PROGRAM: INITIAL LICENSE OPERATOR PROGRAM

COURSE: INITIAL LICENSE EXAMINATION (NRC 01)

TOPIC: DYNAMIC SIMULATOR EXAMINATION

LESSON: SGTL/R & SBLOCA **LESSON NO.:** ES-500-0101

APPROXIMATE TIME FOR INSTRUCTION: 90 min. **REVISION:** 2 (As Given)

INSTRUCTOR MATERIALS:

1. Lesson Guide
2. Attachment 1, Simulator Exercise Summary
3. Attachment 2, Simulator Documentation Record
4. Attachment 3, Scenario Objectives
5. Attachment 4, Shift Turnover

LESSON REFERENCES:

1. Technical Specifications
2. AOI 1.2 Steam Generator Tube Leak
3. POP 3.1 Plant Shutdown from Full Power Operations to Zero Power Condition
4. AOI 16.1.1 Dropped or Misaligned Rod / Rod Position Indicator Failure
5. AOI 28.5 Pressurizer Pressure Channel Fails High
6. EOP E-0 Reactor Trip or Safety Injection
7. EOP E-3 Steam Generator Tube Rupture
8. EOP ECA-3.1 SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired
9. SAO 124 Oral Reporting of Non-Emergency Events and Items of Interest

REMARKS:

1.

SUBMITTED: _____ **DATE:** _____

TECH REVIEW: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____

TRAINING SUPERVISOR

Total Malfunctions (5-8/scenario):

Prior to EOP Entry:
1. Leak, primary to secondary, 23 Steam Generator 40 gpd increase to 70 gpd over 10 minutes
2. Failure, instrument loop, Individual Rod Position Indication (IRPI) System, open circuit
3. Failure, instrument high, PT-455 Pressurizer pressure controller, selected channel fails high
4. Leak, primary to secondary, 23 Steam Generator increase to 500 gpm

After EOP Entry (1-2/scenario):
1. Failure, Auto Action, Auxiliary feedwater actuation circuit inoperable, 22 & 23 AFW pump
2. Leak, primary to containment atmosphere, 23 intermediate leg

Abnormal Events (2-4/scenario):
1. 23 Steam Generator Tube Leak
2. Individual Rod Position Indication signal loop failure open
3. Pressurizer Pressure controlling channel failure
4. Auxiliary Feedwater Actuation circuit failure to automatically start auxiliary feedwater pumps

Major Transients (1-2/scenario):
1. 23 Steam Generator Tube Rupture
2. Loss of Coolant Accident, 23 Reactor Coolant System intermediate leg

EOPs entered/requiring substantive actions (1-2/scenario):

1. E-3 Steam Generator Tube Rupture

EOP Contingencies requiring substantive action (0-2/scenario):
1. ECA-3.1 SGTR with Loss of Reactor Coolant - Subcooled Recovery Desired
2. ECA-3.2 SGTR with Loss of Reactor Coolant - Saturated Recovery Desired

Scenario run time (60-90 minutes):
90 minutes

EOP run time (40-70% of run time):
65%

Critical Tasks (2-3/scenario):

CT #	Task ID	Description
1	E-0 -- F	Establish the minimum required AFW flow rate to the SGs before transition out of E-0, unless transition is to FR-H-1, in which case the task must be initiated before RCPs are manually tripped in accordance with step 3 of generic guideline FR-H.1
2	E-1 -- C	Trip all RCPs so that CET temperatures do not become superheated when forced circulation in the RCS stops
3	E-3 -- A	Isolate feedwater flow and steam flow on the ruptured SG before a transition to ECA-3.1

Technical Specifications referenced during evaluation (1/scenario):

1. T/S 3.7.B.1.a 23Emergency Diesel Generator OOS
2. T/S 3.4.B.(1) Auxiliary Feedwater Pumps OOS
3. T/S 3.10.6 Individual Rod Position Indication System
4. T/S 3.10.3 Quadrant Power Tilt Limits
5. T/S 3.5 Instrumentation Systems

SIMULATOR SET-UP

1. Perform IC reset
2. Perform Simulator Check List
3. Initialize Simulator to 100% power MOL
4. Run Setup, 23 EDG OOS, 23 AFWP OOS, 21 CCP OOS
5. Place 23 EDG, 23 AFWP, 21 CCP in PULLOUT and Stop Tag
6. In MANUAL, run ES5000101 drill file

TIMELINE AND EXAMINER ACTIONS FOR SIMULATION

EVENT	INIT CUE	CONSOLE ENTRY	SYMPTOMS / CUES / DESCRIPTION
A	5 Minutes After Turnover	MAL RDS14C ACT,0,0.075,600,0,0,D	23 SGTL 40 to 70 GPD
B	Floor Instructor Directed	XMT CRF40 1,0,0,0D	IRPI Instrument Loop Failure
C	Floor Instructor Directed	XMT RCS28 1,2500,5,0,D	PZR Press controller PT-455 Failure
D1	Floor Instructor Directed	MAL RCS14C ACT,20,10,0,0,D	23 SGTR 500 gpm
D2	Floor Instructor Directed	MAL RCS4C ACT, 2,30,0,0,C	23 Intermediate Leg SBLOCA

	NAME	SM	WE	CRS	RO	BOP
SM:	**Position Not Manned**	X				
WE:	**Surrogate:**		X			
CRS:				X		
RO:					X	
BOP:						X

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	A	**23 SGTL 40 to 70 GPD** **AOI-1.2 Steam Generator Tube Leak** **POP-3.1 Plant Shutdown from Full Power Operations to Zero Power Condition** **Note:** DO NOT report leakage greater than 75 gpd Break starts out approximately 40 gpd and increases to 70 gpd over 10 minutes.					
____	1.	Check IF a significant increase is observed on R-45, perform the following: **Check:** R-45 Air Ejector Radiogas dose rates				___	
		Performs: Notify Health Physics Commence Leak Rate Estimate per Attachment 8 Dispatch an NPO to N-16 Rad Monitor			___		___
____	2.	VERIFY -45 Air Ejector Radiogas AUTOMATIC actions: **Check:** 21, 22, and 23 SJAE Discharge Valves - OPEN SJAE Blower - STARTS PCV 1229 and 1230 - OPEN			___	___	___
		Dispatch an NPO to PCV 1133 - OPEN					

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	3. VERIFY R-49 AUTOMATIC actions: **Check:** SG Blowdown Isolation valves - CLOSED: 1214, 1214A, 1215, 1215A, 1216, 1216A, 1217, 1217A Dispatch an NPO to check HCV 5046, 5047, 5048, 5049, 5050, 5051, 5052, 5053, and PCV 1227 - CLOSED			___	___	___
____	4. DIRECT Chemistry to perform Leak Rate Calculations **Check:** MAINTAIN steady state conditions while Chemistry performs Leak Rate Calculation			___		___
	Performs: PERFORM Attachment 5 at least once every 15 minutes.				___	
	Note: With numbers provided at turnover, the attachment calculation should be ~ 82 gpd.					
	INSTRUCTOR CUE: **As NPO sent to N-16 monitor, report 23 SGTL jumped from 5 gpd to 40 gpd and then increased to 70 gpd over 10 minutes. Leakrate is now stable at 70 gpd.**					

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	5.	CHECK Primary to Secondary Leak Rate: **Check:** Leak Rate - GREATER THAN 5 GPD Leak Rate - GREATER THAN OR EQUAL TO 30 GPD Leak Rate - GREATER THAN 75 GPD AND INCREASED BY 30 GPD IN THE LAST HOUR **Performs:** Determines 23 SGTL greater than 30 and less than 75 gpd **Note:** DO NOT report leakage greater than 75 gpd Time frame for Chemistry analysis results from time of sample to Control Room report is approximately 1 hour			___	___	___
____	6.	PERFORM a Normal Plant Shutdown per POP 3.1 concurrently with this procedure **Check:** Leakage in excess of 30 gpd and less than 75 gpd **Performs:** Hot Shutdown within 24 hours			___	___	___
____	7.	ENSURE necessary notifications are performed per SAO 124.			___		
____	8.	Direct Chemistry to calculate AND plot leak rate every 2 hours per IPC-A-110 Verify leak rate is consistent with DRMS AND N-16 indications.			___	___	___
____	9.	DIRECT Chemist to obtain grab samples for each S/G blowdown/activity of each SG					

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	10. CHECK 23 SG Atmospheric Steam Dump Pressure Controller at 74% (1030 psig) **Performs:** PCV-1136, 23 SG set to app. 74%, 1030 psig				___	
____	11. Isolate Blowdown On Affected Steam Generator **Checks:** PCV-1216, 23 SG Isol. Vlv 1 PCV-1216A, 23 SG Isol. Vlv 2					___
____	12. Check 22 AND 23 SGs - INTACT **Performs:** - Declare LCO per Technical Specification 3.4.B.(1)b - Trip PCV-1139 22 AFW pump steam stop valve - Dispatch operator to isolate steam supply from ruptured SG(s) to turbine-driven AFW pump, MS-42 (23 SG) - After ruptured SG is isolated, place PCV-1139 22 AFW pump steam stop valve in AUTO			___	___	___
____	13. PERFORM the appropriate attachments(s): Attachment 3 - 23 Steam Generator Isolation **INSTRUCTOR CUE:** **Role-play Shift Manager - Inform CRS that another licensed operator will complete Attachment 3 - 23 Steam Generator Isolation AND direct the CRS to commence the shutdown at 200 MW/hr**			___	___	___
____	14. **POP 3.1 PLANT SHUTDOWN FROM FULL POWER OPERATION TO ZERO POWER OPERATION**					
____	15. REQUEST Test Group to determine if Pressurizer Level instrumentation must be recalibrated. **Note:** Pressurizer Level instrumentation must be recalibrated			___		

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	16. ENSURE LCV-1129 Hotwell M/U return to CST is closed, isolated locally per SOP-20.2 **Check:** LCV-1129 Condensate Return Line closed and locally isolated			—		—
	Note: LCV-1129 is locally isolated					
____	17. During load reduction: BORATE per SOP 3.2, as necessary to maintain control banks above insertion limits required by Graph RPC-1A, Rod Bank Insertion Limit - four Loop Operations			—		
	- IF necessary, PLACE rod control in MANUAL to maintain above the Insertion Limit				—	
	18. MAINTAIN delta flux within the target band				—	
____	19. MONITOR condenser sextants for sodium increase. USE Computer Chemical Information System					—
____	20. ENSURE Tave AND Pressurizer Level are maintained on program per Graph RCS-2, Pressurizer Level V.S. Tave				—	
____	21. MAINTAIN Steam Generator levels between 40 AND 50 percent Narrow Range.				—	
____	22. NULL manual setpoint on feedwater regulating valve control to facilitate rapid transfer from AUTOMATIC to MANUAL control.				—	
____	23. NOTIFY nuclear AND conventional NPOs that load reduction is in progress.			—		

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	24. DIRECT NPOs to perform the following during load reduction: - MONITOR Main Turbine Oil Temperatures - MONITOR Hydrogen Seal Oil Temperatures - MONITOR MBFP Oil Temperatures - BALANCE Heater Drain Tank Pump flows between the pump in Auto AND Manual per SOP 19.1 - IF SJAEs are in service, MAINTAIN Steam Pressure per SOP 20.1 AND periodically CHECK SJAEs for backfiring - IF FCV-1120 is in MANUAL, ADJUST to maintain FCV-1113 closed.			—		
____	25. INITIATE load decrease: - Intermittently LOWER Governor Control			—		
	EVALUATOR CUE: **Allow the operating crew to reduce power by greater than 5 % nuclear power then initiate the next event.**				—	

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**B IRPI Instrument Loop Failure**					
	AOI 16.1.1: Dropped or Misaligned Rod / Rod Position Indicator Failure					
____	1. DETERMINE power has NOT been lost to the Individual Rod Position Indication system, VERIFY no rods have dropped using the following secondary indications: - Power range flux tilt - RCS Temperature **Perform:** Verify NI's flux tilt and RCS Temperature			___	___ ___	___
____	2. DETERMINE Turbine load reduction is NOT required: - T-AVE Equal to T-REF				___	
____	3. ENSURE PORV block valves 535 and 536 CLOSED once conditions have stabilized.				___	
____	4. ENSURE Loss of Load interlock RESET once conditions have stabilized				___	
____	5. USE digital voltmeter at the RPI drawer AND RPI graphs (RPC-3 in Graph Book) to determine the nature of RPI failure: **INSTRUCTOR NOTE: I&C should report 3.345 volts indicated at the RPI drawer when requested to obtain voltage readings**					___
____	6. DETERMINE DVM at the RPI drawer indicates expected rod position (within misalignment limitations of step counter position), flight panel indicator has failed. Continue normal operation using DVM at the RPI drawer to monitor rod position. **EVALUATOR CUE:** **After the crew determines that the RPI has failed, initiate the next event.**					___

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	C	**PZR Press controller PT-455 Failure**					
		AOI 28.5 Pressurizer Pressure Channel Fails High					
____	1.	Obtain correct procedure: AOI 28.5 Pressurizer Pressure Channel Fails High			—		
____	2.	Identify failed channel: PT-455 fails high.			—	—	
____	3.	PLACE Pressurizer Pressure control in MANUAL					
____	4.	STABILIZE Pressurizer Pressure at 2235 psig.				—	
____	5.	In Foxboro Rack B6, PLACE the Pressurizer Pressure Defeat Switch (P/455A) to defeat 1&4				—	
		Note: This action places channel 3 in control for Pressurizer pressure.					—
____	6.	RETURN Pressurizer Pressure control to AUTO.			—	—	
____	7.	DETERMINE if placing the bistable trip switches for the affected channel to TRIP would cause a Reactor Trip CHECK Bistable status panel - NO White/Blue/Yellow Pressure trips active.			—		—
____	8.	Place the bistable(s) for the affected channel in TRIP					
		PC-455B Hi Press Trip Red rack A-4 (UP)					—
		PC-455A Lo Press Trip Red rack A-4 (UP)					—
		PC-455E SI Red rack A-4 (UP)					—
		PC-455C Unblock SI Red rack A-4 (UP)					—
		TC-411A Overtemp Trip Red rack A-4 (UP)					—
____	9.	Ensure that the requirements of Technical Specification Tables 3.5-2 AND 3.5-3 are met.					—

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
		EVALUATOR CUE: **After the crew determines that the Technical Specification minimum channels are still being met, insert the next event**					
____	**D**	**23 SGTR 500 gpm** **And** **23 Intermediate Leg SBLOCA**					
		E-0 Reactor Trip or Safety Injection					
____		Initiate Manual Reactor Trip and Safety Injection					
		Performs: DEPRESS Reactor Trip and Initiate Safety Injection PBs when leakage exceeds capacity of 2 charging pumps			___	___	
____	1.	Verify Reactor Trip					
		Checks: Rod Bottom Lights – LIT Reactor Trip Breakers – OPEN Rod Position Indicators - AT ZERO Neutron Flux – DECREASING					
____	2.	Verify Turbine Trip				___	
		Checks: Turbine Stop valves – CLOSED Turbine Governor valves – CLOSED				___	
____	3.	Check if SI is actuated					
		Checks: SI Annunciator – LIT (Low PRZR Pressure) SI System pumps – RUNNING				___	___
____	4.	Generator Output breakers - OPEN					
		Checks: Breakers 7 & 9 OPEN				___	

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	5. AC 480V Busses - At Least One Energized **Checks:** 2A AND 3A, OR 5A, OR 6A Breaker alignment and voltage					___
____	6. AC 480V Busses - all energized by Offsite Power **Checks:** 2A AND 3A, AND 5A, and 6A Breaker alignment and voltage			___	___	___
____	7. Verify RCP seal cooling **Performs:** Start one charging pump Align charging pump suction to the RWST OPEN LCV-112B CLOSE LCV-112C [RCS M/U Control Stop]				___	___
____	8. Verify power to lighting and MCCs **Checks:** All 480V busses energized by offsite – **Performs:** Dispatch NPO to: Reset lighting Reset all MCCs except MCC 28 and MCC 28A Ensure MCC 24, MCC 27, and MCC29 energized					
____	9. Verify CCW System Operation **Checks:** 3 CCW pumps running					___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	10. Verify FW Isolation **Checks:** MBFPs - TRIPPED -Amber light-LIT MBFP Discharge valves - CLOSED SG Blowdown Isolation valves - CLOSED				___	___
____	11. Verify Proper Emergency SI Valve Alignment **Checks:** SI Pump Cold Leg Inj. Valves, 856A, C, D, & E OPEN RHR Hx CCW Outlet valves 822A & B OPEN RHR Hx Motor operated valves 746 & 747 OPEN					___
____	12. Verify AFW Pumps Running **Checks:** Motor Driven Pumps - running Turbine driven pump - running if necessary **Performs:** Starts 21 Motor Drive Auxiliary Feedwater Pump **Dispatch an NPO** to investigate/Start the 22 AFW pump **NOTE:** Only Motor driven pumps receive auto start signal on SI					___
____	13. Verify SI System Pumps Running **Checks:** Three SI pumps - running 22 SI pump discharge isolation MOV-851A & MOV-851B - OPEN Two RHR pumps – running				___	___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	14. Verify Proper Service Water System Operation **Checks:** Three service water pumps - running on Essential Header Service water valves from Diesel Generator - OPEN [1276 and 1276A]					___
____	15. Verify Containment Fan Cooler Units – In Service **Checks:** 5 Containment Recirc Fans - running Charcoal filter valves - OPEN [Inlets and Outlets] Fan normal discharge valves – CLOSED Service water containment recirc.[TCV-1104 & 1105] OPEN					___
____	16. Verify Containment Ventilation Isolation **Checks:** Containment Purge valves: FCV-1170 through 1173 CLOSED [Air Inlets and Outlets] Containment Pressure Relief valves: PCV-1190 through 1192 CLOSED					___
____	17. Verify Containment Isolation Phase A **Checks:** Phase A actuated Phase A valves CLOSED [Red lights on TWO IS TRUE Pnl] IVSW valves 1410, 1413, 3518, & 3519 OPEN WCP system valves PCV-1238, 1239, 1240, & 1241 OPEN **Performs:** Places Personnel and Equipment hatch solenoids to INCIDENT on SM panel					___
____	18. Verify CCR Air Conditioner Status **Checks:** Train A and B running in INCIDENT Mode 2					___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	19. Check if Main Steamlines Should be Isolated **Checks:** High Steamflow with Low Tave or Low Steamline Pressure, and Containment Pressure ever >24 psig				___	___
____	20. Check if Containment Spray Should be Actuated **Checks:** Containment Pressure remained below 24 psig			___		___
____	21. Verify SI Pump Flow **Check:** RCS Pressure <1660 psig (1690 psig) Check SI pump flow indicators					___
____	22. Verify RHR Pump Flow **Check:** RCS Pressure <320 psig (340 psig) Check RHR pump flow indicators					___
	Performs: Place an RHR pump in pullout if - RCS pressure is >320psig (340psig)					___
____	23. Verify TOTAL AFW Flow greater than 400 gpm **Check:** Greater than 400 gpm total flow					___
	INSTRUCTOR NOTE: **If NPO was dispatched back in step 12 to investigate 22 AFW pump start failure.** **Remove LOA failure on 22 AFW pump and Report, as NPO, that trip throttle valve on 22 AFW pump needed reset. 22 AFW pump is now running.**					

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**MINIMUM AFW FLOW ESTABLISHED TO SGs CT # 1 (400 gpm) complete.**					
____	24. Verify AFW Flow to ALL SGs **Check:** AFW flow to ALL Steam Generators					___
	Note: Feed flow to 23 SG should be isolated.					
____	25. Align Service Water System **Check:** Service Water System aligned for THREE HEADER OPERATIONS					
	Ensure closed SWN-4 & SWN-5					___
____	26. Check RCS Temperatures **Expected:** RCS Average Temp Stable or Trending to 547 F RCS Cold Leg Temp Stable or Trending to 547 F				___	
	If temperature less than 547 F and decreasing **Performs:** Stop dumping steam Isolate unnecessary steam loads If cooldown continues reduce AFW flow as required If cooldown continues close MSIVs					___ ___ ___ ___
	If temperature greater than 547 F and increasing **Performs:** Dump steam				___	
____	27. Check PZR PORVs **Expected:** PORVs Closed				___	

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	28. Check Normal PZR Spray Valves **Expected:** Normal Spray Valves Closed				___	
____	29. Check Auxiliary Spray Valve **Expected:** Auxiliary Spray Valve Closed					___
____	30. Check if RCP Should be Stopped **Check:** SI Pumps - AT LEAST ONE RUNNING RCS subcooling based on Core Exit TCs LESS THAN 24F (31F FOR ADVERSE CONTAINMENT) **Performs:** Stops all Reactor Coolant Pumps				___	___
____	31. Check if Any SG Secondary Pressure Boundary is Faulted **Check:** Any SG Press decreasing in uncontrolled manner Any SG completely depressurized				___	
____	32. Check if SG Tubes are intact **Check:** No SG Level increasing in uncontrolled manner R-45 Normal R-49 Normal R-28,29,30,31 Normal **Performs:** Identify 23 Steam Generator Tube Rupture Identify that a transition to E-3, STEAM GENERATOR TUBE RUPTURE, is required.			___	___	___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**E-3, STEAM GENERATOR TUBE RUPTURE**					
____	1. Obtain correct procedure			___		
____	2. Check if RCPs Should be Stopped					
	Checks: SI Pumps - AT LEAST ONE RUNNING RCS subcooling based on Core Exit TCs LESS THAN 24F (31F FOR ADVERSE CONTAINMENT)				___	
	Performs: Stops all Reactor Coolant Pumps					___
	NOTE: Continuous action step RCPs expected secured					
____	3. **RCPs TRIPPED IF A LOSS OF SUBCOOLING OCCURS AND AN SI PUMP IS RUNNING CT # 2**					
____	4. Identify Ruptured SG(s)					
	Checks: Unexpected rise in any SG narrow range level High radiation from any SG sample High radiation on R-28, 29, 30, and 31 High radiation from any SG blowdown on R-49				___	
____	5. CHECK 23 SG Atmospheric Steam Dump Pressure Controller at 74% (1030 psig)				___	
	Performs: PCV-1136, 23 SG set to app. 74%, 1030 psig					
____	6. Check ruptured SG atmospheric steam dump valve - CLOSED					
	Checks: SG Atmospheric verified closed					___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	7. Verify Blowdown isolation valve(s) from ruptured SG(s) - CLOSED **Checks:** Blowdown isolation valves closed				___	
____	8. Verify at least one motor-driven AFW pump - RUNNING **Checks:** Motor-driven AFW pump status 23 motor driven AFW pump in service					___
____	9. Check 22 and 23 SGs – INTACT **Performs:** Close turbine-driven AFW Pump steam supply valve PCV-1139				___	___
____	10. Dispatch operator to perform the following: **Performs:** Dispatch operator to: Close steam traps upstream of ruptured SG(s) MSIV Ensure ruptured SG(s) MSIV bypass valve - Closed			___		___
____	11. Close ruptured SG(s) MSIV(s) **Performs:** Close ruptured SG(s) MSIV(s) **INSTRUCTOR NOTE:** **Insert malfunction for LOCA on loop 3 when 23 MSIV is closed**					___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	12. Check ruptured SG(s) level **Checks:** Narrow range level >9% (26%) **Performs:** Stops feed flow to 23 SG when NR level >9%.				___	
____	13. **RUPTURED SG IDENTIFIED AND ISOLATED** **CT # 3 complete**			___	___	___
____	14. Check PZR PORVs and Block Valves - CLOSED **Checks:** Power available to block valves PORVs CLOSED **NOTE:** This is a continuous action step				___	
____	15. Check if any SG is Faulted **Checks:** Any SG pressure decreasing in an uncontrolled manner or completely depressurized				___	
____	16. Check Intact SG Levels **Checks:** Narrow Range SG level >9% (26%) **Performs:** Controls feed flow to maintain between 9% (26%) and 52% **NOTE:** This is a continuous action step				___	

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	17. Check CCW Pump status **Check:** CCW Pumps running **Performs:** Places CCW pump control switches in pullout if not running					___
____	18. Place controls for main feedwater and bypass feedwater regulating valves in CLOSE **Performs:** Place controls for main feedwater and bypass feedwater regulating valves in CLOSE				___	
____	19. Ensure Automatic Safeguards Actuation Key switches on Panel SB-2 in DEFEAT **Performs:** Places key switches to DEFEAT					___
	20. Depress Safety Injection Reset Pushbutton (Panel-SB2) Train A Train B					___
____	21. Verify SI Reset Relays SIA-1, SIA-2, SIM-1, and SIM-2 VERTICAL POSITION					___
____	22. Place IVSW switches to OPEN **Performs:** Place IVSW switches to OPEN [SOV3518,3519,1410, and 1413]					___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	23. Place Containment Rad Monitor WCPS Valve switch to OPEN **Performs:** Places CNTMT RAD MON WCPS valves to open[1238 and 1241					___
____	24. Personnel and Equipment Hatch Solenoid switches to INCIDENT **Performs:** Places Personnel and Equipment Hatch Solenoid switches to the INCIDENT mode.					___
____	25. Place ALL remaining phase "A" Valves switches in CLOSE **Performs:** Places ALL remaining Phase "A" valves switches to CLOSE [Yellow plaques]					___
____	26. Reset Phase "A" Containment Isolation **Performs:** Depress Phase "A" Containment Isolation reset pushbuttons Train A Train B					___
____	27. Verify Train A and B Reset **Checks:** Phase "A" Containment Isolation Train A and Train B reset Relays CA-1 and CA-2 VERTICAL POSITION					___
____	28. Check Phase "B" Actuated **Checks:** Check Containment Isolation Phase "B" actuation **Expected:** Operator proceeds to next step as Phase "B" should not have actuated					___

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	29. Establish Instrument Air to Containment **Required Actions:** Open PCV-1228					—
____	30. Check Ruptured SG(s) pressure **Checks:** Ruptured SG pressure >440 psig				—	
____	31. Determine required core exit temperature from table **Checks:** Ruptured SG pressure			—	—	
____	32. Transfer steam dump to pressure mode and dump steam to condenser from intact SG(s) at maximum rate not to exceed 0.5E6 lbs/hr **Performs:** Transfers steam dump controller to pressure mode Dump steam at maximum rate not to exceed 0.5E6 lbs/hr				—	
____	33. Core Exit TCs - less than required temperature **Checks:** Core exit TCs **Performs:** Stops cooldown and maintain required core exit temperature					—
____	34. Establish Charging flow **Checks:** Charging Pump – one running Charging pump suction aligned to the RWST Charging pump speed to maximum **NOTE:** This step should be performed during cooldown				—	

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	35. Caution prior to Step 14 specifies RCS cooldown must be completed prior to continuing			___		
____	36. Check Ruptured SG(s) pressure - stable or increasing				___	
____	37. Check core exit TCs greater than value from table					
	Checks: RCS pressure and obtains desired subcooling value RCS subcooling against value obtained				___	
	Performs: Identify that a transition to ECA-3.1, STGR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, is required			___		

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	D	**ECA-3.1** **SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED**					
____	1.	Obtain correct procedure			___		
____	2.	Reset SI **Checks:** Safety Injection Reset			___		
____	3.	Reset Containment Isolation Phase "A" and "B" **Checks:** Containment Isolation Phase "A" RESET Containment Isolation Phase "B" NEVER ACTUATED			___		
____	4.	Establish Instrument Air to Containment **Checks:** Instrument Air aligned to Containment			___		
____	5.	Verify ALL 480V Busses - Energized by Off-site power **Checks:** ALL 480V Busses energized by Off-site power					___
____	6.	Restore Ventilation Systems **Checks:** Radiation Monitors R-43 and R-44 IN SERVICE Verify adequate power to restore PAB ventilation Restore PAB ventilation on buss supplied by off-site power Dispatch operator to locally start one 480V switchgear room exhaust fan, 213 or 215 or 216 Verify at least one cable tunnel exhaust fan running			___	___	___
____	7.	Check if Containment Spray should be STOPPED **Checks:** Containment Spray pumps running			___		

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	8. Check if RHR Pumps should be stopped **Checks:** RCS Pressure greater than 320 psig (340 psig) RCS Pressure stable or increasing **Performs:** Stop RHR Pumps and place in AUTO				—	—
____	9. Check Ruptured SG(s) Levels **Checks:** Narrow Range greater than 9% **Performs:** Stop feed flow to ruptured SGs				—	—
____	10. Initiate Evaluation of Plant Status **Checks:** PAB radiation normal Operating safeguards equipment for proper operation **Performs:** Obtains samples Places plant equipment in service as necessary to assist in recovery			—		
____	11. Establish Charging Flow **Checks:** Charging pump – one running Charging pump suction aligned to the RWST Establish maximum charging flow – start additional charging pumps					—
____	12. Check if ANY SG Secondary Pressure Boundary is Faulted **Checks:** Pressures in all Steam Generators - Any decreasing in an uncontrolled manner or completely depressurized					—

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	13. Check Intact Steam Generator levels **Checks:** Narrow range level greater than 9% (26%)					
____	14. Initiate RCS Cooldown to Cold Shutdown Performs: RCS cooldown maintaining cooldown rate in RCS cold legs less than 100F/hr **TERMINATE THE DRILL AFTER THE RCS COOLDOWN HAS BEEN STARTED.**					

TIME EVENT/EXPECTED OPERATOR RESPONSE:

SM WE CRS RO BOP

EMERGENCY PLAN

Evaluated by job performance measure.

1. Classifies event as an **ALERT** (3.1.2)

TERMINAL OBJECTIVES

00960 Utilize references and indications to identify and quantify Steam Generator primary to secondary leaks, and implement contingency actions to mitigate adverse consequences

ENABLING OBJECTIVES

2884 Demonstrate the ability to perform the required actions to decrease Turbine Load from 100% to 50%

2894 Demonstrate the ability to perform the required actions for a Steam Generator Tube Leak

2984 Demonstrate the ability to perform the required actions for a small break LOCA

2964 Demonstrate the ability to perform the required actions for a Pressurizer Pressure channel failing high

2994 Demonstrate the ability to perform the required actions for a Reactor trip or Safety Injection (E-0)

3015 Demonstrate the ability to perform the required actions for a SGTR with Loss of Reactor Coolant, Subcooled Recovery Desired (ECA-3.1)

Watch Crew Turnover Sheet:

Date/Time:	TODAY	**Condition:**	Power Ops
RCS Temp:	559°F	**% Power:**	100%
RCS Press:	2235 psig	**MW Gross:**	990
PZR Level:	45%	**River Water:**	66°F
RCS Total Leakage:	0.4 gpm	**Boron Conc:**	805 ppm
RCS Unidentified Leakage:	0.4 gpm	**Rod Position:**	220 CBD

Xenon:	Equilibrium	**RCS Total Act:**	$2.85E^{-1}$ µCi/cc
EFPD:	30	**Air In-Leakage:**	19.0 SCFM
PZR Press Control:	Channel 1		
PZR Level Control:	Channel 2		
Service Water:	3 Header Ops		

Risk Assessment:	YELLOW	**Daily Risk Factor:**	10.8

Plant Equipment Status:

1. 23 Emergency Diesel Generator, Out of Service, 6 hours ago. Mechanical Maintenance and FIN troubleshooting high differential pressure on the fuel oil duplex strainers. Fuel oil supply system is disassembled. Tech Spec 3.7.B.1.a (7 day LCO) entered.
2. 23 Motor Driven Auxiliary Feedwater Pump, Out of Service, 48 hours ago, pump disassembled due to excessive leakage on the inboard seal package. Mechanical Maintenance working, expected back for surveillance test within 12 hours. Tech Spec 3.4.B.1.(1).a) (72 hour LCO) entered.
3. 21 Charging Pump, Out of Service, 3 weeks ago, needs replacement of hydraulic coupling vane packages, awaiting qualification of parts from manufacturer.
4. 23 S/G has 5 gallon per day steam generator tube leakage by Chemistry report.
5. 11 Centac Air compressor Out of Service, awaiting parts for inner cooler.
6. 22 Condenser - Increased air in-leakage, Vendor to inspect later today.
7. From the Con Edison System Operator - "A thunderstorm warning is in effect for the next 4 hours for the Greater New York City Metropolitan Area and the lower Hudson Valley Regions."

Instructions to the Shift:

1. Maintain 100% power.

PROGRAM: INITIAL LICENSE OPERATOR PROGRAM

COURSE: INITIAL LICENSE EXAMINATION (NRC 02)

TOPIC: DYNAMIC SIMULATOR EVALUATION

LESSON: LOSS OF OFF-SITE POWER AND STATION BLACKOUT **LESSON NO.:** ES-500-0102

APPROXIMATE TIME FOR INSTRUCTION: 90 min. **REVISION:** 2 (As Given)

INSTRUCTOR MATERIALS:

1. Lesson Guide
2. Attachment 1, Simulator Exercise Summary
3. Attachment 2, Simulator Documentation Record
4. Attachment 3, Scenario Objectives
5. Attachment 4, Shift Turnover
6. DSR-4A Unit 2 Quadrant Power Tilt forms

LESSON REFERENCES:

1.	POP	1.3	Plant Startup from Zero Power Conditions to Full Power Operation
2.	SOP	20.2	Condensate System Operation
3.	AOI	13.1.3	Power Range Channel Failure
4.	SOP	13.1	Nuclear Instrumentation System Operation
5.	AOI	28.12	Steam Generator Level Channel Fails Low
6.	AOI	16.1.1	Dropped or Misaligned Rod/Rod Position Indicator Failure
7.	AOI	20.1	Loss of Condenser Vacuum
8.	EOP	E-0	Reactor Trip or Safety Injection
9.	EOP	ES-0.1	Response to Reactor Trip
10.	AOI	27.0	Diagnosis and Response to Electrical Failure
11.	AOI	27.1.13	Loss of 480V Bus
12.	EOP	ECA-0.0	Loss of All AC Power

REMARKS:

1.

SUBMITTED: _____ **DATE:** _____

TECH REVIEW: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____

TRAINING SUPERVISOR

Total Malfunctions (5-8/scenario):

Prior to EOP Entry:

1. Power Range N-44 fails high
2. 21 Steam Generator level transmitter LT-417B fails low
3. Rod N-3 drops

After EOP Entry (1-2/scenario):

1. 21 EDG fails to start
2. 22 EDG fails to start

Abnormal Events (2-4/scenario):

1. Power Range N-44 failure AOI-13.1.3
2. 21 Steam Generator level transmitter LT-417B failure AOI-28.12
3. Rod N-3 drops AOI-16.1.1

Major Transients (1-2/scenario):

1. Loss of Condenser vacuum
2. Loss of Offsite power

EOPs entered/requiring substantive actions (1-2/scenario):

1. E-0
2. ES-0.1

EOP Contingencies requiring substantive action (0-2/scenario):

1. ECA-0.0

Scenario run time (45-60 minutes, one scenario may approach 90 minutes):

90 minutes

EOP run time (40-70% of run time):

70%

EXERCISE: LOSS OF CONDENSATE PUMP / SGTR / SEAT LEAKAGE PZR PORV AND BLOCK VALVE **SCENARIO** ES-500-0102

QUANTITATIVE ATRIBUTES PER NRC EXAMINERS STANDARD ES-302

Critical Tasks (2-3/scenario):

CT #	Task ID	Description
1	E-0 -- C	Energize at least one AC emergency bus before transition out of E-0/ES-0.1, unless the transition is to ECA-0.0, in which case the critical task must be performed before placing safeguards equipment handswitches in the pull-to-lock position
2	ECA-0.0 -- G	Depressurize the intact SG(s) at the maximum rate such that all the following limiting conditions are met: - SG depressurization is not initiated until narrow-range level in at least one intact SG is greater than 4% - If narrow-range level cannot be maintained greater than 4% in at least one intact SG (after depressurization is commenced), then SG depressurization is stopped until narrow-range level is restored to greater than 4% in at least one intact SG - SG pressure does not decrease to less than 130 psig - RCS cold leg temperature does not decrease to less than 243F - If a positive SUR is indicated on either the source range or the intermediate range (after depressurization is commenced), then SG depressurization is stopped and the RCS is allowed to heatup
3	ECA-0.0 -- H	Isolate RCP seal injection before a charging pump starts or is started

Technical Specifications referenced during test (1/scenario):

1. T/S 3.7.B.1.a 23 Emergency Diesel Generator OOS
2. T/S 3.4.B.(1).a 23 Motor Driven Auxiliary Feedwater Pump OOS
3. T/S 3.5 Power Range Nuclear Instrumentation OOS
4. T/S 3.10 Dropped Rod
5. T/S 3.7 Electrical Distribution

SIMULATOR SET-UP

1. Perform IC reset
2. Perform Simulator Check List
3. Initialize Simulator to 89% power.
4. Run Setup, 23EDG OOS, 23AFWP OOS, 21CCP OOS
5. Place 23 EDG, 23AFWP, 21 CCP in PULLOUT and Stop Tag
6. Stop 22 Condensate pump and ensure '22 Condensate Pump Auto Start ON'
7. In MANUAL run ES5000102 drill file

TIMELINE AND EXAMINER ACTIONS FOR SIMULATION

EVENT	INIT CUE	CONSOLE ENTRY	SYMPTOMS / CUES / DESCRIPTION
A	Floor Instructor Directed	MAL NIS4D ACT,120,12,0,0,D	Power Range N-44 fails high
B	Floor Instructor Directed	XMT SGN14 1,0,40,0,D	21 Steam Generator level transmitter LT-417B fails low
C	Floor Instructor Directed	MAL CRF2A ACT,N3,2,0,0,D	Rod N-3 drops
C	60 seconds after Rod N-3 drops	MAL CRF2A CLR	Clear malfunction for Rod N-3 dropping
D	Floor Instructor directed	MAL CFW4B ACT,100,240,0,0,D	Loss of vacuum 22 Condenser
E	Conditional On timer	MAL SWD2C ACT,540,0,C, JI:P.NE.0	Loss of Off-Site Power
	Floor Instructor directed	MAL DSG3A CLR	Clear malfunction on 21 EDG

	NAME	SM	WE	CRS	RO	BOP
SM:	**Position Not Manned**	X				
STA:	**Surrogate:**		X			
CRS:				X		
RO:					X	
BOP:						X

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____		**Power Escalation**					
____	1.	Obtain correct procedure POP-1.3 Plant Startup From Zero Power To Full Power Operation			—		
____	2.	Obtain SOP-20.2 Condensate System Operation for placing 22 Condensate Pump in service.			—		
____	3.	Place Unit Aux Tap Changer in manual and adjust 480V bus voltage to within specs on DSR-1 for 480V bus voltage					—
____	4.	Start 22 Condensate Pump					—
____	5.	Place Unit Aux Tap Changer in Auto					—

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**A**	**Power Range N-44 fails high**					
____		Obtain correct procedure AOI-13.1.3 Power Range Channel Failure			___		
____	1.	Place rod control to manual, (Crew may elect to restore Tave to Tref with rod withdrawal or load reduction.			___	___	
____	2.	Ensure the requirements of Tech Spec 3.10.10 and 3.10.2.9 are met			___		
____	3.	Verify remaining NIS channels are operable					
____	4.	Obtain SOP-13.1 Nuclear Instrumentation System Operation to remove channel from service				___	
____	5.	Obtain guidance from I&C and Rx engineering to determine which sections of procedure to perform if a partial failure			___		
		INSTRUCTOR CUE: **If necessary inform crew, as engineering, entire channel is to be removed from service**					
____	6.	Ensure Rod Control is in manual				___	
____	7.	PLACE the Overpower Rod Stop Bypass Switch to BYPASS for the failed channel (Miscellaneous Control and Indication Panel, Rack C-8)					___
____	8.	PLACE the Delta-T Defeat switch T/411A OR T/411B to DEFEAT (Foxboro Rack B-8) for the failed channel:					
		Performs: Place switch T/411B to DFEAT LOOP 4					___
____	9.	PLACE the NIS Dropped Rod Mode Switch (Power Range A Drawer) for channel 44 to BYPASS					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	10. Determine if tripping the OT delta-T bistables will cause a Reactor trip **Checks:** Bistable Status panel and determines that tripping the bistable will not cause a Reactor trip			—		—
____	11. Trip OT delta-T bistable in Foxboro Rack B-10					—
____	12. PLACE the Power Mismatch Bypass Switch (Miscellaneous Control and Indication Panel, Rack C-8) to BYPASS for channel 44					—
____	13. PLACE the Upper Section AND Lower Section Switches (Detector Current Comparator, Rack C-8) to defeat the failed channel N-44					—
____	14. PLACE the Comparator Channel Defeat Selector Switch (Comparator and Rate Drawer, Rack C-8) to defeat the failed channel N-44					—
____	15. TRIP all nuclear bistables associated with the failed channel by removing the Control Power Fuses for channel N-44					—
____	16. IF directed by the CRS, RESTORE Rod Control to AUTO					—
____	17. IF Reactor power remains above 75 percent, DETERMINE the core quadrant power balance daily with the movable detectors, using at least two thimbles per quadrant (Technical Specification 3.10.2.9)			—		
____	18. PERFORM a Manual Tilt calculation, using DSR-4A (preferred) OR DSR-4B **INSTRUCTOR CUE:** **As Shift Manager, inform CRS that another licensed operator will perform the manual QPTR calculation. AFTER 2 minutes, inform CRS that QPTR is SAT.**					—

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	19. Ensure compliance with Technical Specification 3.10.10 **After Technical Specifications have been referenced, Insert the next event.**			—		

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**B**	**21 SG Level transmitter LT-417B fails low**					
____	1.	Identify failed channel LT-417B, and refer to AOI 28.12 "Steam Generator Level Channel Fails Low"			__	__	
____	2.	Place affected steam generator feedwater regulator in MANUAL				__	
____	3.	Adjust steam generator level to programmed level				__	
____	4.	Place appropriate steam generator level bistable trip switches to TRIP **Performs:** Trips Loop 1B High Level bistable in Blue rack B-2 Trips Loop 1B Low Level bistable in Blue rack B-2					
____	5.	Ensure requirements of Technical Specification Table 3.5-1, 3.5-2, and 3.5-3 are met.			__		__

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	C	**Dropped Rod N-3**					
____	1.	Identify Rod N-3 dropped				___	
____	2.	Obtain correct procedure AOI-16.1.1 Dropped or Misaligned Rod/Rod Position Indicator Failure			___		
____	3.	Determines that load reduction is required			___	___	
____	4.	Adjust Turbine load			___	___	
____	5.	CHECK RPI AND Digital Volt Meter (DVM) at the RPI drawer to DETERMINE which rod(s) is dropped or misaligned **NOTE:** I&C reports that DVM voltage indicates Zero volts if requested			___		
____	6.	DETERMINE if rod(s) is dropped OR misaligned **Checks:** OBSERVE for deviation between power range channels OBSERVE NIS recorder for unexpected drop in power			___	___	
____	7.	RESET Dropped Rod Mode Switch on affected NIS channels					___
____	8.	DETERMINE Quadrant Power Tilt Ratio per SOP 15.3, AND ENSURE requirements of Technical Specification 3.10.3 are met. **INSTRUCTOR CUE:** **As Shift Manager, inform CRS that another licensed operator will perform the manual QPTR calculation. AFTER 2 minutes, inform CRS that QPTR is SAT.**			___		___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	9. ENSURE requirements of Tech. Spec. 3.10.5 (Rod Misalignment Limitations) are met. **After Technical Specifications have been referenced, Insert the next event.**			___		

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**D**	**Loss of Vacuum 22 Condenser**					
	1.	Identify loss of Turbine load due to loss of vacuum			—	—	—
____	1.	Obtain correct procedure AOI-20.1 Loss of Condenser Vacuum			—		
____	2.	Reduce Turbine load as required			—	—	
____	3.	DISPATCH NPO(s) to check the following: SJAE Air Lanes for backfiring OR failure Gland Steam Pressure Gland Seal Steam Drop Out Tank Level Hogger OR SJAE steam supply Indications of Air Inleakage			—		
____	4.	DISPATCH NPO to ensure both vacuum pumps in service per SOP 20.1			—		
____	5.	DETERMINE whether turbine trip is required **Checks:** Condenser vacuum decreases to less than that required by Figure 1 Vacuum differential between condensers exceeds 2 inches Hg. Turbine exhaust hood differential between condensers exceeds 30°F Turbine exhaust hood temperature exceeds 175°F for greater than 15 minutes Turbine Exhaust hood temperature exceeds 250°F			—		—

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____		**E-0 Reactor Trip or Safety Injection**					
		NOTE: Manual Reactor trip initiated due to loss of Condenser vacuum					
____	1.	Verify Reactor Trip					
		Checks: Rod Bottom Lights – LIT; Reactor Trip Breakers – OPEN; Rod Position Indicators - AT ZERO; Neutron Flux – DECREASING					
____	2.	Verify Turbine Trip				___	
		Checks: Turbine Stop valves – CLOSED; Turbine Governor valves – CLOSED				___	
____	3.	Check if SI is actuated					
		Checks: SI annunciator – LIT; SI System pumps – RUNNING				___	___
		NOTE: SI is not required. Transition to ES-0.1 is required					

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**ES-0.1 Reactor Trip Response**					
____	1. Generator Output Breakers Open and Gennerrex Excitation Off				—	
____	2. 6.9KV busses transferred to Busses 5 and 6					—
____	3. Check 480V Busses - At Least One Energized **Checks:** 2A AND 3A, OR 5A, OR 6A Breaker alignment and voltage					—
____	4. All 480V Busses - all energized by Offsite Power **Checks:** 2A AND 3A, AND 5A, and 6A Breaker alignment and voltage			—	—	—
	5. Start one charging pump				—	
____	6. Dispatch an NPO to Reset lighting Reset all MCCs except MCC 28 and MCC 28A Ensure MCC 24, MCC 27, and MCC29 energized **INSTRUCTOR NOTE:** **Loss of power is on a 3 minute T.D. EDG 21 will start but it's output breaker will fail to close. Crew should recognize and manually close EDG 21 output breaker. When EDG 21 trips, crew will transition to ECA 0.0 on page 19. (Remaining steps of ES-0.1 will not be performed)**			—		
____	Manually close EDG 21 Output breaker					—

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
	CT#1 Complete (E-0-C) **Energize at least one AC emergency bus before transition out of E-0/ES-0.1, unless the transition is to ECA-0.0, in which case the critical task must be performed before placing safeguards equipment handswitches in the pull-to-lock position**					
____	7. Check RCS Temperatures **Expected:** RCS Average Temp Stable or Trending to 547 F RCS Cold Leg Temp Stable or Trending to 547 F				___	
	If temperature less than 547 F and decreasing **Performs:** Stop dumping steam Isolate unnecessary steam loads If cooldown continues reduce AFW flow as required If cooldown continues close MSIVs					___
	If temperature greater than 547 F and increasing **Performs:** Dump steam				___	
____	8. Check FW status **Checks:** Checks RCS temperature less than 541 F Main Feed Regs closed Low Flow Feed Regs closed after 90 seconds Total Aux Feed flow greater than 400 gpm				___	___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	9. Verify Auto actions have occurred **Checks:** Heater Drain Tank pumps tripped 22 Condensate pump tripped Transformer cooling equipment shutdown (Local) Reheat steam supply valves closed Extraction steam Valves closed (Local if necessary) MBFP turbine reheat steam supply non-return "A" valves closed					
____	10. Verify all Control Rods fully inserted				—	
____	11. Check Pressurizer level control **Checks:** Charging in service Pressurizer level greater than 18% Letdown in service Pressurizer level trending to 37%				—	
____	12. Check Pressurizer pressure control **Checks:** Pressurizer pressure greater than 1840 psig Pressurizer pressure stable at or trending to 2235 psig				—	
____	13. Check SG levels **Checks:** Narrow range level greater than 9% **Performs:** Control feed flow to maintain narrow level between 9% and 52% if narrow level greater than 9%				—	—

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	14. All 480V Busses - all energized by Offsite Power **Checks:** 2A AND 3A, AND 5A, and 6A Breaker alignment and voltage					___
____	15. Check radiation monitors R-43/44 in service				___	
____	16. Restore PAB ventilation			___		
____	17. Locally start one 480V room exhaust fan			___		
____	18. Verify One Cable Tunnel fan in service					___
____	19. Transfer Condenser Steam Dumps to pressure mode				___	
____	20. Check MCC 28 and MCC 28A energized					___
____	21. Check RCP status at least one running					
____	22. Check Source Range detectors energized **Performs:** Transfers nuclear recorder to the Source Range scale					___
____	23. Shutdown unnecessary plant equipment Circulators not required Condensate pumps not required Service Water pumps not required			___	___	
____	24. Maintain stable plant conditions Pressurizer pressure at 2235 psig Pressurizer level at 37% SG narrow range levels 9% - 52% RCS temperature at 547 F					___
____	25. Place Main turbine and MBFP turbines on turning gear after shafts stop			___		

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	26. Determine if Cooldown is required **Performs:** Transition to POP-3.2 or POP-3.3 or ES-0.2			—		

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	E	**ECA-0.0 Loss of all AC Power**			—		
		NOTE: Loss of Offsite Power should occur when in ES-0.1					
____	1.	Obtain correct procedure ECA-0.0 Loss of all AC Power			—		
____	2.	Verify Reactor Trip					
		Checks: Reactor Trip Breakers - OPEN Neutron Flux - DECREASING				—	
____	3.	Verify Turbine Trip					
		Checks: Turbine Stop valves - CLOSED Turbine Governor valves - CLOSED				—	
____	4.	Check if RCS is Isolated					
		Checks: PZR PORVs - CLOSED LCV-459 and 200A, B, & C - CLOSED 213 - CLOSED				—	—
____	5.	Verify AFW flow greater than 400 gpm					
		Checks: Turbine-Driven AFW pump running					
		Required Actions: Aligns turbine-driven AFW pump flow control valves as necessary					—

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	6.	Generator Output breakers - OPEN **Checks:** Breakers 7 & 9 OPEN				—	
____	7.	Generrex excitation - OFF **Checks:** Generator Field Amps - Zero					—
____	8.	6.9KV busses transferred to busses 5 and 6					—
____	9.	**Instructor Cue:** **Report as SO/DO:** 138 KV is unavailable due to problems in Buchanan Switchyard					
____	10.	Check diesel generator status **Checks:** If any diesel generator running					—
____	11.	Dispatch NPO to attempt start of 21 and 22 EDGs			—		
____	12.	Check 480V Busses - At Least One Energized **Checks:** 2A AND 3A, OR 5A, OR 6A Breaker alignment and voltage					—

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	13. Place following equipment switches in Pullout: Spray Pumps SI pumps FCUs Motor-driven AFW pumps CCW pumps RHR pumps Turning Gear Oil pump Bearing Oil pump Turbine Auxiliary oil pump					____
____	14. Check Power available to any 480V busses 2A and 3A OR 5A OR 6A					____
____	15. Check 480 V bus switchgear and cabling available 2A and 3A OR 5A OR 6A					____
____	16. Check if any 480 V bus energized 2A and 3A OR 5A OR 6A					____

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	17. Dispatch personnel to locally isolate RCP seals			—		
	Performs: Places controls switches to CLOSE and directs NPO to locally close following valves: MOV-222, 250A, B, C, & D, and 789					—
	CT#3 Complete (ECA-0.0-H) **Isolate RCP seal injection before a charging pump starts or is started**					
____	18. Check if CST is isolated from hotwell					
	Performs: Verifies LCV-1128, 1128A, 1129, CD-6, & CT-8 CLOSED Places valve controllers to manual for LCVs					—
____	19. Check SG status					
	Checks: MSIVs CLOSED Main and Bypass Feedwater valves CLOSED Blowdown isolation valves CLOSED				—	
____	20. Check if any SG Pressure Boundary is faulted					
	Checks: Any SG pressure decreasing in an uncontrolled manner or completely depressurized				—	

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	21. Check if SG tubes intact **Checks:** SG level increasing in an uncontrolled manner Secondary radiation monitors R-45, R-49, and R-28, 29, 30 and 31 abnormal				—	
____	22. Check Intact SG Levels **Checks:** Narrow Range SG level >9% (26%) **Performs:** Controls feed flow to maintain between 9% (26%) and 52%				—	—
____	23. Check DC Bus loads **Performs:** Sheds all large non-essential DC loads Directs NPO to purge H_2 and shutdown DC seal oil pump Directs NPO to monitor DC power supplies and shed loads as necessary			—		
____	24. Check CST level >2 feet					—

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	25. Depressurize Intact S/Gs to <210 psig **Checks:** Narrow range level >9% (26%) in at least one SG **Performs:** Dumps steam to atmosphere until SG pressure <210 psig (but >110 psig) or RCS cold leg <325°F and maintains SG pressure constant. **CT#2 Complete (ECA-0.0-G)** **Depressurize the intact SG(s) at the maximum rate such that all the following limiting conditions are met:** - **SG depressurization is not initiated until narrow-range level in at least one intact SG is greater than 9%** - **If narrow-range level cannot be maintained greater than 9% in at least one intact SG (after depressurization is commenced), then SG depressurization is stopped until narrow-range level is restored to greater than 9% in at least one intact SG** - **SG pressure does not decrease to less than 130 psig** - **RCS cold leg temperature does not decrease to less than 243F** **If a positive SUR is indicated on either the source range or the intermediate range (after depressurization is commenced), then SG depressurization is stopped and the RCS is allowed to heatup**				—	

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	26. Check Reactor Subcritical **Checks:** Intermediate range channels - ZERO OR NEGATIVE STARTUP RATE				—	
	Source range channels - ZERO OR NEGATIVE STARTUP RATE					
____	27. Check SI Signal Status: **Checks:** SI – HAS NOT BEEN ACTUATED			—	—	—
____	28. Check CCW Pump status **Check:** CCW Pumps running					
	Performs: Places CCW pump control switches in pullout if not running					—
____	29. Place controls for main feedwater and bypass feedwater regulating valves in CLOSE **Performs:** Place controls for main feedwater and bypass feedwater regulating valves in CLOSE				—	
____	30. Ensure Automatic Safeguards Actuation Key switches on Panel SB-2 in DEFEAT **Performs:** Places key switches to DEFEAT					—

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	31. Depress Safety Injection Reset Pushbutton (Panel-SB2) Train A Train B					___
____	32. Verify SI Reset					___
____	33. Place IVSW switches to OPEN **Performs:** Place IVSW switches to OPEN					___
____	34. Place Containment Rad Monitor WCPS Valve switch to OPEN **Performs:** Places CNTMT RAD MON WCPS valves to open					___
____	35. Personnel and Equipment Hatch Solenoid switches to INCIDENT **Performs:** Places Personnel and Equipment Hatch Solenoid switches to the INCIDENT mode.					___
____	36. Place ALL remaining phase "A" Valves switches in CLOSE **Performs:** Places ALL remaining Phase "A" valves switches to CLOSE					___
____	37. Reset Phase "A" Containment Isolation **Performs:** Depress Phase "A" Containment Isolation reset pushbuttons Train A Train B					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	38. Verify Train A and B Reset **Checks:** Phase "A" Containment Isolation Train A and Train B reset					___
____	39. Verify Containment Ventilation Isolation **Checks:** Containment Purge valves: FCV-1170 through 1173 CLOSED Containment Pressure Relief valves: PCV-1190 through 1192 CLOSED					___
____	40. Check Containment pressure **Checks:** Containment pressure has remained less than 24 psig				___	
____	41. Checks Containment radiation **Checks:** Containment radiation less than 10 R			___	___	
____	42. Checks Core Exit TCs **Checks:** Core Exit TCs- less than 1200F					___
____	43. Stabilize SG pressures **Performs:** Manually control atmospheric steam dumps **Terminate scenario when SG pressures are stabilized or at the direction of the Lead Evaluator**					___

Comments:

TIME EVENT/EXPECTED OPERATOR RESPONSE:

SM WE CRS RO BOP

EMERGENCY PLAN

Evaluated by job performance measure.

1. Classifies event as an **Site Area Emergency** (6.1.4)

Comments:

TERMINAL OBJECTIVES

00931 Demonstrate the ability to perform actions for ECA-0.0 "LOSS OF ALL AC POWER"

ENABLING OBJECTIVES

2901 Demonstrate the ability to perform the required actions for a power range channel failing high

2972 Demonstrate the ability to perform the required actions for a steam generator level channel "B" failing low.

2903 Demonstrate the ability to perform the required actions for a dropped rod.

2906 Demonstrate the ability to perform the required actions for loss of condenser vacuum.

2915 Demonstrate the ability to perform the required actions for a loss of outside power (Unit Shutdown)

2994 Demonstrate the ability to perform the required actions for a reactor trip or safety injection (E-0)

3000 Demonstrate the ability to perform the required actions for a reactor trip response (E-0.1)

3009 Given specific conditions, establish priorities and state the required actions following a loss of all AC power (ECA-0.0)

Comments:

ATTACHMENT 4, SHIFT TURNOVER

Watch Crew Turnover Sheet:

Date/Time:	TODAY	**Condition:**	Power Ops
RCS Temp:	557°F	**% Power:**	89%
RCS Press:	2235 psig	**MW Gross:**	898
PZR Level:	44%	**River Water:**	66°F
RCS Total Leakage:	0.4 gpm	**Boron Conc:**	855 ppm
RCS Unidentified Leakage:	0.4 gpm	**Rod Position:**	212 CBD
Xenon:	Burning Out (-1 pcm/min)	**RCS Total Act:**	$2.85E^{-1}$ µCi/cc
EFPD:	30	**Air In-Leakage:**	19.0 SCFM
PZR Press Control:	Channel 1		
PZR Level Control:	Channel 2		
Service Water:	3 Header Ops		
Risk Assessment:	YELLOW	**Daily Risk Factor:**	10.8

Plant Equipment Status:

1. 23 Emergency Diesel Generator, Out of Service, 6 hours ago, Mechanical Maintenance and FIN troubleshooting high differential pressure on the fuel oil duplex strainers. Fuel oil supply system disassembled.
2. 23 Motor Driven Auxiliary Feedwater Pump, Out of Service, 48 hours ago, pump disassembled, excessive leakage on the inboard seal package, Mechanical Maintenance working, expected back for surveillance test within 12 hours.
3. 21 Charging Pump, Out of Service, 3 weeks ago, replacement of hydraulic coupling vane packages, awaiting qualification of parts from manufacturer.
4. 23 S/G has 5 gallon per day steam generator tube leakage by Chemistry report.
5. 11 Centac Air compressor Out of Service, awaiting parts for inner cooler.
6. 22 Condenser - Increased air in-leakage, Vendor to inspect later today.
7. From the Con Edison System Operator - "A thunderstorm warning is in effect for the next 4 hours for the Greater New York City Metropolitan Area and the lower Hudson Valley Regions."

Instructions to the Shift:

1. Increase power to 100% using POP-1.3 beginning at step 4.70. All prior steps have been completed in POP-1.3.

PROGRAM: INITIAL LICENSE OPERATOR PROGRAM

COURSE: INITIAL LICENSE EXAMINATION (NRC 04)

TOPIC: DYNAMIC SIMULATOR EVALUATION

LESSON: ATWAS AND LOSS OF SECONDARY COOLANT **LESSON NO.:** ES-500-0104

APPROXIMATE TIME FOR INSTRUCTION: 90 min. **REVISION:** 2 (As Given)

INSTRUCTOR MATERIALS:

1. Lesson Guide
2. Attachment 1, Simulator Exercise Summary
3. Attachment 2, Simulator Documentation Record
4. Attachment 3, Scenario Objectives
5. Attachment 4, Shift Turnover

LESSON REFERENCES:

1.	POP 1.3	Plant Startup from Zero Power Conditions to Full Power Operation
2.	SOP 27.1.6	Instrument Bus, DC Distribution, and PA System Inverter
3.	AOI 3.4	Uncontrolled Reactivity Addition
4.	AOI 27.1.6	Loss of Instrument Bus
5.	EOP E-0	Reactor Trip or Safety Injection
6.	EOP FR-S.1	Response to Nuclear Power Generation/ATWAS
7.	EOP E-2	Faulted Steam Generator Isolation

REMARKS:

1.

SUBMITTED: _____ **DATE:** _____

TECH REVIEW: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____

TRAINING SUPERVISOR

Total Malfunctions (5-8/scenario):

Prior to EOP Entry:

1. Boric Acid Blender totalizer failure
2. 22 Battery Charger output breaker opens
3. Loss of 22 Instrument Bus

After EOP Entry (1-2/scenario):

1. Automatic and manual Reactor trip failure
2. MOV-333 Emergency Boration Valve Failed Closed
3. 24 Steam Generator safeties fail open

Abnormal Events (2-4/scenario):

1. Blender totalizer failure AOI-3.4 Uncontrolled Reactivity Addition
2. 22 Battery Charger DC output breaker opens SOP-27.1.6
3. Loss of 22 Instrument Bus AOI-27.1.6 Loss of Instrument Bus

Major Transients (1-2/scenario):

1. ATWAS
2. 24 Steam Generator Safeties fail Open

EOPs entered/requiring substantive actions (1-2/scenario):

1. E-2 Faulted Steam Generator Isolation

EOP Contingencies requiring substantive action (0-2/scenario):

1. FR-S.1 Response to Nuclear Power Generation ATWS

Scenario run time (60-90):

90 minutes

EOP run time (40-70% of run time):

70%

Critical Tasks (2-3/scenario):

CT #	Task ID	Description
1	FR-S.1-A	Isolate the main turbine from the SGs before plant and scenario-specific criteria are exceeded
2	FR-S.1-C	Insert negative reactivity into the core by at least one of the following methods before completing the immediate-actions steps of FR-S.1 - De-energize the control rod drive MG sets - Insert RCCAs - Establish emergency boration flow to the RCS
3	E-2-A	Isolate the faulted SG before transition out of E-2

Technical Specifications referenced during test (1/scenario):

1. T/S 3.7.B.6 22 Battery Charger
2. T/S 3.7.B.1.a 23 Emergency Diesel Generator
3. T/S 3.4.B.1.(1).a) 23 Motor Driven Auxiliary Feedwater Pump

SIMULATOR SET-UP

1. Perform IC reset
2. Perform Simulator Check List
3. Initialize Simulator to 91% power.
4. Run setup 23 EDG OOS, 23AFWP OOS, 21CCP OOS, Primary Water totalizer failed, Reactor trip breakers failed as is, Fail all breakers on 2A and 6A to 6.9KV busses so that 2A cannot be de-energized, Fail MOV-333 Emergency Boration valve closed.
5. Place 23 EDG, 23 AFWP, 21CCP in PULLOUT and Stop Tag
6. In MANUAL, run ES5000104 drill file

TIMELINE AND EXAMINER ACTIONS FOR SIMULATION

EVENT	INIT CUE	CONSOLE ENTRY	SYMPTOMS / CUES / DESCRIPTION
A	Malfunction entered in Setup	SWI CVC42H ACT,1,0,D	Primary Water Totalizer failed
B	Floor Instructor Directed	LOA EPS890 F,0,D	22 Battery Charger DC breaker open
C	Floor Instructor Directed	LOA EPS152 F, 0, D LOA EPS893 F, 0, D	Loss of 22 Instrument Bus
D	Floor Instructor Directed		21 SG level channel fails low/ATWS Requiring Transition to FR-S.1
E	Floor Instructor Directed	PLP SGN14 100,0,D PLP SGN18 100,0,D PLP SGN22 100,0,D	24 Steam Generator Safeties (3) fail open

NAME	SM	WE	CRS	RO	BOP
SM: Position Not Manned	X				
WE: Surrogate:		X			
CRS:			X		
RO:				X	
BOP:					X

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
	1 Raise Reactor/Turbine Power to 98% Crew determines amount of dilution water required for turbine power increase.			—	—	—
	Commences RCS dilution					
	Raise turbine load by increasing governor control				—	
	EVALUATOR CUE: **After reactor power has been raised to 96%(or as instructed by lead evaluator), insert the primary water totalizer failure so the next dilution will be affected.**					—
	A Primary Water Totalizer Failed					
___	1. Primary Water Totalizer to Boric Acid Blender Totalizer Failure **Performs:** Place CVCS Makeup Control Switch to STOP				—	
	EVALUATOR NOTE: **Depending on how quickly the failure is recognized, there may not be the need to reference AOI-3.4 UNCONTROLLED REACTIVITY ADDITION. If the crew stops the dilution quickly, and doesn't need to apply AOI-3.4 UNCONTROLLED REACTIVITY ADDITION, then steps 2-4 will not need performed.**					

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	2. Obtain correct procedure AOI-3.4 UNCONTROLLED REACTIVITY ADDITION			—		
____	3. INITIATE Boration using the desired method AND CONTINUE Boration UNTIL one of the following conditions has been satisfied: IF Boration is due to an uncontrolled reactivity addition, CONTINUE Boration UNTIL the Termination Criteria of Attachment 3 have been satisfied as determined by the SM **Performs:** Normal Boration Path (Preferred) Set boric acid integrator to 600 gals Place RCS Makeup Control Switch to STOP Place RCS Makeup Mode Selector Switch to BORATE Place RCS Makeup Control Switch to START Place FCV-110 Boric Acid Blow Controller in MANUAL AND ADJUST to maximum flow.				—	
____	4. Determine Termination Criteria of Attachment 3 **Directs:** Boration until Neutron Flux stable OR decreasing AND Rods above RIL per Graph RPC-1A			—		
____	*5.* CONTACT maintenance to perform repairs of the blender **EVALUATOR CUE:** **After maintenance is contacted, Insert next event**			—		

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
	B 22 Battery Charger DC breaker open					
____	1. Obtain correct procedure ARP SKF 1-2 "22 DC BUS TROUBLE" **Performs:** CHECK 22 DC Bus Voltage AND Dispatches an NPO to check 22 Battery Charger, 22 Battery, to determine the cause of the alarm.					___
	2. IF 22 charger can NOT be maintained in service, VERIFY, that the conditions of Technical Specification 3.7.B.(6) are met. **Checks:** Technical Specifications 3.7.B.(6) 24 hour LCO				___	
	INSTRUCTOR CUE: **After 5 minutes Report as NPO 22 Battery Charger AC supply breaker is OPEN. Electrical Maintenance Personnel performing a walkdown of a workpackage inadvertently tripped the breaker OPEN.**					
	3. Obtain correct procedure SOP 27.1.6, INSTRUMENT BUS, DC DISTRIBUTION SYSTEM AND PA SYSTEM INVERTER				___	
	EVALUATOR CUE: **If necessary, role-play the Shift Manager and instruct the CRS to restore 22 Battery Charger to service**					
	4. Startup of 21, 22, 23 and 24 Battery Charger **Performs:** Direct NPO to restore 22 Battery Charger to service In Accordance With SOP 27.1.6 Step 4.2.1				___	

Comments:

TIME EVENT/EXPECTED OPERATOR RESPONSE:

SM WE CRS RO BOP

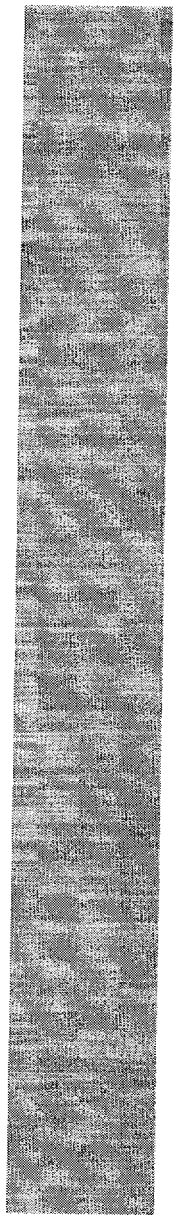
INSTRUCTOR CUE:
After 5 minutes remove LOA EPS890 F,0,D and reclose 22 Battery charger breaker

EVALUATOR CUE:
After 22 Battery charger breaker is reclosed, Insert the next event.

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	C	**Loss of 22 Instrument Bus**					
____	1.	Identify 22 Instrument bus failure by All instruments powered by 22 Instrument bus (WHITE power supply markings) fail low			___	___	___
____	2.	Obtain correct procedure AOI-27.1.6 Loss of Instrument Bus			___		
____	3.	IDENTIFY the failed instrument bus by observing the Instrument Bus voltage indication on the rear of the Panel FD. Dispatch an NPO to investigate the cause of the Instrument Bus failure.					___
____	4.	PLACE the Rod Control System in manual				___	
		NOTE: **Crew may refer to AOI 28.8, 28.10 or 28.16 in the following steps to support recovery of the failed instruments.**					
____	5.	ENSURE that the following control functions have operable instrument channels- Pressurizer Pressure, Pressurizer Level, Steam Generator Level, Overpressure Protection System (OPS) **Performs:** PLACES Pressurizer level controller and Main Feed regulator valves to MANUAL and restores level to program value. Selects operable channel for control or IF an operable channel can NOT be selected, THEN PLACE the associated controller(s) in manual.				___	
____	6.	PLACE control switches for 21,22,and 23 B/U Group PRZR heaters to OFF				___	

Comments:



____ 7. PLACE 22 Charging pump speed to control to MANUAL ___

____ 8. PLACE pressurizer level defeat switch (L460A) to "DEFEAT 2" ___

9. PLACE 22 Charging pump speed to control to AUTOMATIC

10. PLACE control switches for 21,22,and 23 B/U Group PRZR heaters to AUTO ___

RESTORE LETDOWN

11. CLOSE 75 gpm letdown orifice stop valve 200A ___

12. PLACE LCV - 459 to OPEN ___

13. PLACE PCV-135 in MANUAL and ADJUST to 75 % OPEN(25% on the output scale) ___

14. OPEN 75 gpm letdown orifice stop valve 200A ___

15. ADJUST PCV-135 to maintain letdown pressure to between 225 and 275 psig and place in AUTO ___

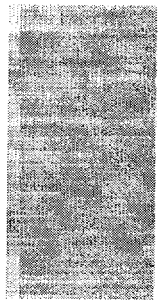
EVALUATOR CUE:
After Letdown has been re-established, Insert the next event.
INSTRUCTOR CUE:
AS NPO sent to investigate Instrument bus failure, call CRS and report that the Inverter has failed and it did NOT automatically swap to the Alternate power supply. Inform CRS that a Manual transfer to the alternate power supply to restore the bus is possible.

Comments:

TIME		EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
		INSTRUCTOR CUE: **Once FR-S.1 is entered, restore power to the 22 Instrument Bus by removing the previously entered malfunction on the bus.**					
____	**D**	**21 SG Level Transmitter 417A Fails Low/ATWS Requiring Transition to FR-S.1**					
		E-0, REACTOR TRIP OR SAFETY INJECTION					
		Automatic or Manual Initiated Reactor Trip					
		Perform: Trip Reactor			___	___	___
____	1.	Verify Reactor Trip					
		Checks: Rod Bottom Lights – LIT Reactor Trip Breakers – OPEN Rod Position Indicators – AT ZERO Neutron Flux – DECREASING					
		Perform: Ensure Rx trip breakers open and flux decreasing Manually trip reactor					
	2.	The reactor will NOT trip AND is NOT Subcritical				___	
		Perform: De-energize 480V busses 2A AND 6A for 10 seconds					___

Comments:

____ 3. The reactor can NOT be tripped, GO TO FR.S-1, RESPONSE TO NUCLEAR POWER GENERATION/ATWAS Step 1



Identify:
Reactor is NOT shutdown
Transition to FR.S-1

___ ___ ___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	1. **FR.S-1 RESPONSE TO NUCLEAR POWER GENERATION/ATWAS** **Note:** Steps 2 through 10 are immediate action steps			___		
____	2. Verify Reactor Trip **Checks:** Reactor Trip Breakers – OPEN Neutron Flux – DECREASING Rob bottom lights – LIT Rod position indicators – AT ZERO				___	
____	3. Manually trip reactor **Performs:** Manual reactor trip				___	
	Check: The reactor will NOT trip, THEN perform the following: **Performs:** Manually insert control rods					
____	4. MANUAL Turbine Trip **Check:** Turbine stop valves AND control valves – CLOSED				___	___
____	**ISOLATE THE MAIN TURBINE FROM THE SGs BEFORE PLANT AND SCENARIO-SPECIFIC CRITERIA ARE EXCEEDED CT # 1**			___	___	___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	5. Check AFW Pumps Running: **Check:** Motor-driven pumps – RUNNING Turbine-driven pumps – RUNNING					___
____	6. Check Containment Conditions **Check:** Containment conditions NOT ADVERSE Containment pressure LESS THAN 4 psig Containment Radiation LESS THAN $1E^{+5}$ R/hr Reactor SUBCRITICAL Power range channels – LESS THAN 5% AND Intermediate range channels – NEGATIVE STARTUP RATE				___	___
____	7. Initiate Emergency Boration of the RCS: **Performs:** Start charging pumps Establish emergency boration flow path - Open emergency boration valve: MOV-333 **Identifies:** MOV-333 NOT OPEN					___ ___
____	8. Align AND establish normal boration flow path per SOP 3.2, REACTOR COOLANT SYSTEM BORON CONCENTRATION CONTROL			___		

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	9. Establish normal boration flow path **Performs:** -PLACE Boric Acid Makeup Control Switch to Stop -SET Boric Acid Integrator to 600 -Place the RCS Makeup Mode Selector switch to BORATE -FCV-110 in AUTO or MANUAL -ENSURE boric acid transfer pumps are in AUTO -PLACE the RCS Makeup Control Switch to START -ENSURE BATPs shift to FAST speed				___	
____	10. Align charging pump suction to RWST **Performs:** -Open charging pump suction valve from RWST LCV-112B -Close charging pump suction valve from VCT LCV-112C -Place RCS Makeup Control switch to STOP					___
____	**INSERT NEGATIVE REACTIVITY INTO THE CORE BY AT LEAST ONE OF THE FOLLOWING METHODS BEFORE COMPLETING THE IMMEDIATE ACTIONS STEPS OF FR-S.1** - **De-energize the control rod drive MG sets** - **Insert RCCAs** - **Establish emergency boration flow to the RCS** **CT # 2**			___	___	___
____	11. Check PRZR pressure – LESS THAN 2335 PSIG **Check:** Pressurizer pressure less than 2335 psig, IF pressure greater than 2335 psig, ENSURE PORVs AND block valves OPEN IF pressure less than 2135 psig, ensure PORVs are closed					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	12. Verify Containment Ventilation Isolation **Check:** Containment Purge valves: FCV-1170 through 1173 CLOSED Containment Pressure Relief valves: PCV-1190 through 1192 CLOSED					___
____	13. Check if the Following Trips have Occurred: **Check:** Reactor Trip Turbine Trip **Dispatch:** Operator to locally open trip breakers **INSTRUCTOR NOTE:** **2 Minutes after being dispatched, Insert LOA to locally open reactor trip breakers and report to CCR**				___	
____	14. Check If SI Is Actuated **Check:** SI Annunciator – LIT OR SI system pumps – RUNNING			___	___	___
____	15. Verify Power to 480V Busses **Check:** Generator Output Breakers – OPEN 480V Busses – AT LEAST ONE ENERGIZED				___	___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	16. AC 480V Busses - all energized by Offsite Power If ALL 480V energized from offsite: **Perform:** 1) Start one charging pump Dispatch an NPO to: 2) Reset Lighting 3) Reset all MCCs except 28 & 28A 4) Ensure MCC 24, 27, & 29 energized Instructor CUE: Insert LOA to restore MCCs and lighting			___	___	
____	17. Verify CCW System Operation **Checks:** CCW pumps on busses supplied by offsite power running					___
____	18. Verify FW Isolation **Checks:** MBFPs - TRIPPED MBFP Discharge valves - CLOSED SG Blowdown Isolation valves - CLOSED				___	___
____	19. Verify Proper Emergency SI Valve Alignment **Checks:** SI Pump Cold Leg Inj. Valves, 856A, C, D, & E OPEN RHR Hx CCW Outlet valves 822A & B OPEN RHR Hx Motor operated valves 746 & 747 OPEN					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	20. Verify Containment Isolation Phase A **Checks:** Phase A actuated Phase A valves CLOSED IVSW valves 1410, 1413, 3518, & 3519 OPEN WCP system valves PCV-1238, 1239, 1240, & 1241 OPEN **Performs:** Places Personnel and Equipment hatch solenoids to INCIDENT on SM panel					____
____	21. Verify AFW Pumps Running **Checks:** Motor Driven Pumps - running Turbine driven pump - running if necessary **NOTE:** Only Motor driven pumps receive auto start signal on SI, turbine driven pump may be operating if low level exists in 2 S/Gs					____
____	22. Verify SI System Pumps Running **Checks:** Three SI pumps - running 22 SI pump discharge isolation MOV-851A & MOV-851B - OPEN Two RHR pumps – running					____
____	23. Verify Proper Service Water System Operation **Checks:** Three service water pumps - running on Essential Header Service water valves from Diesel Generator - OPEN					____

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	24. Verify Containment Fan Cooler Units - Running in Incident Mode **Checks:** Fan Coolers - running Charcoal filter butterfly valves - OPEN Fan discharge butterfly valves – CLOSED TCV-1104 & 1105 OPEN					___
____	25. Verify Containment Ventilation Isolation **Checks:** Purge duct isolation valves FCV-1170 through 1173 CLOSED Relief duct isolation valves PCV-1190 through 1192 CLOSED					___
____	26. Verify CCR Air Conditioner Status **Checks:** Train A and B running in INCIDENT mode					___
____	27. Check if Containment Spray Should be Actuated **Checks:** Containment Pressure ever >24 psig, **if it was:** Spray pumps running Spray pump discharge valves MOV-866A, B, C, & D OPEN Containment Isolation Phase B valves CLOSED **Performs:** Stop all RCPs					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	28. Check SG levels **Checks:** Narrow Range level in at least one Steam Generator greater than 9% (26%)				___	
	Performs: If NO Narrow Range level in at least one Steam Generator greater than 9% (26%) ensure 800gpm total feed flow If Narrow Range level in at least one Steam Generator greater than 9% (26%) control feed flow to maintain between 9% (26%) and 52%					___
____	29. Verify ALL Dilution paths isolated **Checks:** FCV-111A Primary Water to Blender closed NO flow indicated on FI-111 Primary Water flow indicator					
____	30. Check for Reactivity insertion from Uncontrolled Cooldown **Checks:** RCS temperature decreasing in an uncontrolled manner Any Steam Generator pressure decreasing in an uncontrolled manner OR completely depressurized				___	
____	31. Check MSIVs closed **Performs:** Close all MSIVs **NOTE:** This step performed only if an uncontrolled cooldown is in progress					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	32. Identify Faulted Steam Generator **Checks:** Pressures in ALL Steam Generators – Any Steam Generator decreasing in an uncontrolled manner OR completely depressurized				—	
	NOTE: This step performed only if an uncontrolled cooldown is in progress					
____	33. Isolate Main Feed Line **Checks:** Main & Low Flow Reg Vlv's Closed				—	
____	34. Isolate AFW Flow **Performs:** CLOSES affected S/G AFW Reg Valve					—
____	35. Isolate Flow to 22 AFW Pump if necessary **Performs:** Directs NPO to Shut MS-41 or 42 if #22 or #23 S/G was determined to be Faulted			—		
____	36. Verify S/G Atmospheric Steam Dump Closed **Checks:** Affected S/G Atmospheric Steam Dump Closed				—	
____	37. Check Core Exit TCs less than 1200F				—	

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	38. Verify Reactor Subcritical **Checks:** Power range channels – LESS THAN 5% AND Intermediate range channels – NEGATIVE STARTUP RATE					
____	39. Return to procedure and step in effect **Performs:** Transition to E-0 step 1				—	

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
	E 24 Steam Generator Safeties fail open					
	E-0 Reactor Trip OR Safety Injection					
____	1. Verify Reactor Trip					
	Checks: Rod Bottom Lights – LIT Reactor Trip Breakers – OPEN Rod Position Indicators - AT ZERO Neutron Flux – DECREASING				___	
____	2. Verify Turbine Trip					
	Checks: Turbine Stop valves – CLOSED Turbine Governor valves – CLOSED				___	
____	3. Check if SI is actuated					
	Checks: SI Annunciator – LIT SI System pumps – RUNNING				___	___
____	4. Generator Output breakers - OPEN					
	Checks: Breakers 7 & 9 OPEN				___	
____	5. AC 480V Busses - At Least One Energized					
	Checks: 2A AND 3A, OR 5A, OR 6A Breaker alignment and voltage					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	6. AC 480V Busses - all energized by Offsite Power **Checks:** 2A AND 3A, AND 5A, and 6A Breaker alignment and voltage					___
____	7. Verify RCP seal cooling **Performs:** Start one charging pump Align charging pump suction to the RWST				___	___
____	8. Verify power to lighting and MCCs **Checks:** All 480V busses energized by offsite – **Performs:** Reset lighting Reset all MCCs except MCC 28 and MCC 28A Ensure MCC 24, MCC 27, and MCC29 energized If all 480V busses NOT energized by offsite – Verify MCC 26A, MCC 26B, MCC26C, MCC24A, MCC 24A, MCC27A, MCC29A, and MCC211 energized Ensure one cable tunnel fan running if any EDG loaded Align lighting to the TSC bus per AOI-27.1.12					
____	9. Verify CCW System Operation **Checks:** 3 CCW pumps running					
____	10. Verify FW Isolation **Checks:** MBFPs - TRIPPED MBFP Discharge valves - CLOSED SG Blowdown Isolation valves - CLOSED					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	11. Verify Proper Emergency SI Valve Alignment **Checks:** SI Pump Cold Leg Inj. Valves, 856A, C, D, & E OPEN RHR Hx CCW Outlet valves 822A & B OPEN RHR Hx Motor operated valves 746 & 747 OPEN					___
____	12. Verify AFW Pumps Running **Checks:** Motor Driven Pumps - running Turbine driven pump - running if necessary					___
____	13. Verify SI System Pumps Running **Checks:** Three SI pumps - running 22 SI pump discharge isolation MOV-851A & MOV-851B - OPEN Two RHR pumps – running **Performs:** Start three Safety Injection pumps					___
____	14. Verify Proper Service Water System Operation **Checks:** Three service water pumps - running on Essential Header Service water valves from Diesel Generator - OPEN					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	15. Verify Containment Fan Cooler Units – In Service **Checks:** 5 Fan Coolers - running Charcoal filter valves - OPEN Fan normal discharge valves – CLOSED TCV-1104 & 1105 OPEN					___
____	16. Verify Containment Ventilation Isolation **Checks:** Containment Purge valves: FCV-1170 through 1173 CLOSED Containment Pressure Relief valves: PCV-1190 through 1192 CLOSED					___
____	17. Verify Containment Isolation Phase A **Checks:** Phase A actuated Phase A valves CLOSED IVSW valves 1410, 1413, 3518, & 3519 OPEN WCP system valves PCV-1238, 1239, 1240, & 1241 OPEN **Performs:** Places Personnel and Equipment hatch solenoids to INCIDENT on SM panel					___
____	18. Verify CCR Air Conditioner Status **Checks:** Train A and B running in INCIDENT Mode 2					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	19. Check if Main Steamlines Should be Isolated					
	Checks:					
	High Steamflow with Low Tave or Low Steamline Pressure, and					
	Containment Pressure ever >24 psig					
	If required, MSIVs are verified CLOSED				___	___
____	20. Check if Containment Spray Should be Actuated					
	Checks:					
	Containment Pressure ever >24 psig, **if it was:**					
	Spray Pumps Running					___
	Spray Pump Discharge valves MOV-866A, B, C, & D OPEN					___
	Containment Isolation Phase B valves CLOSED					___
	IVSW isolation Phase B valves (NPO action) 7864, 7865, 7866, & 7867 OPEN			___		
	Performs:					
	Stop all RCPs					___
____	21. Verify SI Pump Flow					
	Check:					
	RCS Pressure <1660 psig (1690 psig)					
	Check SI pump flow indicators					___
	Performs:					
	Place an RHR pump in pullout if -					
	RCS pressure is >1660 psig (1690 psig)					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	22. Verify RHR Pump Flow **Check:** RCS Pressure <320 psig (340 psig) Check RHR pump flow indicators					___
	Performs: Place an RHR pump in pullout if - RCS pressure is >320psig (340psig)					___
____	23. Verify TOTAL AFW Flow greater than 400 gpm **Check:** Greater than 400 gpm total flow					
____	24. Verify AFW Flow to ALL SGs **Check:** AFW flow to ALL Steam Generators					___ ___
	Note: Feed flow to 24 SG should be isolated.					
____	25. Align Service Water System **Check:** Service Water System aligned for THREE HEADER OPERATIONS Ensure closed SWN-4 & SWN-5					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	26. Check RCS Temperatures **Expected:** RCS Average Temp Stable or Trending to 547 F RCS Cold Leg Temp Stable or Trending to 547 F If temperature less than 547 F and decreasing **Performs:** Stop dumping steam Isolate unnecessary steam loads If cooldown continues reduce AFW flow as required If cooldown continues close MSIVs If temperature greater than 547 F and increasing **Performs:** Dump steam				___	
____	27. Check PZR PORVs **Expected:** PORVs Closed				___	
____	28. Check Normal PZR Spray Valves **Expected:** Normal Spray Valves Closed				___	
____	29. Check Auxiliary Spray Valve **Expected:** Auxiliary Spray Valve Closed					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	30. Check if RCP Should be Stopped **Check:** SI Pumps - AT LEAST ONE RUNNING RCS subcooling based on Core Exit TCs LESS THAN 24F (31F FOR ADVERSE CONTAINMENT) **Performs:** Stops all Reactor Coolant Pumps				—	
____	31. Check if Any SG Secondary Pressure Boundary is Faulted **Check:** Any SG Press decreasing in uncontrolled manner Any SG completely depressurized **Note:** Transition to E-2 Faulted Steam Generator Isolation is required due to 24 Steam Generator Safeties failed open				—	—

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	**E-2 Faulted Steam Generator Isolation**					
____	40. Check affected MSIV CLOSED **Performs:** Close affected MSIV					—
____	41. Check if any S/G Secondary Pressure Boundary is Intact **Checks:** Any S/G pressure stable or increasing				—	
____	42. Identify Faulted S/G **Checks:** Any S/G pressure decreasing in uncontrolled manner or is completely depressurized				—	
____	43. Isolate Main Feed Line **Checks:** Main & Low Flow Reg Vlv's Closed				—	
____	44. Isolate AFW Flow **Performs:** CLOSES affected S/G AFW Reg Valve					—
____	45. Isolate Flow to 22 AFW Pump if necessary **Performs:** Directs NPO to Shut MS-41 or 42 if #22 or #23 S/G was determined to be Faulted			—		
____	46. Verify S/G Atmospheric Steam Dump Closed **Checks:** Affected S/G Atmospheric Steam Dump Closed				—	

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	47. Verify S/G Blowdown Valves Closed **Checks:** Check both B/D Valves for affected S/G Closed					—
____	48. Direct Local Isolation of affected S/G: Steam Traps upstream of MSIVs MSIV bypass valves			—		
	CT #3 Complete **E-2-A Isolate the faulted SG before transition out of E-2**					
____	49. Check CST Level Greater Than 2 FT					—
____	50. Check CCW Pump status **Check:** CCW Pumps running **Performs:** Places CCW pump control switches in pullout if not running					—
____	51. Place controls for main feedwater and bypass feedwater regulating valves in CLOSE **Performs:** Place controls for main feedwater and bypass feedwater regulating valves in CLOSE				—	
____	52. Ensure Automatic Safeguards Actuation Key switches on Panel SB-2 in DEFEAT **Performs:** Places key switches to DEFEAT					—
	53. Depress Safety Injection Reset Pushbutton (Panel-SB2) Train A Train B					— —

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	54. Verify SI Reset					___
____	55. Place IVSW switches to OPEN **Performs:** Place IVSW switches to OPEN					___
____	56. Place Containment Rad Monitor WCPS Valve switch to OPEN **Performs:** Places CNTMT RAD MON WCPS valves to open					___
____	57. Personnel and Equipment Hatch Solenoid switches to INCIDENT **Performs:** Places Personnel and Equipment Hatch Solenoid switches to the INCIDENT mode.					___
____	58. Place ALL remaining phase "A" Valves switches in CLOSE **Performs:** Places ALL remaining Phase "A" valves switches to CLOSE					___
____	59. Reset Phase "A" Containment Isolation **Performs:** Depress Phase "A" Containment Isolation reset pushbuttons Train A Train B					___
____	60. Verify Train A and B Reset **Checks:** Phase "A" Containment Isolation Train A and Train B reset					___

Comments:

TIME	EVENT/EXPECTED OPERATOR RESPONSE:	SM	WE	CRS	RO	BOP
____	61. Check Phase "B" Actuated **Checks:** Check Containment Isolation Phase "B" actuation **Expected:** Operator proceeds to next step as Phase "B" should not have actuated					—
____	62. Establish Instrument Air to Containment **Required Actions:** Open PCV-1228					—
____	63. Check Secondary radiation **Checks:** Request periodic activity samples R-28, 29, 30, & 31 recorder R-45 recorder R-49 recorder			—	—	
____	32. Transition to E-1 Loss Of Reactor Or Secondary Coolant Terminate the Drill once E-1 Loss Of Reactor Or Secondary Coolant has been entered.			—		

Comments:

TIME EVENT/EXPECTED OPERATOR RESPONSE:

SM	STA	CRS	RO	BOP

EMERGENCY PLAN
Evaluated by job performance measure.

1. Classifies event as a Site Area Emergency (1.1.2)

Comments:

TERMINAL OBJECTIVES

1083 Demonstrate the ability to perform the required actions for a response to nuclear power generation/ATWAS (FR-S.1).

ENABLING OBJECTIVES

2895 Demonstrate the ability to perform the required actions for an uncontrolled reactivity addition.

2956 Demonstrate the ability to perform the required actions for a loss of an RCP (locked rotor)

2987 Demonstrate the ability to perform the required actions for a steam break upstream of the MSIVs.

2994 Demonstrate the ability to perform the required actions for a reactor trip or safety injection (E-0)

Watch Crew Turnover Sheet:

Date/Time:	TODAY	**Condition:**	Power Ops
RCS Temp:	558F	**% Power:**	91.0%
RCS Press:	2235 psig	**MW Gross:**	900
PZR Level:	44%	**River Water:**	66F
RCS Total Leakage:	0.4 gpm	**Boron Conc:**	850 ppm
RCS Unidentified Leakage:	0.4 gpm	**Rod Position:**	212 CBD

Xenon:	Equilibrium	**RCS Total Act:**	$2.85E^{-1}$ µCi/cc
EFPD:	30	**Air In-Leakage:**	19 SCFM
PZR Press Control:	Channel 1		
PZR Level Control:	Channel 2		
Service Water:	3 Header Ops		

Risk Assessment:	YELLOW	**Daily Risk Factor:**	10.8

Plant Equipment Status:

1. 23 Emergency Diesel Generator, Out of Service, 6 hours ago, Mechanical Maintenance and FIN troubleshooting high differential pressure on the fuel oil duplex strainers. Fuel oil supply system disassembled. Tech Spec 3.7.B.1.a (7 day LCO) entered.
2. 23 Motor Driven Auxiliary Feedwater Pump, Out of Service, 48 hours ago, pump disassembled, excessive leakage on the inboard seal package, Mechanical Maintenance working, expected back for surveillance test within 12 hours. Tech Spec 3.4.B.1.(1).a) (72 hour LCO) entered.
3. 21 Charging Pump, Out of Service, 3 weeks ago, needs replacement of hydraulic coupling vane packages, awaiting qualification of parts from manufacturer.
4. 23 S/G has 5 gallon per day steam generator tube leakage by Chemistry report.
5. 11 Centac Air compressor Out of Service, awaiting parts for inner cooler.
6. 22 Condenser - Increased air in-leakage, Vendor to inspect later today.
7. From the Con Edison System Operator - "A thunderstorm warning is in effect for the next 4 hours for the Greater New York City Metropolitan Area and the lower Hudson Valley Regions."

Instructions to the Shift:

1. Increase power to 100% using POP-1.3 beginning at step 4.73. All prior steps have been completed in POP-1.3. A Heat balance has just been completed, and the NIs have been adjusted.