

Scenario Outline

Facility: Clinton Power Station

Scenario No.: NRC 1.2

Op Test No.: 1

Examiners: _____ Operators: _____

Initial Conditions:

- The Unit is operating at 80% reactor power following valve testing.
- Emergency Reserve Transformer out of service for bushing replacement.
- Control 24-29 is stuck at position 48

Turnover:

- Raise reactor power to 90%.
- Shift WT pumps to allow routine maintenance on pump. The Mechanics are standing by.

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	R	RO SRO	Raise reactor power to 90%.
2	N/A	N	BOP SRO	Swap WT Pumps at first opportunity
3	PC01B	C	BOP SRO	B Drywell Chiller trips
4	I/O	I	RO SRO	Inadvertant RR FCV closure
5	YP_XREMT (782)	I	BOP SRO	Standby air compressors fail to start on low air pressure and must be manually started.
6	IA01D	C	RO SRO	Instrument air header leak eventually causes multiple control rod drifts requiring a manual scram be inserted.
7	RP03A	M	ALL	ATWS, hydraulic lock.
8	SL01B	C	BOP SRO	SLC Pump A fails to start and B trips shortly after starting requiring alternate boron injection.

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

Narrative Summary

Event(s)	Description
1	Once the turnover is completed, The SRO should direct the RO to raise power to 90% using recirculation flow.
2	The SRO should also direct the BOP to swap WT pumps to facilitate maintenance activities.
3	The running Drywell chiller trips requiring the shifting of the drywell fans, chilled water pumps, CCP chilled water supply and starting the standby drywell chiller. The first Hydrogen Mixing Compressor that is tried will not start. The SRO should enter Tech Specs for the inop Mixing Compressor
4	Once Drywell cooling has been restored, the B Recirc Flow Controller will fail closing the FCV. The RO should Lockout the Hydraulic Control Unit to stop the valve movement. The SRO should enter Tech Specs for RR Flow mismatch and FCV operability.
5	The instrument air header leak will require entry into the abnormal operating procedure and the standby air compressors will fail to start automatically requiring the BOP operator to start them to attempt to maintain air header pressure.
6	An instrument air header leak will occur and eventually will cause multiple control rod drift alarms. The RO will manually scram the reactor based on this condition.
7	When the RO inserts a manual scram an ATWS hydraulic lock will occur. This will require the RO to perform alternate control rod insertions that will be complicated by the loss of control air pressure.
8	The MSIVs will close due to loss of air pressure resulting in the BIT being approached. The crew will start SLC. The A SLC will not start and 15 seconds after B SLC is started the pump will trip requiring Alternate Boron injection.

Critical Tasks

Crew maintains reactor water level to suppress reactor power.

Inserting control rods to reduce power.

EOPs Entered

EOP-6, Primary Containment Control

EOP Contingencies Entered

EOP-1A, ATWS RPV Control

Event No.(s): 1		Page 1 of 1
Description: Raise reactor power to 90% with Flow.		
Initiation: When the crew takes the shift		
Cues: Directed by SRO		
Time	Position	Applicant's Actions or Behavior
	RO	<ul style="list-style-type: none"> • Increases Recirc Flow with the Loop Flow Controllers to raise power. The operator will open one Flow Control Valve at a time.
	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.
Terminus: Observable power increase has been observed		

NOTES:

<ul style="list-style-type: none"> • Solid bullets are required actions
<ul style="list-style-type: none"> ○ Hollow bullets are actions that may or may not be performed

Event No.(s):	2	Page 1 of 1
Description: Swap Turbine Building Closes Cooling Water Pumps.		
Initiation: When the crew takes the shift		
Cues: Directed by SRO		
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	Per 3204.01 Turbine Building Closed Cooling Water <ul style="list-style-type: none"> ○ Directs the D area to open/check open the B pump suction and discharge valves and to vent the pump • Starts the A pump • Check for increasing pressure • Stop the B pump ○ Verify system pressure is at least 70 psig
	SRO	<ul style="list-style-type: none"> • Directs the pump swap.
Terminus: TBCCW pumps are swapped.		

NOTES:

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Event No.(s): 3		Page 1 of 1
Description: A Drywell Chiller trips		
Initiation: When directed by the Lead Examiner		
Cues: Annunciator 5050-3K TROUBLE DRYWELL CHILLER 1B		
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	<ul style="list-style-type: none"> ● Acknowledges Annunciator 5050-3K and refers to the annunciator procedure. ● Attempts to start a Hydrogen Mixing Compressor ● Reports the Mixing Compressor will not start ● Starts the other Mixing Compressor <p>Per 3320.01 Drywell Cooling</p> <ul style="list-style-type: none"> ● Starts Drywell Cooling Fans 1VP01CA and 1VP01CC ● Starts Chill Water Pump 1VP03PA. ○ Verifies/places 1SX020A, Drywell Chiller 1A Inlet Valve in Auto After Open. ● Starts standby Drywell Chiller 1VP04CA using the START push-button on 1H13-P801. ● Sends an area operator to the Drywell Chiller to monitor performance and load the chiller ● Shuts Supplemental Drywell Cooling Coil Units Supply and Return Isol Valves, 1VP090B/1VP091B. ● Opens Supplemental Drywell Cooling Coil Units Supply and Return Isol Valves, 1VP090A/1VP091A. ○ Verifies WO system lineup to Supplemental Drywell Cooling Coil Units, 1VP02SG and 1VP02SH. ○ Stops Drywell Cooling Fans 1VP01CB and 1VP01CDC ○ Stops Chill Water Pump 1VP03PB
	SRO	<ul style="list-style-type: none"> ● Directs starting a Mixing Compressor to control Drywell pressure ● Directs starting of the A Drywell Chiller. ● Enters Tech Spec LCO 3.6.3.3.A Restore within 30 Days.
Terminus: The A Drywell cooling system is in operation		

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Event No.(s):		4	Page		1	of	1
Description: Inadvertant RR FCV closure							
Initiation: When directed by the Lead Examiner							
Cues: Reactor power decreasing and the B FCV closing							
Time	Position	Applicant's Actions or Behavior					
	RO	<ul style="list-style-type: none"> • Determines that the FCV is closing • Locks out the HCU using the Arm and Depress Pushbutton <ul style="list-style-type: none"> ○ Refers to 4008.01 Abnormal Reactor Coolant Flow ○ Determines that RR flow mismatch is not within Tech Spec limits 					
	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. • Enters Tech. Spec LCOs 3.4.1.A, Shutdown one loop within 2 hours 					
Terminus: Tech Specs have been entered							

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Event No.(s):	5	Page 1 of 1
Description: Standby air compressors fail to start on low air pressure and must be manually started.		
Initiation: When directed by the Lead Examiner		
Cues: Annunciator 5040-6F HIGH/LOW PRESS ADS IA SUPPLY DIV 1 OR 2		
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	<ul style="list-style-type: none"> ○ Refers to 4004.01 Instrument Air Loss ○ Determines that the Standby Service Air Compressor has failed to Auto start at 80 psig. ● Manually starts the Standby Service Air Compressor with the control switch.
	SRO	<ul style="list-style-type: none"> ● Directs actions listed above.
Terminus: The Standby Service Air Compressor is running		

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Event No.(s): 6		Page 1 of 3
Description: Instrument air header leak eventually causes multiple control rod drifts requiring a manual scram be inserted.		
Initiation: When directed by the Lead Examiner		
Cues: Annunciator 5006-4G ROD DRIFT		
Time	Position	Applicant's Actions or Behavior
	RO	<ul style="list-style-type: none"> ○ Depresses the ROD DRIFT button on the Operator Control Module to display rod drift information on full core display map. • Determines that multiple control rods are drifting (multiple drift lights) • Places the Mode Switch in Shutdown. • Announces a failure to scram • Arms and depresses the Manual scram buttons • Initiates ARI <p>Terminates Feed Water and lowers level to –60 inches by:</p> <ul style="list-style-type: none"> • Placing RFPT Flow Controller A/B, C34-R601A/B in MANUAL/min. • Shutting 1FW004, MDRFP Feed Reg Valve by placing: Flow Control RFPT C, C34-R601C in MANUAL/min.and Start-Up Level Control, C34-R602 in MANUAL/min. • Shutting 1FW002A/B, RFP 1A/1B Disch Vlvs. ○ Shutting 1FW003A/B, RFP Discharge Bypass Valves, by placing Flow Controller, FC-FW231 in minimum. • Maintains level TAF to –60 inches with the MDRFP <p>After IA is restored inserts Control Rods by:</p> <ul style="list-style-type: none"> • Driving control rods in with the IN TIMER SKIP or the INSERT button.

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Event No.(s): 6 (continued)		Page 2 of 3
Description: Instrument air header leak eventually causes multiple control rod drifts requiring a manual scram be inserted.		
Initiation: When directed by the Lead Examiner		
Cues: Annunciator 5006-4G ROD DRIFT		
	BOP	<ul style="list-style-type: none"> • Inhibits ADS • Starts both trains of SLC • Announces the failure of SLC <ul style="list-style-type: none"> ○ Announces the MSIV closure and takes the MSIV switches to close. Terminates and prevents HPCS, RCIC, LPCS, LPCI by: <ul style="list-style-type: none"> • Removal of 'QS' Relay (back panel) HPCS <ul style="list-style-type: none"> • While holding control switch in CLOSE for 1E22-F004, HPCS To CNMT Outbd Isln Valve Arm and Depress HPCS MANUAL INITIATION push-button. • After starting current has decayed, stop HPCS Pump, 1E22-C001. RCIC <ul style="list-style-type: none"> • Depress RCIC TURBINE REMOTE TRIP push-button. • Shut 1E51-C002, RCIC Turbine Trip Valve Stem. • Shut 1E51-F013, RCIC Pump Disch To Rx Outbd Isol Valve. LPCS/LPCI A <ul style="list-style-type: none"> • Arm and Depress LPCS/LPCI FM RHR A MANUAL INITIATION push-button. • Provide a CLOSE signal to 1E21-F005, LPCS To CNMT Outbd Isol Valve. • Provide a CLOSE signal to 1E12-F042A, LPCI Fm RHR A Shutoff Valve. <ul style="list-style-type: none"> ○ Shut 1E12-F053A, RHR A To Feedwater S/D Cooling Rtrn Vlv. ○ Start DW/CNMT Mixing Compressors per P800 HARD CARD or 4411.11. LPCI B/C <ul style="list-style-type: none"> ○ Verify/remove relay 1UAY-AP567B (QS) per step 2.1. • Arm and Depress LPCI FM RHR B & C MANUAL INITIATION push-button. • Provide a CLOSE signal to 1E12-F042B, LPCI Fm RHR B Shutoff Valve. • Provide a CLOSE signal to 1E12-F042C, LPCI Fm RHR C Shutoff Valve. <ul style="list-style-type: none"> ○ Shut 1E12-F053B, RHR B To Feedwater S/D Cooling Rtrn Vlv. ○ Shut 1E12-F023, RHR B Supp To Rx Head Spray Valve. ○ Start DW/CNMT Mixing Compressors per P800 HARD CARD or 4411.11. • Coordinates with the RO and controls pressure with SRVs

Description: Instrument air header leak eventually causes multiple control rod drifts requiring a manual scram be inserted.

Initiation: When directed by the Lead Examiner

Cues: Annunciator 5006-4G ROD DRIFT

	<p>SRO</p> <ul style="list-style-type: none"> • Enters EOP-1 • Enters EOP-1A <p>Directs the following:</p> <ul style="list-style-type: none"> • Inhibit ADS • Insert a Manual scram • Initiate ARI • Start SLC • Alternate Control Rod insertion • Terminate and prevent HPCS, RCIC, LPCS, LPCI and Feed Water • Maintain level TAF to –60 inches • Maintain pressure 800 to 1065 psig with SRVs • Alternate Boron Injection
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Terminus: Level is being maintained TAF to -60 inches and Control Rods are being inserted

NOTES:

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Simulator Operator Instructions

Initial Setup

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

Event #

1. Raise reactor power to 90%.
 - a. None
2. Swap WT Pumps
 - a. Roll play as D area
3. A Drywell Chiller trips
 - a. **Remote 1**
 - b. Roll play as C area
4. Hydrogen Mixing Compressor fail to start
 - a. Monitor the compressor switches and remove the I/O to allow the second compressor to start
5. Standby air compressors fail to start on low air pressure and must be manually started.
 - a. **Remote 3**
6. Instrument air header leak eventually causes multiple control rod drifts requiring a manual scram be inserted.
 - a. **Remote 4**
7. ATWS, hydraulic lock.
 - a. None
8. SLC A does not start and Pump B trips shortly after starting requiring alternate boron injection.
 - a. None