Scenario No.: 1

Target Quantitative Attributes per Scenario (NRC Form ES-D-1)

Facility: _____Salem_____ Scenario No.: ____1_____ Op-Test No.: __19-01 NRC__

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-201: 90% power, MOL; 23 Charging Pump is in service. The following equipment is out of service: 2C EDG C/T for governor oil replacement and fuel rack lube.

Turnover: The crew is directed to continue power ascension to 100% power at 10% per hour IAW S2.OP-IO.ZZ-0004 using dilution, control rods and turbine load control.

Critical Tasks:

1. Energize at least one AC Emergency Bus (see WOG CT-24)
2. Manually start SW Pump for EDG Cooling (see WOG CT-25)

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	ALL (R)	Power ascension to 100% at 10% per hour IAW IOP-4
2	RC0022A	CRS (TS)	RCS Wide Range Pressure Channel 2PT-405 fails low
3	PR0017A	ATC (I) CRS (I,TS)	PZR Level Channel 1 fails Low
4	EL0048	ATC (C) BOP (C) CRS (C, TS)	Loss of #4 SPT and 23 CW Bus
5	EL0134	ALL (M)	Loss of Offsite Power
6	EL0144 EL0162	ALL (C)	Loss of 2A 4KV Vital Bus 2B EDG Trips on Overspeed (time delayed)
		ABs	AR.ZZ-4 →AB.CVC-1 → AB.CW → AB.LOAD-1 → AB.LOOP-3
		EOPs	TRIP-1 → LOPA-1

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

Scenario No.: 1

Target Quantitative Attributes per Scenario (See Section D.5.d)	Actual Attributes	Event No.
1. Total malfunctions (5-8)	4	3-6
2. Malfunctions after EOP entry (1-2)	1	6
3. Abnormal events (2-4)	2	3,4
4. Major transients (1-2)	1	5
5. EOPs entered/requiring substantive actions (1-2)	1	LOPA-1
6. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0	N/A
7. Preidentified critical tasks (≥2)	2	CT-24, CT-25
8. Tech Specs exercised (≥ 2)	3	2,3,4

I. OBJECTIVES

1. Using station procedures perform a reactor power ascension IAW S2.OP-IO.ZZ-0004.
2. Given a malfunction with SW Accumulator, direct/perform actions to respond to the malfunction in accordance with Alarm Response Procedures.
3. Given a malfunction with a PZR level channel, direct/perform actions to respond to the malfunction in accordance with S2.OP-AB.CVC-0001.
4. Given a loss of the #4 SPT direct/perform actions to respond to the loss of #4 SPT in accordance with S2.OP-AB.LOOP-0003.
5. Given a loss of the 23 CW Bus direct/perform actions to respond to the loss of three circulators in accordance with S2.OP-AB.CW-0001.
6. 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.
7. Given indication of a reactor trip, DIRECT the response to the reactor trip in accordance with the approved station procedures.
8. Given the order or indications of a loss of all AC power, complete actions as the nuclear control operator to PERFORM the immediate response in accordance with the approved station procedures.
9. Given the order with the immediate response to a loss of all AC accident completed and no safety injection actuated or required, perform actions as the nuclear control operator to RECOVER from the loss of AC in accordance with the approved station procedures.
10. Given indication of a loss of all AC power, DIRECT the immediate response in accordance with the approved station procedures.
11. Given the plant with the immediate response completed for a loss of all AC power which did not result in a required safety injection, DIRECT the recovery of the loss of AC in accordance with the approved station procedures.
12. 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. RCS Wide Range Pressure Channel (2PT-405) fails low (TS only)
3. PZR Level Channel 1 fails low (TS)
4. Loss of #4 SPT and Loss of 23 CW Bus (power reduction) (TS)
5. Loss of Offsite Power
6. Loss of 2A Vital Bus and 2B EDG Trips on Overspeed.

III. SCENARIO SUMMARY

1. The crew takes the watch with the unit at 90% power, MOL. 2C EDG is C/T for governor oil replacement and fuel rack lube with 68 hours remaining in the TSAS.
2. The crew will be briefed prior to taking the watch to perform power ascension to 100% at 10%/hour. The crew will directed to initiate a dilution, adjusting control rods and turbine load control for raising reactor power.
3. After the power ascension has commenced, the RCS Wide range Pressure Channel 2PT-405 will fail low. The crew will recognize the failed channel by OHA alarm and 2RP4 indication on Subcooling Margin Monitor. The crew will take action IAW **S2.OP-AR.ZZ-0004** and determine an invalid indication. The CRS will enter TS 3.3.3.7 Action a.1
4. Following actions for RCS Wide Range pressure channel failure, Pressurizer Level Channel 1 will fail low and result in the loss of letdown flow. The crew will take action IAW S2.OP-AB.CVC-0001, Loss of Charging, to take manual control of charging flow, swap to operable channel, and restore pressurizer heaters and letdown flow. The CRS will enter TS 3.3.1.1
5. Once the crew has addressed the failed pressurizer level channel, a loss of #4 Station Power Transformer (SPT) and 23 CW Bus will occur. The crew will take the following actions; enter S2.OP-AB.CW-0001 for a loss 21A-23A circulators and S2.OP-AB.LOOP-0003, Partial Loss of Offsite Power. As a result of the loss of 23 CW Bus, condenser differential temperatures (DT) will exceed the limits of 27 F and require a turbine load reduction (to less than 80% power) to reduce DTs. The crew may re-energize 23 CW Bus IAW AB.LOOP-0003 Attachment 4 by closing the cross-tie breaker from 24 CW Bus. The CRS will enter TS 3.8.1.1 Action c (one off-site source and one EDG inoperable).
6. After the crew has initiated a turbine load reduction, a loss of offsite power will occur. The reactor will automatically trip and the crew will enter 2-EOP-TRIP-1, Reactor Trop or Safety Injection. While in EOP-TRIP-1, a loss of 2A 4kV Vital Bus on Bus Differential protection and the 2B EDG will trip on overspeed resulting in a loss of all 4KV Vital Busses. The crew will transition to 2-EOP-LOPA-1, Loss of All AC Power, based on all three vital busses de-energized.
7. While in EOP-LOPA-1, the crew will recognize that the 2A EDG is running with no service water pumps and will need to be stopped. Maintenance will return 2C EDG to available status following SI Reset in EOP-LOPA-1. Following the report of the release of 2C EDG from the

work control supervisor, the crew will start 2C EDG, close its output breaker and re-energize the 2C 4KV Vital Bus [**Critical Task #1**]. Once the bus is re-energized, the crew will start one service water pump to provide EDG cooling [**Critical Task #2**].

8. The scenario will terminate when 2C 4KV vital bus is re-energized and the crew starts one SW Pump to provide EDG cooling.

IV. INITIAL CONDITIONS

____ **IC-201**

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

Initial	Description
____ 1	VC1and VC4 C/T
____ 2	RCPs (SELF CHECK)
____ 3	RTBs (SELF CHECK)
____ 4	MS167s (SELF CHECK)
____ 5	500 KV SWYD (SELF CHECK)
____ 6	SGFP Trip (SELF CHECK)
____ 7	23 CV PP (SELF CHECK)
____ 8	**2C EDG C/T**
____ 9	**Jet C/T**
___ 10	**Suggested Protected Equipment:** ▪ **2A and 2C EDGs**
___ 11	**S2.OP-IO.ZZ-0004 open at Step 4.1.25**
___ 12	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	
	1	EVENT ACTION: COMMAND: PURPOSE:	MONP254 < 10. //CONT ROD BANK C < 10 (RX TRIP) <update as needed>

MALFUNCTIONS:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Severity
_____ 01	PR0017A PZR LEVEL CH I (LT459) FAILS H/L	N/A	N/A	N/A	RT-2	0
_____ 02	EL0048 LOSS OF #4 STAT POWER XFMR-DIFF	N/A	N/A	N/A	RT-3	
_____ 03	EL0134 LOSS OF ALL 500KV OFF-SITE POWE	N/A	N/A	N/A	RT-4	
_____ 04	EL0144 LOSS OF 2A 4160V VITAL BUS	00:00:30	N/A	N/A	ET-1	
_____ 05	EL0162 2B EMERG DIESEL GENERATOR TRIP	00:00:30	N/A	N/A	ET-1	
_____ 06	VL0083 2SJ1 Fails to Position (0-100%)	N/A	0	00:01:00	RT-14	100
_____ 07	VL0085 2CV40 Fails to Position (0-100%)	N/A	0	00:01:00	RT-15	0
_____ 08	VL0053 2SW26 Fails to Position (0-100%)	N/A	0	00:02:00	RT-15	0
_____ 09	VL0045 2CV116 Fails to Position (0-100%)	N/A	0	00:02:00	RT-13	0
_____ 10	VL0087 2CC131 Fails to Position (0-100%)	N/A	0	00:01:00	RT-7	0
_____ 11	VL0580 21MC31 Fails to Position (0-100%)	N/A	N/A	N/A	RT-8	5
_____ 12	VL0581 22MC31 Fails to Position (0-100%)	N/A	N/A	N/A	RT-8	5
_____ 13	VL0582 23MC31 Fails to Position (0-100%)	N/A	N/A	N/A	RT-8	5
_____ 14	RC0022A RCS PRESS (PT405) FAILS HI/L	N/A	N/A	N/A	RT-1	0

REMOTES:

SELF-CHECK	Description	Delay Time	Initial Value	Ramp Time	Trigger	Condition
_____ 01	DG01D DEENERGIZE "A" SEC CABINET	N/A	N/A	N/A	RT-12	YES
_____ 02	DG02D DEENERGIZE "B" SEC CABINET	00:00:05	N/A	N/A	RT-12	YES
_____ 03	DG03D DEENERGIZE "C" SEC CABINET	00:00:10	N/A	N/A	RT-12	YES
_____ 04	DG28D 2C DIESEL GEN LOCKED OUT	N/A	N/A	N/A	N/A	YES
_____ 05	DG29D 2C DG BKR CONTROL POWER	N/A	N/A	N/A	N/A	OFF
_____ 06	DG30D 2C DG BKR RACK OUT	N/A	N/A	N/A	N/A	TAGGED
_____ 07	CV28A 21CV98 RCP SEAL INJ MAN ISOL	00:02:00	7500	00:01:00	RT-9	0

_____ 08	CV29A 22CV98 RCP SEAL INJ MAN ISOL	00:03:00	7500	00:01:00	RT-9	0
_____ 09	CV30A 23CV98 RCP SEAL INJ MAN ISOL	00:04:00	7500	00:01:00	RT-9	0
_____ 10	CV31A 24CV98 RCP SEAL INJ MAN ISOL	00:05:00	7500	00:01:00	RT-9	0
_____ 11	AF20D 21 AFW PUMP BKR CONTROL POWER	00:01:00	N/A	N/A	RT-6	OFF
_____ 12	AF25D 22 AFW PUMP BKR CONTROL POWER	00:01:30	N/A	N/A	RT-6	OFF

OVERRIDES:

SELF-CHECK	**Description**	**Delay Time**	**Initial Value**	**Ramp Time**	**Trigger**	**Condition/ Severity**

OTHER CONDITIONS:

	Description

_____ 1.

V. SEQUENCE OF EVENTS

1. State shift job assignments.
2. Hold a shift briefing, detailing instruction to the shift: (provide crew members a copy of the shift turnover sheet).
3. 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”.
4. 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 100%			
	CRS holds crew brief to discuss Rx Plan for power ascension to 100% IAW S2.OP-IO.ZZ-0004.		
	RO commences a dilution IAW S2.OP-SO.CVC-0006.		
	PO raises main generator loading IAW S2.OP-SO.TRB-0001.		
Proceed onto next event after power ascension has commenced or by direction from Lead Examiner			
2. RCS Wide Range Pressure Channel fails low (2PT-405):			
Simulator Operator: Insert RT-1 on direction from Lead Examiner. **RC0022A, 2PT-405 fails H/L** **Value = 0**			
	RO reports unexpected OHA alarms for D-40 SUBCLG CH A MARGIN LO.		
	RO reports Subcooling Channel A is lost to monitor on 2RP4 and recorder on 2CC2.		
	Crew refers to OHA D-40 ARP.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports 2PT-405 has failed low.		
	ARP refers CRS to review Tech Specs.		
TS evaluation #1:			
	CRS enters TS 3.3.3.7 Action a.1 (30 days)		
Proceed to next event after Tech Specs has been evaluated or by direction from Lead Examiner.			
3. PZR Level Channel 1 Fails Low			
Simulator Operator: Insert **RT-2** on direction from Lead Examiner. This will insert the following malfunction: **PR0017A PZR level CH 1 Fails Low Value = 0**			
	RO reports unexpected OHA E-36, PZR HTR OFF LVL LO and diagnoses failure of PZR level channel.		
	RO reports letdown isolated		
Examiner's Note: Crew may place Master Flow Controller in Manual prior to entering AB procedure.			
	CRS enters S2.OP-AB.CVC-0001, Loss of Charging.		
	PO initiates of Attachment 1 CAS.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO reports 23 charging pump is running.		
	RO reports there is no indication of cavitation.		
	RO reports PZR level channel 1 has failed Low.		
	RO takes manual control of charging flow, if not previously done, and lowers charging flow to minimize level rise in PZR.		
	RO selects operable channel for Control, Alarm and Recorder.		
	RO energizes PZR heaters to normal alignment		
Examiner's Note: An auto CVCS makeup to the VCT may occur at some point based on no letdown flow.			
Restoration of Letdown:			
	RO ensures open 2CV7		
	RO places 2CV18 in Manual and opens until close PB extinguishes		
	RO opens 2CV2 and 2CV277 and place in Auto		
	RO ensures charging flow ≈ 85-90 gpm		
	RO opens one letdown orifice (2CV3, 4, 5) and adjusts 2CV18 to maintain letdown pressure ≈ 300 psig		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO places 2CV18 in Auto		
	CRS directs charging placed in Auto when PZR level returns to program		
	CRS directs Maintenance assistance to remove failed channel from service IAW S2.OP-SO.RPS-0003.		
TS evaluation #2:			
	CRS enters TS 3.3.1.1 Action 6 (6 hours). Note: T/S 3.3.3.5 and 3.3.3.7 do not apply.		
Proceed to next event after Tech Specs evaluated or at direction of Lead Examiner			
4. Loss of #4 SPT			
Simulator Operator: Insert **RT-3** on direction from Lead Examiner. This will insert the following malfunction: **EL0048, Loss of #4 SPT**			
	PO reports several OHA alarms for B and K window and investigates the cause.		
	PO reports one or more of the following: • 500 KV Bus Section 1 is de-energized, • Loss of #4 SPT • All the Vital Busses are energized from 24 SPT (single source of off-site power).		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports that 23 CW Bus is de-energized and 21A thru 23A CW pumps have tripped.		
Examiner's Note: The crew will need to enter 2 AB procedures. Following the trip of the 21A-23A circulators, the crew should recognize that the condenser DTs have exceeded the procedural limit of 27 F and initiate a turbine load reduction to less than 80% IAW S2.OP-AB.CW-0001 as the first priority.			
S2.OP-AB.CW-0001 starts here:			
	Crew enters S2.OP-AB.CW-0001, CW System Malfunction.		
	PO initiates Attachment 1 CAS.		
	PO reports no pipe ruptures in the circulating system.		
	PO reports 3 circulators are out of service.		
	PO reports condenser hotwells are being maintained.		
	PO reports at least once circulator pump in operation on each condenser.		
	CRS dispatches field operators to OPEN the 21-23MC62, TURB HOD SPRAY NYPASS VLV on affected condenser.		
Simulator Operator: Insert **RT-8** to simulate opening of 21-23MC62 Hood Spray Bypass valve.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
VL0580, 21MC31 fails to position **VL0581, 22MC31 fails to position** **VL0582, 23MC31 fails to position** **Value = 5%** (Monitor hood spray temps on P250 to maintain 100 F)			
	CRS directs PO to monitor condenser hotwell and condensate pump suction piping for signs of flashing.		
	CRS directs event response team to investigate cause of loss of 23 CW Bus.		
	PO reports that condensate pump suction temperature temp is less than 120 F.		
	CRS contacts Chemistry to maintain chlorination parameters within limits and monitor condensate polisher resin.		
Condenser DTs exceed 27 F (load reduction):			
	PO reports that Attachment 1 CAS Step 5 Condenser DTs is greater than 27 F and that a load reduction is required.		
	Crew briefs reactivity plan for turbine load reduction IAW **S2.OP-AB.LOAD-0001**, Rapid Load Reduction.		
Examiner's Note: During validation, the crew needed to lower turbine load to less than 80% power to lower DTs to less than 27 F. The crew may perform load reductions is small power increments until the desired DT is reached.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO initiates boration IAW S2.OP-SO.CVC-0006		
	PO initiates turbine load reduction as directed by CRS IAW AB.LOAD-0001 and S2.OP-SO.TRB-0001.		
	RO reports when control rods are inserting to maintain Tavg on program.		
	RO energizes all PZR heaters.		
IF the crew determines to NOT re-energize 23 CW Bus, THEN by direction from Lead Examiner, use the below Role Play to direct the crew to re-energize the 23 CW Bus.			
Re-energizing 23 CW Bus IAW S2.OP-AB.LOOP-3:			
Possible Role Play: ***This is Rick DeSanctis Operations Director, for plant stability you are directed to re-energize the 23 CW Bus IAW S2.OP-AB.LOOP-0003.***			
S2.OP-AB.LOOP-0003, Partial Loss of Off-site Power, starts here:			
	PO initiates Attachment 1 CAS		
	CRS notifies SM to refer to ECGs		
	PO reports no 4KV Vital Bus powered by EDGs		
	PO reports 500 KV Bus Section 1 is de-energized and		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	Bus Section 2 is energized.		
	CRS request **Unit 1** to OPEN the following breakers: • 500 KV BS 1-5 breaker (12X) • 500 KV BS 1-8 breaker (20X) [**Note**: already open as part of the event, indication is on 2CC3]		
Role Play: Respond as Unit 1 Operator that both the 500 KV BS 1-5 and 1-8 breakers are OPEN.			
	PO OPENS 500 KV BS1-9 breaker (32X) [Note: already open as part of the event]		
	CRS initiates action to determine the cause of loss of 500 KV BS 1		
	PO OPENS 500 KV Circuit Switchers: • **2T60, 13 KV Ring Bus** • **4T60, 13 KB South Bus**		
Re-energizing 23 CW Bus:			
	CRS directs PO to energize 2CW Bus Section 23 from Bus Section 24 IAW Attachment 4.		
Examiner's Note: The crew at this time may determine not to re-energize 23 CW Bus until the cause of the event is determined.			
	PO reports that OHA's K-2 and K-10 are clear.		
	PO reports that the breakers listed in Attachment 4 Step 1.2 are OPEN.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO reports 2CW Bus Section 24 voltage is within the band of 4.22-4.36KV		
	PO PRESSES 2CW2BD AUTO SWAP OFF pushbutton and ensures pushbutton is illuminated.		
	PO PRESSES Mimic Bus 2CW SWGR BUS-TIE BREAKER 2CW2BD pushbutton and ensures bezel is illuminated.		
	PO PRESSES 2CW2BD CLOSE pushbutton and ensures the breaker goes CLOSED, Bus Section 23 voltage is within the band of 4.22-4.36KV, and 2CW2BD Mimic bezel is extinguished.		
TS evaluation #3:			
	CRS enters TS 3.8.1.1 Action C (1 hour and 12 hours) for one source of off-site power <u>and</u> one EDG Inoperable.		
<u>Examiner's Note</u>: Tech Spec evaluation could be delayed until end of scenario by Lead Examiners discretion.			
Proceed to next event by direction from Lead Examiner.			
5. Loss of Offsite Power			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Insert **RT-4** on direction from Lead Examiner. This will insert malfunction: **EL0134, Loss of Offsite Power**			
	RO reports reactor automatically tripped and performs immediate actions of 2-EOP-TRIP-1. • Trips the reactor • Confirms the reactor tripped • Trips the main turbine		
5. Loss of 2C Vital Bus and 2B EDG Emergency Trips on Overspeed:			
Simulator Operator: Ensure **ET-1** is TRUE following Rx Trip. This will insert the following malfunctions: **EL0144, Loss of 2A Vital Bus (Bus Diff Protection)** **EL0162, 2B EDG Emerg Trips on Overspeed** **Time Delay = 30 seconds**			
	RO reports that all 4KV Vital Busses are de-energized.		
EOP-LOPA-1 starts here:			
	Crew transitions to 2-EOP-LOPA-1, Loss of All AC Power.		
	PO throttles AFW flow to no less than 22E4 lbm/hr.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	RO performs immediate actions of LOPA-1: ▪ Trip the Reactor ▪ Trip the Turbine		
	CRS and RO verify performance of immediate actions.		
	RO closes 2CV2 and 2CV277		
	RO reports 2CV278 and 2CV131 are closed.		
	RO reports that both PZR PORVs are closed.		
	PO reports total AFW pump is > 22E4 lbm/hr.		
	RO makes page announcement.		
	CRS dispatches operator to de-energize all SECs.		
De-energize SECs:			
Simulator Operator: After being contacted, Insert **RT-12** to de-energize all SECs with a time delay. **REMOTES:** **DG01D** De-energize A SEC **DG02D** De-energize B SEC **DG03D** De-energize C SEC **NOTIFY** CRS when complete.			
Examiner's Note: Around this point the crew should be discussing strategy to recover a vital			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
bus. 2B EDG tripped on overspeed and will take some time to troubleshoot. 2C EDG is C/T for minor maintenance. 2A vital bus is de-energized on Bus Differential protection and therefore not expected back soon. Crew should determine that success path is to restore 2C EDG from maintenance and start the diesel.			
	CRS directs performance of blackout coping actions of S2.OP-AB.LOOP-1, Att 2, Part A.		
Role Play (AB.LOOP-1, Attachment 2 Part A): After **10-15 minutes** report back that Blackout Coping actions in Attachment 2 Section 1.A and 1.B have been completed within 30 minutes.			
	PO reports 23 AFW supplying feed flow to SGs.		
	Crew waits until all SECs are de-energized.		
	CRS receives report that all SECs are de-energized.		
Stop running EDGs:			
	PO stops 2A EDG based on no service water pump running IAW CAS of LOPA-1.		
	RO depresses stop pushbutton for all loads in Table A of LOPA-1.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Examiner's Note: PO may report the following to the crew regarding vital bus status: **2A Bus** – Bus de-energized, EDG is running with No Service Water pumps in service, OHA for Bus Differential Bus de-energized **2B Bus** – Bus de-energized, EDG started but emergency tripped **2C Bus** – EDG is C/T			
	PO reports status of 4 KV Vital Busses and priority should be placed on restoring 2C EDG from maintenance.		
Role Play (2B EDG): IF dispatched, report that ***B EDG tripped on overspeed and the fuel rack linkage looks bent***. **Role Play (Maintenance on 2C EDG)**: When contacted about status of 2C EDG maintenance, ***state that you will go to the field to get a status from maintenance***.			
	PO reports that no 4 KV Vital Bus are energized		
	RO reports that SI has not actuated or required.		
Examiner's Note: There will be no console indications to verify valve positions during LOPA-1 only local field reports.			
	CRS directs WCC to Open 2SJ1 or 2SJ2		
Simulator Operator: Insert **RT-14** to open 2SJ1.			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
VL0083 2SJ1 fails to position **Final = 100** **Ramp: 01:00 mins**			
	CRS directs WCC to Close 2CV40 or 2CV41.		
Simulator Operator: Insert **RT-15** to close 2CV40. **VL0085 2CV40 fails to position** **Final = 0** **Ramp: 01:00 mins**			
	CRS directs WCC to Close 2SW26.		
Simulator Operator: Insert **RT-15** to close 2SW26. **VL0053 2SW26 fails to position** **Final = 0** **Ramp: 02:00 mins**			
	RO reports SI has not actuated and initiates SI.		
	Crew verifies closure of Phase A and CVI valves. Note: 2CV116 closed later.		
Proceed to Role Play below when SI is being reset:			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Role Play: ***Notify CRS that Maintenance has returned 2C diesel and the tag release should be completed in next 5 minutes. Will notify you when release is confirmed and IV completed.***			
Simulator Operator: **MODIFY** the following Remotes to simulate releasing tags on 2C EDG: **DG29D, Output Bkr control power to ON** **DG30D, Output Bkr Racked Out to UNTAGGED** **DG28D, 2C Lockout Switch to NO (expect OHA alarm when reset)**			
	RO resets SI.		
	RO resets Phase A signal.		
	RO opens 21 and 22 CA330s.		
	CRS directs WCC to remove control power for 21 and 22 AFW pumps.		
Simulator Operator: Insert **RT-6** to remove control power to 21 and 22 AFW pumps. **Remote:** **AF20D, 21 AFW Control Power** **AF25D, 22 AFW Control Power** **Value = OFF**			
	CRS request assistance to restore power IAW S2.OP-AB.LOOP-0001, Loss of Offsite Power, while		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	continuing with LOPA-1.		
EOP-LOPA-1, Step 26 starts here:			
	CRS reads Step 26, "When at least one 4kV vital bus is energized, THEN go to step 43".		
Role Play: Notify CRS that 2C EDG tags are released and IVs complete.			
	CRS informs crew to not start any Charging pumps until directed.		
Examiner's Note: When the 2C EDG tags are released, the crew should return to step 14 to start the EDG and energize the bus.			
Starting 2C EDG:			
Critical Task #1 (CT-24): Energize one vital bus before transition out of LOPA-1. **SAT_____ UNSAT_____**			
	CRS returns to CAS Step 14 after notification that 2A EDG tags are released.		
	PO depresses start PB for 2C EDG and observes voltage increasing to 4KV.		
	PO depresses 2C EDG output breaker mimic PB and ensures mimic PB backlight illuminates.		

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
	PO depresses 2C EDG output breaker closed PB bezel and verifies closed PB illuminates. [Critical Task #1 complete]		
Critical Task #2 (CT-25): Start one SW pump on running EDG before transition out of LOPA-1. **SAT_____ UNSAT_____**			
	PO starts 25 or 26 SW pump. [Critical Task #2 complete]		
	CRS directs WCC to close 2CV83, 2CV89 and 2CV95 and 2CV116		
Simulator Operator: Insert RT-9 to close 21-24 CV98. This will simulate closure for 2CV83, 2CV89 and 2CV95 to isolate seal injection filters. **Remotes:** **CV28A, 21CV98 fails to position** **CV29A, 22CV98 fails to position** **CV30A, 23CV98 fails to position** **CV31A, 24CV98 fails to position** **Final = 0** **Ramp: 1 min** **Delay = 0-5 mins**			

Evaluator/Instructor Activity	Expected Plant/Student Response	SBT LOG	Comment
Simulator Operator: Insert RT-13 to close the 2CV116 valve. **VL0045 2CV116 fails to position** **Final = 0** **Ramp = 2 min**			
	CRS directs WCC to close 2CC131.		
Simulator Operator: Insert RT-7 to close 2CC131. **VL0087 2CC131 fails to position** **Final = 0** **Ramp: 01:00 min**			
Terminate scenario when crew starts one SW Pump on 2A Bus or as direct by Lead Examiner.			

VI. SCENARIO REFERENCES

1. Alarm Response Procedures (Various)
2. Technical Specifications
3. Emergency Plan (ECG)
4. OP-AA-101-111-1003, Use of Procedures
5. S2.OP-IO.ZZ-0004, Power Operation
6. S2.OP-AB.CVC-0001, Loss of Charging
7. S2.OP-AB.LOOP-0001, Loss of Off-site Power
8. S2.OP-AB.LOOP-0003, Partial Loss of Offsite Power
9. S2.OP-AB.CW-0001, Circulating Water System Malfunction
10. S2.OP-AB.LOAD-0001, Rapid Load Reduction
11. 2-EOP-TRIP-1, Rx Trip or Safety Injection
12. 2-EOP-LOPA-1, Loss of All AC Power

ATTACHMENT 1
UNIT TWO PLANT STATUS
TODAY

MODE: 1 POWER: 90% RCS BORON: 837 MWe 1090

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

NA

REACTIVITY PARAMETERS

- Rx Plan: To raise Rx power 10% at 10%/hour add 1500 gallons of water along with withdrawing control rods to maintain Tavg on program. Reactor Engineering directs the crew to perform a dilution first.

MOST LIMITING LCO AND DATE/TIME OF EXPIRATION:

- 3.8.1.1.b Action b (72 hrs), 2C EDG, 68 hours remain.

EVOLUTIONS/PROCEDURES/SURVEILLANCES IN PROGRESS:

- S2.OP-ST.500-0001 was just completed 1 hour ago.
- S2.OP-IO.ZZ-0004 in progress at Step 4.1.25.

ABNORMAL PLANT CONFIGURATIONS:

- Jet is C/T due to emergent troubleshooting of output breaker failing to close.

CONTROL ROOM:

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

PRIMARY:

- 2C EDG C/T for governor oil replacement and fuel rack lube.

SECONDARY:

- Polisher in service
- Blowdown 35K per loop to 23 Condenser / Flashtank

RADWASTE:

No discharges in progress

CIRCULATING WATER/SERVICE WATER:

None

ATTACHMENT 2

SIMULATOR READY FOR TRAINING CHECKLIST

____ 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 ECG paperwork is marked “Training Use Only” and is current revision.
____ 27. Ensure sufficient copies of ECG paperwork are available.

ATTACHMENT 3

CRITICAL TASK METHODOLOGY

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.

ATTACHMENT 4

SIMULATOR SCENARIO REVIEW CHECKLIST

SCENARIO IDENTIFIER: 19-01 NRC Scenario 1 **REVIEWER: R. Chan**

Initials		Qualitative Attributes
R	1.	The scenario has clearly stated objectives in the scenario.
R	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.
R	3.	The scenario consists mostly of related events.
R	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
R	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.
R	6.	The events are valid with regard to physics and thermodynamics.
R	7.	Sequencing/timing of events is reasonable, and allows for the examination team to obtain complete evaluation results commensurate with the scenario objectives.
R	8.	The simulator modeling is not altered.
R	9.	All crew competencies can be evaluated.
R	10.	The scenario has been validated.
R	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.
R	12.	ESG-PSA Evaluation Form is completed for the scenario at the applicable facility.

ATTACHMENT 5

ESG CRITICAL TASKS

19-01 NRC Scenario 1

CT-1 (CT-24):

Critical Task: Energize at least one AC emergency bus before transition out of EOP-LOPA-1.

BASIS: See WOG Rev. 2

CT-2 (CT-25):

Critical Task: Manually start one SW pump for EDG cooling before transition out of EOP-LOPA-1.

BASIS: See WOG Rev. 2

ATTACHMENT 6

ESG-PRA 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
Y	Loss of Offsite Power	N	Loss of Control Air
Y	Loss of Switchgear and Pen Area Ventilation	**Y**	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	**Y**	Any Diesel Generator
N	RHR Suction Line valves from Hot Leg	**Y**	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
Y	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-2 [ARP, AB.COND-1, AB.ROD-3, AB.RC-1, TRIP-1, LOCA-1, LOCA-5]

SCENARIO NUMBER: 19-01 NRC ESG-2

EFFECTIVE DATE: See Approval Dates

EXPECTED DURATION: 60 minutes

REVISION NUMBER: 04

PROGRAM:

[ ] **L.O. REQUAL**

[X] **INITIAL LICENSE**

[ ] **STA**

[ ] **OTHER** _____

Revision Summary:

- See ESG-1807 for previous revisions.
- Rev. 03 (last used 2019 Annual ESG-1913) Modified for 19-01 ILOT NRC exam. Modified abnormal events. Incorporated comments from validation; added 22 vacuum pump trip.
- Rev 04 Incorporated comments from NRC working mtg on 2-14-20 to reduce the scenario duration. Deleted Loss of Off-site Power and Loss of 2A 4KV Vital Bus. Added 21 RHR Pump is C/T for maintenance to support LOCA-5 conditions. Added comments from NRC Prep Week 6-17-20.

PREPARED BY:	R. Chan **Lead Regulatory Exam Author**	6-18-20 **Date**
APPROVED BY:	N/A **Operations Training Manager or designee**	 **Date**
APPROVED BY:	N/A **Operations Director or designee**	 **Date**

Last Updated: 8/27/2020 12:37 PM

SCAN OF SIGNED SCENARIO COVER SHEET