Form 3.3-1 Scenario Outline

Facility:	Salem	Scenario #:	3
Scenario Source:	New	Op. Test #:	21-01
Examiners:		Applicants/ Operators:	

Initial Conditions: Unit 2 is at 93% power MOL

Turnover: The crew is directed to raise power to 98% power at 10% per hour IAW S2.OP-IO.ZZ-0004 using dilution, control rods and turbine load control. The 23 Charging pump is C/T for maintenance.

Critical Tasks:

1. Insert negative reactivity into the core by inserting control rods and/or performing emergency boration and dispatching operators to locally trip the reactor and/or the turbine
2. Close pressurizer PORV block valve prior to step 7 of EOP-TRIP-2

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ATC(R) BOP(R) CRS(N)	Raise load to 98% at 10%/hr IAW IOP-4.
2	CC0172A	ATC (C,MC) CRS (C)	21 CCW Pump trips and 23 CCW fails to Auto start
3	CV0208A	ATC(C) CRS(C,TS)	21 Charging Pump trips
4	PR0016A	ATC(I,MC) CRS(I,TS)	PZR Pressure Controlling Channel fails HIGH
5	TU0083A	All(M)	Main Turbine high vibrations
6	RP058 RP0059A RP0059B RP0060A RP0060B	ATC(C) BOP(C) CRS(C)	Rx fails to trip by all means from the control room
7	RD0061	ATC(I,MC) CRS(I)	Rods speed controller fails to 8 spm **(CT-1)**
8	VL0298	ATC(C,MC) CRS(C)	2PR2 PZR PORV fails open following exiting EOP-FRSM-1**(CT-2)**
		ABs	ARP → AB.CVC-1 → AB.PZR-1 → AB.TURB-1
		EOPs	TRIP-1 → FRSM using BAT pumps → TRIP-2

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

I. OBJECTIVES

A. Given the order, the crew will commence a power ascension IAW S2.OP-IO.ZZ-0004.

B. Given the indication of a CCW component or system malfunction, perform actions to RESPOND to the loss of a CCW pump in accordance with S2.OP-AB.CC-0001.

C. Given the order or indications of a charging system malfunction, perform actions as the nuclear control operator to RESPOND to the loss or malfunction of the charging system in accordance with the approved station procedures.

D. Given indication of a loss or malfunction of the Charging system DIRECT corrective action for a Charging System malfunction in accordance with the approved station procedures.

E. Given a failure of PZR pressure malfunction, the crew will take corrective action, IAW S2.OP-AB.PZR-0001.

F. Given the order or indications of a PZR pressure system malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with the approved station procedures.

G. Given indication of a PZR pressure problem, system malfunction DIRECT the response to the malfunction in accordance with the approved station procedures.

H. Given the order or indications of a main turbine or generator malfunction, perform actions as the nuclear control operator to RESPOND to the malfunction in accordance with the approved station procedures.

I. Given indications of a main turbine or generator malfunction, DIRECT the response to the malfunction in accordance with the approved station procedures.

J. Given the order or indications of an anticipated transient without trip (ATWT), complete actions as the nuclear control operator to PERFORM the immediate response to the ATWT in accordance with the approved station procedures.

K. Given indication of an anticipated transient without trip (ATWT), DIRECT the immediate response to the ATWT in accordance with the approved station procedures.

L. Given the order or indications of a reactor trip, perform actions as the nuclear control operator to RESPOND to the reactor trip in accordance with the approved station procedures.

M. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.

N. During performance of emergency operating procedures, monitor the critical safety function status trees in accordance the EOP in effect.

II. MAJOR EVENTS

1. Power ascension to 100% at 10%/hour.
2. 21CCW pump will trip requiring manual start of 23 CCW pump
3. 21 Charging pump trips
4. Pressurizer pressure channel 1 fails high
5. Main turbine rising vibrations
6. Reactor fails to TRIP by all means in the control room
7. 2PR2 pressurizer PORV fails open

III. SCENARIO SUMMARY

1. The crew will continue the power ascension to raise reactor power to 98% at 10% per hour. The reactivity plan calls for performing a dilution first, before raising turbine load. After the crew commences the power ascension, Event #2 will be entered.
2. 21 CCW pump will trip. The crew will receive multiple console alarms for pump trip and note backflashing stop pushbutton for 21 CCW pump. The crew will take actions as directed in the Alarm Response Procedure to start 23 CCW pump. Once the 23 CCW pump is started, Event #3 can be entered.
3. 21 charging pump trips. The crew will respond IAW S2.OP-AB.CVC-0001, Loss of Charging, and start the only remaining charging pump. The crew will then restore letdown flow. The CRS will evaluate Tech Specs and enter 3.5.2.a action a, 3.1.2.2.b, and 3.1.2.4. After Tech Specs have been evaluated, Event #4 will be entered.
4. The controlling PZR pressure channel will fail high. The crew will respond per S2.OP-AB.PZR-0001, Pressurizer Pressure malfunction, and take manual control of the master pressure controller. The crew will select an operable control channel. The CRS will evaluate Tech Specs and enter 3.3.1.1 action 6, and 3.3.2.1.b action 19, 3.4.5 action b and 3.2.5.b. After Tech Specs have been evaluated, Event #5 and 6 will be entered.
5. Main turbine vibrations will begin to rise and the crew will enter S2.OP-AB.TRB-0001, Main Turbine abnormality. The crew will recognize the degrading conditions and recommend a downpower to remove the turbine from service.
6. Main turbine vibrations will continue to rise requiring the operators to trip the turbine and reactor based on power level greater than 49%. The crew will perform the trip using guidance in the abnormal procedure and enter 2-EOP-TRIP-1, Reactor Trip or safety injection. The Reactor will fail to trip using the trip switches and reactor trip breaker Bezel pushbuttons requiring entry into 2-EOP-FRSM 1, Response to nuclear power generation-ATWS.
7. While in 2-EOP-TRIP-1, Reactor Trip or safety injection actions will be required to insert negative reactivity and rods will not step in automatically. The crew will be required to take control rods to manual and begin inserting negative reactivity using the Rod control manual pushbutton for rod insertion. Once actions have been completed in 2-EOP-FRSM 1, Response to nuclear power

generation-ATWS to establish a boration CT#1 then the reactor trip breakers will be open locally by the dispatched operator. Event #8 will be entered once the transition is made back to 2-EOP-TRIP-2, Reactor Trip response.

8. During EOP-TRIP-2 Reactor trip response, the crew will recognize that 2PR2 is open and attempt to close and when it will not close the crew will close the 2PR7 block valve CT#2.

A. INITIAL CONDITIONS

____ **IC-242**

PREP FOR TRAINING (i.e. computer setpoints, procedures, bezel covers ,tagged equipment)

Initial	Description
____	VC1and VC4 C/T
____	RCPs (SELF CHECK)
____	RTBs (SELF CHECK)
____	MS167s (SELF CHECK)
____	500 KV SWYD (SELF CHECK)
____	SGFP Trip (SELF CHECK)
____	21 CV PP (SELF CHECK)
____	**23 CV Pump C/T**
____	**Suggested Protected Equipment:** ▪ **None**
____	Complete Attachment 2 “Simulator Ready-for-Training/Examination Checklist.”

Note: Tables with blue headings may be populated by external program, do not change column name without consulting Simulator Support group

EVENT TRIGGERS:

Initial	ET #	Description	
	2	EVENT ACTION: COMMAND: PURPOSE:	PCRTIME > 5200 <update as needed>
	3	EVENT ACTION: COMMAND: PURPOSE:	KB440TTD //REACTOR TRIP BREAKER "A"-TRIP <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	CC0361C 23 COMPONENT COOLING PUMP Fails to Start on Low Pressure	N/A	N/A	N/A	N/A	
_____ 02	CC0172A 21 COMPONENT COOLING PUMP TRIP	N/A	N/A	N/A	RT-1	
_____ 03	CV0208A 21 CHARGING PUMP TRIP	N/A	N/A	N/A	RT-2	
_____ 04	TU0083A MN TURBINE HI VIBRATION - BRG #	N/A	0	00:05:00	RT-4	10
_____ 05	RP0060A FAILURE OF TRAIN "A" RX TRIP BREAKER TO TRIP	N/A	N/A	N/A	N/A	
_____ 06	RP0060B FAILURE OF TRAIN "B" RX TRIP BREAKER TO TRIP	N/A	N/A	N/A	N/A	
_____ 07	RP0058 FAILURE OF AUTOMATIC RX TRIP	N/A	N/A	N/A	N/A	
_____ 08	RP0059A FAILURE OF MANUAL RX TRIP	N/A	N/A	N/A	N/A	
_____ 09	RP0059B FAILURE OF MANUAL SI/RX TRIP	N/A	N/A	N/A	N/A	
_____ 10	RD0061 ROD SPEED CONTROL PROGRAM FAILS	N/A	N/A	N/A	ET-3	8
_____ 11	VL0298 2PR2 Fails to Position (0-100%)	N/A	N/A	N/A	RT-5	100
_____ 12	PR0016A PZR PRESS CH I (PT455) FAILS H/L	N/A	0	00:00:10	RT-3	2500

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	PR34D PORV STOP VALVE 2PR6 TAGGED	N/A	N/A	N/A	RT-13	TAGGED
_____ 02	RP07D 21 MG SET MOTOR BKR	N/A	N/A	N/A	RT-10	STOP
_____ 03	RP08D 22 MG SET MOTOR BKR	N/A	N/A	N/A	RT-10	STOP
_____ 04	RP09D 21 MG SET GEN OUTPUT BKR	N/A	N/A	N/A	RT-10	TRIPPED

_____ 05	RP10D 22 MG SET GEN OUTPUT BKR	N/A	N/A	N/A	RT-10	TRIPPED
_____ 06	RP18D Open MAIN RX TRIP BKR A	N/A	N/A	N/A	RT-9	TRIP OPEN
_____ 07	RP19D Open MAIN RX TRIP BKR B	N/A	N/A	N/A	RT-9	TRIP OPEN

OVERRIDES:

SELF-CHECK	**Description**	**Delay Time**	**Initial Value**	**Ramp Time**	**Trigger**	**Condition/ Severity**
_____ 01	C310 F DI KC310TN0 2E6D PRESSURE HEATER BUS 480V-OPEN	N/A	N/A	N/A	N/A	OFF
_____ 02	C510 F DI KC510TN0 2G6D PRESSURE HEATER BUS 480V-OPEN	N/A	N/A	N/A	N/A	OFF

OTHER CONDITIONS:

	Description

SEQUENCE OF EVENTS

a. State shift job assignments.

b. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).

c. Inform the crew “The simulator is running. You may commence panel walkdowns at this time. SM please inform me when your crew is ready to assume the shift”.

d. Allow sufficient time for panel walk-downs. When informed by the SM that the crew is ready to assume the shift, ensure the simulator is cleared of unauthorized personnel.

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
1. Power Ascension to 98%			
	CRS briefs crew on power ascension to 98% at 10%/hour IAW S2.OP-IO.ZZ-0004, Power Operation.		
	RO briefs reactivity plan for power ascension.		
	PO briefs turbine load control plan.		
Turnover reactivity plan calls for 1000 gal dilution to be performed for Load increase **RO will most likely use boration "hard card" Attachment 3 of S2.OP-SO.CVC-0006 and select Alternate Dilute**	**RO initiates dilution IAW S2.OP-SO.CVC-0006 and uses control rods.** • **PRESS** Make up mode **STOP** • **ADJUST** 2CV179 primary water flow setpoint to desired value • **SET** primary water flow register to desired gallons • **PRESS** Makeup control mode DILUTE or Alternate Dilute pushbutton • **PRESS** Makeup control mode START • **ENSURE** 2CV172 Boric Acid Flow closes • **ENSURE** Primary Water flow register indicates flow		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO initiates turbine load control IAW S2.OP-SO.TRB-0001, Turbine Generator Startup Operation. • **ADJUST** turbine ramp rate for TIP control to 10%/hr • **ADJUST** setter to 98% • **Select GO** • **ENSURE** setter – actual and Reference displays are updating		
	RO monitors Tavg and control rods for proper response.		
Proceed to next event by direction from Lead Examiner.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
2. 21 CCW pump trips, 23 CCW pump fails to Auto start			
Simulator Operator: Insert **RT-1** at the direction from Lead Evaluator. **CC0172A, 21 CCW pump trip**			
	RO reports unexpected console alarms for 21 CC HDR Pressure Lo and RCP Thermal Barrier Discharge Flow Lo.		
	RO reports 21 CCW pump tripped and the standby pump failed to Auto start.		
	CRS enters S2.OP-AB.CC-0001.		
Evaluator's Note: The crew can also enter the console ARP procedure and take actions to start the standby CCW pump.			
	RO places 23 CCW in Manual and starts 23 CCW pump.		
	RO reports Discharge Flow Lo is cleared.		
Proceed to next event at Lead Examiner's direction.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
3. 21 Charging pump trip			
Simulator Operator: Insert **RT-2** on direction from Lead Evaluator. **MALF: CV0208A 21 CHARGING PUMP TRIP**			
	RO reports 21 charging pump trip.		
	RO reports letdown is isolated as expected.		
	CRS enters S2.OP-AB.CVC-0001, Loss of Charging.		
	PO initiates AB.CVC-1 CAS.		
	CRS initiates S2.OP-AB.RCP-0001 from CAS item 4.0. (No action will be performed in AB other than monitoring RCP parameters.)		
	RO reports No charging pumps are running.		
	RO reports no indication of cavitation prior to 21 charging pump trip.		
	RO reports letdown is isolated.		
	RO reports 21 Charging pump tripped.		
	RO reports 22 Charging pump is available.		
	RO verifies RCP seal inlet temps <225°F		
	RO closes 2CV55		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO Starts 22 Charging Pump		
	RO adjusts 2CV55 to desired flow and insures RCP seal injection is 6-12 gpm		
	RO ensures open 2CV7		
Role Play: If dispatched by crew then report back after 2-3 minutes that 21 CVpp breaker is tripped and nothing abnormal noted at the pump or the breaker.			
	RO opens 2CV2 and 2CV277 and places in Auto.		
	RO adjusts charging flow to 85-90 gpm		
	RO opens one letdown orifice and maintains letdown pressure < 300 psig by adjusting 2CV18 in manual.		
	RO places 2CV18 in Auto when one orifice valve is in service.		
	RO reports PZR level can be maintained stable or rising, and returns 2CV55 to auto when PZR level is on program.		
TS evaluation #1:			
	CRS enters TS 3.5.2.a act a (72 hours) 3.1.2.4 (72 hours) and 3.1.2.2 (72 hours).		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
4. PZR Pressure Channel 1 Fails High			
Simulator Operator: Insert **RT-3** on direction from Lead Evaluator. **MALF: PR0016A, PZR PRESS CH I FAILS H/L** **Severity: 2500** **Ramp: 10 seconds**			
	RO reports unexpected OHA alarms D-8 RC Press HI, and E-42 2PR1 ½ Trip.		
	RO determines actual pressure is not high and reports spray valves open and heaters off, and recommends placing Master Pressure Controller in manual.		
	CRS directs RO to place Master Pressure Controller (MPC) in manual.		
	RO places MPC to Manual and lowers demand (increase pressure) to close sprays and energize PZR heaters.		
	CRS enters S2.OP-AB.PZR-0001, Pressurizer Pressure Malfunction.		
	CRS directs initiation of Att. 1 CAS.		
	CRS gives band for control of PZR pressure.		
	RO reports PZR Press Channel I failed high.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO selects Channel III for control.		
	RO matches MPC demand to current pressure and returns Master Pressure Controller to AUTO.		
	RO closes 2PR6 to comply with Tech Specs.		
Evaluator's Note: The requirement to shut 2PR6 and deenergize it is within one hour of the PZR Pressure Channel I instrument failure IAW Tech Specs.			
	CRS directs WCC to remove control power from 2PR6.		
Simulator Operator: Insert **RT-13** 2 minutes after being directed to remove power from 2PR6 **PR34D PORV Stop Valve 2PR6 Condition: Tagged**			
	CRS directs PO to initiate removing failed channel from service and contact I&C for support IAW S2.OP-SO.RPS-0003.		
	PO checks that tripping associated bistables will not result in an ESF or RPS actuation.		
Evaluator's Note: Crew may wait for I&C response before performing any actions in S2.OP-SO.RPS-0003.			
	PO verifies that Channel III is selected for Master Pressure Control.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO selects PZR Pressure recorder to channel other than I.		
TS evaluation #1:			
	CRS enters LCOs 3.3.1.1 Action 6 (72 hours), 3.3.2.1.b Action 19* (72 hours), 3.4.5.b (1 hour), and 3.2.5.b DNB (2 hours).		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
5. Main turbine high vibrations			
Simulator Operator: Insert **RT-4** when directed by lead examiner.			
Evaluators Note: OHA G-35 TSI trouble will alarm with high vibration approx. 3 minutes after malfunction is entered.			
	PO will announce unexpected alarm G-35 TSI Trouble and dispatch secondary operator to evaluate		
	PO will check vibrations on plant computer and note that vibrations have risen and continue to rise		
	CRS will hold brief to discuss limits and requirements to trip the turbine when > 9 Mils on any bearing		
	CRS may direct a downpower to reduce the vibrations		
Vibrations will continue to rise and reach the turbine trip required setpoint of > 9 mils			
	CRS will direct reactor trip and turbine trip when vibrations continue to rise and are rising above the trip criteria.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
6. Reactor fails to trip by all means from the control room			
	RO attempts to trip Rx and it fails to trip		
	Crew announces ATWT		
Simulator operator: Ensure **ET-3** is true when RO attempts to open A Rx trip breaker. This will insert **MALF RD0061 ROD SPEED CONTROL PROGRAM FAILS** and fail the auto rod speed insertion rate to 8 steps per minute.			
	RO attempts to trip using Both Rx trip switches and Rx trip breaker bezels		
	RO recommends entering EOP-FRSM-1		
	CRS enters EOP-FRSM-1, Response to Nuclear Power Generation.		
Evaluator note: If RO allows rods to insert in auto the speed will be failed to 8 steps per minute, should recognize failure and place in manual and insert rods.			
	RO initiates manual rod insertion. [This action also satisfies CT-1]		
	The crew dispatches NEO to locally open the Reactor Trip Breakers and M-G Set breakers		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports PZR heater bus breakers will not open.		
	PO trips the Main Turbine.		
	PO starts 21 and 22 AFW pumps**.**		
	PO reports three S/G's greater than 14%		
	PO reports total AFW flow.		
	RO reports immediate actions of EOP-TRIP-1 and FRSM-1 are complete.		
	RO ensures 22 Charging pump is running. (21 CV is C/T).		
	RO reports SI has not actuated.		
	RO starts both boric acid pumps in fast speed.		
	RO opens 2CV175 Rapid Boration Valve		
	RO closes 21 and 22CV160s		
	RO reports flow is indicated on Rapid Borate flowmeter.		
	RO places 2CV55 or Master flow controller in manual and verifies flow from charging pump is greater than 87 gpm		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Critical Task-1 (CT-52): Insert negative reactivity into to the core by at least one of the following methods, <u>and</u> dispatch operators to locally trip the reactor and/or the turbine: • De-energize RDMG sets • Insert control rods • Establish Emergency Boration flow to the RCS **SAT_____ UNSAT_____**			
Locally Open Rx Trip breakers:			
Simulator Operator: Insert **<u>RT-9</u>** to open both RTBs breakers when directed by lead evaluator. Timeframe from being dispatched may need to be delayed to ensure the evaluators have time evaluate completion of Critical task-1(CT-52) by the crew **NOTIFY** control room when RTBs are open.			
Simulator Operator: Insert **<u>RT-10</u>**. To open the Rod Drive MG set motor and generator breakers.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports PZR pressure is less than 2335 psig.		
	RO reports 2VC5 and 2VC6 are closed.		
	RO reports RTBs and bypass breakers are open.		
Evaluator's Note: The crew will continue in FRSM-1 but should recognize that the RTBs are now open and report PRNI < 5% and IR SUR negative (step 7 CAS) and then GO TO step 16 to exit procedure.			
	PO reports all turbine stop valves are closed.		
	RO reports PRNIs indicate < 5%.		
	RO reports IRNI SUR is negative.		
	CRS GOES TO Step 16.		
	CRS directs boration to continue to obtain Adequate SDM		
	CRS returns to procedure in effect, EOP-TRIP-1.		
	CRS transitions to EOP-TRIP-2		
Proceed to next event after CRS has transitioned to EOP-TRIP-2, RO has acknowledged or silenced alarms and RCS pressure has recovered to >2100 psig or as directed by lead evaluator			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
7. PZR PORV (2PR2) fails open:			
Simulator Operator: Insert **RT-5** at direction from Lead Evaluator. **MALF: VL0298 2PR2 fails to position (0-100%)** **Final Value: 100**			
	RO reports unexpected OHA for 2PR1/2 NOT CLSD.		
	RO reports PZR pressure is not stable or trending to 2235 psig.		
	RO reports PZR pressure is not > 2235 psig.		
	RO reports PZR pressure lowering, and identifies 2PR2 failed open.		
	RO reports 2PR2 will NOT close in manual.		
Critical Task-2 (CT-10): Close the block valve upstream of the stuck open PZR PORV. **SAT_____ UNSAT_____**			
	RO closes PZR PORV block valve 2PR7. [Critical Task-2]		
The scenario may be terminated after the crew has Completed CT-2 or by direction from Lead Examiner.			

B. SCENARIO REFERENCES

A. Alarm Response Procedures (Various)

B. Technical Specifications

C. Emergency Plan (ECG)

D. OP-AA-101-111-1003, Use of Procedures

E. S2.OP-IO.ZZ-0004, Power Operation

F. S2.OP-AB.CVC-0001, Loss of Charging

G. S2.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality

H. S2.OP-AB.RCP-0001, RCP Abnormality

I. S2.OP-AR.ZZ-0011, 2CC1 Alarm Response Procedure

J. S2.OP-AR.ZZ-0013, 2CC2 Alarm Response Procedure

K. 2-EOP-TRIP-1, Reactor Trip or Safety Injection

L. 2-EOP-FRHS-1, Response to Loss of Secondary Heat Sink

MODE: 1 POWER: 90% RCS BORON: 750 MWe 1090

SHUTDOWN SAFETY SYSTEM STATUS (5, 6 & DEFUELED): N/A

REACTIVITY PARAMETERS

- Rx Plan: To raise Rx power to 98% in preparation for calorimetric at 10%/hour add 1000 gallons of water along with withdrawing control rods to maintain Tavg on program. Reactor Engineering directs the crew to start a dilution first. Fuel is conditioned no rod withdrawal limitations apply.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- None

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- Continue power ascension to 98% at 10%/hour IAW S2.OP-IO.ZZ-0004, Power Operation
- Engineering is monitoring BF19s vibrations during startup
- .

ABNORMAL PLANT CONFIGURATIONS:

CONTROL ROOM:

Unit 1 and Hope Creek at 100% power.
No penalty minutes in the last 24 hrs.

PRIMARY:

- 23 CV Pump C/T for lube.

SECONDARY:

- Blowdown 35K per loop to 23 condenser / flashtank
- Polisher in service

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

None

____ 1. Verify simulator is in “TRAIN” Load

____ 2. Simulator is in RUN

____ 3. Overhead Annunciator Horns ON

____ 4. All required computer terminals in operation

____ 5. Simulator clocks synchronized

____ 6. All tagged equipment properly secured and documented

____ 7. TSAS Status Board up-to-date

____ 8. Shift manning sheet available

____ 9. Procedures in progress open and signed-off to proper step

____ 10. All OHA lamps operating (OHA Test) and burned out lamps replaced

____ 11. Required chart recorders advanced and ON (proper paper installed)

12. All printers have adequate paper AND functional ribbon

____ 13. Required procedures clean

____ 14. Multiple color procedure pens available

____ 15. Required keys available

____ 16. Simulator cleared of unauthorized material/personnel

____ 17. All charts advanced to clean traces and chart recorders are on.

____ 18. Rod step counters correct (channel check) and reset as necessary

____ 19. Exam security set for simulator

____ 20. Ensure a current RCS Leak Rate Worksheet is placed by Aux Alarm Typewriter

____ with Baseline Data filled out

____ 21. Shift logs available if required

____ 22. Recording Media available (if applicable)

____ 23. Ensure ECG classification is correct

____ 24. Reference verification performed with required documents available

____ 25. Verify phones disconnected from plant after drill.

____ 26. Verify EGC paperwork is marked “Training Use Only” and is current revision.

____ 27. Ensure sufficient copies of ECG paperwork are available.

In reviewing each proposed CT, the examination team assesses the task to ensure, that it is essential to safety. A task is essential to safety if, in the judgment of the examination team, the improper performance or omission of this task by a licensee will result in direct adverse consequences or in significant degradation in the mitigative capability of the plant.
The examination team determines if an automatically actuated plant system would have been required to mitigate the consequences of an individual's incorrect performance. If incorrect performance of a task by an individual necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

I. Examples of CTs involving essential safety actions include those for which operation or correct performance prevents...

- degradation of any barrier to fission product release
- degraded emergency core cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility license condition
- incorrect reactivity control (such as failure to initiate Emergency Boration or Standby Liquid Control, or manually insert control rods)
- a significant reduction of safety margin beyond that irreparably introduced by the scenario

II. Examples of CTs involving essential safety actions include those for which a crew demonstrates the ability to...

- effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph.
- recognize a failure or an incorrect automatic actuation of an ESF system or component.
- take one or more actions that would prevent a challenge to plant safety.
- prevent inappropriate actions that create a challenge to plant safety (such as an unintentional Reactor Protection System (RPS) or ESF actuation.

SCENARIO IDENTIFIER: 21-01 NRC Scenario #3 REVIEWER: K. Hantho

Initials		Qualitative Attributes
KH	1.	The scenario has clearly stated objectives in the scenario.
KH	2.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue crew into expected events.
KH	3.	The scenario consists mostly of related events.
KH	4.	Each event description consists of: • the point in the scenario when it is to be initiated • the malfunction(s) that are entered to initiate the event • the symptoms/cues that will be visible to the crew • the expected operator actions (by shift position) • the event termination point
KH	5.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.
KH	6.	The events are valid with regard to physics and thermodynamics.
KH	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
KH	8.	The simulator modeling is not altered.
KH	9.	All crew competencies can be evaluated.
KH	10.	The scenario has been validated.
NA	11.	If the sampling plan indicates that the scenario was used for training during the requalification cycle, evaluate the need to modify or replace the scenario.
KH	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

21-01 NRC Scenario 3

CT-1 (CT-52)

Critical Task
Insert negative reactivity into the core by at least one of the following methods, and dispatch operators to locally trip the reactor and/or the turbine:

- De-energize the control rod drive MG sets
- Insert control rods
- Establish emergency boration flow to the RCS

Safety Significance
Failure to insert negative reactivity, under the postulated plant conditions, results in an unnecessary situation in which the reactor remains critical or returns to a critical condition. Performance of the critical task would make the reactor subcritical and provide sufficient shutdown margin to prevent (or at least minimize the power excursion associated with) any subsequent return to criticality.
Failure to insert negative reactivity constitutes misoperation or incorrect crew performance which fails to prevent "incorrect reactivity control (such as failure to initiate emergency boration… or manually insert control rods)."

Cues:

- Indication of ATWS

AND

- Indication that the reactor is not tripped and that a manual reactor trip is not effective

Measurable Performance Indicator

Manipulation of controls in the control room as required to initiate the insertion of negative reactivity into the core

- For scenarios in which it is possible for the crew to de-energize the rod drive MG sets from the control room:
  - Circuit breaker position indication lamps show the appropriate breakers to be open
  - Individual rod position indication system shows control rods to be on the bottom
- For scenarios in which it is possible for the crew to insert control rods:
  - Group and individual rod position indication systems show control rods moving inward
  - Control rod banks sequentially reach core bottom
- For scenarios in which it is possible for the crew to initiate emergency boration
  - Valve position indication that the emergency boration flow path is established
  - Indication that the appropriate pump(s) are running
  - Flow rate indication of emergency boration

Feedback

- Indication of a negative SUR on the intermediate range of the excore NIS
- Indication of less than 5% power on the power range of the excore NIS

CT-2 (CT-10)

Critical Task

Close the block MOV upstream of the stuck open PRZR PORV by completion of the first step in the ERG network that directs the crew to close the block MOV

Safety Significance

Closing the block MOV under the postulated plant conditions constitutes a task that "is essential to safety," because "its improper performance or omission by an operator will result in direct adverse consequences or significant degradation in the mitigative capability of the plant." In particular, the crew has failed to prevent "degradation of any barrier to fission product release." In this case, the RCS fission product barrier can be restored to full integrity simply by closing the block MOV. Therefore, failure to close the MOV also represents a failure by the crew to "take one or more actions that would prevent a challenge to plant safety."

Degradation of the RCS fission product barrier is not initiated by operator action. However, the crew's failure to close the block MOV results in unnecessary continuation of the degraded condition of the RCS barrier.

Cues:

- Valve position indication and/or annunciation that the PRZR PORV is open, even after attempts to close it manually from the control room

AND

- Indication and/or annunciation of decreasing RCS pressure

AND

- Indication and/or annunciation consistent with the discharge of PRZR fluid to the PRT
  - PRT temperature, level, pressure
  - Tailpipe RTDs and/or acoustic monitors

AND

- Valve position indication that the block MOV upstream of the stuck open PRZR PORV is Open

Measurable Performance Indicator

Manipulation of controls as required to close the block MOV for the stuck open PRZR PORV

- Valve position indication that the block MOV upstream of the stuck open PRZR PORV is Closed

Feedback

Valve position indication that the block MOV upstream of the stuck open PRZR PORV is closed

ATTACHMENT 6

ESG-PSA RELATIONSHIP EVALUATION

EVENTS LEADING TO CORE DAMAGE

Y/N	Event	Y/N	Event
N	TRANSIENTS with PCS Unavailable	N	Loss of Service Water
N	Steam Generator Tube Rupture	N	Loss of CCW
N	Loss of Offsite Power	N	Loss of Control Air
N	Loss of Switchgear and Pen Area Ventilation	N	Station Black Out
N	LOCA		

COMPONENT/TRAIN/SYSTEM UNAVAILABILITY THAT INCREASES CORE DAMAGE FREQUENCY

Y/N	COMPONENT, SYSTEM, OR TRAIN	Y/N	COMPONENT, SYSTEM, OR TRAIN
N	Containment Sump Strainers	N	Gas Turbine
N	SSWS Valves to Turbine Generator Area	N	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	**N**	Auxiliary Feed Pump
N	CVCS Letdown line Control and Isolation Valves	N	SBO Air Compressor

OPERATOR ACTIONS IMPORTANT IN PREVENTING CORE DAMAGE

Y/N	OPERATOR ACTION
N	Restore AC power during SBO
N	Connect to gas turbine
N	Trip Reactor and RCPs after loss of component cooling system
N	Re-align RHR system for re-circulation
N	Un-isolate the available CCW Heat Exchanger
N	Isolate the CVCS letdown path and transfer charging suction to RWST
N	Cooldown the RCS and depressurize the system
N	Isolate the affected Steam Generator that has the tube rupture(s)
N	Early depressurize the RCS
N	Initiate feed and bleed

SIMULATOR
EXAMINATION SCENARIO GUIDE

SCENARIO TITLE:	NRC-4 [IOP-3, AR.ZZ-3, AB.CVC-1, AB.SW-3, LOPA-1]
SCENARIO NUMBER:	21-01 NRC ESG-4
EFFECTIVE DATE:	See Approval Dates
EXPECTED DURATION:	70 minutes
REVISION NUMBER:	05
PROGRAM:	[ ] **L.O. REQUAL**
	[X] **INITIAL LICENSE**
	[ ] **STA**
	[ ] **OTHER** _____

Revision Summary:

Rev. 04 (last used 19-01 NRC) Used for 20-01 NRC exam. Modified to include malfunctions not used on the previous two NRC exams which include; 23A CW traveling screen high DP, 21 CFCU failure to start, PZR spray valve 2PS3 fails to close during depressurization.
Rev. 05 Modified for use in 21-01 NRC exam.

PREPARED BY:	K. Hantho **Lead Regulatory Exam Author**	9-21-22 **Date**
APPROVED BY:	M. Wadusky **Operations Training Manager**	1/19/23 **Date**
APPROVED BY:	M. Winkelspecht **Facility Representative**	1/19/23 **Date**

SCAN OF SIGNED SCENARIO COVER SHEET

Form 3.3-1 Scenario Outline

Facility:	Salem	Scenario #:	4
Scenario Source:	20-01 ESG-4	Op. Test #:	21-01
Examiners:		Applicants/ Operators:	

Initial Conditions: Salem Unit 2 is at 2% power BOL; 21 SGFP in service

Turnover: The crew is directed to continue power ascension to 10% reactor power IAW S2.OP-IO.ZZ-0003 using control rods, steam dumps, and turbine load control.

Critical Tasks:

1. Establish 220,000 lbm/hr AFW flow before steam generator dryout occurs (WR ≤ 11%) during SBO
2. Depressurize the intact SG(s) such that a maximum of 100°F per hour cooldown rate is established and SG pressure(s) does not go below 310 psig

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ATC(R) BOP(R) CRS(N)	Continue power ascension to 10% IAW IOP-3 and enter MODE 1.
2	VC0311A	ATC (I) CRS (I,TS)	Containment pressure channel fails high
3	CV0035	ATC(C,MC) CRS(C)	Charging Master flow controller fails low
4	SW0216A	BOP(C) CRS(I,TS)	# 2 SW bay leak
5	EL0134	All(M)	Loss of offsite power
6	EL0144 EL0145 EL0163	ATC(C) BOP(C) CRS(C)	Loss of all AC power**(CT-2)**
7	AF0353C	BOP(I,MC) CRS(I)	23 AFW pump fails to start**(CT-1)**
		ABs	IOP-3 → ARP → AB.CVC-1 → AB.SW-2
		EOPs	LOPA-1

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control