Scenario Outline

Facility: *Clinton Power Station* **Scenario No.:** *NRC 1.1* **Op Test No.:** *1*

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- A startup is in progress with power at 55%.
- Withdrawing rods to the 100% rod line.
- Need to shift EHC pumps first thing for a T/O on the 1B pump.
- Emergency Reserve Transformer out of service for bushing replacement.
- Control 24-29 is stuck at position 48

Turnover:

- **Continue with power ascension IAW GP.**

Event No.	Malf. No.	Event Type*		Event Description
1		*N*	*BOP SRO*	*Shift EHC Pumps*
2		*R*	*RO SRO*	*Withdraw rods to the 100% rod line*
3	YP_XMFTB	*C*	*RO SRO*	*Uncoupled Control Rod*
4	LC08	*C*	*BOP SRO*	*Loss of a CRD Pump*
5	FW09B	*I*	*RO*	*Feedwater pump control signal failure*
6	YP_XMFTB(4007)	*C*	*BOP SRO*	*Loss of Bus 1J (restore Cycled Condensate)*
7	*RR03*	*M*	*BOP RO SRO*	*LOCA due to small Reactor Recirc leak*
8	*I/O*	*C*	*RO*	*Fail Mode Switch in RUN*
9	RP04	*C*	*RO SRO*	*Auto scram failure, ARI successful*
10	ED04C1	*C*	*BOP*	*Loss of Division 3 bus*
11	YARIMVFP(2)	*C*	*BOP*	*RCIC injection valve fails to open*

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

Narrative Summary

Event(s)	Description
1	Shift EHC Pumps
2	Withdrawal control rods to the 100% rod line
3	While withdrawing control rods a rod becomes uncoupled. The RO should refer to the Abnormal operating procedures and upon taking corrective action the rod will become coupled on the second attempt.
4	The running CRD pump will trip on over current. Diagnostics will be done and the standby pump started per CPS 3304.01
5	A Feedwater Level Control Signal failure on the B TDRFP will occur requiring the RO to shift the A TDRFP control to the manual potentiometer.
6	A loss of Bus 1J will occur causing the loss of "A" CY Pump. The only indication of this is CY pressure decreasing. If 'C' CY Pump is started it will appear to be running but pressure will continue to decrease. 'A' and 'C' pumps are powered from Bus 1J. After diagnosing the problem the 'B' CY Pump should be started, and pressure will return to normal.
7	A small Recirc Loop break will cause a high Drywell Pressure requiring entry into EOP-1 and EOP-6. This will also shunt trip TBMCC 1M causing a loss of the MDRFP. An emergency depressurization will be required when Containment pressure cannot be maintained within Figure N.
8	When the mode switch is placed in Shutdown an ATWS will occur. Power should remain high initially. The plant will remain stable because Main Turbine is still online. Manual Initiation of ARI will cause all control rods to insert.
9	Due to the Mode Switch in Run, a Group 1 Isolation will occur on low Steam Line pressure causing a loss of the Main Turbine and Turbine Driven Reactor Feed Pumps. SRVs will need to be used initially to control reactor pressure.
10	A loss of the DIV 3 Emergency Bus will cause a loss of HPCS.
11	The RCIC injection valve will fail to open but will open with the switch.

Critical Tasks
Performing Alternate Rod Insertion
Performing Emergency Depressurization if cannot stay inside Figure N.

EOPs Entered
EOP-1, RPV Control
EOP-6, Primary Containment Control

EOP Contingencies Entered
EOP-3 Emergency RPV Depressurization

Event No.(s): 1	**Page** 1 **of** 1
Description: Shift EHC Pumps	
Initiation: When the crew takes the shift	
Cues: Directed by SRO	

Time	Position	Applicant's Actions or Behavior
	RO	o Monitors reactor to ensure operations remain within established bands. o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	BOP	• Starts the 1A EHC Pump. o Ensures pump discharge pressure comes up to ~ 1600 psig. o Allows the EHC Pump just started to run for at least 30. • Stops the 1B EHC Pump.
	SRO	o Directs actions listed above.

Terminus: Observable power increase has been observed.

NOTES:

- Solid bullets are required actions
- o Hollow bullets are actions that may or may not be performed

Event No.(s): 2		**Page** 1 **of** 1
Description: Withdrawal rods to 100% rod line		
Initiation: When the crew takes the shift		
Cues: Directed by SRO		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	• Withdraw control rods per the control rod sequence.
	BOP	o Monitors reactor to ensure operations remain within established bands. o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	o Directs actions listed above.
Terminus: Observable power increase has been observed.		

NOTES:

• Solid bullets are required actions
o Hollow bullets are actions that may or may not be performed

Event No.(s): 3		**Page** 1 **of** 1
Description: Uncoupled control rod		
Initiation: When the rod is withdrawn to 48		
Cues: Annunciator 5006-5G Rod Overtravel		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	• Determine control rod 08-41is uncoupled by pressing the ROD UNCOUPLED button. • Informs SRO of an uncoupled control rod. Per CPS 3304.02, ROD CONTROL AND INFORMATION SYSTEM, step 8.2.6.1 • Verifies that the INDIVID DRIVE light is energized on the OCM. If not, selects individual drive by depressing DRIVE MODE push-button. • Inserts the drive 1 or 2 notches in an attempt to recouple the rod. • Determines if the rod has recoupled by fully withdrawing the drive. • Determines that the rod has not recoupled and informs the SRO. • Performs the attempt to recouple the rod again and determines that the rod is recoupled.
	BOP	o Monitors reactor to ensure operations remain within established bands. o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Enters LCO 3.1.3.C and declares the control rod inoperable when the first attempt to recouple fails. o After the control rod is recoupled, it could be declared operable.
Terminus: Control rod has been recoupled.		

NOTES:

• Solid bullets are required actions
o Hollow bullets are actions that may or may not be performed

Event No.(s): 4		**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	• Determines control rod 24-45 accumulator is alarming. • Reports control rod 24-45 accumulator is alarming to SRO. o Monitors reactor to ensure operations remain within established bands. o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	BOP	Per CPS 3304.01, CONTROL ROD HYDRAULIC & CONTROL section 8.3.5 • At Panel 1H13-P601, take manual control of 1C11-R600, Flow Controller and close 1C11-F002A, CRD Flow Control Valve. o Direct the C area to Isolate RR Pump Seal Filter D/P. o Direct the C area to check control rod 24-45 accumulator • Start the CRD Aux Oil Pump. o 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. o Directs the D area to Verify oil pressure ≥ 3 psig. • Start CRD Pump A, 1C11-C001A. o 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. o Adjust tape setpoint to null out deviation. • Place flow controller 1C11-R600 in automatic mode. o Directs the C area to restore RR seal filter DP gauge on 755' Containment
	SRO	• Directs actions listed above. • Enters LCO 3.1.5.B restore charging header to >1600 psig within 20 minutes and declare 24-45 inop within 1 hour.
Terminus: CRD pump is running		

NOTES:

• Solid bullets are required actions
o Hollow bullets are actions that may or may not be performed

Event No.(s): 5		**Page** 1 **of** 1
Description: B TDRFP Control Signal Failure		
Initiation: On the signal of lead examiner		
Cues: Annunciators 5002-2Q RX WTR LVL HI-LO and 5002-3P RFPT CONT SIG FAILURE		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	• Determines the B TDRFP has a control signal failure, Amber cont sig failure light is lit. Per 3103.01 Feedwater: • Adjust Manual Speed Control potentiometer until a zero milliamp signal is indicated on the deviation meter. • Transfer control to the Manual Speed Control Potentiometer by pressing the MAN XFR push-button. o Vary TDRFP speed utilizing the Manual Speed Control pot to maintain desired RPV level. o Adjust TDRFP speed to equalize flows between the two RFPs. o Place Flow Controller in MANUAL.
	BOP	o Monitors reactor to ensure operations remain within established bands. o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs shifting the B TDRFP to the manual potentiometer. o Obtain IMD support to trouble shoot loss of control signal.
Terminus: The B TDRFP is being controlled on the manual potentiometer		

NOTES:

• Solid bullets are required actions
o Hollow bullets are actions that may or may not be performed

Event No.(s): 6		**Page** 1 **of** 1
Description: Loss of Bus 1J		
Initiation: On the signal of lead examiner		
Cues: Annunciators 5012-3B AUTO TRIP 480V BUS FEEDER BKR and 5014-2D LOW PRESS CYCLED COND XFER PUMPS DISCH HDR		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	o Monitors reactor to ensure operations remain within established bands. o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	BOP	• Determines the A Cycled Condensate pump has stopped. Note: The pump breaker will still be shut with the red light on. • Determines that the B pump must be started as the A pump has also lost power. Note: The operator may try to start the C pump first if he has not diagnosed the loss of power Per 3208.01 CYCLED/MAKEUP CONDENSATE: • Dispatches the D area to shut the B pump discharge valve. • Starts the B pump. • Directs the D area to open the discharge valve.
	SRO	• Directs actions listed above.
Terminus: Cycled Condensate is restored		

NOTES:

• Solid bullets are required actions
o Hollow bullets are actions that may or may not be performed

Event No.(s): 7, 8 & 9		**Page** 1 **of** 1
Description: Small break LOCA		
Initiation: On the signal of lead examiner		
Cues: Rising drywell pressure and fission product monitor alarms		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	• When directed places the Mode Switch to SHUTDOWN announces a failure to scram. • Inserts a manual scram. • Initiates ARI • Reports power at 1% lowering. • Aligns feedwater for a scram with a TDRFP. • After feedwater is aligned for post scram operation reports all rods inserted except 24-29. • Inserts NI's. • Trips Recirc Pumps
	BOP	• Announces the reactor scram. • Evacuates the Containment. • When Directed starts mixing compressors. o Verifies the TG trips on reverse power and is coasting down.
	SRO	• Directs starting mixing compressors. • Enters the Reactor Coolant Leakage off-normal. o Directs the B CRO to evacuate the Containment. o Directs the A CRO to place the Mode Switch to SHUTDOWN. • Acknowledges scram report and all rods in except 24-29 report. • Enters EOP-1 on failure to scram and enters EOP-1A. • Exits EOP-1A returns to EOP-1 when shutdown criteria met. • Enters EOP-6 on high drywell pressure.
Terminus:		

NOTES:

• Solid bullets are required actions
o Hollow bullets are actions that may or may not be performed

Event No.(s): 10 & 11 **Page** 1 **of** 1

Description: Loss of High Pressure Injection

Initiation:

Cues:

Time	Position	Applicant's Actions or Behavior
	RO	o Monitors reactor to ensure operations remain within established bands. o Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. • Controls pressure with SRVs (could also be performed by BOP). • Restores level 3 to 8 with Condensate Booster.
	BOP	o Announces the Group 1 Isolation. o Announces the loss of the Div 3 Bus. • Announces the failure of the RCIC injection valve. • Opens the RCIC injection valve with the handswitch. o Maximizes CRD flow. o Starts both trains of SLC. • Initiates Containment spray. • Initiates ADS.
	SRO	Directs the following actions: • Control pressure with SRVs 800-1065 psig. • Control level and specifies a band o Maximize CRD flow. o Start both trains of SLC. • Initiate Containment spray. • Initiate ADS (when it is determined that cannot stay within Figure N). • Restore level 3 to 8 with Condensate Booster.

Terminus: Reactor is blown down and level is restored to level 3 to 8.

NOTES:

- Solid bullets are required actions
- o Hollow bullets are actions that may or may not be performed

Simulator Operator Instructions

Initial Setup

1. Verify daily lamp test completed
2. Reset to IC named scenario #1
3. Load the lesson plan for this scenario
4. Place simulator in RUN
5. Tag out the ERAT
6. Ensure Control Rod 24-29 is stuck and the accumulator is discharged.
7. Turn on and advance recorders
8. Reset SRM A drawer
9. Verify the AR/PR server is running and stabilize AR/PR
10. Verify GETAR alarm is reset
11. Identify T/S issues associated with OOS and turnover
12. Verify simulator conditions match the turnover

Event #

1. Shift EHC Pumps
   a. Roll play as D area

2. Withdraw rods to the 100% rod line
   a. If asked for a 3D Monicore predictor, as the Reactor Engineer "All thermal limits are within spec".

3. Uncoupled control rod
   a. **Remote 1** to recouple the rod on the second attempt
   b. If RE is contacted, "continue to attempt recoupling per 3304.02, while I prepare a maneuver review to drive the rod in

4. CRD Pump trip
   a. Remote 2
   b. Roll play as D area
   c. As C area report accumulator pressure for 24-45 is 1500 psig

5. Feedwater Level Control Level Input Fails High
   a. **Remote 3**

6. Loss of Bus 1J
   a. **Remote 4**

7. Small break LOCA
   a. **Remote 6**

8. Fail Mode Switch in RUN
   a. None

9. Auto scram failure, ARI successful
   a. None

10. Loss of Division 3 bus
    a. **Remote 7**

11. RCIC injection valve fails to open
    a. None