

Scenario No.: 1

Operating Test No.: 2018-301

Narrative Summary

Event #	Description
1.	<p>Perform On-Line Testing of the Emergency Seal Oil Pump Following shift turnover, the BOP will perform on-line testing of the Emergency Seal Oil Pump IAW CPS 3109.01 Generator Seal Oil (SO) section 8.1.2.3 On-Line Testing Of Emergency Seal Oil Pump (ESOP) for post-maintenance testing.</p>
2.	<p>Raise Power with flow to ~ 45% The crew will raise Reactor power with Recirc Flow IAW CPS 3005.01 Unit Power Changes and the current ReMA.</p>
3.	<p>'A' RR Flow Control Valve (FCV) Drifts Open The 'A' RR Flow Control Valve slowly drifts open causing reactor power to rise and requires the ATC to perform an emergency shutdown of the 'A' RR Hydraulic Power Unit to stop further RR FCV movement. The crew will enter and execute CPS 4008.01 Abnormal Reactor Coolant Flow. The crew will evaluate core thermal limits by demanding a 3D Monicore Case to ensure core thermal limits are within TS limits. The crew will also evaluate RR loop flow mismatch to ensure operation within ITS 3.4.1 Recirculation Loops Operating limits.</p>
4.	<p>Failure of DG Fuel Oil Transfer Pump 1A to auto start Annunciators 5060-8C LOW LEVEL DG DAY TANK 1A and 5060-8E TROUBLE DIESEL GEN 1A are received. The BOP will report that the Fuel Oil Transfer Pump (FOTP) failed to auto start. The SRO will direct the BOP to manually start the FOTP. The ATC/BOP will dispatch an operator to DG 1A room to determine the cause of the alarm. The Equipment Operator will report that the alarm is due to low fuel level in the Div 1 DG Day Tank; currently at 45% and lowering/rising based on whether the FOTP running. Annunciators will clear approximately 1 minute after the FOTP has started. The SRO will declare Div 1 DG inoperable and take actions for TS 3.8.1 Action B.</p>
5.	<p>'B' RWCU pump seal plate temperature high Annunciator 5000-2E CLEANUP PUMP SEAL GLAND PLATE TEMP HI comes in due to RWCU Recirc Pump B (1G33-C001B) developing excessive seal leak requiring its removal from service. The ATC Operator will dispatch an Equipment operator and coordinate/perform operations per CPS 3303.01 Reactor Water Cleanup (RT) Sections 8.1.3 System/Filter Demin Flow Control and 8.1.4 Removing RWCU Pump from Service.</p>
6.	<p>Trip of ERAT SVC Annunciator 5011-8E ERAT SVC TRIP comes in due to a trip of the ERAT Static VAR Compensator for unknown reasons. The ARP will direct the BOP/ATC to dispatch an Equipment Operator to investigate, the BOP to place the ERAT SVC control switch to OFF and to transfer the 1A1 bus to the RAT. The SRO will enter CPS 4200.01 Loss Of AC Power, ensure/make necessary notifications to the Power Team and TSO (Ameren) and will declare the 138KV Offsite Source inoperable and take actions for TS 3.8.1 Action A and Action D (due to DG1A being INOP).</p>
7.	<p>Generator Trip / Turbine Trip / Bypass Valve 1 sticks open / RAT Failure after MSIVs closed The Main Generator will trip resulting in a Turbine trip and reactor scram. The Steam Bypass Valves will initially open as expected following the Main Turbine trip, but #1 Bypass Valve will remain open causing RPV pressure to decrease. The crew will diagnose the failure of the Bypass Valves to control Reactor pressure and will shut the MSIVs to prevent exceeding the 100°F/hr cooldown rate limitation and to prevent flooding the MSLs with feedwater. Shutting the MSIVs will eliminate the RFPTs as a high pressure injection source. A RAT trip will occur due to a fault when the MSIVs are closed (not related), resulting in a loss of BOP power and eliminating the FW/CD/CB system as a feed source.</p>
8.	<p>LOCA - HPCS Pump fails to auto start / RCIC failure / HPCS Injection Valve fails to auto open An unisolable RCS leak occurs in the DW, causing DW pressure to exceed 1.68 psig. The RCIC pump shaft will fail if automatically or manually initiated. The HPCS Pump will fail to automatically start and 1E22F004 HPCS Injection Valve will fail to automatically open, requiring the MCR to manually start the HPCS Pump and open the injection valve for inventory control and to avoid the necessity for performing a blowdown when RPV level reaches TAF.</p>

Appendix D

Scenario Outline

Form ES-D-1

Facility: Clinton Power Station Scenario No.: 2 Operating Test No.: 2018-301

Examiners: _____ Operators: _____

Initial Conditions:

- Mode 1 at ~73% power.
- Power ascension to RTP is in progress IAW CPS 3005.01 Unit Power Changes (but on hold for this shift).
- Weather conditions are calm and clear.

Turnover:

- Priorities for the shift are as follows:
 - Shift Generator Stator Cooling Pumps IAW CPS 3110.01 Generator Stator Cooling (GC) section 8.2.4 Shifting GC Water Pumps (MCR).
 - Maintain power at 73% throughout the shift.

Critical Tasks:

- ATC inserts a manual scram when multiple rods begin drifting.
- PC-6.1 Within 10 minutes of exceeding Figure N and containment pressure continuing to rise, enter EOP-3 Emergency RPV Depressurization. If the crew anticipates blowdown using bypass valves, and in doing so Figure N is not exceeded, then this critical task is considered to be met. (PRA)

Event No.	Malf. No.	Event Type*	Event Description
1	NA	N-BOP	Shift Generator Stator Cooling (GC) Pumps
2	A02_A11_S01=2	TS-SRO	Failure of the EOC-RPT Bypass Relay (5006-1J)
3	YPRR15AB 0%	TS-SRO	FW NR Level Transmitter C34N004B failure
4	A04_A01_04_4_TVM	R-ATC	Loss of IPBD Cooling requires power reduction to < 17,000 amps generator output
5	A02_A05_01_7_TVM=2	C-ATC	CRD high temperature
6	A01_A03_02_1_TVM Steady	C-ATC	Loss of seal water to the 'A' TDRFP
7	GS1GS02CA_SHEAR	C-BOP	Steam Packing Exhauster Blower Failure
8	A11_A02_03_7_TVM 2	C-BOP	Clogged CW Pump 1C TW Supply Strainer
9	A11_A08_S07 Close LCRPOS for 28-29, 44-17, 20-21, and 48-33 YPXRR21A_2 100% YPXMALSE_510 1% YPCTHOLE 10%	M-All	Loss of IA to Cnmt / Multiple Rod Drifts / Unisolable RR B Suction Line Leak / DW Failure / ED on Fig. N
10	YPXMALSE_76 0% YPXMALSE_87 0% YPXMALSE_79 0%	C-BOP	3 ADS SRVs Fail To Open

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

Scenario No.: 2

Operating Test No.: 2018-301

Narrative Summary

Event #	Description
1.	<p>Shift Generator Stator Cooling (GC) Pumps The BOP will shift GC Water Pumps IAW CPS 3110.01 Generator Stator Cooling (GC) section 8.2.4 Shifting GC Water Pumps (MCR) to support upcoming maintenance on 1GC01PB.</p>
2.	<p>Failure of the EOC-RPT Bypass Relay (5006-1J) Annunciator 5006-1J DIV 1 RPT BYP will be received. The CRS will request IMD to report to the MCR to investigate the alarm. The IMD technicians will report it appears that the Div 1 EOC/RPT Bypass Circuitry is malfunctioning and that it is not an annunciator issue. The SRO will declare Div 1 EOC-RPT Instrumentation inoperable and enter ITS 3.3.4.1 Action B.1 to place one channel in affected function in trip within 6 hours.</p>
3.	<p>FW NR Level Transmitter C34N004B failure FW NR Level Transmitter C34N004B fails causing annunciator 5002-3P RX WTR LVL CONT SYS TROUBLE to alarm. The SRO will evaluate and enter ORM 2.2.12 Feedwater System / Main Turbine Trip Action 3.2.12.a Restore channel to an operable status within 7 days.</p>
4.	<p>Loss of IPBD Cooling requires power reduction to < 17,000 amps generator output Annunciator 5010-4D TROUBLE ISOL PHASE DUCT COOLERS will alarm. The BOP will dispatch an EO to investigate the alarm locally. The EO will report that the running IPBD cooling fan has tripped. The EO will report that the belt for the standby IPBD Fan failed when the fan auto started. Bus duct temperature is slowly rising but < 187°F. Due to the loss of forced cooling, the SRO will direct the ATC to lower Main Generator load to < 17,000 amps.</p>
5.	<p>CRD high temperature Annunciator 5006-1G CRD HYDR TEMP HI is received. The ATC operator will dispatch a field operator to the local recorder on 1H22-P007 to determine rod 52-25 is alarming. The ATC operator will note that rod 52-25 is currently at position 48 and IAW CPS 3304.01 Control Rod Hydraulic & Control (RD) perform an extended coupling check. The annunciator will clear for ~ 30 seconds and then alarm again. The ATC operator will then insert rod 52-25 to position 46 which will clear the high temperature condition.</p>
6.	<p>Loss of seal water to the 'A' TDRFP Annunciator 5002-2A LOW PRESS RFP 1A SEAL WATER will alarm due to local pressure control valve 1TD600A failing closed. The SRO will direct the D-Area operator to swap seal water filters. The MCR will determine that shifting the filters did not corrected the low seal water pressure condition. The ATC will closely monitor reactor water level while removing RFP 1A from service.</p>
7.	<p>Steam Packing Exhauster Blower Failure Annunciator 5019-1B HIGH PRESSURE STM PACKING EXH SUCTION is received. The BOP operator will determine that the running SPE blower failed and will start the parallel non-running SPE blower.</p>
8.	<p>Clogged CW Pump 1C TW Supply Strainer Annunciator 5041-3G LOW FLOW CW PUMP 1C BRG SEAL WATER comes in due to CW Pump 'C' seal water flow less than the setpoint (15 gpm). The BOP operator will dispatch an Equipment Operator to investigate. Seal water flow to Circulating Water (CW) Pump 1C cannot be restored. The BOP/ATC operator(s) will closely monitor main condenser vacuum (may enter Loss of Vacuum off-normal) while securing CW Pump 1C and starting CW Pump 1A.</p>
9.	<p>Loss of IA to Cnmt / Multiple Rod Drifts / Unisolable RR B Suction Line Leak / DW Failure / ED on Fig. N 11A005 Cnmt IA Outbd Isol Vlv will fail closed due a failure of the actuator air supply line, causing a loss of IA to the containment. The control rod scram valves will begin to fail open, causing multiple control rods to drift. The ATC will insert a manual scram due to the drifting control rods. When the mode switch is placed in shutdown, an unisolable reactor coolant leak will begin, causing DW pressure to rise. EOP's 1 and 6 will be entered. The DW will fail, causing containment pressure to rise. The SRO will direct containment sprays to be initiated when containment pressure is in the OK to Spray region of Figure O Containment Spray Initiation Limit. Initiating Containment Spray fails to prevent Containment pressure from exceeding Fig. N Pressure Suppression Pressure, requiring an ED to be performed.</p>
10.	<p>3 ADS SRVs Fail To Open Upon initiation of ADS in event 9, three ADS SRVs (41F, 51G, and 47A) fail to open. The BOP Operator will open three additional safety relief valves to complete the blowdown.</p>

Appendix D

Scenario Outline

Form ES-D-1

Facility: Clinton Power Station Scenario No.: 3 Operating Test No.: 2018-301

Examiners: _____ Operators: _____

Initial Conditions:

- Mode 1 Rx Power at 78%.
- Thunderstorms are expected in the area within the next hour.

Turnover:

- Perform CPS 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test.
- On the previous shift, the Drywell was vented per CPS 3316.01 Containment Combustible Gas Control (HG) to support performance of CPS 9064.01.
- Maintain Rx Power at 78%.

Critical Tasks:

- SC-1.1 ATC inserts a manual Scram before area temperature reaches max safe in any one area.
- RPV-6.2 BOP Inhibits ADS within 105 seconds of RPV level reaching Level 1 (-145.5" Wide Range).
- RPV-6.3 BOP terminates and prevents injection from HPCS before RPV level reaches Level 2 (-45.5" Wide Range).
- RPV-6.3 BOP terminates and prevents injection from LPCS and LPCI before RPV level reaches Level 1 (-145.5" Wide Range).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP	Drywell Vacuum Breaker Test
2	A05_A02_A0203_5_TVM Steady	C-BOP TS-SRO	RCIC Suppression Pool Level Transmitter Failure - High
3	ROD0429TFIA3	C-ATC TS-SRO	Rod drifts outward
4	YPXMALSE_612	I-BOP	Turbine Oil Temperature Controller Failure
5	YPXMALSE_528 YPXMALSE_529	C-ATC	RR Pump 'A' Seal Failure / Emergency Loop Shutdown and Isolation
6	N/A	R-ATC	Exit the Controlled Entry Region
7	YARITPLA_1 0.2% XPXMALSE_253	M-All	Unisolable leak in RCIC/4 stuck rods will not insert/2 nd area exceeds Max Safe/EOP-3 with a low power ATWS
8	YP_XMFTB_4094	C-All	Trip of MDRFP

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

Scenario No.: 3

Operating Test No.: 2018-301

Narrative Summary

Event #	Description
1.	<p>Drywell Vacuum Breaker Test Following shift turnover, the SRO will direct the BOP Operator to perform CPS 9064.01 Drywell Post-LOCA Vacuum Breaker Verification Test.</p>
2.	<p>RCIC Suppression Pool Level Transmitter Failure - High Annunciator 5063-3E Suppression Pool Water Level High is received. The crew will recognize that the RCIC suction source failed to automatically shift to the Suppression Pool. The SRO will direct the BOP to transfer RCIC suction to the Suppression Pool IAW CPS 3310.01 Reactor Core Isolation Cooling (RI) section 8.1.9.2 Shifting RCIC Suction to Suppression Pool. The SRO will enter ITS LCO 3.3.5.2 RCIC System Instrumentation A.1, D.1. and (D.2.1 or D.2.2).</p>
3.	<p>Rod drifts outward Annunciator ROD DRIFT (5006-4G) comes in due to rod 04-29 drifting outward. The ATC Operator will take the Immediate Actions and applicable Subsequent Actions as directed by the SRO for an Inadvertent Rod Movement per CPS 4007.02 Inadvertent Rod Movement. Rod 04-29 will drift outward until individually scrammed at the Hydraulic Control Unit (HCU). Technical Specification LCO 3.1.3 Actions C.1 and C.2 will be evaluated requiring full insertion of the inoperable control rod in 3 hours <u>and</u> disarming the associated CRD in 4 hours. Technical Specification LCO 3.1.6 Actions A.1 will also be evaluated and found not to apply.</p>
4.	<p>Turbine Oil Temperature Controller Failure Annunciator 5018-3A High Temp Turb Gen Lube Oil will be received due to a failure of the auto portion of the Turbine Oil Cooling Water Controller. The BOP will take manual control of the controller and coordinate with the ATC to restore turbine oil temperature to the normal control band.</p>
5.	<p>RR Pump 'A' Seal Failure / Emergency Loop Shutdown and Isolation The inner and outer seals will partially fail on the 'A' RR Pump. Annunciators 5003-4E RECIRC PMP A OUTER SEAL LEAKAGE HI is received, followed by 5003-1K RECIRC PMP MTR A OR B TEMP HI due to rising seal temperatures. CPS 3302.01 Reactor Recirculation (RR), section 8.3.3 Rising Temperature on RR Seals requires the MCR crew to perform an Emergency Loop Shutdown and Isolation of the 'A' RR Loop per CPS 3302.01 Reactor Recirculation (RR), sections 8.2.3 RR Loop – Emergency Shutdown and 8.2.4 Idle RR Loop - Isolating. Additionally, the SRO will enter CPS 4008.01 Abnormal Reactor Coolant Flow.</p>
6.	<p>Exit the Controlled Entry Region Due to the RR Pump 'A' Emergency Loop Shutdown and using CPS 3005.01 Unit Power Changes (Figure 1: Stability Control & Power/Flow Operating Map), the crew will identify a forced entry into the CONTROLLED ENTRY REGION (below the MELLA Limit). The SRO will direct the ATC to promptly exit the CONTROLLED ENTRY REGION via reverse rod sequence or CRAM RODS.</p>
7.	<p>Unisolable leak in RCIC/4 stuck rods will not insert/2nd area exceeds Max Safe/EOP-3 with a low power ATWS Annunciator 5065-6F Sec. Cnmt. Area High Temp will be received. The BOP will monitor secondary containment temperatures and will report rising temperatures in the RCIC Pump Room (1TR-CM326 points 8 and 9). When temperatures exceed max normal values, EOP-8 Secondary Containment Control and CPS 4001.01 Reactor Coolant Leakage will be entered. The SRO will direct the RCIC Steam supply to be isolated, but 1E51-F063 RHR & RCIC Stm Supp Inbd Isol Valve will fail to close. Due to the inability to isolate the leak into the RCIC pump room, the SRO will direct the reactor to be scrammed before temperatures in the RCIC Pump Room exceed max safe values. Four control rods will fail to insert requiring entry into EOP-1 RPV Control and then transitioning into EOP-1A ATWS RPV Control. After the reactor is scrammed, the leak into the secondary containment will worsen, causing two areas to exceed max safe values, requiring blowdown per EOP-3 Emergency RPV Depressurization.</p>
8.	<p>Trip of MDRFP Per EOP-3 Emergency RPV Depressurization, the SRO will direct RPV injection to be terminated and prevented. Three minutes after starting, the MDRFP will trip. The BOP will initiate ADS and verify that 7 ADS valves open. The operating crew will monitor RPV pressure, and recommence RPV injection with CD/CB IAW CPS 4411.03 Injection/Flooding Sources when RPV pressure reaches 138 psig. The scenario is terminated when reactor power is below 5% and reactor water level is being maintained between -162" and Level 8 (+52").</p>

Appendix D

Scenario Outline

Form ES-D-1

Facility: Clinton Power Station Scenario No.: 4 Operating Test No.: 2018-301

Examiners: _____ Operators: _____
 _____ _____
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Initial Conditions:

- Mode 1 at ~90% power. Power reduction is scheduled in preparation for surveillance testing.
- Thunderstorms are expected in the area within the next hour.
- Suppression Pool Cleanup and Transfer Pump 1B (1SF01PB) is OOS for maintenance. Not expected back this shift.
- RCIC Surveillance CPS 9054.01 was completed last shift. RHR B is currently in Suppression Pool Cooling to support the RCIC surveillance and is no longer required.

Turnover:

- Priorities for the shift are as follows:
 - Secure Suppression Pool Cooling per CPS 3312.01 Residual Heat Removal (RHR) Section 8.1.10 – First Priority. NOTE: RHR HX MC layup is being deferred.
 - Lower Reactor Power to 85% using rods.

Critical Tasks:

- Shuts Safety Relief Valves (SRVs) before Suppression Pool temperature reaches 110°F.
- TSA-1 Initiate ADS (7 SRVs) within 17.5 minutes of blowdown being required (Rx Level at TAF).
- RPV-1.2 Maximize injection to restore water level above -160" (TAF).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP	Secure from Suppression Pool Cooling
2	A05_A02_A0108_3_TVM = 2 A05_A02_A15DS53_1 = Off A05_A02_A15DS54_1 = Off A05_A02_A15DS55_1 = Off A05_A02_A0107_4_TVM = 2	TS-SRO	HPCS Water Leg Pump trip
3	CD01PB	C-ATC	Condensate Pump 'B' Trips
4	N/A	R-ATC	Lower Power using rods
5	YPXMALSE_83 to 50	C-BOP TS-SRO	Inadvertent opening of LLS SRV F047F
6	YPXMALSE_525	C-BOP	Packing Leak on 1B33F060A (RR 'A' FCV)
7	YP_XMFTB_4964 YP_XMFTB_4092 YP_RR23A YP_RR23B	C-ATC	TDRFP 'A' trips and FCVs 'A' & 'B' fail to runback with Auto Scram failure
8	YPXMALSE_511 YAFWL83 YP_XMFTB_4960	M-All	Feedwater Leak /RPV Leak to TAF/RCIC trips on start-no reset
9	YP_XMFTB_4948 RH17CON02FSPI=Fail Low	C-BOP	RHR 'B' Fails To Auto Start RHR 'B' Injection Valve 1E12F042B Fails to Auto Open at 472 psig RPV pressure
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario No.: 4

Operating Test No.: 2018-301

Narrative Summary

Event #	Description
1.	<p>Secure from Suppression Pool Cooling The BOP Operator will secure Suppression Pool Cooling per CPS 3312.01 Residual Heat Removal (RHR) Section 8.1.10 Suppression Pool Cooling - Shutdown.</p>
2.	<p>HPCS Water Leg Pump trip Annunciator HPCS WATER LEG PUMP AUTO TRIP (5062-8C) comes in due to the HPCS Water Leg Pump trip. The BOP Operator will dispatch a field operator to investigate. Upon the report of a breaker trip, the BOP operator will direct the field operator to pull the HPCS Pump Breaker control power fuses per CPS 3309.01 High Pressure Core Spray (HPCS) Precaution 4.3. Technical Specification LCO 3.5.1 Actions B.1 and B.2 will be evaluated requiring verification by administrative means that the RCIC system is operable when required AND the HPCS system is restored to operable status within 14 days.</p>
3.	<p>Condensate Pump 'B' Trips Annunciator 5014-2B Low Pressure Cond Pumps Disch Header comes in due to a trip of the 'B' Condensate Pump. The ATC will start the standby Condensate Pump per the ARP. The crew will enter and execute CPS 4002.01 Abnormal RPV Level / Loss of Feedwater At Power to stabilize RPV level. The crew will dispatch an Equipment Operator and/or Maintenance personnel to determine the cause of the trip.</p>
4.	<p>Lower reactor power using rods SRO directs the ATC to lower reactor power to ~ 85% at 100 Mwe/hr using rods to support upcoming surveillance testing IAW CPS 3005.01 Unit Power Changes.</p>
5.	<p>Inadvertent opening of LLS SRV F047F Annunciators 5066-5B ADS OR SAFETY RELIEF VALVE LEAKING and 5067-8L SRV MONITORING SYSTEM TROUBLE come in due to SRV 1B21-F047F failing ~ 50 % open. The BOP operator will diagnose and determine the problem is with 1B21-F047F. The SRO will direct the BOP operator to sound the containment evacuation alarm and coordinate with the ATC and attempt to close the SRV IAW CPS 4009.01 Inadvertent Opening Safety/Relief Valve. The SRO will enter and execute CPS 4005.01 Loss of Feedwater Heating and direct the ATC to restore and maintain reactor power at or below the original power level. SRV 1B21-F047F will shut when the first fuse is removed for the second solenoid at 1H13-P661/P662. The SRO will evaluate and enter ITS LCO 3.6.1.6 Action A.1 restore LLS valve to operable status within 14 days.</p>
6.	<p>Packing Leak on 1B33F060A (RR 'A' FCV) A packing leak will develop on the inner packing ring of 1B33F060A RR 'A' FCV, causing annunciator 5064-7D LD System Vlv Stem Leakage High Leak Rate to alarm. The ARP directs the BOP to CPS 3315.02 Leak Detection (LD), section 8.2.3 Determining Leakage From Valve Stem Leak Detection. The BOP will determine that the recorder point for 1B33F060A is alarming on 1E31-R612. The SRO will direct the BOP to close the associated solenoid valve for 1B33-F060A (1B33-F308A on MCR backpanel 1H13-P855). When this is accomplished, the leakage from the packing will stop.</p>
7.	<p>TDRFP 'A' trips and FCVs 'A' & 'B' fail to runback with Auto Scram failure The 'A' Turbine Driven Reactor Feed Pump (TDRFP) trips with a failure of the 'A' & 'B' Reactor Recirculation Flow Control Valves (FCVs) to runback. The crew enters CPS 4002.01 Abnormal RPV Level/Loss of Feedwater at Power. The 'B' TDRFP will pump at maximum capacity and Reactor Pressure Vessel (RPV) level will slowly lower. The ATC will initiate a reactor scram as level is approaching 12" and prior to 8.9" (level 3). Although the ATC is expected to scram the reactor prior to Level 3 (8.9"), an Automatic Scram failure will allow the SRO time to direct the action if required.</p>
8.	<p>Feedwater Leak /RPV Leak to TAF/RCIC trips on start-no reset An unisolable feedwater header leak in conjunction with an RPV leak in the lower plenum develops. The RCIC turbine will trip when started (automatically or manually) and cannot be reset. This failure completes a loss of all major high pressure feed sources. Reactor Pressure Vessel (RPV) water level will lower until it reaches Top of Active Fuel (TAF). At that time the CRS will enter EOP-3, blowdown, recover and restore RPV level per EOP-3.</p>
9.	<p>RHR 'B' Fails to Auto Start / RHR 'B' Injection Valve 1E12F042B Fails to Auto Open at 472 psig RPV pressure The RHR 'B' Pump will fail to auto start when DW pressure reaches 1.68 psig and will have to be manually started (critical task). In addition, 1E12-F042B RHR 'B' Injection Valve will fail to automatically open at 472 psig RPV pressure, requiring the injection valve to be manually opened to recover RPV level above TAF.</p>

Facility: Clinton Power Station Scenario No.: 5 Operating Test No.: 2018-301

Examiners: _____ Operators: _____

Initial Conditions:

- Mode 1 at ~10% power.
- Weather conditions are calm and clear.
- Section 8.3 LPCS Operability/WLP Double Check Valve Test of CPS 9052.01 LPCS/RHR A PUMPS & LPCS/RHR A Water Leg Pump Operability is in progress. An extra equipment operator is briefed, staged and ready to provide field support. LPCS is inop per ITS LCO 3.5.1 due to 1E21-F012 being open.

Turnover:

- CPS 3002.01 Heatup and Pressurization is complete.
- CPS 3004.01 Turbine Startup and Generator Synchronization is in progress. Section 5.0 Prerequisites are complete. Steps 8.1.1 – 8.1.5 are complete.
- On Step 8. Gang 4A is at position 24.
- Priorities for the shift are as follows:
 - Complete the LPCS Operability IAW CPS 9052.01 – LPCS/RHR A PUMPS & LPCS/RHR A Water Leg Pump Operability starting at step 8.3.11.
 - Continue with power ascension to 15% IAW Step 8.1.6 of CPS 3004.01. The RE has requested single rod, single notch rod motion.
 - After reaching 15% power, perform Turbine Roll IAW Step 8.1.8 of CPS 3004.01.

Critical Tasks:

- Starts the standby Service Air Compressor before 5006-2H Rod Out Block or 5006-4G Rod Drift annunciators are received.
- PC-3.1, SCRAMs the reactor before suppression pool level lowers to less than 15' 1".
- PC-3.3, Enters EOP-3 prior to suppression pool level reaching 15'1" and performs an emergency depressurization. If the suppression pool level lowers to less than 15'1" after the announcement is made to enter EOP-3, but before the blowdown is initiated, then this critical task is considered to be met.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP	LPCS Operability IAW CPS 9052.01 – LPCS/RHR A PUMPS & LPCS/RHR A Water Leg Pump Operability
2	NA	R-ATC	Raise power with rods to 15%.
3	Rod2025TFIA4	C-ATC	Control Rod difficult to withdraw
4	ROD2025TFIA5	C-ATC TS-SRO	Uncoupled Rod
5	ROD4413TFIA6	TS-SRO	CRD HCU Accumulator Trouble (Rod 44-13)
6	SA01B1SA1CFO SA01B0SA1CFTC	C-BOP	#1 SA Compressor trips with failure of Standby Compressor to Auto Start
7	A05_A02_A0706_3_TVM	C-BOP	CRD Pump High Seal Leakage / Pump Shift
8	YPXMALSE_665 100% YPXMALSE_666 100%	M-All	Suppression Pool leak into the LPCS Room/RHR 'A' Pump Room
9	A05_A02_A09S38_2=ON A05_A02_A16DS60_1=OFF A05_A02_A16DS61_1=OFF	C-All	1E21F001 LPCS Suppr Pool Suction Valve fails to close

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

Scenario No.: 5

Operating Test No.: 2018-301

Narrative Summary

Event #	Description
1.	<p>LPCS Operability IAW CPS 9052.01 – LPCS/RHR A PUMPS & LPCS/RHR A Water Leg Pump Operability The SRO directs BOP to complete the LPCS Operability IAW CPS 9052.01 – LPCS/RHR A PUMPS & LPCS/RHR A Water Leg Pump Operability starting at step 8.3.11. The BOP Operator will exercise the 1E21-F012 LPCS Test Valve to Suppr Pool, verify the 1E21-F011 LPCS Pump Min Flow Valve opens and stop the LPCS Pump (1E21-C001). Additionally, the BOP will verify closure of the 1E21-F303 and 1E12-F003 check valves and reposition the LPCS MOV TEST PREP and LPCS OUT OF SERVICE switches prior to field restoration.</p>
2.	<p>Raise power with rods to 15% The crew will continue the power ascension to 15% by withdrawing control rods in accordance with CPS 3004.01 Turbine Startup and Generator Synchronization.</p>
3.	<p>Control Rod difficult to withdraw Control Rod 20-25 will not withdraw when using normal drive differential pressure. The crew will perform actions for a difficult to withdraw control rod IAW CPS 3304.01 Control Rod Hydraulic & Control (RD) Section 8.3.4 Control Rod Difficult to Withdraw. When drive dP is increased to 300 psid, the control rod withdrawal will be successful, allowing the power ascension to continue.</p>
4.	<p>Uncoupled rod When the first in-sequence control rod (20-25) reaches position 48, the ATC will perform a coupling check IAW CPS 3304.02 Rod Control And Information System (RC&IS) section 8.1.10 Coupling Check by applying a continuous withdraw to the rod at position 48. Annunciator 5006-5G Rod Overtravel will be received, indicating that the control rod has become uncoupled from its drive mechanism. The operating crew will attempt to recouple the control rod IAW the annunciator response procedure. The SRO will evaluate and enter ITS 3.1.3 Condition C until the control rod is successfully recoupled.</p>
5.	<p>CRD HCU Accumulator Trouble (Rod 44-13) Annunciator ACCUMULATOR TROUBLE (5006-1H) is received. The ATC will determine which accumulator is alarming by depressing the ACCUM FAULT button. The ATC will then acknowledge the accumulator fault to clear the annunciator so another fault will cause an alarm. An Equipment Operator (EO) will be dispatched into the containment to determine the cause of the alarm (high level or low pressure). The EO will report that the accumulator for rod 44-13 is at 1540 psig. IAW 5006-1H, the SRO will declare the accumulator inoperable and will enter TS 3.1.5 Action A.1 or A.2. The SRO will consult with the RE to determine the number of control rods that are slow (0). The ATC/BOP will direct the Equipment Operator (EO) to recharge the accumulator for control rod 44-13.</p>
6.	<p>#1 SA Compressor trips with failure of Standby Compressor to Auto Start Annunciator 5041-1A AUTO TRIP PUMP/MOTOR is received due to a trip of the #1 Service Air Compressor (1SA01C). The SRO will enter CPS 4004.01 Instrument Air Loss and direct the BOP to start the standby Service Air Compressor (0SA01C). If the crew fails to manually start 0SA01C, the air compressor will fail to automatically start to restore air pressure.</p>
7.	<p>CRD Pump High Seal Leakage / Pump Shift Annunciator 5068-6C, CRD Pump C001B Seal Leakage High is received. The BOP operator will dispatch an Equipment Operator to determine the status of the B CRD Pump Seals. The Equipment Operator will report that the 'B' CRD Pump seals are spraying water on the floor around the pump. The BOP operator will shift to the 'A' CRD Pump per CPS 3304.01 Control Rod Hydraulic & Control (RD) section 8.1.2 Shifting Drive Water Pumps and then shutting 1C11-F017 Cross Connect Valve to isolate the seal leak.</p>
8.	<p>Suppression Pool leak into the LPCS Room/RHR 'A' Pump Room IMD technicians (performing restoration activities for CPS 9052.01 in the LPCS Pump Room) report a Suppression Pool Leak (due to a leak in the LPCS Pump Suction piping) including cross-flooding into the RHR 'A' Pump Room. The crew will determine that the leak is isolable, but efforts at closing 1E21-F001 LPCS Suppr Pool Suction Valve will fail (breaker trips on overcurrent when the control switch is taken to close). The SRO will determine that Suppression Pool level cannot be maintained above 15'1" requiring the reactor to be scrammed and an Emergency Depressurization performed.</p>
9.	<p>1E21-F001 LPCS Suppr Pool Suction Valve fails to close When the BOP attempts to close 1E21-F001 to isolate the suction piping leak in event 8, the breaker will trip resulting in loss of indicating lights and the inability to operate the valve from the MCR.</p>