

Appendix D

Scenario Outline

Form ES-D-1

Facility: Clinton Power StationScenario No.: 1Operating Test No.: 2019-301Examiners: _____

_____Operators: _____

Initial Conditions:

- Mode 2 Rx Power at 7%.
- Weather conditions are calm and clear.

Turnover:

- Power ascension is in progress. CPS 3002.01 Heatup and Pressurization is complete up to and including step 8.7.2. CPS 3004.01 Turbine Startup and Generator Synchronization is completed up to and including step 5.2.
- Priorities for the shift are as follows:
 - Complete the remaining steps of CPS 3002.01 Heatup and Pressurization, including the following milestones:
 - Power ascension to 10%.
 - Transition to Mode 1.
 - Perform H₂ Mixing System Operability IAW CPS 9068.01 Hydrogen Mixing System Operability Test (Quarterly Run) starting at step 8.1. An extra equipment operator is briefed, staged and ready to obtain data at the Div 1 Mixing Compressor.

Critical Tasks:

- [CT-1] Inserts control rods to shutdown the reactor before containment temperature reaches 185°F.
- [CT-2] Initiates at least one train of Containment Spray (CS):
 - before anticipating blowdown or entering EOP-3 Blowdown, and
 - within the OK To Spray region of Figure O Containment Spray Initiation Limit curve.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	R-ATC	Raise Power with Rods to enter Mode 1
2	LS06_MALF	C-ATC	(NEW) Control Rod Reed Switch Stuck Open
3	YP_XMFTB_4901 Failed	C-ATC	(NEW) Stuck IRM F Detector
4	N/A	N-BOP	(NEW) Perform CPS 9068.01 Hydrogen Mixing System Operability Test (Div 1)
5	1HG02CA-1A=1	TS-SRO	(NEW) 1HG02CA Compressor Motor Failure (Shaft Break)
6	A05_A02_A0103_4_TVM=2 A05_A02_A0108_5_TVM=2 A05_A02_A08S10_2=ON	C-BOP TS-SRO	(NEW) E22N654C RCIC Storage Tank Level Instrument Failure
7	YP_XMFTB_3917	C-BOP	CCW Pump 1A trip
8	YACUL029=50% YP_XMFTB_4963	M-AII	(NEW) RT Leak in CNMT/ATWS (ARI Successful)
9	YP_XMFTB_4947	C-BOP	Div 1 RHR Pump Fails to Auto Start
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor NEW – Not used in the last two (2) NRC exams.			

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Scenario Outline

Form ES-D-1

Scenario No.: 1

Operating Test No.: 2019-301

Narrative Summary

Event #	Description
1. Raise Power with Rods to enter Mode 1	The crew will continue the power ascension to 10% by withdrawing control rods in accordance with Step 8.7.3 of CPS 3002.01 Heatup and Pressurization.
2. Control Rod Reed Switch Stuck Open	Following the attempted withdrawal of the second control rod/group, a rod position reed switch fails (stuck open) in one channel of the two channel position probe. The ATC will determine which channel is inaccurate and enter substitute position data IAW CPS 3304.02 Rod Control and Information System (RC&IS) Section 8.2.4 Entering Substitute Data. Once substitute position data has been substituted for the control rod with the failed reed switch, the crew will continue the power ascension.
3. Stuck IRM F Detector	When the ATC operator attempts to withdraw IRM detectors IAW CPS 3306.01 Source/Intermediate Range Monitors (SRM/IRM), the IRM F detector IN light will remain illuminated. The ATC Operator will inform the SRO, review CPS 3306.01 section 8.2.1 Stuck SRM/IRM Detector and recommends attempting to free the detector by driving it in the opposite direction. This action frees the stuck detector and allows all IRM detectors to be withdrawn when attempted the second time.
4. Perform CPS 9068.01 Hydrogen Mixing System Operability Test (Div 1)	Once the Mode Switch has been placed in Run, the SRO will direct the BOP to perform the Div 1 H ₂ Mixing System Operability IAW CPS 9068.01 Hydrogen Mixing System Operability Test starting at step 8.1.
5. 1HG02CA Compressor Motor Failure (Shaft Break)	During the conduct of CPS 9068.01 Hydrogen Mixing System Operability Test (Quarterly Run), the BOP operator will note low dP (~0 psid) reading for the Div 1 Mixing Compressor (1HG02CA) and report to the SRO. If requested, the operator in the field will report a failed shaft coupling device. The BOP operator will secure the Div 1 Mixing Compressor. The SRO will evaluate and enter Technical Specification LCO 3.6.3.3, Action A.1 requiring the restoration of Containment/Drywell Hydrogen Mixing System to OPERABLE status within 30 days.
6. E22N654C RCIC Storage Tank Level Instrument Failure	Annunciator RCIC STORAGE TANK LEVEL LOW (5062-3D), HPCS OUT OF SERVICE (5062-8E) and HPCS D3 ATM CAL OR GR FAIL light come in due to level instrument 1E22-N654C failing low. Based upon review of the ARP the BOP operator will recommend taking manual actions for automatic actions that did not occur – Open 1E22-F015 HPCS Suppression Pool Suction Valve and Close 1E22-F001 HPCS Storage Tank Suction Valve. The SRO will evaluate and enter Technical Specification LCO 3.3.5.1 Action A.1 Enter the condition referenced in table 3.3.5.1-1 for the channel <u>and</u> D.2.1 Place channel in trip <u>or</u> D.2.2 Align the HPCS pump suction to the suppression pool.
7. CCW Pump 1A trip	The following annunciators are received: 5040-1B AUTO TRIP PUMP/MOTOR, 5040-2C LOW PRESS CCW HX OUTLET HEADER and 5003-3D/3K RECIRC MTR A/B WDG CLG WTR FLOW LO. BOP will observe that CCW Pump 1A has tripped, review the ARP and start a standby CCW pump.
8. RT Leak in CNMT/ATWS (ARI Successful)	A leak develops between the RWCU Regenerative and Non-Regenerative Heat Exchangers. Annunciators 5000-2F RWCU HI DIFF FLOW TIMER INITIATED and 5000-5A RWCU HI RM WEST TEMP HI are received. An automatic isolation occurs but the leak continues due to isolation valve leak-by. The MCR will scram the reactor per CPS 4001.02 Automatic Isolation. When the mode switch is placed in shutdown, the reactor will fail to scram requiring entry into EOP-1 RPV Control transitioning into EOP-1A ATWS RPV Control. Control rods will be successfully inserted when ARI is manually initiated. Once shutdown criteria is met, the SRO will exit EOP-1A and re-enter EOP-1. As containment pressure/temperature continues to rise, the SRO will enter EOP-6 Primary Containment Control. The SRO will direct the BOP operator to initiate containment sprays prior to exceeding figure N, Pressure Suppression Pressure.
9. Div 1 RHR Pump Fails to Auto Start	The Div 1 RHR Pump fails to automatically start when DW pressure reaches 1.68 psig and will have to be manually started.

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Scenario Outline

Form ES-D-1

Facility: <u>Clinton Power Station</u>	Scenario No.: <u>2</u>	Operating Test No.: <u>2019-301</u>	
Examiners: _____ _____	Operators: _____ _____		
<p>Initial Conditions:</p> <ul style="list-style-type: none"> • Mode 1 Rx Power at 25%. Plant startup is in progress. • Weather conditions are calm and clear. • Reactor Water Cleanup is in a single pump/single filter demin (F/D) lineup ('A' pump and 'A' F/D in service). <p>Turnover:</p> <ul style="list-style-type: none"> • Priorities for the shift are as follows: <ul style="list-style-type: none"> • Main EHC pump 1B is in service. Shift hydraulic pumps IAW CPS 3105.02 MAIN EHC HYDRAULIC POWER UNIT (EH) to support hanging a clearance order – First Priority. • Continue plant startup by withdrawing control rods in sequence IAW CPS 3004.01 Turbine Startup And Generator Synchronization. Raise reactor power to 30% in preparation for Reactor Recirculation (RR) pump shift to fast speed. <p>Critical Tasks:</p> <ul style="list-style-type: none"> • [CT-1] Starts GC pump 'A' prior to bypass valves starting to open. • [CT-2] SC-1.1 ATC inserts a manual Scram before area temperature reaches max safe in any one area. 			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP	(NEW) Shift Main EHC Pumps
2	N/A	R-ATC	Raise Power With Rods to 30%
3	RR_A_STATOR_WDG	C-ATC TS-SRO	(NEW) RR 'A' High Stator Temperature / Emergency Loop Shutdown
4	FC01BFC2PBFO	C-BOP	(NEW) 'B' FC Pump trip
5	RT_PUMPA_FAIL_TRIP YFCUPPSS_1	C-ATC	(NEW) RT Pump Shaft Shear/Failure to Trip on Low Flow
6	CAM1PR006ATV_VALUE1	TS-SRO	(NEW) 1RIX-PR006A Fuel Building Exhaust PRM fails high
7	1GC01PB=3	C-BOP	(NEW) Trip of Operating GC Pump (1GC01PB) / Failure of Standby GC Pump to Auto Start
8	YP_XMFTB_5082	M-All	(NEW) RPV Instrument Line Leak
9	CAM1PR006(A/B/C/D) TV_VALUE1 = 21-24 mr A11_A03_01_4_TVM 4 A11_A03_02_3_TVM 4 A18_A03_S11 = 1 A18_A03_S10 = 1 A12_A01_07_6_TVM 2 A12_A02_07_6_TVM 2	C-BOP	(NEW) Radiation Monitor fails to isolate VF/Startup VG
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p> <p>NEW – Not used in the last two (2) NRC exams.</p>			

Appendix D

Scenario Outline

Form ES-D-1

Scenario No.: 2Operating Test No.: 2019-301

Narrative Summary

Event #	Description
1.	<p>Shift Main EHC Pumps Following shift turnover, the SRO will direct the BOP operator to shift Main EHC Pumps IAW CPS 3105.02 MAIN EHC HYDRAULIC POWER UNIT (EH) section 8.1.2 Shifting Hydraulic Pumps to support hanging a clearance order.</p>
2.	<p>Raise Power With Rods to 30% The crew will raise Reactor power with Control Rods to achieve ~30% Reactor Power IAW CPS 3004.01 Turbine Startup And Generator Synchronization in preparation for transferring RR pumps to FAST speed.</p>
3.	<p>RR 'A' High Stator Temperature / Emergency Loop Shutdown Annunciator 5003-1K RECIRCULATION PUMP/MOTOR A OR B TEMPERATURE HIGH is received. Per the ARP, the BOP Operator will check the Pump/Motor A&B Temp Recorder (1B33-R601) and note that the 'A' RR pump motor stator temperatures (A/B/C phase windings) are reading 270° F and rising. The ARP directs the 'A' RR pump to be stopped if any motor winding temperature is > 266° F and rising. The ATC Operator will perform an emergency loop shutdown of the 'A' RR loop IAW CPS 3302.01H001 RR Loop/Pump Shutdown And Isolation Hardcard. Additionally, the SRO will enter CPS 4008.01 Abnormal Reactor Coolant Flow and ITS 3.4.1 Required Action C.1.</p>
4.	<p>'B' FC Pump trip Annunciators 5040-1E AUTO TRIP PUMP/MOTOR DIVISION 2 and 5040-7D TROUBLE FC SYSTEM LOCAL PNL 0PL45J comes in due to a trip of the 'B' Fuel Pool Cooling (FC) Pump 1FC02PB. The BOP Operator will diagnose the FC pump trip, dispatch an Equipment Operator to investigate, and shut FC supply/return containment isolation valves 1FC007, 1FC008, 1FC036 and 1FC037.</p>
5.	<p>RT Pump Shaft Shear/Failure to Trip on Low Flow Annunciator 5000-2F RWCU HI DIFF FLOW TIMER INITIATED comes in momentarily (can be cleared), 5000-2C F-D SYSTEM TROUBLE reflashs (~ 10 seconds later) and 5000-1A PUMP FLOW LO is received (~ 1 minute later) due to a shaft shear of the 'A' RT pump. The ATC Operator will recognize the failure of the 'A' RT pump to trip and manually trip the 'A' RT pump. The ATC will inform the SRO and review the ARP for any additional actions.</p>
6.	<p>1RIX-PR006A Fuel Building Exhaust PRM fails high A high alarm is received on the MCR AR/PR LAN for 1RIX-PR006A Fuel Building Exhaust PRM. The BOP will verify normal readings for 1RIX-PR006B, 6C, and 6D. The SRO will declare 1RIX-PR006A inoperable and enter TS 3.3.6.2 Secondary Containment Isolation Instrumentation Action A.1.</p>
7.	<p>Trip of Operating GC Pump (1GC01PB) / Failure of Standby GC Pump to Auto Start Annunciator AUTO TRIP TURBINE AUXILIARY PUMP / MOTOR (5017-1A) comes in due to the GC1PB breaker trip. The standby GC pump will fail to auto start. The BOP operator will start the standby pump manually <u>before</u> bypass valves start to open, inform the SRO and review the ARP.</p>
8.	<p>RPV Instrument Line leak An RPV instrument line will break resulting in a partial loss of RPV instrumentation, a steam leak in the secondary containment and EOP-8 entry. Secondary containment temperatures will rise requiring a reactor scram. Two areas in secondary containment will exceed Maximum Safe temperature requiring blowdown. The crew may Anticipate Blowdown using bypass valves prior to two areas reaching max safe.</p>
9.	<p>Radiation Monitor fails to isolate VF/Startup VG Due to the RPV instrument line leak in the secondary containment, the VF exhaust radiation monitors trend up to the trip isolation set point but fail to actuate VF system isolation and start of VG requiring BOP to manually perform.</p>

Appendix D

Scenario Outline

Form ES-D-1

Facility: Clinton Power StationScenario No.: 3Operating Test No.: 2019-301Examiners: _____

_____Operators: _____

Initial Conditions:

- Mode 1 Rx Power at RTP.
- Weather conditions are calm and clear.
- CRD Drive Water Pump 1A (1C11-C001A) is Out Of Service (OOS) for maintenance.

Turnover:

- CPS 9067.01 Standby Gas Treatment System Train Flow / Heater Operability in progress on VG Train A. Train A has been operating for 3 hours and is ready to be secured. Fuel Building Exhaust radiation monitors (1RIX-PR006A-D) are INOPERABLE due to conduct of CPS 9067.01.
 - First Priority – Secure VG Train A IAW CPS 9067.01 Standby Gas Treatment System Train Flow / Heater Operability and to restart the Fuel Building Ventilation (VF) System Train A.
 - Maintain Rx Power at RTP.

LCOs in effect:

- 3.3.6.2 (Secondary Containment Isolation Instrumentation) Required Actions A.1, B.1, C.1.1 & C.2.1

Critical Tasks:

- [CT-1] Shut SRV prior to Suppression Pool Temperature reaching 110°F.
- [CT-2] Place mode switch in Shutdown within 38 minutes of CRD drive water pump 1B trip.
 - 2 minutes (time for Equipment Operator to reach containment and report accumulator pressures).
 - 16 minutes (time it takes for second accumulator trouble to come in).
 - 20 minutes (once LCO 3.1.5 is met, time in which LCO required action must be taken).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP TS-SRO	(NEW) Shutdown VG Train A / Restart VF Train A
2	A01_A08_A02_4 Manual A01_A08_A02_7 False	C-ATC	(NEW) Hotwell M/U Controller Failure
3	1VF04CA 1VF04CB	C-BOP TS-SRO	(NEW) VF Exhaust and Supply Fans Trip
4	A02_A05_03_8 TVM=2 TFRPC_4=Off TFRPC_3=Off TFRPC_2=Off TFRPC_1=On C34DA014subsf=True C34DA014subsv=-1	TS-SRO	(NEW) RWL Inoperable
5	YPXMALE_72=50	C-BOP	Inadvertent opening of a SRV
6	YFCUCTPW_1	C-ATC	(NEW) 'A' RT Filter Demin Trip
7	YPXMALE_18 3% (ramped over 3 minutes)	R-ATC	(NEW) Loss of Main Generator H ₂ requiring power reduction
8	YP_XMFTB_4853	M-All	(NEW) Trip CRD Drive Water Pump 1B / Complete Loss of CRD / Scram
9	YP_XMFTB_4986	C-All	(NEW) Low SB Hydraulic Pressure due to reservoir leak
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor NEW – Not used in the last two (2) NRC exams.			

Appendix D

Scenario Outline

Form ES-D-1

Scenario No.: 3Operating Test No.: 2019-301

Narrative Summary

Event #	Description
1. Shutdown VG Train A / Restart VF Train A	The SRO will invoke ITS LCO 3.0.5 (allows unisolating penetrations for the operation of VG and VF under administrative control to demonstrate operability of duct monitors 1RIXPR006A-D). The SRO will then direct the BOP to secure VG Train A IAW CPS 9067.01 Standby Gas Treatment System Train Flow / Heater Operability and to restart the Fuel Building Ventilation (VF) System Train A. Once VF has been restarted and 1RIXPR006A-D channel checks completed SAT (Operability Restored), all associated ITS LCOs (3.0.5, 3.3.6.2) may be exited.
2. Hotwell M/U Controller Failure	Annunciator 5014-3B Not Fully Closed Cdsr Emerg M/U Vlv 1CD045 is received and rising hotwell level will be observed. The ATC will diagnose the failure of the Cond Make-Up Controller (1LC-CD057B) and will take manual control per CPS 3104.01 Condensate / Condensate Booster (CD/CB) section 8.6.1 Abnormal Condenser Hotwell Level HIGH Level.
3. VF Exhaust and Supply Fans Trip	The Fuel Building (VF) Exhaust and Supply Fans will trip causing a high differential pressure in the Fuel Building (5042-5D). The SRO will enter ITS 3.3.6.2 (Secondary Containment Isolation Instrumentation) Required Actions A.1, B.1, C.1.1 & C.2.1 and EOP-8 Secondary Containment Control. The VF system will not be able to be restored. The SRO will direct the BOP to manually initiate Standby Gas Treatment System Train A or B IAW CPS 3319.01 Standby Gas Treatment (VG) section 8.2.1 Manual Initiation to restore secondary containment differential pressure.
4. RWL Inoperable	Annunciator 5006-3H LOW POWER ALARM POINT will be received. The ATC operator will observe that the light above HI POWER SET PT, LO POWER ALM PT, and LO POWER SET PT are off and the Turbine 1 st Stage Pressure indication on the PPC shows "white data". The SRO will declare the RWL high power function INOPERABLE. Technical Specification LCO 3.3.2.1, Action A.1 will be evaluated requiring any control rod withdrawal to be suspended immediately.
5. Inadvertent opening of a SRV	Annunciators 5066-5B ADS OR SAFETY RELIEF VALVE LEAKING and 5067-8L SRV MONITORING SYSTEM TROUBLE come in due to SRV 1B21-F041A failing ~ 50% open. The BOP operator will diagnose and determine the problem is with 1B21-F041A. The BOP operator will sound the containment evacuation alarm, 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. 1B21-F041A will shut when the control switch is placed in OFF at 1H13-P601.
6. 'A' RT Filter Demin Trip	Annunciator 5000-2C F-D SYSTEM TROUBLE comes in due to a filter demin alarm on 1G36-P002. In addition, Annunciator 5000-2F RWCU HI DIFF FLOW TIMER INITIATED is received momentarily and clears. The ATC Operator will diagnose the trip of the 'A' Reactor Water Cleanup Filter Demin and dispatch an Equipment Operator (EO) to investigate. The ATC will then coordinate with the EO to lineup system for 2 pump / 1 filter demin operation.
7. Loss of Main Generator H₂ requiring power reduction	Annunciator TROUBLE GC SYSTEM LOCAL PNL 1PL10J (5018-2A) comes in and an Equipment Operator (EO) is dispatched to investigate. Main Generator H ₂ pressure will begin slowly lowering. EO will report that Annunciators MACH GAS PRESSURE HIGH LOW (5021-1A) and DIFF'L SEAL OIL PRESS LOW (due to a malfunction of the Delta Pressure Reg Valve/ H ₂ leak). The BOP will coordinate with the EO to bypass the Delta Pressure Reg Valve IAW CPS 3109.01 GENERATOR SEAL OIL (SO), stopping the leak. The loss of H ₂ pressure will also require the ATC to lower reactor power within the limits of CPS 3111.01 GENERATOR GAS (HY, CO) Appendix A GENERATOR ESTIMATED CAPABILITY CURVES.
8. Trip CRD Drive Water Pump 1B/Complete Loss of CRD/Scram	Annunciators 5068-3B CRD DRIVE WATER PUMP AUTO TRIP and 5068-4B CHARGING WATER PRESSURE LOW are received. The BOP will determine that the running RD Pump tripped, review applicable ARPs and report ITS 3.1.5 as an applicable Tech Spec to the SRO. An Equipment operator (EO) will be dispatched to the containment to monitor HCU accumulator pressures. The ATC will coordinate with the EO to determine when each control rod scram accumulator pressure drops below 1520 psig (rendering it INOPERABLE). Technical Specification LCO 3.1.5 Control Rod Scram Accumulators Conditions A, B and D will be evaluated and entered. The SRO will direct the ATC to scram the reactor within 20 minutes of the second accumulator reported as < 1520 psig.
9. Low SB Hydraulic Pressure due to reservoir leak	Annunciator 5006-2L HPU TROUBLE is received due to low fluid pressure cause by a leak in the reservoir of the Steam Bypass & Pressure Control (SB&PC) Hydraulic Power Unit. Once the Generator has tripped off-line (Event 8), the crew will be unable to control pressure using the bypass valves (BPVs). The SRO will direct the ATC or BOP to control Reactor Pressure using an alternate pressure control method IAW EOP-1 RPV Control and CPS 4411.09 RPV Pressure Control Sources.

Appendix D

Scenario Outline

Form ES-D-1

Facility: Clinton Power StationScenario No.: 1Operating Test No.: 2019-301Examiners: _____

_____Operators: _____

Initial Conditions:

- Mode 2 Rx Power at 7%.
- Weather conditions are calm and clear.

Turnover:

- Power ascension is in progress. CPS 3002.01 Heatup and Pressurization is complete up to and including step 8.7.2. CPS 3004.01 Turbine Startup and Generator Synchronization is completed up to and including step 5.2.
- Transient annunciator response for Feedwater Heater alarms has been authorized.
- Priorities for the shift are as follows:
 - Complete the remaining steps of CPS 3002.01 Heatup and Pressurization, including the following milestones:
 - Power ascension to 10%.
 - Transition to Mode 1.
 - Perform H₂ Mixing System Operability IAW CPS 9068.01 Hydrogen Mixing System Operability Test (Quarterly Run) starting at step 8.1. Two extra equipment operators are briefed, staged and ready to support the evolution.

Critical Tasks:

- [CT-1] Inserts control rods to shutdown the reactor before containment temperature reaches 185°F.
- [CT-2] Initiates at least one train of Containment Spray (CS):
 - before anticipating blowdown or entering EOP-3 Blowdown, and
 - within the OK To Spray region of Figure O Containment Spray Initiation Limit curve.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	R-ATC	Raise Power with Rods to enter Mode 1
2	LS06_MALF	C-ATC	(NEW) Control Rod Reed Switch Stuck Open
3	YP_XMFTB_4901 Failed	C-ATC	(NEW) Stuck IRM F Detector
4	N/A	N-BOP	(NEW) Perform CPS 9068.01 Hydrogen Mixing System Operability Test (Div 1)
5	1HG02CA-1A=1	TS-SRO	(NEW) 1HG02CA Compressor Motor Failure (Shaft Break)
6	A05_A02_A0103_4_TVM=2 A05_A02_A0108_5_TVM=2 A05_A02_A08S10_2=ON	C-BOP TS-SRO	(NEW) E22N654C RCIC Storage Tank Level Instrument Failure
7	YP_XMFTB_3917	C-BOP	CCW Pump 1A trip
8	YACUL029=50% YP_XMFTB_4963	M-All	(NEW) RT Leak in CNMT/ATWS (ARI Successful)
9	YP_XMFTB_4947	C-BOP	Div 1 RHR Pump Fails to Auto Start
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor NEW – Not used in the last two (2) NRC exams.			

Appendix D

Scenario Outline

Form ES-D-1

Scenario No.: 1

Operating Test No.: 2019-301

Narrative Summary

Event #	Description
1. Raise Power with Rods to enter Mode 1	The crew will continue the power ascension to 10% by withdrawing control rods in accordance with Step 8.7.3 of CPS 3002.01 Heatup and Pressurization.
2. Control Rod Reed Switch Stuck Open	Following the attempted withdrawal of the second control rod/group, a rod position reed switch fails (stuck open) in one channel of the two channel position probe. The ATC will determine which channel is inaccurate and enter substitute position data IAW CPS 3304.02 Rod Control and Information System (RC&IS) Section 8.2.4 Entering Substitute Data. Once substitute position data has been substituted for the control rod with the failed reed switch, the crew will continue the power ascension.
3. Stuck IRM F Detector	When the ATC operator attempts to withdraw IRM detectors IAW CPS 3306.01 Source/Intermediate Range Monitors (SRM/IRM), the IRM F detector IN light will remain illuminated. The ATC Operator will inform the SRO, review CPS 3306.01 section 8.2.1 Stuck SRM/IRM Detector and recommends attempting to free the detector by driving it in the opposite direction. This action frees the stuck detector and allows all IRM detectors to be withdrawn when attempted the second time.
4. Perform CPS 9068.01 Hydrogen Mixing System Operability Test (Div 1)	Once the Mode Switch has been placed in Run, the SRO will direct the BOP to perform the Div 1 H ₂ Mixing System Operability IAW CPS 9068.01 Hydrogen Mixing System Operability Test starting at step 8.1.
5. 1HG02CA Compressor Motor Failure (Shaft Break)	During the conduct of CPS 9068.01 Hydrogen Mixing System Operability Test (Quarterly Run), the BOP operator will note low dP (~0 psid) reading for the Div 1 Mixing Compressor (1HG02CA) and report to the SRO. If requested, the operator in the field will report a failed shaft coupling device. The BOP operator will secure the Div 1 Mixing Compressor. The SRO will evaluate and enter Technical Specification LCO 3.6.3.3, Action A.1 requiring the restoration of Containment/Drywell Hydrogen Mixing System to OPERABLE status within 30 days.
6. E22N654C RCIC Storage Tank Level Instrument Failure	Annunciator RCIC STORAGE TANK LEVEL LOW (5062-3D), HPCS OUT OF SERVICE (5062-8E) and HPCS D3 ATM CAL OR GR FAIL light come in due to level instrument 1E22-N654C failing low. Based upon review of the ARP the BOP operator will recommend taking manual actions for automatic actions that did not occur – Open 1E22-F015 HPCS Suppression Pool Suction Valve and Close 1E22-F001 HPCS Storage Tank Suction Valve. The SRO will evaluate and enter Technical Specification LCO 3.3.5.1 Action A.1 Enter the condition referenced in table 3.3.5.1-1 for the channel <u>and</u> D.2.1 Place channel in trip <u>or</u> D.2.2 Align the HPCS pump suction to the suppression pool.
7. CCW Pump 1A trip	The following annunciators are received: 5040-1B AUTO TRIP PUMP/MOTOR, 5040-2C LOW PRESS CCW HX OUTLET HEADER and 5003-3D/3K RECIRC MTR A/B WDG CLG WTR FLOW LO. BOP will observe that CCW Pump 1A has tripped, review the ARP and start a standby CCW pump.
8. RT Leak in CNMT/ATWS (ARI Successful)	A leak develops between the RWCU Regenerative and Non-Regenerative Heat Exchangers. Annunciators 5000-2F RWCU HI DIFF FLOW TIMER INITIATED and 5000-5A RWCU HI RM WEST TEMP HI are received. An automatic isolation occurs but the leak continues due to isolation valve leak-by. The MCR will scram the reactor per CPS 4001.02 Automatic Isolation. When the mode switch is placed in shutdown, the reactor will fail to scram requiring entry into EOP-1 RPV Control transitioning into EOP-1A ATWS RPV Control. Control rods will be successfully inserted when ARI is manually initiated. Once shutdown criteria is met, the SRO will exit EOP-1A and re-enter EOP-1. As containment pressure/temperature continues to rise, the SRO will enter EOP-6 Primary Containment Control. The SRO will direct the BOP operator to initiate containment sprays prior to exceeding figure N, Pressure Suppression Pressure.
9. Div 1 RHR Pump Fails to Auto Start	The Div 1 RHR Pump fails to automatically start when DW pressure reaches 1.68 psig and will have to be manually started.

Facility: Clinton Power StationScenario No.: 2Operating Test No.: 2019-301Examiners: _____

_____Operators: _____

Initial Conditions:

- Mode 1 Rx Power at 25%. Plant startup is in progress.
- Weather conditions are calm and clear.
- Reactor Water Cleanup is in a single pump/single filter demin (F/D) lineup ('A' pump and 'A' F/D in service).

Turnover:

- Priorities for the shift are as follows:
 - Main EHC pump 1B is in service. Shift hydraulic pumps IAW CPS 3105.02 MAIN EHC HYDRAULIC POWER UNIT (EH) to support hanging a clearance order – First Priority.
 - Continue plant startup by withdrawing control rods in sequence IAW CPS 3004.01 Turbine Startup And Generator Synchronization. Raise reactor power to 30% in preparation for Reactor Recirculation (RR) pump shift to fast speed.
- Transient annunciator response to Feedwater Heater alarms has been authorized.

Critical Tasks:

- [CT-1] Shut SRV prior to Suppression Pool Temperature reaching 110°F.
- [CT-2] SC-1.1 ATC inserts a manual Scram before area temperature reaches max safe in any one area.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP	(NEW) Shift Main EHC Pumps
2	N/A	R-ATC	Raise Power With Rods to 30%
3	YPXMALSE_72=50	C-BOP	Inadvertent opening of a SRV
4	RR_A_STATOR_WDG	C-ATC TS-SRO	(NEW) RR 'A' High Stator Temperature / Emergency Loop Shutdown
5	FC01BFC2PBFO	C-BOP	(NEW) 'B' FC Pump trip
6	RT_PUMPA_FAIL_TRIP YFCUPPSS_1	C-ATC	(NEW) RT Pump Shaft Shear/Failure to Trip on Low Flow
7	CAM1PR006ATV_VALUE1	TS-SRO	(NEW) 1RIX-PR006A Fuel Building Exhaust PRM fails high
8	YP_XMFTB_5082	M-All	(NEW) RPV Instrument Line Leak
9	CAM1PR006(A/B/C/D) TV_VALUE1 = 21-24 mr A11_A03_01_4_TVM 4 A11_A03_02_3_TVM 4 A18_A03_S11 = 1 A18_A03_S10 = 1 A12_A01_07_6_TVM 2 A12_A02_07_6_TVM 2	C-BOP	(NEW) Radiation Monitor fails to isolate VF/Startup VG
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor NEW – Not used in the last two (2) NRC exams.			

Scenario No.: 2Operating Test No.: 2019-301**Narrative Summary**

Event #	Description
1. Shift Main EHC Pumps	Following shift turnover, the SRO will direct the BOP operator to shift Main EHC Pumps IAW CPS 3105.02 MAIN EHC HYDRAULIC POWER UNIT (EH) section 8.1.2 Shifting Hydraulic Pumps to support hanging a clearance order.
2. Raise Power With Rods to 30%	The crew will raise Reactor power with Control Rods to achieve ~30% Reactor Power IAW CPS 3004.01 Turbine Startup And Generator Synchronization in preparation for transferring RR pumps to FAST speed.
3. Inadvertent opening of a SRV	Annunciators 5066-5B ADS OR SAFETY RELIEF VALVE LEAKING and 5067-8L SRV MONITORING SYSTEM TROUBLE come in due to SRV 1B21-F041A failing ~ 50% open. The BOP operator will diagnose and determine the problem is with 1B21-F041A. The BOP operator will sound the containment evacuation alarm, 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. 1B21-F041A will shut when the control switch is placed in OFF at 1H13-P601.
4. RR 'A' High Stator Temperature / Emergency Loop Shutdown	Annunciator 5003-1K RECIRCULATION PUMP/MOTOR A OR B TEMPERATURE HIGH is received. Per the ARP, the BOP Operator will check the Pump/Motor A&B Temp Recorder (1B33-R601) and note that the 'A' RR pump motor stator temperatures (A/B/C phase windings) are reading 270° F and rising. The ARP directs the 'A' RR pump to be stopped if any motor winding temperature is > 266° F and rising. The ATC Operator will perform an emergency loop shutdown of the 'A' RR loop IAW CPS 3302.01H001 RR Loop/Pump Shutdown And Isolation Hardcard. Additionally, the SRO will enter CPS 4008.01 Abnormal Reactor Coolant Flow and ITS 3.4.1 Required Action C.1.
5. 'B' FC Pump trip	Annunciators 5040-1E AUTO TRIP PUMP/MOTOR DIVISION 2 and 5040-7D TROUBLE FC SYSTEM LOCAL PNL 0PL45J comes in due to a trip of the 'B' Fuel Pool Cooling (FC) Pump 1FC02PB. The BOP Operator will diagnose the FC pump trip, dispatch an Equipment Operator to investigate, and shut FC supply/return containment isolation valves 1FC007, 1FC008, 1FC036 and 1FC037.
6. RT Pump Shaft Shear/Failure to Trip on Low Flow	Annunciator 5000-2F RWCU HI DIFF FLOW TIMER INITIATED comes in momentarily (can be cleared), 5000-2C F-D SYSTEM TROUBLE reflashs (~ 10 seconds later) and 5000-1A PUMP FLOW LO is received (~ 1 minute later) due to a shaft shear of the 'A' RT pump. The ATC Operator will recognize the failure of the 'A' RT pump to trip and manually trip the 'A' RT pump. The ATC will inform the SRO and review the ARP for any additional actions.
7. 1RIX-PR006A Fuel Building Exhaust PRM fails high	A high alarm is received on the MCR AR/PR LAN for 1RIX-PR006A Fuel Building Exhaust PRM. The BOP will verify normal readings for 1RIX-PR006B, 6C, and 6D. The SRO will declare 1RIX-PR006A inoperable and enter TS 3.3.6.2 Secondary Containment Isolation Instrumentation Action A.1.
8. RPV Instrument Line leak	An RPV instrument line will break resulting in a partial loss of RPV instrumentation, a steam leak in the secondary containment and EOP-8 entry. Secondary containment temperatures will rise requiring a reactor scram. Two areas in secondary containment will exceed Maximum Safe temperature requiring blowdown. The crew may Anticipate Blowdown using bypass valves prior to two areas reaching max safe.
9. Radiation Monitor fails to isolate VF/Startup VG	Due to the RPV instrument line leak in the secondary containment, the VF exhaust radiation monitors trend up to the trip isolation set point but fail to actuate VF system isolation and start of VG requiring BOP to manually perform.

Appendix D

Scenario Outline

Form ES-D-1

Facility: Clinton Power StationScenario No.: 3Operating Test No.: 2019-301Examiners: _____

_____Operators: _____

Initial Conditions:

- Mode 1 Rx Power at RTP.
- Weather conditions are calm and clear.
- CRD Drive Water Pump 1A (1C11-C001A) is Out Of Service (OOS) for maintenance.

Turnover:

- CPS 9067.01 Standby Gas Treatment System Train Flow / Heater Operability in progress on VG Train A. Train A has been operating for 3 hours and is ready to be secured. Fuel Building Exhaust radiation monitors (1RIX-PR006A-D) are INOPERABLE due to conduct of CPS 9067.01. The WEC Supervisor will make required entries to CPS 9094.01 Cumulative Data Report.
- First Priority – Secure VG Train A IAW CPS 9067.01 Standby Gas Treatment System Train Flow / Heater Operability and to restart the Fuel Building Ventilation (VF) System Train A.
- Maintain Rx Power at RTP.

LCOs in effect:

- 3.3.6.2 (Secondary Containment Isolation Instrumentation) Required Actions A.1, B.1, C.1.1 & C.2.1

Critical Tasks:

- [CT-1] Starts GC pump 'A' prior to bypass valves starting to open.
- [CT-2] Place mode switch in Shutdown within 38 minutes of CRD drive water pump 1B trip.
- 2 minutes (time for Equipment Operator to reach containment and report accumulator pressures).
- 16 minutes (time it takes for second accumulator trouble to come in).
- 20 minutes (once LCO 3.1.5 is met, time in which LCO required action must be taken).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOP TS-SRO	(NEW) Shutdown VG Train A / Restart VF Train A
2	A01_A08_A02_4 Manual A01_A08_A02_7 False	C-ATC	(NEW) Hotwell M/U Controller Failure
3	1VF04CA 1VF04CB	C-BOP TS-SRO	(NEW) VF Exhaust and Supply Fans Trip
4	A02_A05_03_8 TVM=2 TFRPC_4=Off TFRPC_3=Off TFRPC_2=Off TFRPC_1=On C34DA014subsf=True C34DA014subsv=-1	TS-SRO	(NEW) RWL Inoperable
5	1GC01PB=3	C-BOP	(NEW) Trip of Operating GC Pump (1GC01PB) / Failure of Standby GC Pump to Auto Start
6	YFCUCTPW_1	C-ATC	(NEW) 'A' RT Filter Demin Trip
7	YPXMALSE_18 3% (ramped over 3 minutes)	R-ATC	(NEW) Loss of Main Generator H ₂ requiring power reduction
8	YP_XMFTB_4853	M-All	(NEW) Trip CRD Drive Water Pump 1B / Complete Loss of CRD / Scram
9	YP_XMFTB_4986	C-All	(NEW) Low SB Hydraulic Pressure due to reservoir leak
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor NEW – Not used in the last two (2) NRC exams.			

Appendix D

Scenario Outline

Form ES-D-1

Scenario No.: 3Operating Test No.: 2019-301

Narrative Summary

Event #	Description
1. Shutdown VG Train A / Restart VF Train A	The SRO will invoke ITS LCO 3.0.5 (allows unisolating penetrations for the operation of VG and VF under administrative control to demonstrate operability of duct monitors 1RIXPR006A-D). The SRO will then direct the BOP to secure VG Train A IAW CPS 9067.01 Standby Gas Treatment System Train Flow / Heater Operability and to restart the Fuel Building Ventilation (VF) System Train A. Once VF has been restarted and 1RIXPR006A-D channel checks completed SAT (Operability Restored), all associated ITS LCOs (3.0.5, 3.3.6.2) may be exited.
2. Hotwell M/U Controller Failure	Annunciator 5014-3B Not Fully Closed Cdsr Emerg M/U Vlv 1CD045 is received and rising hotwell level will be observed. The ATC will diagnose the failure of the Cond Make-Up Controller (1LC-CD057B) and will take manual control per CPS 3104.01 Condensate / Condensate Booster (CD/CB) section 8.6.1 Abnormal Condenser Hotwell Level HIGH Level.
3. VF Exhaust and Supply Fans Trip	The Fuel Building (VF) Exhaust and Supply Fans will trip causing a high differential pressure in the Fuel Building (5042-5D). The SRO will enter ITS 3.3.6.2 (Secondary Containment Isolation Instrumentation) Required Actions A.1, B.1, C.1.1 & C.2.1 and EOP-8 Secondary Containment Control. The VF system will not be able to be restored. The SRO will direct the BOP to manually initiate Standby Gas Treatment System Train A or B IAW CPS 3319.01 Standby Gas Treatment (VG) section 8.2.1 Manual Initiation to restore secondary containment differential pressure.
4. RWL Inoperable	Annunciator 5006-3H LOW POWER ALARM POINT will be received. The ATC operator will observe that the light above HI POWER SET PT, LO POWER ALM PT, and LO POWER SET PT are off and the Turbine 1 st Stage Pressure indication on the PPC shows "white data". The SRO will declare the RWL high power function INOPERABLE. Technical Specification LCO 3.3.2.1, Action A.1 will be evaluated requiring any control rod withdrawal to be suspended immediately.
5. Trip of Operating GC Pump (1GC01PB) / Failure of Standby GC Pump to Auto Start	Annunciator AUTO TRIP TURBINE AUXILIARY PUMP / MOTOR (5017-1A) comes in due to the GC1PB breaker trip. The standby GC pump will fail to auto start. The BOP operator will start the standby pump manually <u>before</u> bypass valves start to open, inform the SRO and review the ARP.
6. 'A' RT Filter Demin Trip	Annunciator 5000-2C F-D SYSTEM TROUBLE comes in due to a filter demin alarm on 1G36-P002. In addition, Annunciator 5000-2F RWCU HI DIFF FLOW TIMER INITIATED is received momentarily and clears. The ATC Operator will diagnose the trip of the 'A' Reactor Water Cleanup Filter Demin and dispatch an Equipment Operator (EO) to investigate. The ATC will then coordinate with the EO to lineup system for 2 pump / 1 filter demin operation.
7. Loss of Main Generator H₂ requiring power reduction	Annunciator TROUBLE GC SYSTEM LOCAL PNL 1PL10J (5018-2A) comes in and an Equipment Operator (EO) is dispatched to investigate. Main Generator H ₂ pressure will begin slowly lowering. EO will report that Annunciators MACH GAS PRESSURE HIGH LOW (5021-1A) and DIFF'L SEAL OIL PRESS LOW (due to a malfunction of the Delta Pressure Reg Valve/ H ₂ leak). The BOP will coordinate with the EO to bypass the Delta Pressure Reg Valve IAW CPS 3109.01 GENERATOR SEAL OIL (SO), stopping the leak. The loss of H ₂ pressure will also require the ATC to lower reactor power within the limits of CPS 3111.01 GENERATOR GAS (HY, CO) Appendix A GENERATOR ESTIMATED CAPABILITY CURVES.
8. Trip CRD Drive Water Pump 1B/Complete Loss of CRD/Scram	Annunciators 5068-3B CRD DRIVE WATER PUMP AUTO TRIP and 5068-4B CHARGING WATER PRESSURE LOW are received. The BOP will determine that the running RD Pump tripped, review applicable ARPs and report ITS 3.1.5 as an applicable Tech Spec to the SRO. An Equipment operator (EO) will be dispatched to the containment to monitor HCU accumulator pressures. The ATC will coordinate with the EO to determine when each control rod scram accumulator pressure drops below 1520 psig (rendering it INOPERABLE). Technical Specification LCO 3.1.5 Control Rod Scram Accumulators Conditions A, B and D will be evaluated and entered. The SRO will direct the ATC to scram the reactor within 20 minutes of the second accumulator reported as < 1520 psig.
9. Low SB Hydraulic Pressure due to reservoir leak	Annunciator 5006-2L HPU TROUBLE is received due to low fluid pressure cause by a leak in the reservoir of the Steam Bypass & Pressure Control (SB&PC) Hydraulic Power Unit. Once the Generator has tripped off-line (Event 8), the crew will be unable to control pressure using the bypass valves (BPVs). The SRO will direct the ATC or BOP to control Reactor Pressure using an alternate pressure control method IAW EOP-1 RPV Control and CPS 4411.09 RPV Pressure Control Sources.