

Facility: <u>Clinton Power Station</u>		Scenario No.: <u>One</u>	Operating Test No.: <u>2010301</u>
Examiners: <u>Carl Moore</u> <u>Dell McNeil</u>		Operators: _____ _____ _____	
Initial Conditions: Reactor power is 88%			
Turnover: 1. Cross tie H-I busses with I supplying.			
Event No.	Malf. No.	Event Type*	Event Description
1	None	BOP-N	Cross tie H-I busses with I supplying
2	Override	ATC-I/C	Clogged filter CB 'D' pump
3	None	ATC-R	Lower reactor power with flow
4	Override	ATC-C	HCU failure pressure at zero requiring control rod to be driven into 00
5	Override	BOP-C	Turbine L.O. temperature controller
6	A11_A02_01_7_TVM	BOP-C	Loss of seal water to A Circulating water pump
7		ALL-M	RCIC unisolable steam line leak 2 areas requires blowdown leak also causes a group 1 isolation due to high temperature in ABST
8		ALL-C	B/D 2 SRV's fail to open.
9			

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

Scenario No.: OneOperating Test No.: 2010301**Narrative Summary****Event #****Description**

1. Cross tie H-I busses with I supplying
2. Clogged filter CB pump applicant is required to secure the Condensate Booster Pump and start a standby pump.
3. Lower reactor power with flow required per the turnover sheet.
4. HCU 28-33 failure pressure at zero requiring control rod to be driven into 00 call in from the field operator says there is a leak on the F-111 valve and the HCU cannot be pressurized until repairs are complete requiring the control rod to be driven in to position 00
5. Turbine L.O. temperature controller fails causing main turbine lube oil temperature to rise requiring the operator to take manual control of main turbine lube oil temperature IAW 5018 3A.
6. Loss of seal water to A Circulating water pump requiring it to be removed from service
7. RCIC un-isolable steam line leak 2 areas requiring a manual initiation of ADS
8. Upon the initiation of ADS 2 SRV's 41B and 41D fail to open which requires manual operation to open two more relief valves to complete the blow down

EOPS

1,6,3

Critical tasks:

- Blow down when two areas above max safe
- Verify seven relief valves open upon initiation of ADS

Operator Actions

Event No.(s): 1		Page 1 of 1
Description: Cross tie unit sub 1H to 1I with US 1I supplying		
Initiation: Following shift turnover		
Cues: Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 3502.01, 480V Distribution, Step 8.1.4: <ul style="list-style-type: none"> • Close The 480V Unit Sub 1H to 1I Tie Breaker • Open the 480V Unit Sub 1H Main Breaker
	RO	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: US 1H to 1I are cross tied with the US 1H main feeder open		

Operator Actions

Event No.(s): 2		Page 1 of 1
Description: CB pump "D" clogged oil filter/bearing oil deficiency		
Initiation: After the busses have been cross tied, on the signal of lead examiner		
Cues: Annunciator CPS 5001-4H alarming,		
Time	Position	Applicant's Actions or Behavior
	RO	CPS 5001-4H, Clogged Oil Filter CB 1D: <ul style="list-style-type: none"> ▪ Directs field operator to turn Cuno filter CPS 3104.01, CD/CB step 8.2.2: <ul style="list-style-type: none"> • Startup standby CB pump 'C' • Shutdown 'D' CB pump
	BOP	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Standby CB pump started and shutdown the 'D' CB pump.		

Operator Actions

Event No.(s): 3		Page 1 of 1
Description: Reduce Power With Flow (Panel P680, Section 5003)		
Initiation: Following restoration of feed water and condensate by starting the standby pump		
Cues: Directed by SRO		
<u>General Note</u>		
<p>If this evolution was Prebriefed and “Expected Alarms” were reviewed, the following may be allowed:</p> <ul style="list-style-type: none"> • The “Expected Alarms” will be flagged in some manner. • When the annunciator comes in the operator will announce “Expected Alarm” • The Annunciator Response Procedure (ARP) need not be entered because it has already been reviewed in the Prebrief. <p>If a Prebrief was not conducted the operator should perform the following:</p> <ul style="list-style-type: none"> • When an annunciator comes in the ARP should be referred to • The annunciator may then be identified as an “Expected Alarm”, flagged, and from that point on the ARP need not be referred to. (OP-AA-103-102) 		
Time	Position	Applicant’s Actions or Behavior
	ATC	<p>Per, CPS 3005.01, Unit Power Changes reduce reactor power.</p> <ul style="list-style-type: none"> • Reduces power to 80% • Closes the Flow Control Valves individually while maintaining the mismatch within spec. • Monitors parameters as flow is reduced. (Power, FCV Position, Flow, MWe)
	BOP	<ul style="list-style-type: none"> • Monitors plant to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Clearly observable plant response from change in power level.		

Operator Actions

Event No.(s): 4		Page 1 of 1
Description: HCU failure pressure at 0 psig causing rod to be inop and driven into 00 28-33		
Initiation: After power is lowered and upon signal from the lead examiner		
Cues: 5006-1H ACCUMULATOR TROUBLE		
Time	Position	Applicant's Actions or Behavior
	RO	<p>Depress ACCUM FAULT button.</p> <p>☞ The red status light for the rod associated with the alarming HCU will flash.</p> <p>After the alarming HCU has been identified: acknowledge ACCUM FAULT on OCM to clear annunciator so another fault will cause an alarm.</p> <p>Verify control rod scram accumulator pressure is $\geq 1550^{\dagger}$ psig.</p> <p>[†] ITS SR 3.1.5.1/3.9.5.2 1520 psig accumulator pressure value, plus 30 psig to account for instrument and calibration inaccuracies per NSED Calc IP-0-0133.</p> <p>1) IF Accumulator pressure is $< 1550^{\dagger}$, THEN The accumulator shall be declared INOPERABLE. Refer to as applicable for required actions of ITS LCO 3.1.5, ITS LCO 3.9.5 and ORM OR 2.1.2.</p> <p>2) IF CRD header pressure is < 1600 psig, THEN Raise CRD header pressure per CPS 3304.01 (RD).</p> <p>Verify control rod scram accumulator pressure locally.</p> <p>1) IF Pressure is low, THEN Recharge the HCU per CPS 3304.01 (RD).</p> <p>2) IF Pressure is normal, THEN Drain excess water per CPS 3304.01 (RD).</p> <p>Initiate an IR for the alarm.</p> <p>If 2 level alarms are received within approximately one month on the same accumulator, include in the IR to exercise the accumulator piston seal per 3304.01P001.</p> <p>Upon report from the Equipment operator that pressure is zero and cannot be recovered reports to the SRO</p> <ul style="list-style-type: none"> • Insert the control rod and valve out per 3304.02.
	BOP	<ul style="list-style-type: none"> • Monitors plant to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures ○ Disarm control rod per technical specification 3.1.3.C.

Terminus: Control rod 28-33 driven in to 00 and valved out.

Operator Actions

Event No.(s):

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Page

1 of 1

Description: **Turbine LO Temperature Controller Failure**
(Panel P870, Section 5017 & 5018)

Initiation: After the Rod is driven in to 00, and upon direction of the Lead Examiner.

Cues: Annunciator CPS 5018-3A, High Temp Turb-Gen Lube Oil

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Communicates the Annunciator to the SRO. • Refers to the ARP. <p>Per CPS 5018-3A, High Temp Turb-Gen Lube Oil:</p> <ul style="list-style-type: none"> • Direct an Area Operator to check the Lube Oil Coolers. • Determines that the Temperature Controller has failed: <ul style="list-style-type: none"> a) Place TURB OIL CLG WTR Controller in MANUAL. b) Adjust (open/close) TCV controller as needed to maintain turbine oil outlet temperature 110°F to 120°F. o Coordinates temperature monitoring with the 'A' RO
	ATC	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. • Checks for excessive temperatures across the turbine bearings. o Coordinates temperature monitoring with the 'B' RO
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: Turbine LO Temperature Controller has been placed in MANUAL and temperature has returned to normal.

Operator Actions

Event No.(s): 6		Page 1 of 1
Description: Low Flow CW Pump 1A Brg Seal Water (Panel P800, Section 5041)		
Initiation: After control of turbine LO controller is established in manual and temperature is being controlled, and upon direction from the Lead Examiner.		
Cues: Annunciator CPS 5041-1G, Low Flow CW Pump 1A Brg Seal Water, is received.		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Communicates annunciator to SRO • Refers to the ARP. <p>Per, CPS 5041-1G, Low Flow CW Pump 1A Brg Seal Water:</p> <ul style="list-style-type: none"> • Directs Area Operator to flush CW Pump A TW supply strainer 1TW01MA. • Monitor CW pump bearing temperatures. • Trips 1A CW Pump. o Makes a plant announcement on shutting down CW Pump 1A as directed.
	ATC	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. o Makes a plant announcement on shutting down CW Pump 1A as directed.
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. o Conducts a brief on shutting down CW Pump 1A. o Enters CPS 4004.02, Loss of Vacuum. (Vacuum should not substantially change) o Directs a followup to complete shutdown of the pump per CPS 3113.01, Circulating Water (CW).
Terminus: CW Pump 1A has been tripped.		

Operator Actions

Event No.(s): 7		Page 1 of 2
Description: RCIC Line Break.		
Initiation: After actions have been taken for loss of seal water on CW pump and CW pump is secured.		
Cues: Annunciator CPS 5065-6F, Sec. CNMT. Area High Temp.		
Time	Position	Applicant's Actions or Behavior
	ATC	<p>Report EOP-8, Secondary Containment Control, Entry Condition on Area Temperature.</p> <p>Performs EOP actions as directed by SRO.</p> <p>Initiates a manual reactor scram before first Max Safe Temperature is exceeded, and performs Scram Choreography.</p> <p>Carries out Scram Choreography by reporting:</p> <ol style="list-style-type: none"> 1) Mode Switch in Shutdown, Power is... 2) Rod status is... 3) Reactor Power is... and trend 4) Reactor pressure is... and trend 5) Reactor level is... and trend 6) Any EOPs with entry conditions <p>Per CPS 4100.01, Reactor Scram</p> <ul style="list-style-type: none"> • Turn Mode Switch to SHUTDOWN <ul style="list-style-type: none"> ○ Verify reactor power is lowering ○ Verify SHUTDOWN CRITERIA met • <u>IF</u> RPV level is rising with 2 feed pumps operating • <u>THEN</u> Secure 1 Feed Pump and control RPV water level Level 3 to Level 8. • Verify Turbine and Generator trip when required • Evacuate the containment. <ul style="list-style-type: none"> • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. • Coordinates with BOP to monitor and control RPV level and press.

Operator Actions

Event No.(s): 7		Page 2 of 2
Description: RCIC Line Break.		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>Carries out Scram Choreography by:</p> <ul style="list-style-type: none"> • Making an Announcement <ol style="list-style-type: none"> 1) Reactor Scram 2) MDRFP may start 3) Evacuate the RCIC room 4) Evacuate the Containment • Determine Rod status and report to CRS <p>Per CPS 5065-6F, Sec. CNMT. Area High Temp.</p> <ul style="list-style-type: none"> • At 1H13-P678, monitor temperature recorders 1TR-CM326 and 1TR-CM327 and determine which area(s) is in alarm. • Observes on 1TR-CM326; Point 8, Aux Bldg RCIC Pump Room, & Point 9, Aux Bldg RCIC Instr Pnl Rm are alarming and increasing. • Reports that Point 18, Aux Bldg Steam Tunnel is alarming and increasing. <ul style="list-style-type: none"> o Dispatches an operator to RCIC room to investigate • Attempts to isolate RCIC • Reports that isolation valves did not close. <p>Performs EOP actions as directed by SRO.</p> <ul style="list-style-type: none"> • Verifies status of Fuel Building Ventilation and SGTS. • Performs BLOWDOWN IAW EOP-3
Critical Task		
	SRO	<p>Enters EOP-8, Secondary Containment Control, and directs the following:</p> <ul style="list-style-type: none"> • Directs actions of CPS 4100.01, Reactor Scram. • Carries out Scram Choreography by performing an Update: <ol style="list-style-type: none"> 1) Entering EOP-1 and 8 2) Entering Scram Off-Normal 3) Transient Annunciator Response is authorized <p>Enters EOP-1, RPV Control, and directs the following:</p> <ul style="list-style-type: none"> • Directs the stabilization of RPV Pressure 800 to 1065 psig with Bypass Valves or SRVs. • Directs maintaining RPV Level, Level 3 to Level 8 by using Preferred Injection Systems. <p>Expands Level Band to -30 to +40 inches Wide Range.</p> <ul style="list-style-type: none"> • Waits until 2 areas have exceeded Max Safe Values and then performs Blowdown IAW EOP-3
Critical Task		

Operator Actions

Event No.(s): 8		Page 1 of 2
Description: Emergency depressurization 2 ADS valve fail to open		
Initiation:. During execution of EOP-8		
Cues: Self revealing		
Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Places the Mode Switch in S/D • Carries out Scram Choreography by reporting <ul style="list-style-type: none"> – Mode Switch in Shutdown, Power is... – Rod status is... – Reactor Power is... and trend – Reactor pressure is... and trend – Reactor level is... and trend – Any EOPs with entry conditions (EOP-1, 8) <p>Per CPS 4100.01, Reactor Scram</p> <ul style="list-style-type: none"> • Turn Mode Switch to SHUTDOWN <ul style="list-style-type: none"> – Verify reactor power is lowering – Verify SHUTDOWN CRITERIA met • <u>IF</u> RPV level is rising with 2 feed pumps operating • <u>THEN</u> Secure 1 Feed Pump and control RPV water level Level 3 to Level 8. • Verify Turbine and Generator trip when required <p>Performs EOP actions as directed by SRO.</p>

Event No.(s):		8	Page 2 of 2
Description:			
Time	Position	Applicant's Actions or Behavior	
	BOP	<p>Carries out Scram Choreography by:</p> <ul style="list-style-type: none"> • Making an Announcement <ul style="list-style-type: none"> – Reactor Scram – MDRFP may start – Evacuate the RCIC room – Evacuate the Containment • Determine Rod status and report to CRS <p>Per EOP-8 Secondary Containment Control</p> <ul style="list-style-type: none"> • Operates ECCS Systems as needed, to control RPV Water Level, Level 3 to Level 8 • Initiates ADS • Communicates that two ADS Valve did not open. <p>Opens other SRV's for a total of seven open.</p>	
	SRO	<p>Carries out Scram Choreography by performing an Update:</p> <ul style="list-style-type: none"> – Entering EOP-1 and 8 – Entering Scram Off-Normal – Transient Annunciator Response is authorized <p>Enters EOP-1, RPV Control, and directs the following:</p> <ul style="list-style-type: none"> • Determines Mode Switch is in SHUTDOWN. • Determines Shutdown Criteria is met. • Directs control of RPV Pressure 800 to 1065 psig with Bypass Valves or SRVs. • Directs maintaining RPV Level, Level 3 to Level 8 by using Preferred Injection Systems. <p>Enters EOP-8, Secondary Containment Control, and directs the following:</p> <ul style="list-style-type: none"> • Scram of the reactor • <p>Enters EOP-3, Emergency RPV Depressurization, when two areas above max safe.</p> <ul style="list-style-type: none"> • Directs initiation of ADS • Directs opening other SRVs until 7 are open 	
Terminus:			
<ul style="list-style-type: none"> • Reactor power is below the APRMs. • Pressure is being maintained. • Upon approval of Lead Examiner. 			

Simulator Operator Instructions**Initial Setup**

1. Verify daily lamp test completed
2. Reset to IC #02 for this scenario.
3. Load the lesson plan for this scenario 1
4. Place simulator in RUN
5. Verify the AR/PR server is running and stabilize AR/PR
6. Verify RCIC Flow Controller is set at 620 psig.
7. Ensure the correct number of CPs are in service.
8. Ensure CRD drive water D/P is in the expected range
9. Verify correct Control Rod Move Sheets in P680 Book and the correct Cram array are used
10. Turn on and advance recorders
11. Verify simulator conditions match the turnover
12. Provide copies of the following:

Event Triggers and Role PlayEvent #

1. NONE Self revealing
2. Role play: Equipment operator When asked to rotate the cuno report “The cuno filter has been rotated several times”
Equipment operator CB startup and shut down
3. None self revealing.
4. Role play: Equipment operator Local pressure is 0 psig and the packing has blown out of 1C11-F111 valve and the accumulator will not hold pressure.
(Bring single rod REMA to CR) as Reactor engineering that rod 28-33 was declared slow during scram time testing. Give the REMA to the CRS.
5. Turbine LO Temperature Controller Failure
 - a. **Remote Trigger** on the signal from lead examiner
 - b. Role play: **Area Operator:** when directed to check out the Turbine L.O. Coolers report back that everything appears to be fine (if problem has been corrected) or that Temperature Control Valve is closed (if problem has not been corrected)..
6. Low Flow CW Pump 1A Brg. Seal Water
 - a. **Remote Trigger** on the signal of Lead Examiner
 - b. Role play:**Area Operator:** when directed to investigate the problem, report back that the upper and lower motor bearing flow is 0 gpm and 0 psig with a marked vibration increase on CW Pump 1A. Other CW Pumps appear to be fine.
Area Operator: if directed to flush CW Pump C TW supply strainer 1TW01MA, report back in ~ 2 minutes that supply strainer has been flushed, but flows and pressure are still the same.
7. Major: When the WEC SRO is requested then report to CR to monitor secondary containment parameters.

Overview

Makeup/Reject:

ECCS: RHR A, B, C, LPCS and HPCS are Operable. RCIC is Operable

SDC: N/A**Electrical:** 6.9 KV 1A & 1B and 4.16 1A & 1B on UAT, 4160 Volt Busses

1A1, 1B1 & 1C1 are being supplied by RAT

Ventilation:

Radwaste: FP/FP 1B in service. 1WF Evap is in Hot Standby. A and B RT F/D are in service.

Plant Status**On Line Risk** Green**Reactor**

Operational Condition: Mode 1
 Total Core Flow: 76.2 mlb/hr
 FCV Position: A: 65% B: 65%
 Reactor Power 90% (<=100%) 3128 MWt (<=3473) 1035 Mwe
 Xenon: Stable
 RPV Level 34.9 in Narrow Range
 RPV Pressure 1007 psi (< 1045)
 In service SDC loop None MODE 1

Containment

Suppression Pool Temperature: 76 F (<=93.1 F)
 Suppression Pool Level 19.2 ft (19 ft 0 to 19 ft 5 in)
 Drywell Pressure 0.56 psi (0 to 1 psig)
 Drywell to Containment dp: 0.02 psi >=-.02 psid to <=1.0 psid
 Drywell Avg Air Temperature: 105 F (<=146.53 F)
 Secondary Containment: 0.75 in WG (>= 0.25 in WG vacuum)

BOP

Condenser Vacuum: -27.2 in Hg
 Off – Gas Flow: 50.1 scfm
 Condensate Temperature: 96 F
 Generator Reactive Load: 282 MVARs

Plant Chemistry

CPI (goal < 1.1): 1.00
 Reactor Sulfates (goal < 2) 1.31 ppb
 Reactor Chlorides: 0.51 ppb
 FW Iron (goal < 2.1) 0.85 ppb
 I-131 dose equivalent 4x10-6 μCi/g

Protected Equip:

Comments: .

From “Excellence in Human Performance”

Leaders reinforce desired jobsite behaviors (Handbook page 17)

Participate in training program activities.

Leaders monitor and provide feedback to improve training program quality as well as to coach and reinforce individuals who meet or exceed behavior expectations and Standards of performance. During training activities, leaders guide workers on how actions or inactions influence reactor safety and on the potential consequences of mistakes. They give particular attention to recognizing error-likely situations and flawed defenses during tasks important to nuclear safety

Turnover

1. Power, xenon and time in life
2. Status of Tagged Out Equipment
None
3. Shift conditions
Day Shift Today
4. Weather Conditions
Sunny and warm.
5. Thermal Limit Problems or concerns
6. LCO's in effect
7. Surveillances in progress
None.
8. Evolutions planned for the shift
Cross tie 1H-1I busses with I supplying
Lower reactor power with flow for a sequence exchange IAW
3005.01
9. Risk Levels
Green
10. Other

Facility: <u>Clinton Power Station</u>		Scenario No.: <u>Two</u>		Operating Test No.: <u>2010301</u>	
Examiners: <u>Carl Moore</u>		Operators: _____			
<u>Dell McNeil</u>		_____			
_____		_____			
Initial Conditions: Reactor power is 50%					
Turnover: 1. Shift TBCCW pumps for maintenance					
Event No.	Malf. No.	Event Type*	Event Description		
1	None	BOP-N	Swap TBCCW pumps		
2	None	ATC-R	Raise reactor power with rods		
3	YP_XMFTB_391X	BOP-C	CCW pump trip		
4	Override	ATC-C	'B' RWCU pump seal plate temperature high		
5	ED_EK20_TR UE	BOP-C	ERAT Static VAR Compensator trip		
6	YPRR15AA	ATC-I	FWLC level sensor failure		
7		ALL-M	Loss of stator water cooling causing Generator runback		
8	XP_MMFFT_B4963 XMFTB5002	ALL-M	ATWS All Scram functions fail.		
9	YP_XMFTB_4852(3)	ALL-M	CRD Pump trip A or (B) on the scram		

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

Scenario No.: TwoOperating Test No.: 2010301**Narrative Summary****Event #****Description****Narrative Summary****Event #****Description**

1. Swap TBCCW pumps
2. Raise reactor power with rods IAW with the REMA
3. CCW pump trip. The 'B' operator will have to start the standby CCW pump in accordance with the ARP.
4. RWCU pump B develops a seal leak requiring its removal from service.
5. ERAT Static VAR Compensator trips. The 'B' RO places control switch to off and remove from service and perform 9082.01 in accordance with the ARP.
6. Feed water level instrument fails high causing the applicant to transfer FWLC to the operating channel.
7. Loss of stator water cooling generator runback manual scram required
8. ATWS all scram functions fail
9. On initiation of the scram the operating CRD pump will trip which will not allow the control rods to be driven in until CRD is restored.

EOPS

1,1A

Critical tasks:

- Perform a manual scram at the confirmation of the main generator runback
- Restore CRD to drive control rods to shut down the reactor
- Lower reactor water level to control reactor power by terminating and preventing injection
- Inject SLC

Operator Actions

Event No.(s): 1		Page 1 of 1
Description: Swap TBCCW pumps		
Initiation: Following turn over, and upon direction from the Lead Examiner.		
Cues: None normal evolution		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Using CPS 3204.01 TURBINE BUILDING CLOSED LOOP COOLING WATER Step 8.1.2 shifting TBCCW pumps 1) Verify open/open idle pump's 1W003B(A) TBCCW 1B(1A) disch. (booth) 2) Verify open/open idle pump's 1W001B(A) TBCCW pump suction (booth) 3) Vent the idle pump (booth) 4) Start idle 1WT01PB(A) , TBCCW Pump 5) Check for increased system header pressure; THEN stop the operating pump, 1WT01PA(B), TBCCW Pump. 6) Verify proper system pressure of at least 52 psig
	ATC	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs operation to shift pumps • Direct plant announcement for shifting of pumps
Terminus: TBCCW pumps are shifted		
Examiner Note: This will be part of the pre-shift brief prior to the applicants entering the control room when they are sequestered.		

Operator Actions

Event No.(s):	2	Page 1 of 1
Description: Pull rods to raise power (Panel P680, Center Section)		
Initiation: Upon direction from the lead examiner call the control room as SM and return to power ascension.		
Cues: Directed by SRO		
General Note		
If this evolution was Prebriefed and “Expected Alarms” were reviewed, the following may be allowed:		
<ul style="list-style-type: none"> • The “Expected Alarms” will be flagged in some manner. • When the annunciator comes in the operator will announce “Expected Alarm” • The Annunciator Response Procedure (ARP) need not be entered because it has already been reviewed in the Prebrief. 		
If a Prebrief was not conducted the operator should perform the following:		
<ul style="list-style-type: none"> • When an annunciator comes in the ARP should be referred to • The annunciator may then be identified as an “Expected Alarm”, flagged, and from that point on the ARP need not be referred to. (OP-AA-103-102) 		
Time	Position	Applicant’s Actions or Behavior
	ATC	○ Performs Rod Coupling checks as rods are positioned to 48.
	BOP	• Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	<ul style="list-style-type: none"> • Positions himself in proximity to the reactor operator, typically the location from which EOP actions are directed. (OP-AA-300). • Directs actions listed above. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • If not discussed in the Pre-brief, SRO should discuss REMA Critical Parameters.
Terminus: Clearly observable plant response from change in power level.		

Operator Actions

Event No.(s): 3		Page 1 of 1
Description: Auto Trip of 'B' Component Cooling Water (CCW) Pump (Panel P680, Section 5003 and Panel P800, Section 5040)		
Initiation: Upon direction from Lead Examiner.		
Cues: Annunciator 5040-1B, Auto Trip Pump/Motor, is received. Annunciators 5003-3D & 3K, Recirc Mtr A & B Wdg Clg Wtr Flow Lo, is received.		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Communicates Annunciator 5040-1B • References ARP <p>Per CPS 5040-1B, Auto Trip Component Cooling Water Pump:</p> <ul style="list-style-type: none"> • IF Only <u>one</u> CCW pump is running, • THEN <ul style="list-style-type: none"> a) Start a standby CCW Pump, 1CC01PA (C), ○ Makes Plant Announcement on starting Standby CCW Pump. ○ Dispatches Area Operator to the 'B' CCW pump and breaker. ○ Dispatches operator to running pump
	ATC	<ul style="list-style-type: none"> • Communicates Annunciator 5003-3D & 3K • References ARP ○ Monitors Reactor Recirc Pumps for elevated temperatures. • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Directs startup of standby pump • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Component Cooling Water Pump has been started.		

Operator Actions

Event No.(s): 4		Page 1 of 1
Description: RWCU Pump seal plate temperature high		
Initiation: on the signal of the lead evaluator		
Cues: Annunciator CPS 5000-2E alarms		
Time	Position	Applicant's Actions or Behavior
	RO	Per CPS 3303.01, RWCU step 8.1.4 and 8.1.3: <ul style="list-style-type: none"> • Direct field Operator to remove all Filter demins from service • Open the F/D bypass valve • Shutdown RWCU pump 'B' • Place one F/D in service
	BOP	<ul style="list-style-type: none"> • Dispatches a field operator to support RWCU operation • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	Enters CPS 3303.01 Directs actions listed above. <ul style="list-style-type: none"> • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Enforces OPS expectations and standards. ○ Contacts Shift Manager and recommends notifications.
Terminus: RWCU pump has been shutdown IAW CPS 3303.01		

Operator Actions

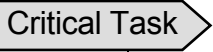
Event No.(s): 5		Page 1 of 1
Description: ERAT static VAR compensator trip		
Initiation: Upon direction from the lead evaluator		
Cues: 5011-8E alarm		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> •1) At MCR panel P870, place the ERAT SVC control switch to OFF, and then release. Verify: ERAT SVC Bkr, 0AP103E is OPEN. ERAT SVC Bkr, 0AP104E is OPEN. 2) Notify Transmission System Operator (TSO) (AmerenIP) and Power Team, as soon as possible and within 30 minutes, of loss of SVC. (FERC VAR-002 requirement) (Operations shall LOG all communications with TSO/TD) •3) Dispatch an operator to the ERAT SVC Building to investigate: 0AP117E, ERAT SVC Alarm and Trip Indication. 0VV100J, ERAT SVC Cooling Skid MAC 50 PLC control panel. •4) 138KV Offsite Source (ITS LCO 3.8.1/2) is INOPERABLE when the ERAT SVC is not in-service and functional. Within 1 hour, perform CPS 9082.01, Offsite Source Power Verification for the OPERABLE 345KV Offsite Source.
	ATC	<ul style="list-style-type: none"> • Monitors reactor to ensure operations remain within established bands o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. o Makes plant announcement for loss of ERAT SVC
	SRO (Surrogate)	<ul style="list-style-type: none"> o Reviews 9082.01 o Conducts brief with crew addressing plant impact and technical specifications
Terminus: ERAT in off and 9082.01 complete		

Event No.(s): 6		Page 1 of 1
Description: FWLC Sensor failure		
Initiation: When the ERAT is in off and Upon direction of the Lead Examiner.		
Cues: 5002-2P amber light on control signal that fails		
Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Difference of 7.5" between the measured channels • Reports to SRO channel 'A' feedwater control failure • Transfers feedwater control to the 'B' channel • Enter into 4002.01 Abnormal RPV/Level loss of feedwater at power • As, necessary take manual control of the FW system to stabilize RPV water level. • ORM 2.2.12 applies
	BOP	<ul style="list-style-type: none"> ○ Peer check 'A' RO • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	<ul style="list-style-type: none"> • Enter into 4002.01 Abnormal RPV/Level loss of feedwater at power • ○ ORM 2.2.12 applies
	CREW	<ul style="list-style-type: none"> ○ May scram the plant if level isn't transferred fast enough
Terminus: Feed water level is operating on the operable channel		
Evaluator Note: The crew may take the unit off line in which case the runback will happen after the scram.		

Operator Actions

Event No.(s):		7	Page 1 of 1
Description: GC pump trip/generator lockout			
Initiation: IF the crew stabilizes feed water on the loss of level transmitter then on the signal of lead examiner			
Cues: Multiple alarms, Generator lockout, Scram			
Time	Position	Applicant's Actions or Behavior	
	ATC	<p>Reports activation of runback circuit and places mode switch in Shutdown or when directed.</p> <p>Reports Scram</p> <ul style="list-style-type: none"> • Check and report power • Report level and pressure are following expected trends • Verify turbine and generator are tripped • Stabilize pressure <1065 psig with SRVs • Restores to Level 3-8 <p>Coordinates with BOP operator to monitor and control RPV level and press.</p>	
	BOP	<p>Reports loss of operating GC pump and attempts to start standby GC pump and reports failure of GC pumps.</p> <p>Performs EOP/ON actions as directed by SRO</p> <ul style="list-style-type: none"> • Makes plant announcement for reactor scram and to evacuate containment • Verify all rods NOT in <p>Coordinates with RO operator to monitor and control RPV level and press.</p>	

Operator Actions

Event No.(s): 8		Page 1 of 3
Description: ATWS		
Initiation: When a Scram is attempted.		
Cues: No Control Rod Movement when Scram is attempted		
Time	Position	Applicant's Actions or Behavior
	ATC	<p>Per CPS 4100.01, Reactor Scram:</p> <ul style="list-style-type: none"> • Performs Scram Choreography <ol style="list-style-type: none"> 1) Mode Switch in Shutdown, Power is...(Still above 5%) 2) Rod status is...(rods still out) 3) Reactor power is...and trend 4) Reactor pressure is...and trend 5) Reactor level is...and trend • Stabilize Reactor pressure 800 to 1065 psig or per directed band. • Calls Area Operator to bypass the CRD Pump Suction Filters. <p>Per EOP-1A, ATWS RPV Control:</p> <ul style="list-style-type: none"> • Inhibit ADS.(May be done by BOP) • Arm and Depress the Manual Scram Pushbuttons • Initiate ARI • Carry out actions to insert control rods per 4411.08 <ol style="list-style-type: none"> 1) Inserts control rods until locked out by Rod Pattern Controller upon turbine trip 2) Directs that Rod Pattern Controller be bypassed. 3) Continues rod insertion • Terminate and Prevent injection from Condensate/Feedwater.
		

Event No.(s):		8	Page 2 of 3
Description: ATWS			
Time	Position	Applicant's Actions or Behavior	
	BOP	<p>Per CPS 4100.01, Reactor Scram:</p> <ul style="list-style-type: none"> • Performs Scram Choreography by: <ol style="list-style-type: none"> 1) Making an announcement <ul style="list-style-type: none"> - Reactor Scram - MDRFP may start - Evacuate the RCIC room - Evacuate the Containment 2) Determine rod status and report to CRS <p>Inhibit ADS (May be Done by ATC)</p> <p>Per EOP-1A, ATWS RPV Control:</p> <ul style="list-style-type: none"> • Terminate and Prevent injection of HPCS, LPCS, & LPCI to lower level <p><u>Removal of 'QS' Relay</u> [HARD CARD at P601] [Prevents TB MCC 1M shunt trip which maintains MDRFP availability.] <u>IF</u> Div 2 LPCI B/C initiation has <u>not</u> occurred, [Manual or Automatic (Level 1/HiDW pressure)], <u>THEN</u> At backpanel 1H13-P851, Bay B :Remove relay 1UAY-AP567B (QS).</p> <p><u>HPCS - Initiation Signal NOT Present</u> 1 While <u>holding</u> control switch in CLOSE for 1E22-F004, HPCS To CNMT Outbd Isln Valve: Arm and Depress HPCS MANUAL INITIATION push-button. 2 After starting current has decayed, stop HPCS Pump, 1E22-C001.</p> <p><u>LPCI B/C - Initiation Signal NOT Present</u> 1. Verify/remove relay 1UAY-AP567B (QS) per step 2.1. 2. Arm and Depress LPCI FM RHR B & C MANUAL INITIATION pushbutton. 3. Provide a CLOSE signal to 1E12-F042B, LPCI Fm RHR B Shutoff Valve. 4. Provide a CLOSE signal to 1E12-F042C, LPCI Fm RHR C Shutoff Valve. 5. Shut 1E12-F053B, RHR B To Feedwater S/D Cooling Rtrn Vlv. 6. Shut 1E12-F023, RHR B Supp To Rx Head Spray Valve. 7. Start DW/CNMT Mixing Compressors per P800 HARD CARD or 4411.11.</p> <p><u>LPCS/LPCIA - Initiation Signal NOT Present</u> 1. Arm and Depress LPCS FM RHR A MANUAL INITIATION pushbutton. 2. Provide a CLOSE signal to 1E12-F005, LPCS Fm Shutoff Valve. 3. Provide a CLOSE signal to 1E12-F042A, LPCI Fm RHR A Shutoff Valve. 4. Shut 1E12-F053A, RHR A To Feedwater S/D Cooling Rtrn Vlv</p> <p><u>RCIC</u> 1. Depress RCIC TURBINE REMOTE TRIO pushbutton 2. Shut 1E51-C002 RCIC Turbine trip valve stem 3 Shut 1E51-F013 RCIC Pump disch to Rx outbd isolation valve</p>	
	Critical Task		
	Critical Task		
	Critical Task		
	Critical Task		

Event No.(s):		8	Page 3 of 3
Description: ATWS			
Time	Position	Applicant's Actions or Behavior	
	SRO	<p>Enters CPS 4100.01, Reactor Scram</p> <ul style="list-style-type: none"> • Carries out Scram Choreography by performing an Update: <ul style="list-style-type: none"> – Entering EOP-1 – Entering Scram Off-Normal – Transient Annunciator Response is authorized <p>Enters EOP-1A, ATWS RPV Control and directs:</p> <ul style="list-style-type: none"> • Inhibit ADS • Insertion of control rods per CPS 4411.08 • Initiation of SLC per CPS 4411.10 • Maintain RPV level in prescribed band with CRD and Feed water • Stabilization of RPV Pressure 800 to 1065 psig with Bypass Valves. • Limit Steam Loads to prevent cooldown • Maintain pressure control 800-1065 while during ATWS. ○ Perform MSIV inboard isolation. 	
		<p>Critical Task</p>	
		<p>Critical Task</p>	
Terminus:			
<ul style="list-style-type: none"> • Reactor power is below the APRMs. • Pressure is being maintained. • Upon approval of Lead Examiner. 			

Critical Tasks

- Insert Control Rods.
- Limit Steam Loads to Prevent cooldown.

Event No.(s):		9	Page 1 of 1
Description: CRD Pump trip			
Initiation: On the signal of lead examiner			
Cues: Annunciator 5068-3B CRD DRIVE WATER PUMP AUTO TRIP			
Time	Position	Applicant's Actions or Behavior	
	RO	<ul style="list-style-type: none"> ○ Monitors reactor to ensure operations remain within established bands. ○ Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. 	
	BOP	<p>Per CPS 4411.03, RPV level control</p> <ul style="list-style-type: none"> ● At Panel 1H13-P601, take manual control of 1C11-R600, Flow Controller and close 1C11-F002A, CRD Flow Control Valve. ○ Direct the C area to Isolate RR Pump Seal Filter D/P. ● Start the CRD Aux Oil Pump. ○ Allow CRD Aux Oil Pump to run approximately 1 minute prior to starting CRD pump. ● Directs the D area to close 1C11-F014A, CRD Pump A Disch Chk Vlv. ○ Directs the D area to Verify oil pressure ≥ 3 psig. ● Start CRD Pump A, 1C11-C001A. ○ Verify CRD Pump running and Aux Oil Pump has auto stopped. ● Directs the D area to Open 1C11-F014A, Pump A Disch Chk Vlv. ● Using 1C11-R600, open 1C11-F002A(B), CRD Flow Control Valve to obtain a flow rate of 41 to 49 gpm as indicated on C11-R606, CRD Hydraulics Flow Indicator. ○ Adjust tape setpoint to null out deviation. ○ Directs the C area to restore RR seal filter DP gauge on 755' Containment 	
	SRO	<ul style="list-style-type: none"> ● Directs actions listed above. 	
Terminus: CRD pump is running			

Simulator Operator Instructions**Initial Setup**

1. Verify daily lamp test completed
2. Reset to IC #40 for this scenario.
3. Load the lesson plan for this scenario 2
4. Place simulator in RUN
5. Verify the AR/PR server is running and stabilize AR/PR
6. Verify RCIC Flow Controller is set at 620 psig.
7. Ensure the correct number of CPs are in service.
8. Ensure CRD drive water D/P is in the expected range
9. Verify correct Control Rod Move Sheets in P680 Book and the correct Cram array are used provided from the exam author
10. Turn on and advance recorders
11. Verify simulator conditions match the turnover
12. Provide copies of the following:

Event Triggers and Role PlayEvent #

1. None
Role play as the equipment operator performing 3204.01 Section 8.1.2
2. Pull rods to raise power
 - a. No Trigger
Role play: Report to the MCR as the rod verifier
3. 3. Auto Trip of 'B' CCW Pump.
 - a. **Remote trigger 1** Upon request from lead evaluator
 - i. Role play: **Equipment Operator:** When requested to check CCW pumps, report the running pumps look good and the motor on the tripped pump is hot and the breaker is tripped.
4. 'B' RT pump seal plate temperature high
 - a. **Remote trigger 2** on request from lead evaluator
 - b. Role play field operator that 'B' RT pump seal temperature is 285 degrees and rising slowly. The CCW is lined up to this pump and the other 'A' RT pump is at 175 degrees and stable. No steam in the room.
 - c. **Remote trigger 3** to remove RT F/D 'A', **Remote trigger 4m** to remove RT F/D 'B'.
 - d. **Remote trigger 5** to place on service RT F/D 'A', **Remote trigger 6** to place on service RT F/D 'B'
5. ERAT SVC Trip
 - a. **Remote trigger 7** on request from lead examiner
 - b. **Role play** Dispatcher for loss of SVC
 - c. **Role play** Load tap changer for the ERAT verified at manual 2 LOWER. (IF called for the performance of 9082.01)
6. FWLC Sensor failure
 - a. **Remote 8** on request from the lead examiner
 - b. **Role play** IMD to the MCR for failure of the level transmitter.
7. Loss of stator water cooling generator runback
 - a. **Remote 9** on request from the lead examiner
 - b. **Role play** Verify runback conditions exist "No stator water cooling pumps are running"

8. ATWS
 - a. None inserted in initial conditions of the lesson plan
 - b. Role play as IMD to pull the QS relay and override EOP interlocks at direction of the RO

9. CRD pump trip
 - a. None cued on position of the MODE switch
 - b. Pumps will have to be swapped in order to drive control rods.
 - c. **Role play** Equipment operator to restore CRD IAW 3304.01

Overview

Makeup/Reject:

ECCS: RHR A, B, C, LPCS and HPCS are Operable. RCIC is Operable

SDC: N/A

Electrical: 6.9 KV 1A & 1B and 4.16 1A & 1B on UAT, 4160 Volt Busses

1A1, 1B1 & 1C1 are being supplied by RAT

Ventilation:

Radwaste: FP/FP 1B in service. 1WF Evap is in Hot Standby. A and B RT F/D are in service.

Plant Status

On Line Risk Green

Reactor

Operational Condition: Mode 1
 Total Core Flow: 53.6 mlb/hr
 FCV Position: A: 29% B: 29%
 Reactor Power: 50% (<=100%) 1721 MWt (<=3473) 529 Mwe
 Xenon: Stable
 RPV Level: 30.7 in Narrow Range
 RPV Pressure: 945 psi (< 1045)
 In service SDC loop: None MODE 1

Containment

Suppression Pool Temperature: 76 F (<=93.1 F)
 Suppression Pool Level: 19.2 ft (19 ft 0 to 19 ft 5 in)
 Drywell Pressure: 0.53 psi (0 to 1 psig)
 Drywell to Containment dp: 0.49 psi (>=-.02 psid to <=1.0 psid)
 Drywell Avg Air Temperature: 103 F (<=146.53 F)
 Secondary Containment: 0.75 in WG (>= 0.25 in WG vacuum)

BOP

Condenser Vacuum: -28.6 in Hg
 Off – Gas Flow: 44.1 scfm
 Condensate Temperature: 85.1 F
 Generator Reactive Load: 171 MVARs

Plant Chemistry

CPI (goal < 1.1): 1.00
 Reactor Sulfates (goal < 2) 1.31 ppb
 Reactor Chlorides: 0.51 ppb
 Iron goal <2.1) 0.85 ppb
 I-131 dose equivalent 4x10-6 μCi/g

Protected Equip:

Comments: .

From “Excellence in Human Performance”

Leaders reinforce desired jobsite behaviors (Handbook page 17)

Participate in training program activities.

Leaders monitor and provide feedback to improve training program quality as well as to coach and reinforce individuals who meet or exceed behavior expectations and Standards of performance. During training activities, leaders guide workers on how actions or inactions influence reactor safety and on the potential consequences of mistakes. They give particular attention to recognizing error-likely situations and flawed defenses during tasks important to nuclear safety

Turnover

1. Power, xenon and time in life
2. Status of Tagged Out Equipment
None
3. Shift conditions
Day Shift Today
4. Weather Conditions
Sunny and warm.
5. Thermal Limit Problems or concerns
6. LCO's in effect
7. Surveillances in progress
None.
8. Evolutions planned for the shift
Raise reactor power with rods to 72%
Swap TBCCW pumps
9. Risk Levels
Green
10. Other
MSR's not inservice for Engineering evaluation.

NOTE REGARDING SPARE SCENARIO

The spare scenario was not included with these scenario's because the applicants did not utilize it during this examination. It will be withheld so that it can be used on future examinations.