

Facility: Clinton Power Station

Scenario No.: 1

Operating Test No.: ILT0601-1

Examiners: _____

Operators: _____

Initial Conditions:
 6% power, normal plant startup is in progress.

Turnover:

- Continue plant startup.
- Cross connect 480V Busses C and D with C supplying for a breaker inspection.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R-ATC/SRO	Raise reactor power with rods.
2	ROD24495T FIA4	C-ATC/SRO	Difficult to Withdraw Control Rod
3	CW06A	C-BOP/SRO	Auto Trip of 'B' CCW Pump
4	IRM_CTFIA 1 YP_XREMT _515	TS-SRO	Downscale failure of IRM C Bypass Div 3 using Sensor Bypass
5	N/A	N-BOP/SRO	Cross connect 480V Busses C and D
6	Overrides	TS-SRO	Both OG H ₂ analyzers lose flow
7	CD01CD_C D01PATVE FFDEC	C-ATC/SRO	'A' CD Pump low discharge pressure, must shift pumps.
8	A05_A02_A 14A01_1	I-BOP/SRO	Failure of the CRD Hydraulic Flow Controller
9	YP_XMFTB _4068, 4070, 4071	M-Crew	Trip of all CD pumps
10	YP_XMFTB _4963	M-Crew	Failure to scram
11	YP_XMFTB _5106 & 5107	C-Crew	Failure of the A SLC Pump to start and a trip of B SLC after one minute of running.

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

Narrative Summary

Event #	Description
1.	Power will be increased using rods.
2.	While power is being increased rod 24-49 will experience difficulty in being withdrawn requiring the ATC Operator to increase drive water pressure to free the rod.
3.	A trip of the 'B' Component Cooling Water (CCW) Pump will force the BOP operator to start the standby pump.
4.	A downscale failure of IRM C causes a Rod Block. This will require evaluation of Technical Specifications LCO 3.3.1.1 action A.1. Continuation of the startup will require Bypassing Div 3 using Sensor Bypass and entry into Technical Specifications LCOs 3.3.1.1, 3.3.1.3, 3.3.4.1, 3.3.6.1 and ORM ORs 2.2.1/3 and 2.2.14
5.	480 VAC busses C and D are crosstied with C supplying.
6.	The loss of OG Hydrogen analyzers requires evaluation of Operational Requirements Manual OR 2.2.11.
7.	A low Condensate Pump Discharge Pressure alarm will require starting another Condensate Pump.
8.	Failure of the CRD Hydraulic Flow Controller will require the BOP Operator to take manual control and establish normal CRD flow.
9.	A trip of all Condensate Pumps will cause RPV level to decrease and the ATC operator will place the Mode Switch in Shutdown prior to RPV level decreasing to Level 3.
10.	The Reactor fails to Scram and the crew will enter EOP-1 and transition to EOP-1A. The crew will have to manually insert Control Rods to shutdown the Reactor.
11.	The A SLC pump will fail to start and the B trip one minute after it starts. The crew will initiate alternate boron injection.

EOP
1, 1A

Critical tasks:

- Insert Control Rods.
- Prevent cooldown

Operator Actions

<i>Event No.(s):</i>	<i>1</i>	<i>Page 1 of 1</i>
<i>Description: Pull rods to raise power (Panel P680, Center Section)</i>		
<i>Initiation: Following Turnover</i>		
<i>Cues: Directed by SRO</i>		
<u><i>General Note</i></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	<i>Position</i>	<i>Applicant’s Actions or Behavior</i>
	ATC	<p>Per, CPS 3002.01, Heatup and Pressurization and NF-CL-721-1002, Control Rod Move Sheets:</p> <ul style="list-style-type: none"> • Pull rods to raise power, (step 25 rod 08-25 @ 40) • Performs Rod Coupling checks as rods are positioned to 48.
	BOP	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> ○ 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 Prebrief, SRO should discuss REMA Critical Parameters.
Terminus: All APRM downscale alarms are clear.		

Note:

- Denotes an action that should be performed.
- Denotes an action that may be performed.

Operator Actions

Event No.(s): 2		Page 1 of 1
Description: <i>Difficult to Withdraw Control Rod</i> (Panel P680, Center Section)		
Initiation: Prior to withdrawal of rod.		
Cues: Control Rod 08-25 does not withdraw.		
Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Determine control rod 24-49 will not withdraw • Informs SRO of a difficult to withdraw rod <p>Upon discovery of the difficult to withdraw rod the operator has the following options, all of which add flexibility and are allowed per the procedures:</p> <ul style="list-style-type: none"> • If in gang mode the operator may move the other rods out to 48 before investigating the problem with 24-49. • If in gang mode the operator may stop moving the other rods and correct 24-49 before moving all the rods in the gang to 48. • Determine if control rod 24-49 has new seals. <p>Per CPS 3304.01, Control Rod Hydraulic & Control, Section 8.3.4:</p> <ul style="list-style-type: none"> ○ Conducts brief on performance of procedure. • Increase Drive Water Diff Press in ≈50 psid increments to a maximum of 500 psid. (BOP Operator may perform this action) ○ Discuss with the CRS how many times to try to move the rod at each pressure. <p>At each ≈50 psid increment perform the following:</p> <ul style="list-style-type: none"> • While monitoring Drive Water Flow and Drive Water Diff Press, Attempt to withdraw rod using normal notch withdrawal. ○ <u>IF</u> control rod moved; <u>THEN</u> record Drive Water Flow and Drive Water Diff Press in the CPS MCR Autolog. • <u>THEN</u> return Drive Water Diff Press to normal.
CUE		
	BOP	<ul style="list-style-type: none"> • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. • Increase Drive Water Diff Press in ≈50 psid increments to a maximum of 500 psid. ○ Record Drive Water Flow and Drive Water Diff Press in the CPS MCR Autolog.
	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. ○ Discusses with the ATC Operator how many times to try to move the rod at each pressure. • Contacts Reactor Engineer

Terminus: Control Rod has been withdrawn.

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: After Control Rod problem is resolved, and 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), <u>or</u> b) <ul style="list-style-type: none"> 1) Shutdown the running FC Pump per CPS 3317.01. 2) Shut 1CC076A & 76B, FC Heat Exchanger Outlet Valves. <ul style="list-style-type: none"> ○ Makes Plant Announcement on starting Standby CCW Pump. ○ Dispatches Area Operator to the B CCW pump and breaker.
	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: 'A' or 'C' Component Cooling Water Pump has been started.

Operator Actions

Event No.(s): **4**

Page **1** of **1**

Description: *Down scale failure of IRM 'A'*
 (Panel P601, Section 5005 and 5006)

Initiation: Following start of the standby CCW Pump, and upon direction from the Lead Examiner.

Cues: Annunciator 5005-3J, IRM Down Scale, is received.
 Annunciator 5006-2H, Rod Out Block, is received.

Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	ATC	<ul style="list-style-type: none"> • Communicates Annunciator 5005-3J • References ARP Per CPS 5005-3J IRM Down Scale. <ul style="list-style-type: none"> • Adjust range switch to maintain IRM scale indication between 15 & 75. <ul style="list-style-type: none"> ○ Bypass the IRM if it has failed. Per CPS 5006-2H Rod Out Block <ul style="list-style-type: none"> • Determines the IRM Down Scale is the cause of the Rod Out Block. Per CPS 3306.01 SRM/IRM section 8.2.4 <ul style="list-style-type: none"> • Verify the bypass status lamps illuminate for the IRM channels
	BOP	Per CPS 3306.01 SRM/IRM section 8.2.4 <ul style="list-style-type: none"> ○ Verify that the minimum number of operable channels will be met. <ul style="list-style-type: none"> • Place the respective Sensor Bypass switch in BYPASS per CPS 3305.01 RPS. Per CPS 3305.01 RPS section 8.2.1 <ul style="list-style-type: none"> • Place the Div 1 channel B21H-S80C Switch Sensor Bypass switch to BYPASS Note: this action will be simulated, the switch is a simulator remote function.
	SRO	<ul style="list-style-type: none"> • Directs the actions listed above Enter into Technical Specifications: <ul style="list-style-type: none"> • LCO 3.3.1.1, Place one channel in trip in 48 hours Note: the following LCOs may be referenced if the channel is not bypassed but must be entered if the channel is bypassed. <ul style="list-style-type: none"> • LCO 3.3.1.3, Place channel in trip in 30 days • LCO 3.3.4.1, Place one channel in trip in 48 hours • LCO 3.3.6.1, Place one channel in trip in 48 hours Note: the following ORs may be referenced if the channel is bypassed. <ul style="list-style-type: none"> • ORM OR 2.2.1/3, Restore within 7 days or place in trip within next hour • ORM OR 2.2.14, Restore within 30 days

Terminus: Channel is bypassed and Technical Specification actions identified.

Operator Actions

<i>Event No.(s):</i> 5		<i>Page</i> 1 <i>of</i> 1
<i>Description:</i> <i>Cross connect 480V Busses C and D</i> (Panel P870, Section 5011)		
<i>Initiation: Directed by the SRO</i>		
<i>Cues: None</i>		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	BOP	Per CPS 3502.01 Section 8.1.4. <ul style="list-style-type: none"> • Close the 480V Bus C & D Tie Breaker 0AP43E. • Open the 480V Bus D Main Breaker 0AP44E. • Verify the 480V Substation D is energized. Red light lit and/or Bus Current > 0 amps.
	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 actions to cross connect 480V Busses C and D with C supplying. • Enforces OPS expectations and standards
Terminus: 480V Busses C and D are cross connected.		

Operator Actions

<i>Event No.(s):</i>	6		<i>Page 1 of 1</i>
<i>Description</i> <i>Off-Gas Hydrogen Analyzer failures</i> (Panel P845 Section 5130)			
<i>Initiation: Following the cross connection of 480V Busses C and D.</i>			
<i>Cues: Annunciators 5130-6E & 6F OG Analyzer A/B Trouble Check Status Lights</i> No Gas Flow and Lo Vacuum Status Lights lit for both Hydrogen Analyzers As EO report: “No sample flow is indicated.” “Cal gas bottle has adequate pressure and regulator is set at 12 psig.” “Actions of CPS 3215.01 OFF GAS (OG), Step 8.3.4 H2 Analyzer Trouble, do not correct the problem.”			
Time	<i>Position</i>	<i>Applicant’s Actions or Behavior</i>	
	BOP	<ul style="list-style-type: none"> • Communicates Annunciators 5130-6E & 6F and status lights • References ARP • Directs EO to take actions per CPS 3215.01 	
	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"> • Enters into the Operations Requirements Manual. • ORM OM 2.2.11, Collect grab samples at least once per 4 hours and analyze within the following 4 hours. 	
Terminus: Operations Requirements Manual review complete.			

Operator Actions

<i>Event No.(s):</i> 7		<i>Page</i> 1 <i>of</i> 1
<i>Description:</i> A' CD Pump low discharge pressure, must shift pumps. (Panel P870, Section 5014)		
<i>Initiation:</i> Following Operations Requirements Manual call, and upon direction of Lead Examiner		
Cues: Annunciator 5014-2B Low Pressure Condensate Pumps Discharge Header		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	BOP	<ul style="list-style-type: none"> • Communicates Annunciator 5014-2B • References ARP <p>Per CPS 5014-2B, Low Pressure Condensate Pumps Discharge Header:</p> <ul style="list-style-type: none"> • Start a standby condensate pump if condenser hotwell level is normal ○ Makes Plant Announcement on starting Standby CD Pump. ○ Dispatches an EO to verify proper operation
	ATC	<ul style="list-style-type: none"> • Starts a standby condensate pump • Monitors system parameters
	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: A standby condensate pump has been started.		

Operator Actions

<i>Event No.(s):</i> 8		<i>Page</i> 1 <i>of</i> 1
<i>Description:</i> CRD Hydraulic Flow Controller failure (Panel P680, Section 5006)		
<i>Initiation:</i> Following start of A standby Condensate Pump, and upon direction from the Lead Examiner.		
<i>Cues:</i> Annunciator 5006-1G CRD Hydraulic Temperature Hi.		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	BOP	<ul style="list-style-type: none"> • Upon identification of problem, may take manual control of controller first and then follow up with Operating Procedure (OP), or may follow through ARP to OP. <p>Per CPS 3304.01 Section 8.3.2</p> <ul style="list-style-type: none"> • Determine which CRD(s) has high temperature from local panel, 1H22-P007 • IF Multiple CRD temperatures are abnormal, • THEN Verify proper cooling water flow and adjust if necessary. <p>Per OP-CL-108-101-1001 Attachment 1:</p> <ul style="list-style-type: none"> • Take manual control of the CRD Hydraulic Flow Controller C11-R600 and reestablish CRD flow to the green band on C11-R605. ○ Communicates equipment status to SRO.
	ATC	<ul style="list-style-type: none"> • Communicates annunciator 5014-4B • References ARP .
	SRO	<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.
Terminus: CRD flow is reestablished.		

Operator Actions

<i>Event No.(s):</i> 9		<i>Page</i> 1 <i>of</i> 1
<i>Description:</i> Loss of all Condensate Pumps (Panel P680, Section 5006)		
<i>Initiation:</i> After CRD flow is reestablished, and upon direction from the Lead Examiner.		
<i>Cues:</i> Annunciator 5002 4F Low Pressure Rx Feed Pumps Suction Header Annunciator 5002 1J Auto/Trip Pump/Motor .		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	ATC	<ul style="list-style-type: none"> • Communicates annunciators 5002-4F & 1J • Communicates that the Motor Driven Feed Pump has tripped on low suction pressure • Communicates that the Condensate Pump has tripped • Attempts to start standby Condensate Pumps • Communicates that no condensate pumps will start.
	BOP	<ul style="list-style-type: none"> • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	<ul style="list-style-type: none"> • Directs startup of a standby Condensate pump • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Operator Actions

Event No.(s): 10 & 11		Page 1 of 3
<i>Description: ATWS and SLC Pump Failures.</i>		
<i>Initiation: When a Scram is attempted.</i>		
<i>Cues: No Control Rod Movement when Scram is attempted</i>		
Time	Position	Applicant's Actions or Behavior
	ATC	<p>Prior to RPV water level reaching Level 3 (8.9"), Places mode switch in shutdown.</p> <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 2) Directs that Rod Pattern Controller be bypassed. 3) Continues rod insertion • Terminate and Prevent injection from Condensate/Feedwater. <p style="text-align: center;"><i>1 Shut IFW004, MDRFP Feed Reg Valve by placing: Flow Control RFPT C, C34-R601C in MANUAL/min.</i></p> <p style="text-align: center;"><i><u>and</u></i></p> <p style="text-align: center;"><i>Start-Up Level Control, C34-R602 in MANUAL/min.</i></p>
Critical Task		

Description: ATWS and SLC Pump Failures.

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"> • Starts SLC and identifies that the A pump does not start and the B pump trips. • Per SRO direction initiates actions for Alternate Boron Injection per CPS 4411.10 • Terminate and Prevent injection of HPCS, RCIC, LPCS, & LPCI to lower level <p><u>Removal of 'QS' Relay [HARD CARD at P601]</u> <i>[Prevents TB MCC 1M shunt trip which maintains MDRFP availability.]</i> <u>IF Div 2 LPCI B/C initiation has <u>not</u> occurred, [Manual or Automatic (Level 1/HiDW pressure)],</u> <u>THEN At backpanel 1H13-P851, Bay B :Remove relay 1UAY-AP567B (QS).</u></p> <p><u>HPCS - Initiation Signal <u>NOT</u> Present</u> <i>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.</i> <i>2 After starting current has decayed, stop HPCS Pump, 1E22-C001.</i></p> <p><u>RCIC</u> <i>1. Depress RCIC TURBINE REMOTE TRIP push-button.</i> <i>2. Shut 1E51-C002, RCIC Turbine Trip Valve Stem</i> <i>3. Shut 1E51-F013, RCIC Pump Disch To Rx Outbd Isol Valve.</i></p> <p><u>LPCI B/C - Initiation Signal <u>NOT</u> Present</u> <i>1. Verify/remove relay 1UAY-AP567B (QS) per step 2.1.</i> <i>2. Arm and Depress LPCI FM RHR B & C MANUAL INITIATION push-button.</i> <i>3. Provide a CLOSE signal to 1E12-F042B, LPCI Fm RHR B Shutoff Valve.</i> <i>4. Provide a CLOSE signal to 1E12-F042C, LPCI Fm RHR C Shutoff Valve.</i> <i>5. Shut 1E12-F053B, RHR B To Feedwater S/D Cooling Rtrn Vlv.</i> <i>6. Shut 1E12-F023, RHR B Supp To Rx Head Spray Valve.</i> <i>7. Start DW/CNMT Mixing Compressors per P800 HARD CARD or 4411.11.</i></p>

Critical Task

		<ul style="list-style-type: none"> • Holds RPV Level in prescribed band (-162 in. and -60 in.) with CRD and RCIC. • Limits Steam Loads to prevent cooldown.
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Event No.(s): **10 & 11** Page **3** of **3**

Description: *ATWS and SLC Pump Failures.*

Time	Position	Applicant's Actions or Behavior
	SRO	Enters CPS 4100.01, Reactor Scram <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 Enters EOP-1A, ATWS RPV Control and directs: <ul style="list-style-type: none"> • Inhibit ADS • Insertion of control rods per CPS 4411.08 • Initiation of SLC per CPS 4411.10 • Initiation of Alternate Boron Injection per CPS 4411.10 • Terminate & Prevent Injection to lower level to reduce subcooling. • Maintain RPV level in prescribed band (Band B: -162 in.(TAF) and -60 in.) with CRD and RCIC • Stabilization of RPV Pressure 800 to 1065 psig with Bypass Valves. • Limit Steam Loads to prevent cooldown
	Critical Task	
	Critical Task	

Terminus:

- 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.

Facility: Clinton Power Station

Scenario No.: 2

Operating Test No.: ILT0601-1

Examiners: _____

Operators: _____

Initial Conditions:
 80% power, steady state.
 MDRFP is CO for coupling replacement.

Turnover:

- Perform 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test.

Event No.	Malf. No.	Event Type*	Event Description
1	YPCTHOLE H_A06_DS1_0 0_1 H_A06_DS1_0 8_1	N-BOP/SRO TS-SRO	Perform 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test - Fails
2	A05_A02_A07 07_3_TVM H_A05_A21D S54_1	C-BOP/SRO	Loss of Lube Oil pressure on the B CRD Pump and a failure of the pump to trip.
3	ROD2029TFI A6 ROD3237TFI A6	TS-SRO	Two Accumulator Faults
4	ROD2421TFI A8	C-ATC/SRO	Control Rod Drift
5	YP_XMFTB_ 5079	C-BOP/SRO	The B FC pump trips
6	A01_A03_02_ 5_TVM YP_RR23A	R-ATC/SRO	Intermittent Low Pressure RFP B Seal Water Alarm. Reduce power with Reactor Recirc to allow removal of RFP B from service.
7	Override	C-ATC/SRO	Turbine trip Pushbutton fails during removal of the B RFP from service.
8	YPXMALSE_ 527	M-Crew	Small break LOCA requiring an Emergency Depressurization.
9	YPXMALSE_ 74	C-Crew	ADS Valve F041C fails to open

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

Narrative Summary**Event #****Description**

1. Perform 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test. Both Vacuum Breakers in one line will go to an intermediate position when either one is tested. This requires evaluation of Technical Specifications LCO 3.6.5.6 action A.1. This also results in a Drywell breach during the LOCA.
2. The running CRD pump will fail to trip on low Lube Oil Pressure. The running pump will be shutdown and the standby pump started per CPS 3304.01
3. The Accumulator faults will require evaluation of Technical Specifications LCO 3.1.5 action B.1.
4. When the standby CRD Pump is started Control Rod 24-21 drifts in and stops at same position as an adjacent withdrawn Control Rod requiring insertion of one of the two Control Rods at least 2 notches.
5. The running Fuel Pool Cooling and Cleanup pump trips. This requires isolation of the upper containment pools, starting the standby pump and unisolating the upper containment pools.
6. The Seal Water Pressure Alarm requires sending an NLO to swap filters to restore pressure. The NLO will report that the standby filter is tagged for cleaning. This will require removing the Feed Pump from service and isolating the pump. Power will be reduced to allow removing the Feed Pump from service.
7. Due to the pushbutton failure the operator will use an alternate method to remove the Feed Pump from service.
8. A small break LOCA causes a high drywell pressure requiring entry into EOP-1 and EOP-6. The stuck open Drywell Vacuum Breakers will cause Containment Pressure to exceed the Pressure Suppression Pressure requiring a Blow Down.
9. When ADS is initiated, one ADS valve fails to open requiring another SRV to be opened.

EOP

1, 6

Critical tasks:

- Starting Containment Sprays
- Blow Down when Figure N is exceeded.

Operator Actions

<i>Event No.(s):</i> <i>Page 1 of 1</i>										
<i>Description:</i> Perform 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test (Panel P678)										
<i>Initiation: Following Turnover</i>										
<i>Cues: Directed by SRO</i>										
<u><i>General Note</i></u> <i>The performance of 9064.01 should have been prebriefed prior to the crew entering the simulator.</i>										
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>								
	ATC	<ul style="list-style-type: none"> • Communicates Annunciator 5006-5K Div 2 or 3 • References ARP Per 5006-5K Drywell Pressure Low <ul style="list-style-type: none"> • Ensure vacuum breakers are closed. • Refer to ITS LCO 3.6.5.4. ○ Reports Drywell Pressure. 								
	BOP	Per CPS 9064.01 Section 8.0 <ul style="list-style-type: none"> • Verify that Drywell Vacuum Relief Valves indicate the expected position of closed. • Press one Test button at a time in MODE 1. • On 1H13-P678, press and hold the following TEST CGCS CHK VLV buttons. Verify that Drywell Vacuum Relief Valves indicate the expected position of open on 1H13-P678. <table style="margin-left: 20px; border: none;"> <tr> <td style="padding: 2px 10px;">1. 1HG010A _____</td> <td style="padding: 2px 10px;">5. 1HG010C _____</td> </tr> <tr> <td style="padding: 2px 10px;">2. 1HG011A _____</td> <td style="padding: 2px 10px;">6. 1HG011C _____</td> </tr> <tr> <td style="padding: 2px 10px;">3. 1HG010B _____</td> <td style="padding: 2px 10px;">7. 1HG010D _____</td> </tr> <tr> <td style="padding: 2px 10px;">4. 1HG011B _____</td> <td style="padding: 2px 10px;">8. 1HG011D _____</td> </tr> </table> <ul style="list-style-type: none"> • Report that both 1HG010C and 1HG011C indicate intermediate. 	1. 1HG010A _____	5. 1HG010C _____	2. 1HG011A _____	6. 1HG011C _____	3. 1HG010B _____	7. 1HG010D _____	4. 1HG011B _____	8. 1HG011D _____
1. 1HG010A _____	5. 1HG010C _____									
2. 1HG011A _____	6. 1HG011C _____									
3. 1HG010B _____	7. 1HG010D _____									
4. 1HG011B _____	8. 1HG011D _____									
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. Enter into Technical Specifications: <ul style="list-style-type: none"> • LCO 3.6.5.6, A.1, Close the post-LOCA vacuum relief subsystem within 4 hours 								
Terminus: Technical Specification actions identified.										

Note:

- Denotes an action that should be performed.

Denotes an action that may be performed. Operator Actions

Event No.(s): 2 & 3		Page 1 of 1
<p><i>Description: Loss of Lube Oil pressure on the B CRD Pump and a failure of the pump to trip</i></p> <p align="center"><i>Two Accumulator Faults</i></p> <p align="center"><i>(Panel P601, 5068)</i></p>		
<p><i>Initiation: Following Technical Specification call, and upon direction of Lead Examiner.</i></p>		
<p><i>Cues: Annunciator 5068-7C CRD Pump C001B Oil Pressure Low, is received.</i></p> <p align="center"><i>Oil pressure permissive light not lit.</i></p> <p align="center"><i>Annunciator 5006-1H Accumulator Fault</i></p>		
Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Communicates Annunciator 5006-1H • References ARP <p>Per CPS 5006-1H Accumulator Fault</p> <ul style="list-style-type: none"> • Depress ACCUM FAULT button <ul style="list-style-type: none"> – The red status light for the rod associated with the alarming HCU will flash • After the alarming HCU has been identified: Acknowledge ACCUM FAULT on OCM to clear the annunciator. • Check accumulator pressure. (EO local indication) • Communicate low accumulator pressure <p>Repeat above for subsequent accumulator(s).</p>
	BOP	<ul style="list-style-type: none"> • Communicates Annunciator 5068-7C • References ARP <p>Per CPS 5068-7C CRD Pump C001B Oil Pressure Low</p> <ul style="list-style-type: none"> • Trip CRD Pump B • Start CRD Pump A per CPS 3304.01 Control Rod Hydraulic and Control Section 8.3.6. <ul style="list-style-type: none"> • Adjust 1C11-R600, Flow Controller, to zero output in manual. • Start A CRD Aux Oil Pump. • Close 1C11-F014A, CRD Pump A Disch Chk Vlv. (EO local operation) • Verify oil pressure ≥ 3 psig. (EO local operation) • Start CRD Pump A • Verify <ul style="list-style-type: none"> ○ CRD Pump running. ○ Aux Oil Pump has auto stopped. (EO local operation) • Open 1C11-F014A Pump Disch Chk Vlv. (EO local operation) • Using 1C11-R600, open 1C11-F002B to obtain a flow rate of 41 to 49 gpm on C11-R606. • Adjust tape setpoint to null out deviation. • Place flow controller 1C11-R600 in auto mode. <ul style="list-style-type: none"> ○ Perform local steps on CRD Pump A. (EO local operation)
	SRO	<ul style="list-style-type: none"> • Directs actions listed above. <p>Enter into Technical Specifications:</p> <ul style="list-style-type: none"> • LCO 3.1.5, B.1, Restore charging water header pressure to ≥ 1600 psig within 20 minutes
<p>Terminus: The A CRD Pump is running and Technical Specification actions identified.</p>		

Operator Actions

<i>Event No.(s):</i> 4		<i>Page</i> 1 <i>of</i> 1
<i>Description:</i> Control Rod Drift (Panel P680, Section 5006)		
<i>Initiation:</i> After CRD pump is started, Technical Specification addressed and direction from Lead Examiner.		
<i>Cues:</i> Annunciator 5006-4G, Rod Drift.		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	ATC	<ul style="list-style-type: none"> • Communicates Annunciator 5006-4G • References ARP <p>Per CPS 5006-4G, Rod Drift:</p> <ul style="list-style-type: none"> • Press the ROD DRIFT button on the OCM to display rod drift information. • Proceed to CPS 4007.02 <p>Per CPS 4007.02 Inadvertent Rod Movement</p> <ul style="list-style-type: none"> • Depress the ROD SELECT CLEAR push-button • Allow the rod to insert • Communicates that the rod stopped at the same position as an adjacent partially withdrawn rod • Insert one of the rods at least 2 notches
	BOP	<ul style="list-style-type: none"> ○ Obtain a 3D case ○ Monitor Main Steam Line Radiation levels ○ Monitor Off-gas Radiation levels.
	SRO	<ul style="list-style-type: none"> • Directs the above actions • Evaluates the 3D case • Contacts the Reactor Engineer, Radiation Protection and Chemistry • Enforces OPS expectations and standards <p>Enter into Technical Specifications:</p> <ul style="list-style-type: none"> • LCO 3.1.3, C.1 and C.2, Declare the rod inop, fully insert within 3 hours, and disarm within 4 hours.
Terminus: Control rods are staggered at least 2 notches.		

Operator Actions

Event No.(s): **5**

Page **1** *of* **1**

Description: **The B FC pump trips**
 (Panel P800, Section 5040)

Initiation: **Following the staggering of control rods and upon direction from the Lead Examiner.**

Cues: **Annunciator 5040-1E, Auto Trip Pump/Motor Division 2, is received.**

Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	BOP	<ul style="list-style-type: none"> • Communicates Annunciator 5040-1E • References ARP Per CPS 5040-1E Auto Trip Pump/Motor Division 2. <ul style="list-style-type: none"> • Shut the following valves <ul style="list-style-type: none"> – 1FC008, FC CNMT Outbd Isol Vlv. – 1FC007, FC CNMT Inbd Isol Vlv. – 1FC037, FC Supp CNMT Inbd Isol Vlv. – 1FC036, FC Supp CNMT Outbd Isol Vlv. ○ Shut down the tripped Div 2 FC and start Div 1 FC. (if desired) ○ Monitor Fuel Pool temperatures.
	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 the above actions • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: The FC valves are shut.

Operator Actions

<i>Event No.(s):</i>	6	<i>Page 1 of 1</i>
<i>Description: Intermittent Low Pressure RFP B Seal Water Alarm. Reduce power with Reactor Recirc to allow removal of RFP B from service (Panel P680, Section 5002)</i>		
<i>Initiation: The FC valves are shut and upon direction from the Lead Examiner.</i>		
<i>Cues: Annunciator 5002-2E Low Pressure RFP 1B Seal Water</i>		
<u><i>General Note</i></u>		
<i>When an EO is sent to shift seal water filters, The EO will report that the standby filter is tagged for cleaning.</i>		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	ATC	<ul style="list-style-type: none"> • Communicates Annunciator 5002-2E • References ARP Per CPS 5002-2E, Low Pressure RFP 1B Seal Water: <ul style="list-style-type: none"> • Verify CB pump discharge header pressure > 350 psig. • Swap seal water inlet filter to the standby filter (EO local operation) • If seal pressure is <u>not</u> restored, remove RFP 1B from service. • Isolate RFP 1B by shutting <ul style="list-style-type: none"> ○ 1CD009B, RFP 1B Suction Valve (EO local operation) ○ 1FW002B, RFP 1B Discharge Valve ○ 1FW038B, Warming Line Isolation (EO local operation) Per CPS 3005.01, Unit Power Changes <ul style="list-style-type: none"> • Lowers power with Recirc Flow/Rods to remove the B RFP from service.
	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"> ○ May enter CPS 4002.01, Abnormal RPV Level/Loss of Feedwater at Power • Directs the above actions • Contacts the Reactor Engineer, Radiation Protection and Chemistry • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Reactor power is <65%.		

Operator Actions

<i>Event No.(s):</i> 7		<i>Page</i> 1 <i>of</i> 1
<i>Description</i> <i>Turbine trip Pushbutton fails during removal of the B RFP from service</i> (Panel P680 Section 5002)		
<i>Initiation: Automatically occurs when the operator tries to trip the B RFP.</i>		
<i>Cues: None</i>		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	ATC	<p>Per CPS 3103.01, Feedwater Section 8.1.12:</p> <ul style="list-style-type: none"> • Discuss with the CRS the need to lockout the RR FCVs <ul style="list-style-type: none"> ○ The FCVs are locked out per CPS 3302.02 Section 8.1.6 by Arming and Depressing the HPU Shutdown trip push-buttons on P680 section 5003. • Transfer the B RFP to either MANUAL on the RFP Flow Controller or the Manual Speed Control Potentiometer. • Reduce the B RFP turbine speed to transfer all flow to the A RFP. • IF on the RFP Flow Controller, then transfer control to the Manual Speed Control Potentiometer. • Reduce the B RFP speed to minimum • Press the B RFP trip push-button <p>Communicate that the B RFP will not trip.</p> <p>Per CPS 3103.01, Feedwater Section 8.3.14</p> <ul style="list-style-type: none"> • Verify the Manual Speed Control Potentiometer is at ZERO. • Select MAN on B RFP AUTO/MAN XFR switch
	BOP	<p>Per CPS 3103.01, Feedwater Section 8.3.14</p> <ul style="list-style-type: none"> • Shut 1B21-F303B B RFP Main Steam Inlet Valve. <p>Per CPS 3103.01, Feedwater Section 8.3.11</p> <ul style="list-style-type: none"> • Direct the EO to isolate the B RFP
	SRO	<ul style="list-style-type: none"> • Directs the above actions • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: B RFP is removed from service.		

Operator Actions

Event No.(s): 8 & 9		Page 1 of 2
<p><i>Description:</i> <i>Small break LOCA requiring an Emergency Depressurization pressure and ADS Valve F041C fails to open</i> (Panel P680, Section 5004)</p>		
<p><i>Initiation:</i> Following shutdown of the B RFP and upon direction of Lead Examiner</p>		
<p>Cues: Rising Drywell Pressure</p>		
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, 6) <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 • Performs EOP actions as directed by SRO.
	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-6 Primary Containment Control</p> <ul style="list-style-type: none"> • Starts Drywell Mixers, as directed. • Starts Containment Spray, as directed. ○ Monitors the start of the ECCS Systems on High Drywell Pressure. • Operates ECCS Systems as needed, to control RPV Water Level, Level 3 to Level 8 • Initiates ADS • Communicates that one ADS Valve did not open. • Opens another SRV.

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> • Carries out Scram Choreography by performing an Update: <ul style="list-style-type: none"> – Entering EOP-1 and 6 – 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. <ul style="list-style-type: none"> ○ May order a lower pressure band (450 – 600 psig) • Directs maintaining RPV Level, Level 3 to Level 8 by using Preferred Injection Systems. <p>Enters EOP-6, Primary Containment Control, and directs the following:</p> <ul style="list-style-type: none"> • Starting Mixers • IAW Fig. O, directs the start of Containment Sprays. <p>Enters EOP-3, Emergency RPV Depressurization, when Figure N is exceeded.</p> <ul style="list-style-type: none"> • Directs initiation of ADS • Directs opening other SRVs until 7 are open <p>May direct the isolation of RT and/or RR.</p> <ul style="list-style-type: none"> • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Critical Task		
Critical Task		
<p>Terminus: 7 SRVs are open, level band of 3 to 8 is established and upon direction of Lead Examiner.</p>		

Critical Tasks

- Initiate Containment Sprays.
- Initiate ADS.

Facility: <u>Clinton Power Station</u>	Scenario No.: <u>3</u>	Operating Test No.: <u>ILT0601-1</u>	
Examiners: _____ _____	Operators: _____ _____		
Initial Conditions: 80% power, steady state. MDRFP is CO for coupling replacement.			
Turnover:			
<ul style="list-style-type: none"> • A VG is running for CPS 9067.01 and is ready to be shut down. 			
Event No.	Malf. No.	Event Type*	Event Description
1	YPXMALSE_5	C-ATC/SRO	The A RWCU F/D resin release
2	N/A	N-BOP/SRO	Shutdown VG
3	A05_A02_A0203_1_TVM	C-BOP TS-SRO	RCIC failure to Auto isolate on an Isolation signal
4	YVMSAVLK_17	I-BOP/SRO	Steam Seal Header Pressure Control Valve Failure
5	YP_XMFTB_4966	C-ATC/SRO TS-SRO	RR Pump B trip to off
6	N/A	R-ATC/SRO	Reduce power to ~40% with Control Rods
7	A03_A03_02_1_TVM A03_A03_02_2_TVM A03_A03_03_1_TVM HPAKFUSE_H892 705CC Overrides	M-Crew	Earthquake HPCS Injection Valve Breaker trips. The RR suction isolation valve Breaker trips.
8	YAFWL91	M- Crew	Leak at A TDRFP discharge
9	YPXMALSE_530 YPXMALSE_531 YPXMALSE_510	M- Crew	The B RR Pump seals and bushing fail

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

Narrative Summary

Event #	Description
1.	The resin gets caught in the resin trap. The outlet conductivity increases and the trap plugs up dropping flow. This will require opening of the F/D Bypass valve when the F/D goes off line. The F/D bypass valve is throttled open to maintain system flow.
2.	Shutdown Standby Gas Treatment in accordance with the surveillance procedure.
3.	The failure to isolate on a isolation signal requires manually shutting the RCIC isolation valves and entry into Technical Specification LCO 3.5.3 A.1 and A.2. and LCO 3.6.1.3 A.1.
4.	The pressure control valve failure requires isolating the Steam Seal Pressure Control Valve and controlling pressure with the Bypass Valve.
5.	The Recirc Pump trip requires immediate shutting of the B RR Pump Discharge Valve and evaluation of the Power to Flow Map. Technical Specification LCO 3.4.1 B.1 and C.1 will be entered.
6.	The Power reduction is required for single loop operations.
7.	OBE Earthquake causes the HPCS Injection valve operator to fail causing the breaker to trip. The valve cannot be opened manually. The RR suction isolation valve breaker also trips.
8.	The Feedwater leak requires closing the manual feed pump suction valve to isolate the leak. Feedwater will need to be shutdown and the Reactor Scrammed.
9.	The Seal and bushing failures combined with the loss of high pressure injection will cause level to decrease to TAF and require a Blowdown.

EOP

1, 6, 3

Critical tasks:

- Blow Down when level is less than TAF.
- Maximize injection to restore level above TAF.

Operator Actions

<i>Event No.(s):</i> 1		<i>Page</i> 1 <i>of</i> 1
<i>Description:</i> <i>The A RWCU F/D resin release</i> (Panel P680, Section 5000)		
<i>Initiation: Following Turnover and upon direction of Lead Examiner</i>		
<i>Cues: Annunciator 5000-2B Filter Demin Effluent Conductivity Hi-Lo</i> Annunciator 5000-2C Filter Demin System Trouble		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	ATC	<ul style="list-style-type: none"> • Communicates Annunciators 5000-2B and 2C • References ARP <p><i>Per 5000-2B Filter Demin Effluent Conductivity Hi-Lo</i></p> <ul style="list-style-type: none"> • Monitor RPV conductivity ○ Request Chemistry to verify reading • Check F/D for normal ΔP and flow • Remove the A F/D from service if it does not automatically isolate <p>Per CPS 3303.01 Section 8.1.3</p> <ul style="list-style-type: none"> • Throttle 1G33-F044, RWCU Filter/Demin bypass to maintain 300 gpm.
	BOP	<p>Monitors reactor to ensure operations remain within established bands</p> <ul style="list-style-type: none"> • 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. • Contacts Chemistry • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: The RWCU A Filter Demin is off-line and system flow is \cong 300 gpm.		

Note:

- Denotes an action that should be performed.
- Denotes an action that may be performed.

Operator Actions

<i>Event No.(s):</i> 2		<i>Page</i> 1 <i>of</i> 1
<i>Description:</i> Shutdown VG (Panel P801, Section 5050)		
<i>Initiation:</i> Following the RWCU F/D trouble and upon direction of Lead Examiner.		
Cues: Directed by the SRO		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	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.
	BOP	<p>Per CPS 9067.01, Standby Gas Treatment System Train Flow/Heater Operability Section 8.7:</p> <ul style="list-style-type: none"> • Stop the A SGTS Train Exhaust Fan 0VG02CA • Verify: <ul style="list-style-type: none"> – 1VG16YA, Fuel Bldg Exh Inbd Isol Dmpr opens. – 1VG17YA, Fuel Bldg Exh Inbd Isol Dmpr opens. – 1VG02YA, SGTS Trn A Fuel Bldg Isol Dmpr shuts. – 1VG05YA, SGTS Trn A Fuel Bldg Suct Dmpr shuts. – 1VG04YA, SGTS Trn A Pmp Rms Suct Dmpr shuts. – 0VG01YA, SGTS Trn A Inlet Dmpr shuts. – 0VG02YA, SGTS Trn A Exh Fan 2CA Dmpr shuts. – SGTS Trn A Htr, 0VG04AA de-energizes. – SGTS Trn A Standby Clg Fan, 0VG03CA starts. – 0VG03YA, SGTS Trn A Cont Bldg Isol Dmpr opens. – 0VG04YA, SGTS Trn A Clg Fan 3CA Exh Damper opens. – (Local) Room Fan, 0VG05CA stops (if room < 100°F). – Annunciator AUTO START STANDBY GAS TREATMENT SYSTEM TRAIN A COOLING FAN 0VG03CA (5050-2G) is energized. – Annunciator RUNNING SGTS COOLING FAN A (5050-6J) is energized. – Both the red and white SYS INITIATE/SYS RESET permissive lights are de-energized. – Verify ORIX-PR008 remains in service after Div 1 SGTS is shut down. • (Record) Time SGTS Trn A Exh Fan, 0VG02CA was stopped.
	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: The A SGTS is Shutdown.		

Operator Actions

Event No.(s): 3		Page 1 of 1
Description: RCIC failure to Isolate on an Isolation signal (Panel P601, Section 5063)		
<i>Initiation: After A SGTS is shutdown and direction from Lead Examiner.</i>		
<i>Cues: Annunciator 5063-4A, RCIC Div 2 Steam Line Differential Pressure High.</i>		
Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • Communicates Annunciator 5063-4A • References ARP <p>Per CPS 5063-4A, RCIC Div 2 Steam Line Diff Press High.:</p> <ul style="list-style-type: none"> • Proceed to CPS 4001.02, Automatic Isolation • Shuts 1E51-F063 and verifies that 1E-F076 is shut on P601.
	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 the above actions <p>Enter into Technical Specifications:</p> <ul style="list-style-type: none"> • LCO 3.5.3, Verify HPCS is Operable within 1 hour and Restore RCIC within 14 days • LCO 3.6.1.3 Primary Containment Isolation Valves, isolate the flow path within 4 hours. ○ May enter 3.3.6.1 Primary Containment and Drywell Isolation
Terminus: RCIC is Isolated and Technical Specification actions identified.		

Operator Actions

Event No.(s): **4**

Page 1 of 1

Description: *Steam Seal Header Pressure Control Valve Failure*
 (Panel P870, Section 5019)

Initiation: Following the Technical Specification call and upon direction from the Lead Examiner.

Cues: Annunciator 5019-3D, High/Low Pressure Steam Seal Header.

Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	BOP	<ul style="list-style-type: none"> • Communicates Annunciator 5019-3D • References ARP <p><i>Per CPS 5040-3D, High/Low Press Stm Seal Hdr.</i></p> <ul style="list-style-type: none"> • Monitor Steam Seal Hdr Pressure. • Throttle open 1GS-S2, Stm Seal Supply Bypass Vlv. • Shut 1GS-S1, Stm Seal Supply Vlv <p>Note: Annunciator 5019-3A will alarm at a later time and the ARP will direct the operator to open 1GS-S10, Stm Seal Evaporator (SSE) Feed Water Bypass to raise level in the SSE.</p>
	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 the above actions • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: Steam Seal Header pressure is restored to normal.

Operator Actions

Event No.(s): 5		Page 1 of 1
<i>Description:</i> Reactor Recirc Pump B trip to off (Panel P680, Section 5003)		
<i>Initiation:</i> After the Steam Seal pressure is restored to normal and upon direction from the Lead Examiner.		
<i>Cues:</i> Annunciator 5003-1M, Recirc Pump B Motor Breaker Trip		
Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> • Communicates Annunciator 5003-1M • References ARP Per CPS 5003-1M,: <ul style="list-style-type: none"> • Proceed to CPS 4008.01, Abnormal Reactor Coolant Flow Per CPS 4008.01, Abnormal Reactor Coolant Flow <ul style="list-style-type: none"> • Shut 1B33-F067B RR Pump B Discharge Valve. ○ Determine position on the Power to Flow Map. ○ Open 1B33-F060B Recirc FCV to ~ 90%. • Reopen 1B33-F067B ~ 5 minutes after it was shut.
	BOP	<ul style="list-style-type: none"> • Demands a 3D Case.
	SRO	<ul style="list-style-type: none"> • Directs the above actions • Contacts the Reactor Engineer Enter into Technical Specifications: <ul style="list-style-type: none"> • LCO 3.4.1, B.1 Reduce THERMAL POWER to ≤ 58% within 4 hours and C.1 Satisfy the LCO requirements B.2 and B.3 within 24 hours ○ May enter CPS 4100.02 Core Stability Control
Terminus: Technical Specification actions identified.		

Operator Actions

<i>Event No.(s):</i> 6		<i>Page</i> 1 <i>of</i> 1
<i>Description</i> <i>Reduce power to ~40% with Control Rods</i> (Panel P680)		
<i>Initiation: Directed by SRO.</i>		
<i>Cues: None</i>		
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>
	ATC	Per CPS 4008.01 Section 4.10.3.1) <ul style="list-style-type: none"> • Power reduction should start as soon as the plant is stabilized, and continue to completion without undue delay. Per CPS 3005.01, Unit Power Changes Section 8.2: <ul style="list-style-type: none"> • Insert control rods per the control rod sequence or CRAM RODS.
	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 the above actions • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Power is being reduced with control rods.		

Operator Actions

Event No.(s): 7		Page 1 of 2
Description: Earthquake, HPCS Injection Valve Breaker trip, RR suction isolation valve Breaker trip (Panel P680 and P601)		
<i>Initiation: Following the power reduction and upon direction of Lead Examiner</i>		
Cues: Annunciator 5009-2A, ACCL Exceeded Seis SW/Oper Bases Earthquake Annunciator 5009-2B, ACCL Exceeded Operational Bases Earthquake Annunciator 5009-3A, Activated Seis Recorder Annunciator 5062-8E, HPCS Out Of Service		
Time	Position	<i>Applicant's Actions or Behavior</i>
	ATC	<ul style="list-style-type: none"> • Communicates Annunciators 5009-2A, 2B and 3A • References ARP Per CPS 5009-2A, 2B and 3A. <ul style="list-style-type: none"> • Proceed to CPS 4301.01, Earthquake Per CPS 4301.01, Earthquake <ul style="list-style-type: none"> • Check the following parameters <ul style="list-style-type: none"> – Reactor power – RPV pressure – RPV level – Feed flow – Steam flow – Generator load – Turbine vibration – Electrical distribution system integrity – Off-Gas, Area Radiation & Process Radiation Monitors – Leak detection systems – Balance of plant annunciators
	BOP	Per CPS 5009-2A, 2B and 3A <ul style="list-style-type: none"> • Verify at Seismic Warning Panel NOTE: This panel is not simulated <ul style="list-style-type: none"> – 1VS-EM014 Contmnt 712'0" red light ON. – Operating Basis Equake red light ON. – Seismic System Triggered red light ON. Per CPS 5062-8E HPCS Out Of Service <ul style="list-style-type: none"> • Verify HPCS OUT OF SERVICE switch in NORMAL. • Verify HPCS MOV TEST PREP switch in NORMAL • Determine that 1E22-F004 HPCS To CNMT Outbd Isln Valve has lost indication. Per CPS 4301.01, Earthquake <ul style="list-style-type: none"> • Check the following parameters <ul style="list-style-type: none"> – Electrical distribution system integrity – Off-Gas, Area Radiation & Process Radiation Monitors – Leak detection systems – Balance of plant annunciators

	SRO	Per CPS 4301.01 Earthquake <ul style="list-style-type: none"> • Determine that a <u>valid</u> seismic event has occurred • Initiate plant walkdown
Terminus: Earthquake has been determined <u>valid</u> .		

Operator Actions

Event No.(s):	8	Page 1 of 1
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Description: Leak at A TDRFP discharge
(Panel P680 and P870)

Initiation: *Following validation of the seismic event and upon direction of Lead Examiner.*

Cues: Reactor Scram on Low Level

General Note

After the FW leak is ramping in, a roving security guard makes an **emergency call** and reports the Turbine Building 800' level is becoming extremely hot and humid.

The FW Pump A suction valve is required to be shut to isolate this leak; therefore, the CD/CB pumps will quickly empty the hotwell to the floor. It would take at least an hour to shut the FW Pump A suction valve.

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, 6) Per CPS 4100.01, Reactor Scram • 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 • Shuts down Feed and Condensate • Performs EOP actions as directed by SRO.
	BOP	Carries out Scram Choreography by: <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

	SRO	<p>Carries out Scram Choreography by performing an Update:</p> <ul style="list-style-type: none"> - Entering EOP-1 - 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 3 to Level 8 using Preferred Injection Systems.
<p>Terminus: EOP-1 has been entered and a level and pressure band specified.</p>		

Operator Actions

<i>Event No.(s):</i>		9	<i>Page</i> 1 <i>of</i> 1
<i>Description</i> <i>The B RR Pump seals and bushing fail</i> (Panel P680)			
<i>Initiation: Direction of Lead Examiner.</i>			
<i>Cues: Rising Drywell Pressure.</i>			
Time	<i>Position</i>	<i>Applicant's Actions or Behavior</i>	
	ATC	<ul style="list-style-type: none"> ○ Communicates rising drywell pressure ○ Attempts to isolate the B RR Loop ○ Informs the SRO that the RR Loop Suction Valve will not shut • Inform the SRO when level is less than TAF 	
	BOP	<p>Per EOP-6 Primary Containment Control</p> <ul style="list-style-type: none"> • Starts Drywell Mixers, as directed. • Starts Containment Spray, as directed. ○ Monitors the start of the ECCS Systems on High Drywell Pressure. • Starts SLC • Maximizes injection with CRD • Initiates ADS • Maximizes injection 	
		<div style="background-color: #cccccc; padding: 2px; display: inline-block; border: 1px solid black;">Critical Task</div>	
		<div style="background-color: #cccccc; padding: 2px; display: inline-block; border: 1px solid black;">Critical Task</div>	
	SRO	<p>Enters EOP-6, Primary Containment Control, and directs the following:</p> <ul style="list-style-type: none"> • Starting Mixers • IAW Fig. O, directs the start of Containment Sprays. <p>Enters EOP-3, Emergency RPV Depressurization, when TAF is exceeded.</p> <ul style="list-style-type: none"> • Directs initiation of ADS • Directs maximizing injection • When water level > TAF, directs water level restored to Level 3 to Level 8 <p>May direct the isolation of RR.</p> <ul style="list-style-type: none"> • Enforces OPS expectations and standards 	
		<div style="background-color: #cccccc; padding: 2px; display: inline-block; border: 1px solid black;">Critical Task</div>	
		<div style="background-color: #cccccc; padding: 2px; display: inline-block; border: 1px solid black;">Critical Task</div>	

		<ul style="list-style-type: none">• Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.• Performs brief on problem and status.
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Terminus: Level is restored above Level 3

Critical Tasks

- Initiate ADS.
- Maximize injection