV-135 controller malfunction AOP 1D
2		TS-SRO	Control power relay alarm/failure B SI pump
3		C-RO C-SRO TS-SRO	Small RCS leak on B RTD loop
4		R-RO N-BOP N-SRO	Bus Duct fan failure drives downpower due to inadequate bus cooling
5		M-ALL	Large break LOCA requiring plant trip and containment sump recirc
6		C-BOP C-SRO	Failure of 1P-15A SI pump auto start
7		C-BOP	Failure of SI-852A Core Deluge to auto open

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

SIMULATOR EXERCISE GUIDE (SEG)

SITE: POINT BEACH **SEG # PBN-LOI-NRC-002E**

SEG TITLE: 2009 NRC EXAM SCENARIO #2 **REV. # 0**

PROGRAM: INITIAL LICENSE TRAINING **#: PB-ILT**

COURSE: **#:**

TOTAL TIME: 2.0

Additional signatures may be added as desired.

Developed by:	**Andrew Zommers**	
	Instructor	*Date*
Reviewed by:	**Sam Hall**	
	Instructor *(Simulator Scenario Development Checklist.)*	*Date*
Validated by:		
	Validation Lead Instructor *(Simulator Scenario Validation Checklist.)*	*Date*
Validated by:	**Tom Larson**	
	Operations Department Representative	*Date*
Approved by:	**Randy Amundson**	
	Training Supervision	*Date*

Guide Requirements

Goal of Training:	To have the crew successfully respond to a failure of a CV-135, B SI pump control power failure, loss of bus duct cooling resulting in a downpower, small RCS leak, LOCA, failure of P-15A to start, non-essential SW isolation failure and SI-852 to open. Embedded within these events is the expectation to properly utilize Technical Specifications.
Learning Objectives:	None
Prerequisites:	**1.** Simulator available **2.** Students enrolled in Initial License Program
Training Resources:	**1.** Floor Instructor as Shift Manager **2.** Floor Instructor as Shift Technical Advisor **3.** Simulator Booth Operator **4.** Communicator **5.** NRC Examiners
References:	**1.** AOP 1D CVCS Malfunction Unit 1 **2.** Alarm Response Books **3.** AOP 1A Reactor Coolant System Leak Unit 1 **4.** AOP 17A Rapid Load Reduction Unit 1 **5.** EOP 0 Reactor Trip or Safety injection Unit 1 **6.** EOP 1.3 Containment Sump Recirculation – Low Head Unit 1 **7.** Technical Specifications
Commitments:	None
Evaluation Method:	Simulator performance will be evaluated by NRC Examiners IAW NUREG-1021
Operating Experience:	None

Related PRA Information:

Initiating Event with Core Damage Frequency:
Large LOCA CDF 3.4E-08

Important Components:

Important Operator Actions with Task Number:
Operator fails to align for LHR

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Failure of CV-135 Letdown Backpressure Controller
2. Failure of 1P-15B SI Pump control power

After EOP Entry:

1. Failure of 1P-15A SI Pump to auto start
2. Failure of 1SI-852A Core Deluge to auto open

Abnormal Events:

1. 10 gpm RCS leak on B RTD manifold
2. Failure of 1W-45A Bus Duct Cooling Fan

Major Transients:

1. Large break LOCA

Critical Tasks:

1. **RT-7, When a reactor trip is procedurally called for, initiate a manual reactor trip prior to pressurizer level reaching 10%**
2. **E0-I Manually start 1P-15A prior to exiting EOP 0**

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard (Specific) IC sets:
   - IC-101, created from IC-02
2. The following equipment is OOS:
   - 1W-45B Bus Duct Cooling Fan
   - 1P-29 TDAFW Pump
   - 1P-2B Charging Pump
   - P-38A and P-38B MDAFW Pumps are protected equipment
   - 1P-2A and 1P-2C Charging Pumps are protected equipment
   - 1W-45A Bus Duct Cooling Fan is protected equipment

SEQUENCE OF EVENTS:

Event 1: Failure of CV-135 Letdown Backpressure Controller

- RO takes manual control and stabilizes system parameters
- SRO directs crew response with AOP 1D

Event 2: Failure of 1P-15B SI Pump control power

- BOP addresses ARB and reports to SRO
- SRO addresses Technical Specifications

Event 3: 10 gpm RCS leak B RTD manifold

- RO estimates leak size based on indications
- Crew enters AOP-1A to respond to leak
- SRO addresses Technical Specifications

- Crew will start to troubleshoot leak location

Event 4: Failure of 1W-45A Bus Duct Cooling Fan

- BOP responds per ARB
- With no bus duct cooling, crew performs unit downpower per AOP-17A

Event 5: Large LOCA, Rx trip, Transfer to sump recirculation

- Crew enters EOP-0 following Rx trip and Safety Injection
- SRO directs transition to EOP-1.3

Event 6: Failure of 1P-15A SI Pump to auto start

- BOP identifies failure
- SRO directs manual start of pump

Event 7: Failure of 1SI-852A Core Deluge to auto open

- BOP identifies failure
- SRO directs valve be manually opened

NOTE: Modify this table as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: Standard IC-101 Unit 1 • Mode: 1 • Burnup: 7800 MWD/MTU • Power: 100% • Boron: 735 ppm (MOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 220 steps • Generator: ≈533 Mwe Unit 2 • Mode: 1 • Burnup: 320 MWD/MTU • Power: 100% • Boron: 1322 ppm (BOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 220 steps • Generator: ≈ 535 Mwe		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		1W-45B Bus Duct Cooling Fan 1P-29 TDAFW Pump (OOS tag) 1P-2B Charging Pump (OOS tag) Protected equipment tags on P-38A and P-38B Protected equipment tags on 1P-2A and 1P-2C
	2. Simulator Pre-brief: a. Inform the crew that this session will be performed in the evaluation mode. b. If required, inform the crew of differences between the simulator and actual plant equipment.		
	3. COMPLETE TURNOVER: a. Review applicable current Unit Status. b. Review relevant At-Power Risk status. c. Review current LCOs not met and Action Requirements. d. Verify crew performs walk down of control boards and reviews turnover checklists. e. Crew takes the shift.		TSAC 3.7.5.B applicable with 1P-29 OOS

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 1:</u> Failure of CV-135 Letdown Backpressure Controller	RO/SRO	RO identifies CV-135 pressure controller malfunction and takes controller to manual to control back pressure. Addresses ARB for Letdown High Pressure.
		SRO	Enter AOP 1D to address the malfunction and verify actions taken.
		RO	Check RCS leak not in progress.
		SRO	Reviews foldout page criteria
	<u>Communications:</u> If asked, the PAB AO reports there is nothing abnormal with CV-135.	RO	Determine CVCS malfunction – CV-135 pressure control which directs transition to step 36.
		SRO	Establish manual control of CV-135
	<u>NOTE:</u> AOP-24 may be utilized in addition to AOP-1D. (see next page for AOP-24 actions)		Request SM to notify DCS and I&C Duty and Call The crew will have to keep CV-135 in manual control and discuss how this will be done. (may review step 36 RNO)
	End of evolution: Proceed to next event at Lead Examiner discretion.	BOP	May send out the PAB AO to look at CV-135 locally.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Failure of CV-135 Letdown Backpressure Controller (cont'd)	SRO	Crew enters AOP-24 for instrument failure.
		RO	Identify failed instrument/controller.
		RO	Check if failed instrument is controlling, the RO should determine CV-135 is controlling.
			Establish manual control as desired. RO takes controller to manual and controls pressure.
			Return affected parameters to normal
			Determine if failed instrument affects RTO, which CV-135 does not.
			Remove instrument from service, which cannot be done for CV-135.
	End of evolution: Proceed to next event at Lead Examiner discretion.	SRO	Return controls to automatic, which cannot be done. Letdown pressure control in manual should be discussed

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Event 2: Failure of 1P-15B SI Pump control power **Communications:** **If AO's are sent to electrical busses or specific components wait 1 minute then report (as requested) critical control power relays normal with the light lit with the exception of 1P-15B Safety Injection Pump (Relay 1-74/A85FM located on 1A52-85)** If Maintenance is notified inform the SRO an Electrician is on the way to investigate. **NOTE: If the relay is to be removed, then clear the malfunction and report relay 1-74/A85FM is removed.** **End of evolution:** Proceed to next event at Lead Examiner discretion.	BOP SRO	Responds to critical control power relay with ARB. Sends AO's in the field to determine cause of alarm. Checks relays on CO1R for 1B03 and 1B04 (ARB actions) Informs the SRO which component is affected, 1P-15B. Determines LCO 3.5.2 is not met and TSAC 3.5.2.A is entered with 72 hours to restore the pump to operable. OS1 should ask the SM to notify Maintenance to determine cause of failure and repair. Crew may ask the relay to be pulled to clear the critical control power relay to allow other potential alarms process through. Crew may elect to place 1P-15B control switch to pullout.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 3:</u> 10 gpm RCS leak B RTD manifold	CREW	Identifies RMS trends, lowering VCT level and Sump A rising which indicates an RCS leak.
			Enter AOP 1A RCS leak to stabilize plant parameters.
	The OS must differentiate between a primary and secondary leak. With this small of an RC leak, it will take about 4-5 minutes before an RMS alert is received.	RO	RO controls charging as needed to determine an RCS leak rate.
			(CA STEP) Check SI not required. Crew should not SI, leak is small.
			(CA STEP) Check reactor trip not required. Crew should not trip, leak is small.
			(CA STEP) Check PZR level. RO should take control of charging to restore and maintain pressurizer level. Letdown isolation should not be needed.
			Check pressurizer pressure. RO should have to take no action for this step.
		SRO	Determines LCO 3.4.13 is not met and TSAC 3.4.13.A is entered with 4 hours to reduce leakage.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	10 gpm RCS leak B RTD manifold (cont'd) **<u>Communications:</u> Shift Manager will be asked to notify DCS and implement E-Plan** **<u>NOTE:</u> The next failure will have approximately 1 minute delay between the trigger and the first control room indication (alarm). Trigger for event 4 should be inserted just prior to diagnostic steps of AOP-1A.** **<u>End of evolution</u>: Proceed to next event at Lead Examiner discretion**.	RO SRO BOP RO	Check make up controls set at desired value OS1 should ask the SM to notify DCS and implement Emergency plan Check S/G tubes intact Check RCP seal leakoff normal

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 4:</u> Failure of 1W-45A Bus Duct Cooling Fan	BOP	Address ARB and direct the TH1 AO to investigate alarm.
	<u>NOTE:</u> Bus Duct Cooling Air Temp High alarm is received about 3 minutes after initial fan failure.		Informs the SRO of equipment status and the need for unit ramp
		SRO	Enter AOP-17A and perform approximately a 5%/min ramp to <12,000 amps on the generator output.
			Determine power level and desired ramp rate. Ramp should be 5%/min until < 12,000 amps.
	<u>Communications:</u> TH1 AO reports back that the fan 1W-45A has thrown its belts due to the motor pulley falling off.		OS1 should inform the SM to notify PSS of load reduction.
	PAB and TH AO's will be notified to monitor the changing plant conditions due to the downpower.	RO	Check rod control in auto. RO should inform the SRO rods are already in auto.
		SRO	Select rate reduction method and reduce load.
		RO	**(CA STEP)** Borate to maintain rods above the low-low insertion limit.
			(CA STEP) Check Pressurizer pressure Stable at <u>OR</u> trending to 2235 psig.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Failure of 1W-45A Bus Duct Cooling Fan (cont'd)	RO	**(CA STEP)** Check Pressurizer Level Stable at <u>OR</u> trending to program level.
	<u>Communications:</u> Unit 1 TH AO will be requested to start 1P-99A and B and will report back when complete.	BOP	**(CA STEP)** Check Steam Generator Level controlling – IN AUTO
		RO	**(CA STEP)** Maintain RCS Tavg
		BOP	Check Main Feed Pump Seal Water Pump – RUNNING. BOP will have AO start 1P-99A and 99B.
		SRO	Determine Desired end point – LESS THAN 50% TURBINE LOAD. SRO will determine this is NO.
		RO	**(CA STEP)** Check if boration can be stopped.
		SRO	OS1 will ask the SM to contact Chemistry to sample the RCS for Iodine within 2-6 hours following the power change.
	<u>End of evolution</u>: Proceed to next event after an appropriate load reduction per Lead Examiner discretion.		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 5:</u> Large LOCA, Rx trip, Transfer to sump recirculation	RO	Determines RCS leak has gotten worse and plant trip is required.
		RO/SRO	Recommend trip of the unit with manual SI/CI per continuous action step 1 of AOP 1A.
			RO should manually trip Unit 1 reactor, SI and CI.
	<u>CRITICAL TASK</u>: RT-7, When a reactor trip is procedurally called for, initiate a manual reactor trip prior to pressurizer level reaching 10%		RO should perform EOP 0 immediate actions and verify them with the SRO. RO should perform RNO for step 4 IA's with no SI pumps running. – perform manual SI and CI
		CREW	When reviewing foldout page criteria the crew should determine RCP's need to be tripped and adverse containment conditions exist. – SI pump should be manually started with injection verified prior to RCP securing
		SRO/BOP	Direct EOP 0 Attachment A to be completed
		RO	Verify secondary heat sink
			Verify RCP Lab seal D/P

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Large LOCA, Rx trip, Transfer to sump recirculation (cont'd)	RO	**(CA STEP)** Verify RCS temperature control.
			Check PORV's shut.
			Check Spray valves shut.
			Check if RCP's should remain running. RCP's should have been secured per foldout page criteria, if not they should be secured here.
	<u>Communications:</u> STA will be asked to commence monitoring Status Trees, acknowledge request.		
		SRO	Start monitoring CSFST's. SRO should direct the STA to perform this function.
	<u>NOTE:</u> CSP-P.1 will be identified as requiring entry by the STA. Depending on the timing of the notification; the Crew may or may not transition to CSP-P.1. If they do transition prior to transition to EOP 1.3, step 1 of CSP-P.1 sends them back to procedure step in effect.	RO	**(CA STEP)** Verify containment sump recirc not required.
		SRO	Transition to EOP 1.3 containment sump recirc.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Large LOCA, Rx trip, Transfer to sump recirculation (cont'd)	BOP	Reset SI
		RO	Check RCS break size.
		BOP	Check if containment sump pH should be adjusted.
		BOP	Check if train A SI flow should be stopped. – stop train A ECCS system
		BOP	Check if Train B should be stopped – go to step 6
	<u>Communication:</u> AO will be contacted to complete Attachment A of EOP 1.3 Transfer to Containment Sump Recirc. Acknowledge request and then insert trigger 13. No follow up report is required because the attachment will not be complete prior to the end of the scenario.	RO	**(CA STEP)** Monitor Core Cooling
		BOP	Direct PAB operator to perform Attachment A
		RO/BOP	Direct unnecessary personnel to evacuate the PAB
		BOP	Check Control Room fans armed
		RO/BOP	Isolate CCW to containment
			Isolate CCW to NRHX
			Check SW Pumps 6 running
			Check SW header a continuous flowpath
			Establish CCW to RHR HX's
			Ensure Core Deluge valves are open

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Large LOCA, Rx trip, Transfer to sump recirculation (cont'd) **<u>Communication:</u> AO will be contacted to complete step 16.b in EOP 1.3 to locally shut both SI test line return isolation valves. Acknowledge report and then insert trigger 15. Report when valves are shut.** **<u>End of scenario</u>: Lead Evaluator can end evaluation any time after sump recirc line up is established and crew is waiting for RWST level to reach 34%.**	RO/BOP SRO BOP	Align SI test lines for recirc Align RHR pump suction valves Check Train A ready for recirculation – yes Check Train B ready for recirculation – no Check at least 1 train ready for recirculation – yes train A Note reference for other procedures are now applicable that do not interfere with EOP 1.3 Check RWST level $\leq$ 34% **<u>NOTE:</u>** Crew may have to transition to CSP-P.1 if not done earlier and stop after step 1. The next transition that should occur is 'procedure step in effect' which is EOP-0 Step 14.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A **<u>CRITICAL TASK</u>: E0-I Manually start 1P-15A prior to exiting EOP 0** **<u>Communication:</u> When contacted the PAB AO should report that SW-LW-61 and 62 radwaste SW isolation valves are both shut.**	BOP	Verify feedwater isolation. Verify containment isolation Verify AFW actuation. BOP should not perform any actions with 1P-29 TDAFW pump due to it being OOS. Check SI pumps running. If not previously started 1P-15A should be manually started. 1P-15B is OOS. The BOP should isolate the suction source and place pump in pullout. Check RHR pumps running. Check only 1 CCW pump running. Verify Service Water System alignment. BOP should contact the PAB to check 2 local valves. Verify containment accident cooling. Check CR ventilation in accident mode. Check if main steam lines can remain open. Verify proper SI valve alignment. If not previously done, 1SI-852A should be opened at this time.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A (cont'd) **<u>Communication</u>: When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is 72˚F. Wait 2 more minutes and report CWPH temperature at 65˚F.**	BOP	**(CA STEP)** Verify containment spray not required. Verify SI flow. **(CA STEP)** Check CSR temperature. **(CA STEP)** Check AFW Area temperature. **(CA STEP)** Check Computer Room temperature. **(CA STEP)** Check CWPH temperature.
	<u>Event 6:</u> Failure of 1P-15A SI Pump to auto start **<u>Communication:</u> If an AO is requested to locally check the pump or breaker report there is nothing abnormal from the field.** **<u>CRITICAL TASK</u>: E0-I Manually start 1P-15A prior to exiting EOP 0**	BOP SRO	Determine that 1P-15A SI pump did not auto start. Action should not be taken to manually start the pump until after immediate actions are completed and verified. This pump can be started per OM 3.7 which allows taking action if auto actions have failed or attachment A of EOP 0 will check this equipment. This pump should be started when the crew has to trip the RCP's due to loss of subcooling on foldout page criteria EOP 0.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 7:</u> Failure of 1SI-852A Core Deluge to auto open **<u>Communication:</u> If an AO is requested to locally check the valve breaker report there is nothing abnormal from the field.**	BOP	Determine that 1SI-852A core deluge did not auto open. Action should not be taken to manually open the valve until after immediate actions are completed and verified. This valve can be opened per OM 3.7 which allows taking action if auto actions have failed or attachment A of EOP 0 will check this valve in the proper position.

Event 1: Failure of CV-135 Letdown Backpressure Controller

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload			MAL1MGA005B	-			1W-45B Bus Duct Fan OOS
Preload	SGN	VLV	VLV1SGN015	1-Fail CP Fuse			1P-29 TDAFW Pump OOS (1MS-2019)
Preload	SGN	VLV	VLV1SGN016	1-Fail CP Fuse			1P-29 TDAFW Pump OOS (1MS-2020)
Preload	CVC	BKR	BKR1CVC006	6- Fail CP Fuse			1P-2B Charging Pump OOS
Preload	AFW	VLV	VLVAFW031	1- Fail CP Fuse			1AF-4000 OOS
Preload	AFW	VLV	VLVAFW032	1- Fail CP Fuse			1AF-4001 OOS
PLE	CVC	CNH	CNH1CVC014F	50	1		CV-135 controller oscillations in automatic

Expected Communications

- **If PAB AO is sent out, inform control room there is nothing abnormal at valve 1CV-135 Letdown backpressure control valve**

LOAs used

None

EVENT 2: Failure of 1P-15B SI Pump control power

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	SIS	BKR	BKR1SIS002	6-fail cntrl pwr fuse	3		1P-15B control power fuse faiure
PLE	ANN	C02	ANN-C02D-D06	OFF	20		Clear control power failure alarm window

Expected Communications

- **If AO's are sent to electrical busses or specific components wait 1 minute then report (as requested) critical control power relays normal with the light lit with the exception of 1P-15B Safety Injection Pump (Relay 1-74/A85FM located on 1A52-85)**
- **If the relay is to be removed (insert trigger 20), and report relay 1-74/A85FM is removed on 1A52-85.**
- **If Maintenance is notified inform the SRO an Electrician is on the way to investigate.**

LOAs used

None

Event 3: 10 gpm RCS leak B RTD loop

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	RCS	MAL	MAL1RCS003E	10 gpm	5	60 sec ramp	RCS loop B RTD manifold leak

Expected Communications

None

LOAs used

None

Event 4: Failure of 1W-45A Bus Duct Cooling Fan

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	MGA	BKR	BKR1MGA008	6-fail CP fuse	7		1W-45A failure
As requested	CFW	LOA	LOA1CFW083	ON	9		Start 1P-99A SGFP Seal Water Injection Pump
As requested	CFW	LOA	LOA1CFW084	ON	9	30 sec delay	Start 1P-99B SGFP Seal Water Injection Pump

Expected Communications

- **After 1 minute, the TH1 AO reports back that the fan 1W-45A has thrown its belts due to the motor pulley falling off.**
- **PAB and TH AO's will be notified to monitor the changing plant conditions due to the downpower.**
- **After starting 1P-99A/B report back to Control Room status of pumps.**

LOAs used

- **When TH1 AO requested to start 1P-99A and B, wait 2 minutes and insert trigger 9.**

Event 5: Large LOCA, Rx trip, Transfer to sump recirculation

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	RCS	MAL	MAL1RCS002F	80	11	360 sec ramp	LOCA B RCS INT Loop
As requested		LOA	LOA1CCW016	0	13	60 sec Ramp	1 CC740A
As requested		LOA	LOA1CCW021	0	13	120 sec Delay 60 sec Ramp	1 CC750A
As requested		LOA	LOA1SIS030	0	15	60 sec Ramp	1 SI 897A
As requested		LOA	LOA1SIS031	0	15	60 sec Delay 60 sec Ramp	1 SI 897B

Expected Communications

- **When the PAB AO is contacted, the PAB AO informs the Control Room SW-LW-61 and 62 SW Radwaste isolations are both shut.**
- **When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is 72˚F. Wait 2 more minutes and report CWPH temperature at 65˚F.**
- **AO will be contacted to complete Attachment A of EOP 1.3 Transfer to Containment Sump Recirc. Acknowledge request and then insert trigger 13. No follow up report is required because the attachment will not be complete prior to the end of the scenario.**
- **AO will be contacted to complete step 16.b in EOP 1.3 to locally shut both SI test line return isolation valves. Acknowledge report and then insert trigger 15. Report when valves are shut.**

LOAs used

- **Trigger 13: Attachment A EOP 1.3**
- **Trigger 15: EOP 1.3 Step 16.b to shut 1SI 897A and B**

Event 6: Failure of 1P-15A SI Pump to auto start

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	SIS	BKR	BKR1SIS001	4-fails to auto close			1P-15A fails to auto start

Expected Communications

- **If an AO is requested to locally check 1P-15A pump or breaker report there is nothing abnormal from the field.**

LOAs used

None

Event 7: Failure of 1SI-852A Core Deluge to auto open

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	SIS	VLV	VLV1SIS027	4-fails to auto open			1SI-852 core deluge

Expected Communications

- **If PAB AO sent to look at breaker locally, nothing abnormal should be reported to control room**.

LOAs used

None

VERIFY the simulator setup for training mode scenario (for evaluated scenarios use PBF-6801):

Rod counters reset

Watchstation nametags assigned

All CO station books in proper places

Digital Displays set appropriately

All mimic bus magnets in proper positions

Sim 20 lighting breakers closed

TR-2000 series recorders in Data (auto) / Scan (auto)

Startup Fireworks PC at 1C20 workstation, if required after initial startup of MST

Ensure the Simulator Base Station is set to Simulator Talk Group 1. (Clear screen saver by moving mouse. Simulator Group 1 should be outlined in green)
[Ref. CAP 01039821, Item 4]

Training signs installed

Horns on

Instrument noise on

STA CSFST Sheets available

MCB / instrument rack doors shut, lights off

Radios available and operable

SPDS computers restarted

Scenario specific props (tags, protected equipment magnets, etc.) installed:

- None

SHIFT TURNOVER INFORMATION

1.0 PLANT CONDITIONS:

	UNIT 1	UNIT 2
Time in core life (MWD/MTU):	*7800*	*320*
Reactor power (%):	*100%*	*100%*
Boron concentration (ppm):	*735 ppm*	*1322 ppm*
Rod height (CBD @):	*CBD @ 220*	*CBD @ 220*

2.0 TECHNICAL SPECIFICATION ACTION CONDITIONS IN EFFECT:

TSAC	Description	Reason
3.7.5.B	One turbine driven AFW pump system inoperable in MODE 1, 2 or 3 for reasons other than Condition A. Restore turbine driven AFW pump system to OPERABLE status within 72 hours.	1P-29 TDAFW Pump was placed OOS 4 hours ago for bearing replacement on the turbine.

3.0 EQUIPMENT OUT OF SERVICE:

- 1P-29 TDAFW pump OOS for bearing replacement
- 1AF4000 and 1AF-4001 TDAFW Discharge MOV's are shut with power removed
- 1W-45B Bus Duct Cooling fan OOS due to motor failure
- 1P-2B Charging Pump is OOS for variable frequency drive maintenance

4.0 PLANNED EVOLUTIONS:

None

5.0 TURNOVER INFORMATION:

- Safety Monitor is Green.
- P38A and P38B MDAFW Pumps are protected equipment.
- 1P-2A and 1P-2C Charging Pumps are protected equipment.
- 1W-45A Bus Duct Cooling fan is protected equipment.
- Clock time is **real time** and you have the normal shift complement.
- There is a Maintenance crew and supervisor on site working 1P-29 TDAFW pump.

Attach the following information as necessary:

- Simulator Set-up Checklist (before and after training)
- Pre-evaluation Brief Guide (for evaluations only)
- Post-evaluation Critique (for evaluations only)
- Turnover Log

Historical Record: (Optional) This SEG is being developed for the ILT 2009 NRC Exam.

Simulator Scenario Development Checklist

Mark with an X Yes, No or N/A for any of the following. If the answer is No or N/A, include justification for the answer or the corrective action needed to correct the discrepancy after the item.

		Yes	No	N/A
1.	The scenario contains objectives for the desired tasks and relevant human performance tools.		X	
2.	The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.)			X
3.	The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	X		
4.	Plant PRA initiating events, important equipment, and important tasks are identified.	X		
5.	Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	X		
6.	The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	X		
7.	The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.	X		
8.	The scenario includes related industry experience.			X
9.	Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.			X
10.	Scenario requires an Emergency Preparedness NARS to be completed. (If YES, a NARS answer key validated by EP personnel is attached to the SEG.) Reference CAP 01021167 – 02.			X

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

Simulator Scenario Validation Checklist

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

		Yes	No	N/A
1.	The desired initial condition(s) could be achieved.	X		
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	X		
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	X		
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	X		
5.	During the simulator scenario, observed changes corresponded to expected plant response.	X		
6.	Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request	X		
7.	Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.	X		
8.	NARS form is accurate for the classification and release conditions presented during the scenario. (MET data is variable based on instrument noise) Reference CAP 01021167 – 02.			X

Discrepancies noted (Check "none" or list items found) ☐ None
SMAR = Simulator Action Request
SMAR:_____ SMAR:_____ SMAR:_____ SMAR:_____

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

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

Facility: ____Point Beach_____ Scenario No.: ___3_____ Op-Test No.: 2009-01

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: ___Unit 1 MOL 28% power hold for Chemistry and Reactor Engineering testing from a trip 6 days ago. Control Rods are in manual for the start up. 1P-29 TDAFW OOS 4 hours ago for turbine bearing replacement. 1P-2B Charging Pump is OOS due to repairs on the variable frequency drive system. Fan 1W-45 B Bus Duct Cooling fan is OOS due to motor failure.

Turnover: OP 1C, "Startup to Power Operation Unit 1" is in effect at step 5.120. Pressurizer Backup Heater group B is energized and an addition letdown orifice is in service. Protected equipment includes 1P-2A Charging Pump, 1P-2C Charging Pump, P-38A MDAFW Pump and P-38B MDAFW Pump. TSAC 3.7.5.B to restore 1P-29 to OPERABLE in 72 hours was entered 4 hours ago. The 28% power hold is cleared and you are directed to raise power to 47% per step 5.120 at a rate of 15% per hour

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO N-BOP N-SRO	Raise power per OP-1C
2		TS-SRO	G02 EDG alarm, low starting air pressure
3		I-RO TS-SRO I-SRO	PT-431 failing high
4		M-ALL	B SGTR requiring plant trip
5		C-BOP	SW-2907/2908 fail to auto open
6		C-BOP	P32E SW Pump failure to auto start

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

SIMULATOR EXERCISE GUIDE (SEG)

SITE: POINT BEACH **SEG # PBN-LOI-NRC-003E**

SEG TITLE: 2009 NRC EXAM SCENARIO #3 **REV. # 0**

PROGRAM: INITIAL LICENSE TRAINING **#: PB-ILT**

COURSE: **#:**

TOTAL TIME: 2.0

Additional signatures may be added as desired.

Developed by:	**Andrew Zommers**	
	Instructor	*Date*
Reviewed by:	**Sam Hall**	
	Instructor *(Simulator Scenario Development Checklist.)*	*Date*
Validated by:		
	Validation Lead Instructor *(Simulator Scenario Validation Checklist.)*	*Date*
Validated by:	**Tom Larson**	
	Operations Department Representative	*Date*
Approved by:	**Randy Amundson**	
	Training Supervision	*Date*

Guide Requirements

Goal of Training:	To have the crew successfully raise reactor power, respond to a failure of PT-431, GO2 EDG alarm, SGTR requiring plant trip, failure of SW 2907/2908 to open and P-32E to start. Embedded within these events is the expectation to properly utilize Technical Specifications.
Learning Objectives:	None
Prerequisites:	**1.** Simulator available **2.** Students enrolled in Initial License Program
Training Resources:	**1.** Floor Instructor as Shift Manager **2.** Floor Instructor as Shift Technical Advisor **3.** Simulator Booth Operator **4.** Communicator **5.** NRC Examiners
References:	**1.** OP 1C Startup to Power Operation Unit 1 **2.** 0-SOP-IC-001-BLUE, Routine Maintenance Procedure Removal of Safeguards or Protection Sensor From Service - Blue Channels **3.** AOP 24 Response to Instrument Malfunctions **4.** Alarm Response Books **5.** EOP 0 Reactor Trip or Safety Injection Unit 1 **6.** EOP 3 Steam Generator Tube Rupture Unit 1 **7.** Technical Specifications and Bases
Commitments:	None
Evaluation Method:	Simulator performance will be evaluated by NRC Examiners IAW NUREG-1021
Operating Experience:	None

Related PRA Information:

Initiating Event with Core Damage Frequency:
SGTR, 1.8E-06

Important Components:
NA

Important Operator Actions with Task Number:
HEP-ODC-EOP-3-21, Operator fails to cooldown and depressurize the intact SG in one hr following a SGTR

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. G02 EDG alarm, low starting air pressure

After EOP Entry:

1. Failure of SW-2907/2908 to auto open
2. Failure of P-32E SW Pump to auto start

Abnormal Events:

1. Failure of Pressurizer pressure transmitter PT-431

Major Transients:

1. SGTR requiring plant trip

Critical Tasks:

1. **E-3 A Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.**
2. **E3-D Terminate SI before a RED simulator Out Of Limits alarm reached (S/G full to MSIV) and control RCS pressure and make up flow so that primary and secondary inventory are stable before the end of the scenario.**

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard (Specific) IC sets:
   - IC-103, created from IC-05
2. The following equipment is OOS:
   - 1W-45B Bus Duct Cooling Fan
   - 1P-29 TDAFW Pump
   - 1P-2B Charging Pump
   - P-38A and P-38B MDAFW Pumps are protected equipment
   - 1P-2A and 1P-2C Charging Pumps are protected equipment

SEQUENCE OF EVENTS:

Event 1: Raise power per OP-1C

- Crew raises power per OP-1C

Event 2: G02 EDG alarm, low starting air pressure

- Crew responds per ARB's
- SRO declares G02 OOS
- SRO addresses Technical Specifications

Event 3: Failure of Pressurizer pressure transmitter PT-431

- RO identifies malfunction, takes manual control and restores pressure
- Crew enters AOP-24 to address malfunction
- Shift pressure control to auto per ARB
- SRO addresses Technical Specifications

Event 4: B SGTR requiring plant trip

- Crew unable to mitigate SGTR
- Crew trips the unit and responds per EOP set

Event 5: Failure of SW-2907/2908 to auto open

- BOP identifies failure
- SRO directs valves be manually opened

Event 6: Failure of P-32E SW Pump to auto start

- BOP identifies failure
- SRO directs pump be manually started

NOTE: Modify this table as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: Standard IC-103 Unit 1 • Mode: • Burnup: 4150 MWD/MTU • Power: 28 % • Boron: 1065 ppm (MOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 166 steps • Generator: ≈146 Mwe Unit 2 • Mode: • Burnup: 120 MWD/MTU • Power: 100% • Boron: 1321 ppm (BOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 220 steps • Generator: ≈ 535 Mwe		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		1W-45B Bus Duct Cooling Fan 1P-29 TDAFW Pump (OOS tag) 1P-2B Charging Pump (OOS tag) Protected equipment tags on P-38A and P-38B Protected equipment tags on 1P-2A and 1P-2C
	2. Simulator Pre-brief: a. Inform the crew that this session will be performed in the evaluation mode. b. If required, inform the crew of differences between the simulator and actual plant equipment.		
	3. COMPLETE TURNOVER: a. Review applicable current Unit Status. b. Review relevant At-Power Risk status. c. Review current LCOs not met and Action Requirements. d. Verify crew performs walk down of control boards and reviews turnover checklists. e. Crew takes the shift.		TSAC 3.7.5.B applicable with 1P-29 OOS.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 1:</u> Raise power per OP-1C **End of evolution:** Proceed to next event at Lead Examiner discretion.	Crew RO	Briefing on power ascension may be performed in classroom prior to beginning of the scenario. Withdraws rods and/or Dilute in addition to adjusting steam demand as needed to establish power increase.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 2:</u> G02 EDG alarm, low starting air pressure	BOP	Address G02 alarm on panel C02. Dispatches AO to determine local alarm that is in.
		SRO	When the report comes back to Control the SRO should determine that G02 EDG is OOS.
	<u>Communication</u>: When sent out, have the TH1 AO wait 2 minutes and report that G02 south bank air pressure is 190 psig and stable with the north bank 160 psig and slowly lowering. The north bank air compressor is running with one of the bank relief valve leaking by. (ARB C65A C35 P7)		LCO 3.8.3 not met, enter TSAC 3.8.3.D immediately and declare G02 OOS. LCO 3.8.1 not met, enter TSAC 3.8.1.E for required standby emergency power sources inoperable. Determine the need to align G01 to both 1A05 and 2A05. Call in Maintenance to troubleshoot and fix.
	End of evolution: Proceed to next event at Lead Examiner discretion.		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 3:</u> Failure of Pressurizer pressure transmitter PT-431	RO	Recognizes PT-431 failing high causing spray valves to open lowering RCS pressure.
		RO/SRO	Take manual control of PT-431 and control pressurizer pressure manually.
		BOP	Address the low pressure condition with the ARB's. - Controlling channel can be changed over per ARB 1C04 1C 1-2 step 6.6. - PORV's and spray controller to manual prior to defeating PT-431 Blue - Return affected parameters to Automatic
	NOTE: IF asked for guidance, the Shift Manager will state OS2 will prepare the required paperwork per 0-SOP-IC-001 BLUE to remove PT-431 from service. Prompt OS1 to complete additional actions while OS2 prepares the paperwork.	SRO	Enter AOP 24 for instrument malfunction.
		RO	Identify failed instrument.
			Check if failed instrument is controlling, the RO should determine PT-431 is controlling.
			Establish manual control as desired. RO takes manual control of HC-431.
			Return affected parameters to normal
		SRO	Determine if failed instrument affects RTO, which PT-431 does not.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	Failure of Pressurizer pressure transmitter PT-431 (cont'd) **End of evolution:** Proceed to next event at Lead Examiner discretion. Intent is to NOT take the instrument OOS per 0-SOP IC 001-Blue, shift to auto control per ARB is desired.	SRO	Remove instrument from service per 0-SOP-IC-001 Address Technical Specifications for PT 431 using 0-SOP-IC-002. TSAC 3.3.1.A enter table 3.3.1-1 immediately. Take PT-431 to trip within 1 hour per 3.3.1.D and 3.3.1.K. TSAC 3.3.2.A enter table 3.3.2-1 immediately. Take PT-431 to trip within 1 hour per 3.3.2.D. If applicable, TSAC 3.4.1.A restore RCS pressure >2205 (TRM 2.1 COLR) within 2 hours.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 4:</u> B SGTR requiring plant trip	CREW	Identifies the SGTR.
		SRO	OS1 suspends any ongoing activities and may implement AOP-3 if time permits.
		RO	Crew may adjust charging to maintain pressurizer level and attempt to determine leak rate.
			Monitors pressurizer level for trip criteria.
			Determine the SGTR size and report to SRO.
			Determines SGTR on B S/G and recommends plant trip.
		CREW	Trip reactor, manual SI and CI, then enter EOP 0 for immediate actions.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	B SGTR (cont'd)	RO	Perform immediate actions of EOP 0 and verify with the SRO.
		CREW	Address foldout page criteria. Isolate ruptured S/G
		SRO/BOP	Direct EOP 0 Attachment A to be completed
		RO	Verify secondary heat sink. RO should feed B S/G until at least 29% level.
			Verify RCP Lab seal D/P
			(CA STEP) Verify RCS temperature control.
			Check PORV's shut.
			Check Spray valves shut.
			Check if RCP's should remain running.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	B SGTR (cont'd)	SRO	Start monitoring CSFST's. SRO should direct the STA to perform this function.
		RO	**(CA STEP)** Verify containment sump recirc not required.
			Check if secondary is intact. RO should verify this to be true.
			Check if S/G tubes are intact. RO should determine tubes are NOT intact.
		SRO	Transition to EOP 3 SGTR.
		RO	**(CA STEP)** Check if RCP's should remain running.
			Identify ruptured S/G.
		BOP	Shut MSIV's for ruptured S/G.
			Reset LOFWTT

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	B SGTR (cont'd)	BOP	Minimize steam dump from ruptured S/G.
			Isolate flow from ruptured S/G.
			(CA STEP) Check if feed flow to ruptured S/G should be stopped.
	<u>Critical Tasks:</u>	SRO	- Unit 2 will enter TSAC 3.7.5.A when P-38B is placed in pullout to isolate AFW to the B generator.
	E-3 A Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.	RO	Check ruptured S/G isolation.
		RO/BOP	Check ruptured S/G >430 psig
			Determine target CET.
			Cooldown to target temperature

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	B SGTR (cont'd)	RO	**(CA STEP)** Check PORV and PORV block valves.
			Check PZR safeties shut
		BOP	Stabilize intact S/G level
			Check SI signal status (previously locked in)
			Reset SI
			Reset CI
			Reset 1B03/B04 lockouts
			Check 4160 safeguards busses energized by offsite
			Re-establish IA to containment
		RO	Check if RHR should be stopped

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	B SGTR (cont'd)	RO	Verify charging flow
			Check if cooldown should be stopped
		BOP	Check ruptured S/G pressure stable
			Check RCS subcooling
			Depressurize RCS and refill using spray (or PORV's) or aux spray
			Check if SI should be terminated
		BOP	Stop both SI pumps
		RO	Verify charging flow
			Verify SI not required
			Check reactor make up controls

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	B SGTR (cont'd) **<u>Critical Tasks:</u>** **CRITICAL TASK: Terminate SI before a RED simulator Out Of Limits alarm reached (S/G full to MSIV) and control RCS pressure and make up flow so that primary and secondary inventory are stable before the end of the scenario.** **End of evolution:** End the simulator session per lead evaluator when sufficient actions are taken to equalize S/G and RCS pressures.		Check if Letdown should be established **(CA STEP)** Align charging pump suction to VCT **(CA STEP)** Control RCS pressure and charging to minimize S/G tube leakage.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 5:</u> Failure of SW-2907/2908 to auto open **<u>Communications:</u> If asked, the PAB AO reports nothing abnormal with SW-2907/2908.**	BOP	Determine that SW-2907/2908 did not auto open. Action should not be taken to manually open the valves until after immediate actions are completed and verified. These valves can be opened per OM 3.7 which allows taking action if auto actions have failed or attachment A of EOP 0 will check this equipment. Unit 2 will enter TSAC 3.7.8.F when these valves are opened.
	<u>Event 6:</u> Failure of P-32E SW Pump to auto start **<u>Communications:</u> If asked, the AO reports nothing abnormal with P-32E Pump or Breaker.**		Determine that P-32E Service Water pump did not auto start. Action should not be taken to manually start the pump until after immediate actions are completed and verified. This pump can be started per OM 3.7 which allows taking action if auto actions have failed or attachment A of EOP 0 will check this equipment.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A **<u>Communication:</u> When contacted the PAB AO should report that SW-LW-61 and 62 radwaste SW isolation valves are both shut.**	BOP	Verify feedwater isolation. Verify containment isolation Verify AFW actuation. BOP should not perform any actions with 1P-29 TDAFW pump due to it being OOS. Check SI pumps running. If not previously started 1P-15A should be manually started. 1P-15B is OOS. The BOP should isolate the suction source and place pump in pullout. Check RHR pumps running. Check only 1 CCW pump running. Verify Service Water System alignment. BOP should contact the PAB to check 2 local valves. Verify containment accident cooling. Check CR ventilation in accident mode. Check if main steam lines can remain open. Verify proper SI valve alignment. If not previously done, 1SI-852A should be opened at this time.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A (cont'd) **<u>Communication</u>: When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is at 72˚F. Wait 2 more minutes and report CWPH temperature is at 65˚F.**	BOP	**(CA STEP)** Verify containment spray not required. Verify SI flow. **(CA STEP)** Check CSR temperature. **(CA STEP)** Check AFW Area temperature. **(CA STEP)** Check Computer Room temperature. **(CA STEP)** Check CWPH temperature.

Event 1: Raise power per OP-1C

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload			MAL1MGA005 B	-			1W-45B Bus Duct Fan OOS
Preload	SGN	VLV	VLV1SGN015	1-Fail CP Fuse			1P-29 TDAFW Pump OOS (1MS-2019)
Preload	SGN	VLV	VLV1SGN016	1-Fail CP Fuse			1P-29 TDAFW Pump OOS (1MS-2020)
Preload	CVC	BKR	BKR1CVC006	6- Fail CP Fuse			1P-2B Charging Pump OOS
Preload	AFW	VLV	VLVAFW031	1- Fail CP Fuse			1AF-4000 OOS
Preload	AFW	VLV	VLVAFW032	1- Fail CP Fuse			1AF-4001 OOS

Expected Communications

None

LOAs used

None

Event 2: **Failure of Pressurizer pressure transmitter PT-431**

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	PCS		XMT1RCS019A	2500	1	10	PT-431 failing high in auto

Expected Communications

None

LOAs used

None

Event 3: G02 EDG alarm, low starting air pressure

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	G02	ANN	ANN-C02F-B01	0-ON	3		G02 EDG alarm

Expected Communications

- When sent out, have the TH1 AO wait 2 minutes and report that G02 south bank air pressure is 190 psig and stable with the north bank 160 psig and slowly lowering. The north bank air compressor is running with one of the bank relief valve leaking by.

LOAs used

None

Event 4: B SGTR requiring plant trip

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	1RCS1	MAL	MAL1RCS008B	9	7	Ramp 360 sec	S/G B Tube Rupture
Preload	1SGN2	LOA	LOA1SGN025	0	9	Ramp 120	1MS-237

Expected Communications

- **When sent to locally check Radwaste SW valves SW-LW-61 & 62 shut, report that both valves are shut.**
- **When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is 72˚F. Wait 2 more minutes and report CWPH temperature is 65˚F.**
- **When directed to locally shut 1P-29 AFP/RW steam isolation, 1MS-237, & MS trap isolation, 1MS-238, insert trigger 9. Report valves closed.**
- **If surveys are requested for the steam lines, RP can report after 5 minutes that B steam line is slightly above background and A steam line is background**

LOAs used

- LOA1SGN025 to shut 1MS-237.
- No LOA for 1MS-238, valve is not modeled.

****Simulator Booth to track these values for monitoring critical task.**

****VSGNV1 (1) S/G A Volume**

****VSGNV1 (2) S/G B Volume**

****2600 YELLOW**

****2685 RED**

****2691 SOLID**

Event 5: **Failure of SW-2907/2908 to auto open**

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	SWS	VLV	VLV1SWS039	4-fail to auto open			1SW-2907 fail to auto open
Preload	SWS	VLV	VLV1SWS040	4-fail to auto open			1SW-2908 fail to auto open

Expected Communications

- **If asked, the PAB AO reports nothing abnormal with SW-2907/2908.**

LOAs used

Event 6: **Failure of P-32E SW Pump to auto start**

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	SWS	BKR	BKR1SWS005	4-fail to auto close			P32E fails to auto start

Expected Communications

- **If asked, the AO reports nothing abnormal with P-32E Pump or Breaker.**

LOAs used

VERIFY the simulator setup for training mode scenario (for evaluated scenarios use PBF-6801):

Rod counters reset

Watchstation nametags assigned

All CO station books in proper places

Digital Displays set appropriately

All mimic bus magnets in proper positions

Sim 20 lighting breakers closed

TR-2000 series recorders in Data (auto) / Scan (auto)

Startup Fireworks PC at 1C20 workstation, if required after initial startup of MST

Ensure the Simulator Base Station is set to Simulator Talk Group 1. (Clear screen saver by moving mouse. Simulator Group 1 should be outlined in green)
[Ref. CAP 01039821, Item 4]

Training signs installed

Horns on

Instrument noise on

STA CSFST Sheets available

MCB / instrument rack doors shut, lights off

Radios available and operable

SPDS computers restarted

Scenario specific props (tags, protected equipment magnets, etc.) installed:

- None

SHIFT TURNOVER INFORMATION

1.0 PLANT CONDITIONS:

	UNIT 1	UNIT 2
Time in core life (MWD/MTU):	*4150*	*120*
Reactor power (%):	*28%*	*100%*
Boron concentration (ppm):	*1065 ppm*	*1321 ppm*
Rod height (CBD @):	*CBD @ 166*	*CBD @ 220*

2.0 TECHNICAL SPECIFICATION ACTION CONDITIONS IN EFFECT:

TSAC	Description	Reason
3.7.5.B	One turbine driven AFW pump system inoperable in MODE 1, 2 or 3 for reasons other than Condition A. Restore turbine driven AFW pump system to OPERABLE status within 72 hours.	1P-29 TDAFW Pump was placed OOS 4 hours ago for bearing replacement on the turbine.

3.0 EQUIPMENT OUT OF SERVICE:

- 1P-29 TDAFW pump OOS for bearing replacement.
- 1AF-4000 and 1AF-4001 TDAFW Discharge MOV's are shut with power removed.
- 1W-45B Bus Duct Cooling fan OOS due to motor failure.
- 1P-2B Charging Pump is OOS for variable frequency drive maintenance.

4.0 PLANNED EVOLUTIONS:

- Continue power escalation to 47% power with a 15%/hr ramp rate per OP-1C, Startup to Power Operation Unit 1.
- Current step in effect is OP 1C Step 5.120.

5.0 TURNOVER INFORMATION:

- Safety Monitor is Green.
- Clock time is **real time** and you have the normal shift complement.
- The Unit tripped 7 days ago and we are holding at 28% power Xe equillibrium for chemistry and flux mapping.
- P-38A and P-38B MDAFW Pumps are protected equipment.
- 1P-2A and 1P-2C Charging Pumps are protected equipment.
- There is a Maintenance crew and supervisor on site working 1P-29 TDAFW pump.
- Control Rods are in manual per OP-1C P&L 3.3.8
- Pressurizer backup heater bank B is energized and an additional orifice in service.

Attach the following information as necessary:

- Simulator Set-up Checklist (before and after training)
- Pre-evaluation Brief Guide (for evaluations only)
- Post-evaluation Critique (for evaluations only)
- Turnover Log

Historical Record: (Optional) This SEG is being developed for the ILT 2009 NRC Exam.

Simulator Scenario Development Checklist

Mark with an X Yes, No or N/A for any of the following. If the answer is No or N/A, include justification for the answer or the corrective action needed to correct the discrepancy after the item.

		Yes	No	N/A
1.	The scenario contains objectives for the desired tasks and relevant human performance tools.		X	
2.	The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.)			X
3.	The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	X		
4.	Plant PRA initiating events, important equipment, and important tasks are identified.	X		
5.	Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	X		
6.	The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	X		
7.	The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.	X		
8.	The scenario includes related industry experience.			X
9.	Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.			X
10.	Scenario requires an Emergency Preparedness NARS to be completed. (If YES, a NARS answer key validated by EP personnel is attached to the SEG.) Reference CAP 01021167 – 02.			X

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

Simulator Scenario Validation Checklist

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

		Yes	No	N/A
1.	The desired initial condition(s) could be achieved.	X		
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	X		
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	X		
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	X		
5.	During the simulator scenario, observed changes corresponded to expected plant response.	X		
6.	Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request	X		
7.	Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.	X		
8.	NARS form is accurate for the classification and release conditions presented during the scenario. (MET data is variable based on instrument noise) Reference CAP 01021167 – 02.			X

Discrepancies noted (Check "none" or list items found) ☐ None
SMAR = Simulator Action Request

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

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

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

Facility: ___Point Beach_____ Scenario No.: ___4 ___ Op-Test No.: _2009-01

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Unit 1 is at 100% power MOL. G01 EDG is OOS for a maintenance overhaul with G02 EDG aligned to 1A05 and 2A05 safeguards busses. 1P-2B Charging Pump is OOS due to repairs on the variable frequency drive system. A severe thunderstorm watch is in effect for the day.

Turnover: Protected equipment includes 1P-2A Charging Pump, 1P-2C Charging Pump. You are to lower Unit 1 to 94% power per OP-2A, "Normal Power Operation" in preparation for Atmospheric Steam Dump testing.

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO N-BOP N-SRO	Normal downpower to 94% per OP-2A
2		I-RO I-SRO TS-SRO	RCS Tcold 401B failed high
3		TS-SRO	1X03 transformer lockout
4		C-ALL	Lowering of Condenser Vacuum
5		M-ALL	1P-30A Circulating Water Pump bearing failure requiring plant trip
6		C-BOP C-SRO	Main Turbine Fails to AUTO & MANUALLY Trip
7		C-ALL	Post trip 1X04 fails along with G02 and G03 requiring entry into ECA 0.0

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

SIMULATOR EXERCISE GUIDE (SEG)

SITE: POINT BEACH **SEG # PBN-LOI-NRC-004E**

SEG TITLE: 2009 NRC EXAM SCENARIO #4 **REV. # 0**

PROGRAM: INITIAL LICENSE TRAINING **#: PB-ILT**

COURSE: **#:**

TOTAL TIME: 2.0

Additional signatures may be added as desired.

Developed by:	**Andrew Zommers**	
	Instructor	*Date*
Reviewed by:	**Sam Hall**	
	Instructor *(Simulator Scenario Development Checklist.)*	*Date*
Validated by:		
	Validation Lead Instructor *(Simulator Scenario Validation Checklist.)*	*Date*
Validated by:	**Tom Larson**	
	Operations Department Representative	*Date*
Approved by:	**Randy Amundson**	
	Training Supervision	*Date*

Guide Requirements

Goal of Training:

To have the crew successfully lower reactor power, respond to a failure of a temperature channel, failure of 1X03, lowering condenser vacuum, failure of a Circulating Water pump requiring plant trip, failure of manual and auto turbine trip and post trip malfunctions that require entry into ECA 0.0. Embedded within these events is the expectation to properly utilize Technical Specifications.

Learning Objectives:

None

Prerequisites:

1. Simulator available
2. Students enrolled in Initial License Program

Training Resources:

1. Floor Instructor as Shift Manager
2. Floor Instructor as Shift Technical Advisor
3. Simulator Booth Operator
4. Communicator
5. NRC Examiners

References:

1. OP 2A Normal Power Operations
2. AOP 5A Loss of Condenser Vacuum Unit 1
3. AOP 6C Uncontrolled Rod Motion Unit 1
4. AOP 24 Instrument Failure or Malfunction
5. EOP 0 Reactor Trip or Safety Injection Unit 1
6. EOP 1.1 SI Termination Unit 1
7. ECA 0.0 Loss of All AC Unit 1
8. Alarm Response Books
9. Technical Specifications

Commitments:

None

Evaluation Method:

Simulator performance will be evaluated by NRC Examiners IAW NUREG-1021

Operating Experience:

None

Related PRA Information:

Initiating Event with Core Damage Frequency:
Transient w/o PCS 1.8E-06
Station Blackout 5.2E-07

Important Components:

Important Operator Actions with Task Number:
Operator fails to align G04 to 1A06 per ECA 0.0

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Lower power from 100% to ~94% IAW OP-2A, Normal Power Operations
2. Failure of 401B Red channel Tcold high
3. Failure of 1X03 transformer

After EOP Entry:

1. Main turbine fails to auto and manual trip
2. 1X04 failure
3. G02 and G03 EDG failures

Abnormal Events:

1. Lowering Main Condenser Vacuum
2. Loss of a Circulating Water Pump requiring plant trip

Major Transients:

1. ECA 0.0

Critical Tasks:

1. **RT-7, When a reactor trip is procedurally called for, initiate a manual reactor trip prior to Main Condenser Vacuum reaching 8 in Hg Abs.**
2. **E-0 C, SRO/BOP must energize at least one AC emergency bus before placing safeguards equipment in pullout per ECA 0.0**

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This scenario can be run from the following Standard (Specific) IC sets:
   - IC-111, created from IC-02
2. The following equipment is OOS:
   - G01 EDG
   - 1P-2B Charging Pump
   - 1P-2A and 1P-2C Charging Pumps are protected equipment
   - G02 EDG is protected equipment

SEQUENCE OF EVENTS:

Event 1: Normal downpower

- Crew performs downpower for Atmospheric Steam Dump testing to 94% per OP-2A

Event 2: Failure of 401B Red T_{cold} high

- Red T_{cold} channel fails high
- Crew responds per AOP-6C
- SRO addresses Technical Specifications

Event 3: Failure of 1X03

- Crew diagnosis and response per ARB's
- Crew reviews OP-2A for operating restrictions
- SRO addresses Technical Specifications

Event 4: Lowering Condenser Vacuum

- Crew responds to lowering vacuum per AOP 5A
- Crew determines downpower required per AOP 17A

Event 5: Loss of Circulating Water Pump

- BOP responds to 1P-30A high bearing temperature
- After pump trip SRO determines to trip the plant

Event 6: Main turbine fails to auto and manual trip

- RO performs RNO actions step 2 EOP 0

Event 7: 1X04, G02 and G03 fail post trip

- Electrical failures require entry into ECA 0.0
- Safeguards busses are recovered via G04 EDG

NOTE: Modify this table as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS: Standard IC-111 from IC-02 Unit 1 • Mode: 1 • Burnup: 7800 MWD/MTU • Power: 100% • Boron: 735 ppm (MOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 220 steps • Generator: ≈533 Mwe Unit 2 • Mode: 1 • Burnup: 320 MWD/MTU • Power: 100% • Boron: 1322 ppm (BOL) • Temperature: NOT • Pressure: NOP • Xenon: Equilibrium • Rods: Bank D @ 220 steps • Generator: ≈ 535 Mwe		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering action items per the "Simulator Input Summary.")		1P-2B Charging Pump (OOS tag) G01 EDG (OOS tag) Protected equipment tags on 1P-2A and 1P-2C. Protected equipment tag for G02 EDG
	2. Simulator Pre-brief: a. Inform the crew that this session will be performed in the evaluation mode per NUREG 10201. b. If required, inform the crew of differences between the simulator and actual plant equipment. c. Crew positions		
	3. COMPLETE TURNOVER: a. Review applicable current Unit Status. b. Review relevant At-Power Risk status. c. Review current LCOs not met and Action Requirements. d. Verify crew performs walk down of control boards and reviews turnover checklists. e. Crew takes the shift.		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 1</u>: Normal downpower to 94% per OP-2A **<u>Communication:</u> When notified, System Control Power System Supervisor acknowledges report of downpower.** **<u>Communication:</u> When notified, the Auxiliary Operators Acknowledge the downpower and the PAB AO understands the requirement to monitor S/G blowdown.** **<u>Communication:</u> When notified, the Unit 1 TH Auxiliary Operator acknowledges the request to start 1P-99A and B, then 2 minutes later reports the pumps are started.** **End of evolution:** Proceed to next event at Lead Examiner discretion.	SRO RO/BOP BOP CREW	Crew will brief the down power and reactivity control requirements prior to taking any actions. Record pre-load reduction information in OP 2A Attachment A. An additional letdown orifice may be placed in service. Crew may elect to start 1P-99A and B SGFP Seal Water Injection Pumps. Lower plant load per OP-2A Attachment A and the pre-job briefing. Monitor the plant during the down power and subsequent stabilization.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 2</u>: T-401B, Red Tcold Fails High	RO	Recognizes instrument failure for the Red channel Tcold. Recommends placing rods to MANUAL.
		SRO	SRO acknowledged recommendation and alarms.
	<u>Communication:</u> If asked, I&C is notified and will work on sending in support as requested.	SRO	Enter AOP 6C for uncontrolled rod motion.
		RO	Check rod motion required – take rods to manual
	<u>Communication:</u> If asked, the Shift Manager will have OS2 prepare the 0-SOP-IC-001 RED procedure to remove the failed instrument from service.		**(CA STEP**) Maintain RCS Tave
			Check RCS Tave at or trending to program – Crew should discuss current temperature and a plan on how to restore it.
		RO	Charging may be taken to manual. With the unit at a reduced power program level will be raised to the full power setting based on the circuit selecting auctioneered high Tave.
		BOP	Condenser Steam Dumps will be shifted to manual pressure control mode per Alarm Response Procedure actions.
		RO	Check control rods above insertion limits
			(CA STEP) Verify AFD within limits
			Check rod motion due to instrument failure

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	T-401A, Red Tcold Fails High (cont'd) **NOTE: The intent is to NOT remove the channel from service.** **End of evolution:** Proceed to next event at Lead Examiner discretion.	SRO RO SRO	Enter AOP-24 Response to Instrument Malfunction. Identify failed instrument Check if failed instrument is controlling channel Establish manual control as required Return affected parameters to desired values Using Attachment A verify failed instrument does not affect PPCS RTO Remove failed instrument from service per 0-SOP-IC-001-RED Review Technical Specifications. SRO should review LCO 3.3.1 Instrumentation Table 3.3.1-1 items 5 and 6. LCO 3.3.2 ESFAS Instrumentation Table 3.3.2-1 item 4d-3.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 3</u>: Lockout of 1X03 HV Station transformer **<u>Communication:</u> If asked, the reports for 1X03 are no smoke, fire, or anything abnormal from outside the switchyard. There is a bad thunderstorm with lots of lightning over the plant.** **If sent into the switchyard the AO confirms or provides the previous information and that there is a 1X03 sudden pressure trip actuation.** **<u>Communication:</u> If asked, SM will inform OS1 that OS2 will work on getting an OI-110 together for starting the Gas Turbine.** **<u>Communication:</u> If asked, the Kewaunee Nuclear Power Generating Station is currently on line at full power.** **<u>Communication:</u> If asked, the Power System Stabilizers are enabled for PBNP and Kewaunee.** **<u>Communication:</u> If asked, the SM will ask OS1 to disable a U2 4160 fast bus transfer along with U1.** **<u>NOTE:</u> Next event takes approximately 5-7 minutes to bring in an alarm.** **End of evolution:** Proceed to next event at Lead Examiner discretion.	BOP SRO/BOP BOP SRO BOP SRO	Identify the loss of 1X03 HV transformer and validate plant conditions are correct. Reviews C02 alarms and verifies they are consistent with the plant conditions: 345 breaker trip, 13.8 breaker trip and 1X03 lockout. ARB for loss of a 345 breaker directs looking in OP-2A for possible power restrictions with less than a fully operable switchyard. There are no power restrictions for Unit 1 and Unit 2 per OP-2A Attachment O. OP-2A Attachment O section 3.0 will require the disabling of one(1) 4160 fast bus transfer for <u>each</u> unit in Mode 1. Typically this is done by going to pullout on the breaker. LCO 3.8.1 AC Sources – Operating should be reviewed. TSAC 3.8.1.A is entered with direction to start the Gas Turbine within 24 hours.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 4</u>: Lowering Main Condenser Vacuum **<u>Communication:</u> If asked, local air ejector air flow electronic and manometer are both reading at their high limit of 25 SCFM.** **<u>Communication:</u> If asked to perform Attachment A, wait 3 minutes and have the TH AO report second set of air ejectors are lined up.** **<u>NOTE</u>: Vacuum malfunction can be slowed or lessoned to show vacuum is stable or recovering after the second set of air ejectors is lined up.** **<u>Communication:</u> If asked, the Shift manager will not place the priming air ejectors in service.** **<u>Communication:</u> If asked, Shift manager can report he will contact the DCS, PSS, NRC Resident and the Duty Regulatory Services Person.**	BOP SRO RO CREW BOP SRO CREW	Identify that vacuum is lowering in the Main Condenser. Address Low Vacuum alarm when it comes in. Enter AOP 5A for lowering Vacuum. Maintain RCS Tave. Check condenser pressure within limits. - Crew should determine if continued plant operation is allowed and set a limit for when the plant should be taken off line. Check for excessive air in-leakage. - AO should be dispatched to get the local readings. Place all available air ejectors in service. – AO should be dispatched to align second set of air ejectors. Check if Priming Air ejector should be used. – SRO should determine this is not required. Notify DCS, PSS, Regulatory Service Duty Person, and NRC Resident. Reduce Load as necessary per AOP-17A.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 5</u>: Loss of Circulating Water Pump requiring plant trip **<u>Communication:</u> If asked, TH AO reports normal oil level and Service Water cooling to 1P-30A Circulating Water Pump. The Upper motor bearing oil is discolored and the top motor area is very hot to the touch** **RT-7, When a reactor trip is procedurally called for, initiate a manual reactor trip prior to Main Condenser Vacuum reaching 8 in Hg Abs**	BOP SRO	Respond to temperature alarm for 1P-30A. BOP will go behind boards to determine which component is alarming. When the pump trip occurs, the SRO should determine condenser vacuum will not be maintained and direct a unit trip.
	<u>Event 6</u>: Failure of Auto and Manual Turbine Trip	RO	Determines the Turbine did not trip. Depress the manual trip button Manually runback the turbine Place the EH Pumps to pullout If turbine still not tripped, then shut both MSIV's

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<u>Event 7</u>: 1X04, G02 and G03 EDG failures causing entry in ECA 0.0 **<u>Communication:</u> If asked, wait 2 minutes and the TH AO reportsG03 has indications and alarms locally that it oversped.** **If asked, wait 2 minutes and the TH AO reports G02 output breaker is open and nothing appears abnormal.** **<u>Communication:</u> If asked, wait 3 minutes and the TH AO can report that 1X04 LV transformer has tripped due to sudden pressure trip and there are no other abnormal indications.** **<u>NOTE</u>: Crew may elect to go right to ECA 0.0 without taking any actions per EOP 0 Step 3 RNO. Entry conditions are met.**	RO SRO RO RO CREW RO/BOP BOP	Determine no 4160 and 480 safeguards busses are energized for Unit 1. Try to fast start any EDG's Try to Exercise start any EDG's If power cannot be restored, have the STA start monitoring Unit 1 CSFST's and transition to ECA 0.0. Enter ECA 0.0 Verify Reactor tripped Verify Turbine tripped. - Will either take action listed in event 6 or verify them taken previously. Monitor foldout page items Maintain RCS inventory – RO and BOP will check various vent valves, sample valves, letdown and PORV's shut. Verify TDAFW Pump operating Check cooling to AFW Pump bearings Check both 4160 VAC busses not energized

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	ECA 0.0 (cont'd)	BOP	Check Diesels – All Running
			Check Diesel Status
		SRO	Check H01 not energized – RNO go to step 11
		BOP	Check 1A05 not energized
		BOP/SRO	Check 1A05 energized from G01 – go to step 13
		BOP	Energize 1A05 from G02 – G02 output breaker will not close
			Check 1A06 not energized
	E-0 C, SRO/BOP must energize at least one AC emergency bus before placing safeguards equipment in pullout per ECA 0.0	BOP/SRO	Energize 1A06 from G03 – cannot be done due to G03 overspeed condition. - Go to step 16.
		BOP	Energize 1A06 from G04 – This will be successful and the crew should energize 1A06 from G04 EDG.
		SRO	Utilize foldout page criteria to transition to step 28.
		BOP	Verify SW operation
		SRO	Return to procedure step in effect, which was EOP 0 step 3 RNO

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	ECA 0.0 (cont'd)	RO/BOP	Verify safeguards power is available for at least one(1) 4160 and 480 VAC bus.
		RO	Check if SI is actuated.
		BOP	Perform Attachment A
		RO	Verify Secondary Heat Sink
			Verify RCP Seal Cooling
			(CA STEP) Verify RCS Temperature Control
			Check PZR PORV's shut
			Check PZR Spray's shut
			Check if RCP's should remain running
		SRO	Start monitoring Critical Safety Function Status Trees
		RO	**(CA STEP)** Verify Containment Sump recirc not required
			Check if Secondary System is intact
			Check if Steam Generator tubes are intact
			Check if RCS is intact inside Containment

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	ECA 0.0 (cont'd)	RO/BOP	**(CA STEP)** Check if SI should be terminated
		SRO	Transition to EOP 1.1
		BOP	Reset Safety Injection
			Reset Containment Isolation
			Reset 1B03 and 1B04 Non-Safeguards Lockouts
			Check 4160 VAC Safeguards Busses Powered by Offsite
			Reestablish Instrument Air to Containment
		RO	Verify Charging Flow
	<u>NOTE</u>: Lead Evaluator can terminate scenario at any point after transition to EOP 1.1 SI Termination.	BOP	Stop both SI Pumps
			Stop both RHR Pumps

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A **<u>Communication:</u> When contacted the PAB AO should report that SW-LW-61 and 62 radwaste SW isolation valves are both shut.**	BOP	Verify feedwater isolation. Verify containment isolation Verify AFW actuation. Check SI pumps running. Check RHR pumps running. Check only 1 CCW pump running. Verify Service Water System alignment. BOP should contact the PAB to check 2 local valves. Verify containment accident cooling. Check CR ventilation in accident mode. Check if main steam lines can remain open. Verify proper SI valve alignment.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	EOP 0 Attachment A (cont'd) **<u>Communication</u>: When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is at 72˚F. Wait 2 more minutes and report CWPH temperature is at 65˚F.**	BOP	**(CA STEP)** Verify containment spray not required. Verify SI flow. **(CA STEP)** Check CSR temperature. **(CA STEP)** Check AFW Area temperature. **(CA STEP)** Check Computer Room temperature. **(CA STEP)** Check CWPH temperature.

SIMULATOR INPUT SUMMARY

EVENT 1: Normal downpower to 94%

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	DSG	MAL	MAL1DSG001A				G01 failure to start
Preload	CVC	BKR	BKR1CVC006	6-fail cont pwr fuse			1P-2B OOS for Maint
PLE	CFW	LOA	LOA1CFW083	on	1		1P-99A SGFP Seal Water Pump
PLE	CFW	LOA	LOA1CFW084	on	1	30 sec delay	1P-99B SGFP Seal Water Pump

Expected Communications

- **When notified, the Auxiliary Operators acknowledge the downpower and the PAB AO understands the requirement to monitor S/G blowdown.**
- **When notified, the Unit 1 TH Auxiliary Operator acknowledges the request to start 1P-99A and B, then 2 minutes later reports the pumps are started.**
-

LOAs used

- **Trigger 1 is used to start 1P-99A/B 1 minute after getting the request.**

SIMULATOR INPUT SUMMARY

EVENT 2: 401 Red Tcold failing high

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	RCS	XMT	XMT1RCS024A	650	3	20 sec ramp	1TE401 Tcold fail high

Expected Communications

None

LOAs used

None

SIMULATOR INPUT SUMMARY

EVENT 3: Lockout of 1X03 HV Station Transformer

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	SWD	MAL	MAL1SWD001A		5		1X03 Lockout

Expected Communications

- **If asked, the reports for 1X03 are no smoke, fire, or anything abnormal from outside the switchyard. There is a bad thunderstorm with lots of lighting over the plant.**
- **If sent into the switchyard the AO confirms or provides the previous information and that there is a 1X03 sudden pressure trip actuation.**

LOAs used

None

SIMULATOR INPUT SUMMARY

EVENT 4: Lowering Main Condenser vacuum

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	CFW	MAL	MAL1CFW005A	550	7	900 sec ramp	Loss of Cond A Vacuum
PLE	CFW	MAL	MAL1CFW005B	550	7	900 sec ramp	Loss of Cond B Vacuum
PLE	MSS	VLV	LOA1MSS001	1	15	60 sec ramp	1MS-101 1st stage AE stm supply
PLE	MSS	VLV	LOA1MSS004	1	15	60 sec ramp	1MS-104 1st stage AE stm supply
PLE	MSS	VLV	LOA1MSS018	1	15	60 sec ramp	1MS-98 2nd stage AE stm supply
PLE	CFW	VLV	LOA1CFW010	1	15	80 sec delay	1AR-5 AE Air Inlet
PLE	CFW	VLV	LOA1CFW013	1	15	80 sec delay	1AR-8 AE Air Inlet
PLE	CFW	VLV	LOA1CFW003	1	15	80 sec delay	1AR-14 AE Air Inlet

SIMULATOR INPUT SUMMARY

Expected Communications

- **If asked, local air ejector air flow electronic and manometer are both reading at their high limit of 25 SCFM.**
- **If asked to perform Attachment A, insert trigger 15, wait 3 minutes and have the TH AO report second set of air ejectors are lined up.**

NOTE: Vacuum malfunction can be slowed or lessoned to show vacuum is stable or recovering after the second set of air ejectors is lined up. Changing the rate of lowering vacuum takes several minutes to see an effect. The booth operator will have to slow the leak down or stop it several inches of mercury prior to 5" hg abs. At the same time as the CW pump trip malfunction, re-insert the original vacuum leak size.

LOAs used

Insert trigger 15 for aligning second set of air ejectors.

SIMULATOR INPUT SUMMARY

EVENT 5 Loss of Circulating Water Pump requiring plant trip

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
PLE	CWS	XMT	XMT1CWS018A	300	20	180 sec ramp	1P-30A CW Pump upper motor bearing high temp
PLE	CWS	PMP	PMP1CWS003	2-shaft siezure	20	180 sec delay	1P-30A CW Pump shaft seizure

Expected Communications

- **If asked, TH AO reports normal oil level and Service Water cooling to 1P-30A Circulating Water Pump. The Upper motor bearing oil is discolored and the top motor area is very hot to the touch.**

LOAs used

None

SIMULATOR INPUT SUMMARY

EVENT 6: Auto and Manual failure of the Turbine Trip

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	EHC	MAL	MAL1EHC007A				Manual Turbine Trip failure
Preload	EHC	MAL	MAL1EHC007B				Auto Turbine Trip failure

Expected Communications

None

LOAs used

None

SIMULATOR INPUT SUMMARY

EVENT 7: 1X04, G02 and G03 EDG failures post trip

Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
Preload	DSG	MAL	MAL1DSG002B				G03 overspeed during startup
Preload	DSG	BKR	BKR1DSG002	5-fail as is			G02 Output Breaker fail as is 1A52-66
Preload	EPS	MAL	MAL1EPS002		9	JCRFTR	1X04 LV Transformer lockout

Expected Communications

- **If asked, wait 2 minutes and the TH AO reportsG03 has indications and alarms locally that it oversped.**
- **If asked, wait 2 minutes and the TH AO reports G02 output breaker is open and nothing appears abnormal**
- **If asked, wait 3 minutes and the TH AO can report that 1X04 LV transformer has tripped due to sudden pressure trip and there are no other abnormal indications.**
- **When contacted the PAB AO should report that SW-LW-61 and 62 radwaste SW isolation valves are both shut.**
- **When contacted, wait 2 minutes and have the AO report room temperatures for the Computer Room is at 72˚F. Wait 2 more minutes and report CWPH temperature is at 65˚F.**

LOAs used

None

VERIFY the simulator setup for training mode scenario (for evaluated scenarios use PBF-6801):

Rod counters reset

Watchstation nametags assigned

All CO station books in proper places

Digital Displays set appropriately

All mimic bus magnets in proper positions

Sim 20 lighting breakers closed

TR-2000 series recorders in Data (auto) / Scan (auto)

Startup Fireworks PC at 1C20 workstation, if required after initial startup of MST

Ensure the Simulator Base Station is set to Simulator Talk Group 1. (Clear screen saver by moving mouse. Simulator Group 1 should be outlined in green)
[Ref. CAP 01039821, Item 4]

Training signs installed

Horns on

Instrument noise on

STA CSFST Sheets available

MCB / instrument rack doors shut, lights off

Radios available and operable

SPDS computers restarted

Scenario specific props (tags, protected equipment magnets, etc.) installed:

- None

SHIFT TURNOVER INFORMATION

1.0 PLANT CONDITIONS:

	UNIT 1	UNIT 2
Time in core life (MWD/MTU):	7500	1500
Reactor power (%):	100%	100%
Boron concentration (ppm):	736 ppm	1498 ppm
Rod height (CBD @):	CBD @ 220	CBD @ 220

2.0 TECHNICAL SPECIFICATION ACTION CONDITIONS IN EFFECT:

TSAC	Description	Reason
None		

3.0 EQUIPMENT OUT OF SERVICE:

- G01 EDG is OOS for a scheduled overhaul.
- 1P-2B Charging Pump is OOS for VFD maintenance.

4.0 PLANNED EVOLUTIONS:

- Reduce power to 94% for Atmospheric Steam Dump testing.

5.0 TURNOVER INFORMATION:

- Safety Monitor is Green.
- G02 EDG is aligned to 1A05 and 2A05 4160 Safeguards busses.
- G02 EDG is protected equipment.
- 1P-2A and 1P-2C Charging Pumps are protected equipment.
- There is a severe thunderstorm watch for the area.
- Clock time is **real time** and you have the normal shift complement.

Attach the following information as necessary:

- Simulator Set-up Checklist (before and after training)
- Pre-evaluation Brief Guide (for evaluations only)
- Post-evaluation Critique (for evaluations only)
- Turnover Log

Historical Record: (Optional)

Rev 0: This scenario is being developed for the ILT 2009 NRC Exam.

Simulator Scenario Development Checklist

Mark with an X Yes, No or N/A for any of the following. If the answer is No or N/A, include justification for the answer or the corrective action needed to correct the discrepancy after the item.

		Yes	No	N/A
1.	The scenario contains objectives for the desired tasks and relevant human performance tools.		X	
2.	The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.)			X
3.	The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both.	X		
4.	Plant PRA initiating events, important equipment, and important tasks are identified.		X	
5.	Turnover information includes a Daily At Power or Shutdown Safety Risk Assessment.	X		
6.	The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given.	X		
7.	The scenario guide includes responses for all anticipated communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices.	X		
8.	The scenario includes related industry experience.			X
9.	Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance.			X
10.	Scenario requires an Emergency Preparedness NARS to be completed. (If YES, a NARS answer key validated by EP personnel is attached to the SEG.) Reference CAP 01021167 – 02.			X

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

Simulator Scenario Validation Checklist

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

		Yes	No	N/A
1.	The desired initial condition(s) could be achieved.	X		
2.	All malfunctions and other instructor interface items were functional and responded to support the simulator scenario.	X		
3.	All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario.	X		
4.	All applicable acceptance criteria were met for procedures that were used to support the simulator scenario.	X		
5.	During the simulator scenario, observed changes corresponded to expected plant response.	X		
6.	Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request	X		
7.	Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence.	X		
8.	NARS form is accurate for the classification and release conditions presented during the scenario. (MET data is variable based on instrument noise) Reference CAP 01021167 – 02.			X

Discrepancies noted (Check "none" or list items found) ☒ None
SMAR = Simulator Action Request
SMAR:_____ SMAR:_____ SMAR:_____ SMAR:_____

Comments: No was selected for several training items on the development checklist. These items will remain 'NO' due this SEG being developed IAW NUREG 1021 for an Initial NRC license exam. No was selected for step 2 of the development checklist due to this being N/A for our plant.

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