FINAL AS-ADMINISTERED SCENARIOS

FOR THE CLINTON INITIAL EXAMINATION - JULY/AUG 2002

Exelon Nuclear

CLINTON POWER STATION

NRC Simulator Dynamic #1

ILT0101

Revision Number: 01

Exam Date: 7/29/02

Date: 07/05/2002

Developed By:	**B. Price**	**7/5/02**
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	Operations Representative	**Date**
Approved By:	**B. Price**	**7/8/02**
	Training Department	**Date**

Facility: Clinton Power Station Scenario No.: One Operating Test No.: **NRC0101-1**

Examiners: _____ Operators: _____

Initial Conditions:
12% power, Drywell pressure is high, A OG hydrogen analyzer is out of service

Turnover:

- Run a mixer to reduce Drywell pressure – first priority
- 12% power –Continue with the startup per CPS 3004.01 by pulling rods.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	BOP-N	Reduce Drywell pressure
2	NA	RO-R	Pull rods to raise power
3	LS02	RO-I	Rod PIP probe fails
4	Override	BOP-C	WS seal water pump trip
5	Override	BOP-I	OG recombiner level controller failure
6	RR02A	RO-C	RR pump trip
7	RH11 HP15	M	Suppression pool leak RHR A pump room with cross leakage into LPCS room
8	HP130 HP131	M	All SRVs fail to respond to initiation of ADS

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

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Scenario No.: One Operating Test No.: **NRC0101-1**

Narrative Summary

Event #	Description
1.	Drywell pressure is high requiring the BOP to run a mixing compressor to reduce Drywell pressure. Operational Requirement Manual action 3.5.2 for the test Prep switch entered.
2.	Progress with the startup by pulling rods to raise power
3.	A rod position indicator fails resulting a rod block. Remove the rod block by substituting its position and evaluate Technical Specification action 3.1.3, with no action required due to the other position indication being functional.
4.	The WS seal water pump will trip on overcurrent resulting in loss of seal water and motor oil cooling to the WS pumps. The BOP will start the standby pump to restore pump sealwater.
5.	The OG recombiner condenser level controller fails requiring BOP to manually control to restore level into the band to prevent failure of recombination.
6.	Recirculation pump trips requiring action per the abnormal coolant flow off-normal procedure. Technical Specification 3.4.1 for single loop requirements per B.1-4.
7. &8.	Suppression pool starts leaking into the RHR A room causing flooding requiring entry to the Flooding Off-Normal and EOP-8. The door between LPCS and RHR A will leak causing its room to flood as well. The suppression pool leak will cause suppression pool level to drop below 15'1" require emergency depressurization. To anticipate blowdown, EOP-1 allows rapid depressurization and may be peformed.
9.	When emergency depressurization is initiated the breakers for the solenoids will trip resulting in SRV failure to respond. This will require emergency depressurization by alternate means.

EOP
6,8,1,3(alt depressurization)

Critical tasks:

- Manually scram the reactor prior to emergency depressurization
- Emergency Depressurize once determine cannot hold suppression pool level above 15' 1"

Shift Turnover Information

⇒ **Day of week and shift**

- Today Day Shift

⇒ **Weather conditions**

- T-STORMS conditions expected over the next 24 hours

⇒ **(Plant power level)/conditions**

- 12% power
- 27.3 Mlbm/hr CORE FLOW
- 4 CPs/CF in service
- MDRFP in service controlling on the S/U level controller
- RFPT A in rolling reserve
- TG in chest warming, shell warming completed

⇒ **Thermal Limit Problems/Power Evolutions**

- Pull rods to raise power to 16% per Turbine Startup and Generator Synchronization, 3004.01, 8.1.4
- RE is present and available – Stay in single notch drive until rods are beyond position 12. Gang is permissible.
- A-2 rod sequence at step number 32

⇒ **Existing LCOs, date of next surveillance**

- NONE

⇒ **Surveillances or major maintenance**

- NONE

⇒ **Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment**

- OG Hydrogen Analyzer A is out of service for C&I maintenance.
- Auxiliary Steam is being provided by an Electrode Boiler.
- Recombiner bypass vlvs 1CD066A/B observe cycling, maintenance is investigating

⇒ **Comments, evolutions, problems, etc.**

- Online Safety is Green
- Drywell pressure is high, requiring burping by using the Division 2 compressor as a first priority.
- RWCU A F/D is near its end of life, chemistry is monitoring

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Operator Actions

Event No.(s): 1 **Page** 1 **of** 1

Description Reduce Drywell pressure

Initiation: Following shift turnover

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 3316.01, Containment Combustible Gas Control, step 8.3: 1. VERIFY OPEN: • 1SX088B, SSW CNMT Outbd Isol Vlv • 1SX089B, SSW CNMT Inbd Isol Vlv • 1SX096B, SSW CNMT Inbd Isol Vlv • 1SX097B, SSW CNMT Outbd Isol Vlv • Places MOV Test Prep Switches into TEST 2. Start CGCS Hydrogen Cmpr 1B, 1HG02CB. • Record start time IAW CPS 9094.01D001 3. Verify 1HG009B, CGCS Cmpr 1B Suct Vlv opens. 4. Verify 1SX095B, SSW CGCS Rm Clr Coil Outlt Vlv opens. **SECURING DRYWELL BURPING** 1. Stop CGCS Hydrogen Cmpr 1B, 1HG02CB. • Record stop time IAW CPS 9094.01D001 2. Verify 1HG009A(B), CGCS Cmpr1B Suct Vlv shuts. 3. Shut/verify shut 1SX095B, SSW CGCS Rm Clr Coil Outlt Vlv. • Places MOV Test Prep Switches into NORMAL
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Applies ORM ACTION 3.5.2

Terminus: D/W burping completed

NOTES:

Operator Actions

Event No.(s): 2 **Page** 1 **of** 1

Description: Pull rods to raise power

Initiation: Following burping the drywell

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	RO	Per, CPS 3004.01 Unit Startup and Generator Synchronization and CPS 2202.01F001, Control Rod Sequence: • Pull rods to raise power to 16%:
	BOP	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: Clearly observable plant response from change in power level.

NOTES:

Operator Actions

Event No.(s): 3 **Page** 1 **of** 1

Description: Rod PIP probe fails

Initiation: During reactivity change after Rod 28-29 is withdrawn, on the next Rod, 20-37

Cues: Annunciator 5006.02H, Rod Block alarm, Data Fault light

Time	Position	Applicant's Actions or Behavior
	RO	Per, CPS 5006-2H, Rod Out Block: • Determine the rod that has a data fault Per CPS 3304.02, Rod Control and Information System • Step 8.2.2 to determine which rod • Step 8.2.4 to Enter Sub Position ° Verify/select INDIVID DRIVE ° Depress the SUBST POSITION push-button Verify: 1) No other gang member of the rod having the defective reed switch is presently using substitute data 2) Data from the other channel is not substitute data 3) RAW DATA is not selected ° Select the rod with the defective reed switch ° Ensure that the rod is at the position at which the defective reed switch exists ° Depress the ENT SUBST push-button located in the PATTERN CONTROL section of the OCM ° Verify that the data has been entered by depressing the SUBST POSITION push-button
	BOP	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Evaluates actions per Tech. Spec. 3.1.3, no action required due to a backup position indication • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.

Terminus: Rod position is substituted

NOTES:

Operator Actions

Event No.(s): 4 **Page** 1 **of** 1

Description: WS seal water pump trip

Initiation: Upon completion of PIP failure and reactivity manipulation, on the signal of lead examiner

Cues: Annunciator CPS 5041-1A,1E,2E, & 3E alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 5041-1A, Auto Trip Pump/Motor, or CPS 3212.01, Plant Service Water, step 8.3.6: • Start the standby WS Seal Wtr Pmp B, 0WS01PB
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501

Terminus: WS Seal Water Pump Started

NOTES:

Operator Actions

Event No.(s): 5 **Page** 1 **of** 1

Description: OG recombiner level controller failure

Initiation: After WS problem has been addressed, on the signal of lead examiner

Cues: Annunciator 5130-4C, Hi Level alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 5130-4C, Condenser Stage Water Level D005B High,: 1. Open drain valve 1N66-F016B by placing 1N66-R621B, RECOMB COND N66-D005B LEVEL CONTROL in MANUAL, and then open 1N66-F016B. 2. Open drain valve 1N66-F016B by taking HS-1N66-AS016B to the open position, then control level with F017B manually. 3. Verify 2nd stage steam flow at 100% on 1N66-R625. 4. Observe condensate flow is not excessive by checking indicator, COND STG D005B COND FLOW, 1N66-R617-2. •
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.

Terminus: condenser stage water level alarm clear, SRO has directed actions accordingly.

NOTES:

Operator Actions

Event No.(s): 6 **Page** 1 **of** 1

Description: RR pump trip.

Initiation: Upon completion of OG problem, on the signal of lead examiner

Cues: annunciator 5003-3C alarmed

Time	Position	Applicant's Actions or Behavior

	RO	Per CPS 5003-3C, Recirc MG A Protective Relay Trip:
		• Proceed to CPS 4008.01, Abnormal Reactor Coolant Flow
		• Monitors reactor to ensure operations remain within established bands
		
		Per CPS 4008.01, Abnormal Reactor Coolant Flow:
		• Shut associated 1B33-F067A Discharge Vlv
		• Monitor for:
		  • Restricted Zone being entered
		  • Core instabilities
		  • For an anticipated RR loop/pump recovery/restart
		  1) Re-open idle loop's 1B33-F067A, Discharge Vlv ~ 5 minutes after the valve is shut.
		  • Per CPS 3302.01, REACTOR RECIRCULATION (RR), 8.2.1 RR Loop shutdown
		  • Open the Recirc Pump A Motor Bkr 3A

	BOP	• Dispatches a field operator to the LFMG • Notify the Reactor Engineer • Demand an official 3D Monicore Case • Verify thermal limits are acceptable • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions

	SRO	• Direct actions above
		• Enter CPS 4008.01, Abnormal Reactor Coolant Flow:
		  • Proceeding to single loop operation
		  • Apply Single loop requirements per LCO 3.4.1.B
		• Enters CPS 3005.01, UNIT POWER CHANGES,
		  • 8.4 Single Recirculation Loop Operation
		• Enters CPS 3302.01, REACTOR RECIRCULATION (RR),
		  • 8.2.1 RR Loop shutdown
		  • 8.2.6, Idle RR Loop - Restart
		• Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.

Terminus: Immediate actions for single loop completed and Single loop requirements per LCO 3.4.1.B Applied

NOTES:

Operator Actions

Event No.(s): 7,8 **Page** 1 **of** 3

Description: **Suppression pool leak RHR A pump room with cross leakage into LPCS room, All SRVs fail to respond to initiation of ADS**

Initiation: Reactor Recirculation pump trip has been addressed, on the signal of lead examiner

Cues: Annunciator High-High Level Floor/Equipment Drain Sump-Aux Building, 5013-5D, **and** SPDS Secondary Containment High Level alarms. ADS SRVs fail to respond to the initiation of ADS

Time	Position	Applicant's Actions or Behavior
	RO	1. Report EOP-8 entry and high level condition in the RHR A pump room 2. Monitors and reports the suppression pool downward level trend 3. Reports high level condition in the LPCS pump room 4. Performs EOP actions as directed by SRO: • Initiate a manual reactor scram per CPS 4100.01, Reactor Scram: Critical Task • **Place mode switch in Shutdown** • Check and report power 1% and trending down • Start MDRFP • Operate FW to control level 3 to 8 • Check rods, reports shutdown criteria is met • Report level and pressure are following expected trends • Stabilize pressure <1065 psig • Coordinates with BOP operator to monitor and control RPV level and press • Rapidly de-pressurizes the RPV using Bypass Valves • Subsequent Scram actions: • Insert IRMs and SRMs Critical Task **5. Upon direction of the SRO to reduce RPV pressure:** • Open all Bypass valves • Utilize RFPTs 6. Monitors reactor to ensure operations remain within established bands Monitors control room panels and notifies the SRO of any unusual or unexpected conditions. • Coordinates with BOP to monitor and control RPV level and press. • RO may Initiate ADS
	BOP	1. Makes plant announcement for reactor scram 2. Reports secondary containment high water level to SRO. 3. Isolate flooding by closing 1E12-F004A, F047A and F003A 4. Initiate suppression pool makeup

NOTES:

Event No.(s): 7, 8		**Page** 2 **of** 3
Time	**Position**	**Applicant's Actions or Behavior**
Critical Task	BOP	Performs EOP actions as directed by SRO • verifies operation of area coolers • verifies operation of VF Fuel building vent. • Evacuates affected areas of Secondary Containment 5. Directs startup of condenser vacuum pump • Monitors area temperatures, levels and radiation levels ▪ Initiate Suppression Pool Makeup ▪ Dumps Upper Containment pools • Initiates ADS • Reports SRVs failed to stay open • Directs field operators to diagnose and restore power to the SRVs • **Upon direction of the SRO to reduce RPV pressure:** • Open MSL drains • Utilize RCIC and RCIC drains line • Open the RPV head vent • Coordinates with RO to monitor and control RPV level and press.
	SRO	Enters EOP-8, Secondary Containment Control, and directs and verifies: 1. Operate VF 2. Operate area coolers 3. Hold floor drain sump levels below max. normal 4. Isolate all discharges into the affected area except systems needed for: a. EOP Actions b. Fire Fighting 5. Directs the closing of 1E12-F004A, RHR A Suppression Pool Suction Valve and heat exchanger isolations 1E12- F047A and F003A for isolation 6. Monitor area temperatures, levels and radiation levels Enters and initiates actions per CPS No. 4304.01, Flooding,: 1. Dispatch area operators to locate and isolate source of flooding 2. Notify RW and RP of flooding source and magnitude 3. Check RHR A Pump Room integrity

NOTES:

Event No.(s): 7, 8		**Page** 3 **of** 3
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	Directs additional actions: 1. Notification of Radiation Protection (RP) Department 2. Evacuate affected areas of Secondary Containment Enters EOP-6 on Low Suppression Pool Level Directs and verifies performance of appropriate actions per EOP-6 1. Start H_2O_2 monitors 2. Initiate makeup to pool per system operating procedures 3. Determine source of leakage, attempts to isolate the leakage 4. Diagnoses the leak may not be stopped prior to 15' 1" in Suppression Pool; • Direct dumping the upper pools Directs and verifies performance of appropriate actions per EOP-1:
Critical Task		**1. Mode Switch to SHUTDOWN**
		2. Shutdown criteria verified 3. Enter Reactor Scram, CPS No. 4100.01 4. Verify needed automatic actions: • Isolations • ECCS start • DG start 5. Control RPV Water Level between Level 3 and Level 8 6. Stabilize RPV pressure below 1065 psig • Makes decision to anticipate blowdown, orders rapid de-pressurization of RPV using Bypass Valves 7. Direct the entry to EOP-3, Blowdown, when it is determined Suppression pool level can't be maintained greater then 15' 1" • Directs the initiation of ADS and verification of 7 ADS SRVs open
Critical Task		**8. Directs alternate RPV Depressurization actions listed above to reduce pressure to less then 50 psig per CPS 4411.09, RPV PRESSURE CONTROL SOURCES**

Terminus:
- RPV level stable and under control in required band
- Alternate depressurization applied with RPV pressure rapidly dropping to less then 50 psig
- Effort has been made to isolate the suppression pool leak
- Upon approval of lead examiner

NOTES:

Simulator Operator Instructions

Initial Setup

1. Verify daily lamp test completed
2. Reset to IC-39 or one made for this scenario(Verify/Adjust Power to 12% with rods to match turnover).
   - Make sure DW pressure is up to .85-.89 built into the initial conditions or the Lesson plan
3. Place simulator in RUN
4. Verify the AR/PR server is running and stabilize AR/PR
5. Load the lesson plan for this scenario
6. Place a fourth CP/CF in service
7. Open/verify open the 1B21-F303B, RFPT 1B MS Inlet
8. Make sure CRD drive water D/P is in the expected range
9. Hotwell levels controllers are set at 50/45
10. Pressure set is at 922 psig
11. Select the B FWLC level instrument
12. OG A Hydrogen analyzer placed into Manual and Zero Purge
13. Document rod position is step 32 complete on a CPS 9000.09D002
14. Turn on and advance recorders
15. Hang OOS tags per turnover
16. Identify T/S issues associated with OOS and turnover
17. Verify simulator conditions match the turnover
18. Provide marked up CPS 3004.01 complete to step 8.1.3, N/A step 8.2.1.

Event Triggers and Role Play

Event #

1. Reduce Drywell pressure
   a. No trigger.
   b. Role play – Containment pressure on ATM is .02 psig.

2. Withdraw Rods To raise power to 16%
   a. No triggers
   b. Roll Play – As RE state to stay in single notch drive until rods are beyond position 12. Gang is permissible. Respond to MCR request to support the startup activities

3. Rod PIP probe fails
   a. **Remote trigger 1 During reactivity change after Rod 28-29 is withdrawn, on the next Rod, 20-37.**
   b. Remove malfunction for the Rod Block annunciator once the rod's position is substituted
   c. Roll Play – There are Data Fault and Data Error lights on RACCS 1at RC+IS back panel none on RGDC, or RACCS #2
   d. Role Play – IC appears to be an open position switch.

4. WS seal water pump trip
   a. **Remote trigger 4** on the signal of lead examiner
   b. Role play – pump tripped on overcurrent, Filtered Water is running. Upon pump start when directed the CW and WS pump seal water flows are normal

5. OG recombiner level controller failure
   a. **OPERATOR MODE** on the signal of lead examiner
   b. Take the B OG RecombinerCOnd N66-D005B level controller to MANUAL and Manualy go to shut.
   c. Role play – Field operator
      - No indications locally that would explain failure.
      - If directed to locally throttle 1N66-F017B to control level respond that will contact RP and will notify once in the room(this would take longer then is allowed for this action)

6. RR pump trip
   a. **Remote trigger 2** on the signal of lead examiner
   b. Role play – the K110A protective relay (86G) is tripped. As RE if 3D requested it is not available at this power level
   c. When RE is directed to run a 3D – Respond not operating at this low power.

Event Triggers and Role Play continues onto the next page

7. Suppression pool leak RHR A pump room with cross leakage into LPCS room
   a. **Remote trigger 5** on the signal of lead examiner
   b. Role play as personnel in the field
      (1) The leak is large and appears to be on the RHR pump A suction piping, but this room is flooding and unable to get closer to determine.
      (2) When isolation of the leak is attempted, the valve 1E12F004A, RHR A SP Suction valve binds and breaker trips resulting in the inability to isolate the major leak. You are unable to get to the suction manual isolation valve or the manual handwheel for 1E12F004A.
      (3) Remove pump fuses when directed using pending.
      (4) When directed to the LPCS room report water is pouring into the LPCS room coming from the water tight door between these two rooms and unable to stop this very large leak that is flooding the LPCS room.

8. All SRVs fail to respond to initiation of ADS
   a. **Conditional triggers are automatic on ADS Actuation**
   b. When the SRV tail pipe temperature is checked for the ADS SRVs a temperature spike from 80 to 150 then drops off.
   c. Role Play – as personnel in the field
      (1) 125VDC MCC 1A (1DC13E) Ckt. #23 is tripped and very hot
      (2) 125VDC MCC 1B (1DC14E) Ckt. #23 is tripped and very hot
      (3) When either breaker is attempted to be reset report that the breaker will not reset

STEP 1, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
EG106-Arm Rev Pwr Trip	REM	TRUE					Initial	
OG A H2 anal. Man Light	OVER	false					Initial	
OG A H2 ZERO Purge Light	OVER	False					Initial	
RR 3A RED LIGHT	OVER	TRUE					initial	
RR3A GRN LIGHT	OVER	FALSE					initial	
5003-1F RRPp A mtr bkr	MALF	4					initial	
5130-5E, OG H2 Anal.High or Loss Pwr	MALF	2					Initial	
5130-1C, Charcoal Adsorbers Differential Pressure High	MALF	off					Initial	
5130-7B, After Filter Differential Pressure High	MALF	off					Initial	

STEP 2, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
HP18H, SRV air leak	MALF	TRUE					Initial	
HP18H, SRV air leak	MALF	false		1:04			initial	

STEP 3, Rod PIP probe fails *on remote 1*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
Sub Positon PB lIGHT	OVER	FALSE					1	
LS02 – RCIS FAILURE OPEN SWS	MALF	TRUE					1	3

STEP 4, Rod PIP probe fails *on cyclic*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
Sub Positon PB lIGHT	OVER	TRUE					CYCLIC	

STEP 5, Rod PIP probe fails *on cyclic*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
Sub Positon PB lIGHT	OVER	FALSE					CYCLIC	

STEP 6, RR pump trip *on remote 2*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
RR02A – RR Pp A trip	MALF	TRUE						6

STEP 7, OG recombiner level controller failure *Using OPERATOR:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE

STEP 8, WS seal water pump trip *on remote 4:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
A11_A08_S01_2, - PSW Seal Pp A 0WS01PA	OVER	TRUE					4	4
A11_A08_S01_4, - PSW Seal Pp A 0WS01PA	REM	DELETE		00:05			4	4
5041-1E, Low Flow PSW Pp 1A Brg Seal Water	MALF	2		00:15			4	4
5041-2E, Low Flow PSW Pp 1A Brg Seal Water	MALF	2		00:15			4	4
5041-3E, Low Flow PSW Pp 1A Brg Seal Water	MALF	2		00:15			4	4
5041-1E, Low Flow PSW Pp 1A Brg Seal Water	MALF	0		:05			B	4
5041-2E, Low Flow PSW Pp 1B Brg Seal Water	MALF	0		:03			B	4
5041-3E, Low Flow PSW Pp 1C Brg Seal Water	MALF	0		:08			B	4

CONDITION: B - Start of the seal water pump

STEP 9, Suppression pool leak RHR A pump room with cross leakage into LPCS room *on remote 5*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
RH11, RH A Sup pool leak	MALF	10%	10:00				5	7
RH11, RH A Sup pool leak	MALF	100%		9:30			5	7
HP15, LPCS Sup pool leak	MALF	10%		3:00			5	7
1E12F004A Red light	Over	False		00:15			C	7
1E12F004A Green Light	OVER	False		00:15			C	7
D1 MOV OL Loss of Pwr status light	OVER	True		00:15			C	7
5064-8G, RH A OOS	MALF	2		00:15			C	7
Fuses RHR A pump brkr	REM	TRUE					pend	

CONDITION: C - 1E12F004A sws to closed

STEP 7, All SRVs fail to respond to initiation of ADS *on condition:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
HP130, De-energize all SRV A Bkr	REM	TRUE		00:02			D	8
HP131, De-energize all SRV B Bkr	REM	TRUE		00:01			D	8

Condition D upon initiation of ADS

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CLINTON POWER STATION

NRC Simulator Dynamic #2

ILT0101

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	Training Department	**Date**

Facility: Clinton Power Station Scenario No.: Two Operating Test No.: NRC0101-2

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 90% power, OG hydrogen analyzer A is out of service

Turnover:

1. Need to reduce power to 85% power TG - CV testing.
2. Shift Drywell Cooling systems to support scheduled activities.

Event No.	Malf. No.	Event Type*	Event Description
1	NA	BOP-N	Shift Drywell Cooling systems
2	NA	RO-R	Reduce power with flow
3	FW01A	RO-C	Condensate pump trips
4	OVERRIDE	BOP-C	GSE compressor high motor temperature
5	YVCUFDCN(1)	RO-C	RWCU filter demineralizer conductivity goes up
6	OVERRIDE	BOP-I	HPCS suppression pool level instrument fails high
7	MC01	M	Loss of vacuum group 1 isolation
8	RP01	M	Failure to scram
9	Override SLO3A	M	SLC failure
10	RH02A	M	RHR pump trip

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

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Scenario No.: Two Operating Test No.: **NRC0101-2**

Narrative Summary

Event #	Description
1.	The Drywell cooling system will be shifted from the "B" train to the "A" train in support of scheduled activities
2.	Power will be reduced with RR flow to support surveillance testing
3.	CD pump trips requiring the startup of a standby pump.
4.	GSE compressor high motor temperature alarm, indicative of a degraded motor requires starting a standby compressor and shutdown of the running compressor.
5.	The A RWCU Filter degrades resulting in RPV water quality diminishing. Requires the filter to be removed from service for backwash and precoating.
6.	A suppression pool high level alarm is activated resulting in the discovery of the failure of both high suppression pool level trip units (one high and one low). This will require Technical Specification 3.3.5.1 action D.1 that requires the shift of the HPCS suction to the suppression pool.
7.	A loss of vacuum will result in a loss of the condenser as a heat sink due to a Group 1 isolation.
8.	The rods fail to insert on a scram resulting in the reactor staying at power. This will result in SRV operation for pressure control adding heat to the suppression pool.
9.	The SLC system failures will result in no sodium pentaborate being injected. This will require the crew to insert rods to shutdown the reactor and direct alternate boron injection to be performed.
10.	When RHR is started in suppression pool cooling one pump will trip limiting the amount of suppression pool cooling and resulting in the elevated suppression pool temperature exceeding the Boron Injection Temperature, requiring lowering RPV water level.

EOPS
1A,6

Critical tasks:

- Insert control rods to shutdown the reactor
- Directs alternate boron injection
- When Boron injection Temperature limit is exceeded lower RPV level by terminating and preventing injection.
- Control the RPV level between –162" and the prescribed lowered level.

D-2, Dynamic Simulator Scenario **two** EXAM DATE: 7/29/2002 **ILT0101-2**

Shift Turnover Information

⇒ **Day of week and shift**

- Today Day Shift

⇒ **Weather conditions**

- T-STORMS conditions expected over the next 24 hours

⇒ **(Plant power level)**

- 89.5% Power/90% FCL
- 3172 MWt
- 1036 MWe
- 81.7 Mlbm/hr CORE FLOW
- A-2, step 49@ 18

⇒ **Thermal Limit Problems/Power Evolutions**

- Need to reduce power with flow to 85% power

⇒ **Existing LCOs, date of next surveillance**

- None

⇒ **Surviellances or major maintenance**

- TG Control Valve testing, CPS 9031.07, to be performed by Off-shift personnel who will brief this outside the MCR

⇒ **Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment**

- OG hydrogen analyzer A is out of service for CI maintenance

⇒ **Comments, evolutions, problems, etc.**

- Online Safety is Green
- Shift Drywell Cooling systems to support scheduled activities, which is the first priority to support
- RWCU A F/D is near its end of life, chemistry is monitoring

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Operator Actions

Event No.(s): 1 **Page** 1 **of** 1

Description: **Shift Drywell Cooling systems**

Initiation: Following shift turnover

Cues: Direction of the SRO

Time	Position	Applicant's Actions or Behavior
	BOP	CPS 3320.01, Drywell Cooling, step 8.1.2: 1. Directs local operations ▪ Open 1VP10Y ▪ Open 1VP12Y 2. Starts the idle Drywell Cooling Fans: ▪ 1VP01CA ▪ Expected annunciator 5050-6K, Running VP fans A & B ▪ 1VP01CC ▪ Expected annunciator 5052-6K, Running VP fans C & D ▪ Directs locally shut the idle 1VP001A, Chill Water Pump Discharge Valve and reopen upon pump start 3. Starts IDLE Chill Water Pump, 1VP03PA and Verify the normal flow light energizes 4. transfer Supplemental Drywell Cooling Coil Units: ▪ Shut Supplemental Drywell Cooling Coil Units Supply and Return Isol Valves 1VP090B/91B. ▪ Open Supplemental Drywell Cooling Coil Units Supply and Return Isol Valves 1VP090A/91A. 6. Directs local operations: ▪ Start Drywell Chiller 1VP04CA ▪ Direct field operator to perform local shutdown actions 7 Stop Chill Water Pump, 1VP03PB. 8 Stop Drywell Cooling Fans 1VP01CB and/or 1VP01CD. 9 Annunciator s 5050-6K, Running VP fans A & B and 5052-6K, Running VP fans C & D clears
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Directs the shift of VP trains • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: VP trains shifted

NOTES:

Operator Actions

Event No.(s): 2 **Page** 1 **of** 1

Description: Reduce power with flow

Initiation: Following shifting VP units

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS3005.01, Unit Power Changes step 8.2.4: • Reduce power with flow
	BOP	• Notifies Chemistry and RP of power reduction • Checks OG Pre and Post treat monitors • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Directs power reduction

Terminus: Clearly observable plant response from change in power level.

NOTES:

Operator Actions

Event No.(s): 3 **Page** 1 **of** 1

Description: **Condensate pump trips**

Initiation: Following power reduction on the signal of lead examiner

Cues: Annunciator 5014-2B alarming, CD Pump trip light

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS 3104.01, CD/CB step 8.6.3: • Start the standby CD Pump if available
	BOP	• Dispatch field Operators to investigate pump trip and support pump start • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Enters CPS 4002.01, Abnormal RPV Level/Loss of Feedwater, at Power and directs the above actions • Contacts Shift Manager and recommends notifications.

Terminus: Start the standby CD Pump

NOTES:

Operator Actions

Event No.(s): 4 **Page** 1 **of** 1

Description: GSE compressor high motor temperature

Initiation: After CD pump trip, on the signal of lead examiner

Cues: Annunciator 5019-2C alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 5019-2C, High Temp STM Packing Exh Blower 1B1, OA 1&2: • sends field operator to investigate • Startup SPE 1B2 • Shutdown SPE 1B1
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications.

Terminus: SPE 1B2 is running and 1B1 shutdown

NOTES:

Operator Actions

Event No.(s): 5 **Page** 1 **of** 1

Description: RWCU filter demineralizer conductivity goes up

Initiation: Following GSE problem is addressed, on the signal of lead examiner

Cues: Annunciator 5000-2B alarming, A F/D conductivity trending up

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS 5000-2B, F-D CNDT HI-LO, OA 4: • Remove F/D from service • Enter CPS 4010.02, Plant Chemistry Per CPS 3303.01, RWCU step 8.1.3: 1. Establish communications between the MCR and the operator at local panel 1G36-P002. 2. Throttle 1G33-F044, RWCU Filter/Demin Bypass 300 gpm
	BOP	• Direct field operator to backwash and precoat F/D and restored to service • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Enter CPS 4010.02, Plant Chemistry, table 1 and directs the above actions • Contacts Shift Manager and recommends notifications.

Terminus: A F/D removed from service for backwash and precoating

NOTES:

Operator Actions

Event No.(s): 6 **Page** 1 **of** 1

Description: HPCS suppression pool level instrument fails high

Initiation: After RWCU filter demineralizer problem has been addressed, on the signal of lead examiner

Cues: Annunciator 5062-3E alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 5062-3E, SP Water Level High: 1. Observes HPCS suction source doesn't shift to the suppression pool 2. Verfies a suction path exists 3. Investigates ATMs 1E22-N655C & G at back panel Per CPS 3309.01, HPCS, STEP 8.1.7.1 shifts suction to the suppression pool: 1. Shut/verify shut: 1) 1E22-F010, HPCS First Test Vlv To Storage Tank. 2) 1E22-F011, HPCS Second Test Vlv To Storage Tank. 2. Open 1E22-F015, HPCS Suppr Pool Suction Valve. 3. Verify 1E22-F001, HPCS Storage Tank Suction Valve shuts.
	RO	• Reports suppression pool level is in the normal band • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Evaluates EOP-6 entry condition and may initially enter. Determines alarm not valid for EOP-6. • Declares HPCS Inoperable and enters LCO 3.5.1 Action B.1 directs that RCIC is verified Operable and B.2 restore in 14 days. • Complies with action statement(s) for T.S. Section 3.3.5.1 Table 3.3.5.1-1, 3e action D.1 • Declares HPCS suction shift logic inoperable and directs the placing of the HPCS suction on the suppression pool. • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Contacts Shift Manager and recommends notifications.

Terminus: HPCS suction on the suppression pool, SRO has addressed T.S. requirements.

NOTES:

Operator Actions

Event No.(s): 7 **Page** 1 **of** 2

Description: Loss of vacuum group 1 isolation

Initiation: After HPCS failure is addressed, on the signal of lead examiner

Cues: OG system high flow and differential pressure alarm, Vacuum dropping, Group 1

Time	Position	Applicant's Actions or Behavior
	RO	CPS 3215.01, Off-Gas step 8.3.1: • As directed reduces power by reducing RR flow and inserting rods • As directed performs Rapid Plant Shutdown per CPS 3005.01, Unit Power Changes 1. Lower reactor power using RR FCVs until core flow is ~ 43 Mlbm/hr 2. Place the mode switch in SHUTDOWN ° Place mode switch in Shutdown ° Check and report power unchanged ° Operate FW to control level 3 to 8 ° Report level and pressure are following expected trends ° Verify turbine and generator are tripped ° Stabilize pressure <1065 psig ° Coordinates with BOP operator to monitor and control RPV level and press 3. Subsequent Scram actions: ° Insert IRMs and SRMs Observes and reports: • Loss of Vacuum • Trip of the TG • Trip of the RFPTs • Group 1 Isolation • Coordinates with BOP operator to monitor and control RPV level and press.
	BOP	• Reports Off Gas panel alarms to SRO • Makes plant announcement for reactor scram • Make a plant announcement that the plant is performing a Rapid Plant Shutdown • Should make plant announcement to evacuate Containment. • Should make plant announcement of a group 1 Isolation

NOTES:

Event No.(s): 7		Page 2 of 2
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	Directs actions listed above • Per EOP-1 enters EOP-1A Enforces OPS expectations and standards Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Manual scram initiated and Group 1		

NOTES:

Event No.(s): 8,9,10		**Page** 1 **of** 3
Description: **Failure to scram, SLC failure, RHR pump trip**		
Initiation: Initial condition		
Cues: Rods fail to insert upon Scramming		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	Performs EOP actions as directed by SRO: • Arms and depresses MANUAL SCRAM push-buttons. • Initiates ARI. Critical Task • **Inserts control rods manually per CPS No. 4411.08, Alternate Control Rod Insertion** • Verifies RR downshifts at Level 3, and trips at Level 2. Critical Task • **Terminates and prevents injection CB/FW systems CPS 4411.02, Terminating and preventing injection:** **AND** Critical Task • **When RPV level reaches –60", control RPV water level between TAF and –60" using only the listed Preferred ATWS Systems** Critical Task • **Terminates and prevents injection CB/FW systems CPS 4411.02, Terminating and preventing injection:** **AND** Critical Task • **When reactor power reaches 5% control RPV water level between TAF and perscribed level using only the listed Preferred ATWS Systems** • Coordinates with BOP to monitor and control RPV level and press.

	BOP	Performs EOP actions as directed by SRO:
		• Inhibits ADS.
		• Verifies needed auto actions.
		  • Isolations
		  • DG Start
		  • Dispatches area operator to monitor DGs
		Performs EOP actions as directed by SRO Per CPS 4411.10, SLC Operations:
		• Starts A&B SLC pumps
		• Observes and reports:
		One system fails to respond
		Other train squib valve fails to actuate,
		• Directs personnel to resolve SLC system problems so it will inject
		Critical Task • **Notifies SRO that SLC is not injecting and Alternate Boron Injection is required, step 2.2**

NOTES:

Event No.(s): 8,9,10		**Page** 2 **of** 3
Time	**Position**	**Applicant's Actions or Behavior**
Critical Task	BOP	• **Terminates and prevents injection systems CPS 4411.02, Terminating and preventing injection:** **1. HPCS** **2. RCIC** 3. LPCS 4. LPCI Stabilizes RPV pressure below 1065 psig Performs EOP-6 actions as directed by SRO • Starts H2/O2 Monitors as directed • Per CPS 3312.01, Residual Heat Removal, Step 8.1.9, places RHR in suppression pool cooling ° Start 1A/1B RHR Pump, reports RHR A tripped ° Directs field operator to investigate cause for trip ° Establish RHR flow. ♦ Open 1E12-F024B open. ♦ Shut 1E12-F048B closed ♦ Lineup SX to the RHR Heat exchanger • Coordinates with RO to monitor and control RPV level and press.
	SRO	Directs entry into EOP-1A and EOP actions as entry conditions are met: 1. Inhibit ADS 2. Arm and depress MANUAL SCRAM push-buttons 3. Initiate ARI 4. Determines Power to be greater than 5% and Directs injection of SLC
Critical Task		**5. Insert control rods manually per CPS No. 4411.08, Alternate Control Rod Insertion**
		6. Verifies needed auto actions. • Isolations • DG Start
Critical Task		**7. Terminate and prevent injection of Detail F1 CPS 4411.02, Terminating and preventing injection**
		AND
Critical Task		**8. When RPV level reaches –60", control RPV water level between TAF and –60" using only the listed Preferred ATWS Systems**

NOTES:

Event No.(s): 8,9,10 **Page** 3 **of** 3

Time	Position	Applicant's Actions or Behavior
Critical Task	SRO	**9. When suppression pool temp reaches Boron Injection Temperature lower level by Terminate and prevent injection of Detail F1 CPS 4411.02, Terminating and preventing injection until:** • Power is less then 5% • Water level is less than –140" • All SRVs shut
Critical Task		**10. When reactor power reaches 5% control RPV water level between TAF and perscribed level using only the listed Preferred ATWS Systems**
		11. Directs crew to stabilize RPV pressure below 1065 psig
		12. Dispatch Operator to investigate SLC System Failures.
Critical Task		13. **Directs personnel to perform alternate boron injection**
		Directs entry into EOP-6; and EOP actions as entry conditions are met: • Directs and verifies performance of appropriate actions per EOP-6: 1. Start H_2O_2 monitors. 2. Monitor status and hold condition of identified parameters below (within) specified values. 3. Start <u>all</u> available pool cooling. 4. Monitor status and hold condition of identified parameters below (within) specified values. General: • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.

Terminus:
- Level lowered per EOP-1A
- RPV level stable and under control in required band
- Rods being inserted
- Alternate boron injection actions directed

Upon approval of lead examiner

NOTES:

Simulator Operator Instructions

Initial Setup

1. Verify daily lamp test completed
2. Reset to IC-1 (Verify/Adjust Power to 3104 MWth with flow to match turnover).
3. Load the lesson plan for this scenario
4. Place simulator in RUN
5. Make sure 8 CPs are in operation
6. Select the B FWLC level instrument
7. OG Hydrogen analyzer A placed into Manual and Zero Purge
8. Turn on and advance recorders
9. Verify the AR/PR server is running and stabilize AR/PR
10. Hang OOS tags per turnover
11. Identify T/S issues associated with OOS and turnover
12. Verify simulator conditions match the turnover
13. Provide CPS 3005.01.
14. CPS 9000.09 marked up to step 49 @ 18

Event Triggers and Role Play

Event #

1. Shift VP trains
   a. Pending triggers to support VP shift
   b. Role play as the field operator Open dampers, Start the A VP chiller, stop the B VP chiller and shut dampers

2. Reduce power with flow
   a. No triggers

3. Condensate pump trips
   a. **Remote trigger 1** on request from lead evaluator
   b. Role Play as field operators to report the breaker tripped on overcurrent and the motor appears hot due to black spots on the paint. Support startup of the standby CD pump.

4. GSE compressor high motor temperature
   a. **Remote trigger 4** on request from lead evaluator
   b. Role Play - The motor bearings are extremely noisy and do as directed to support this activity

5. RWCU filter demineralizer conductivity goes up
   a. **Remote trigger 2** on request from lead evaluator
   b. Role play as Chemistry that have confirmed the F/D is depleted and needs backwash and precoated.
   c. Use pending action to remove the F/D from service

6. HPCS suppression pool level instrument fails high
   a. **Remote trigger 5** on request from lead evaluator
   b. Upon request provide a copy of CPS 9030.01C032
   c. Role play – Status of the ATMs at Panel 1H13-P663;
      (1) 1E22-N655C Ch1 tripped, reading 10"
      (2) 1E22-N655G Ch1 not tripped reading –34"

7. Loss of vacuum group 1 isolation
   a. **Remote trigger 6** on request from lead evaluator
   b. Role play as personnel in the field
      (1) Loud rumbling/sucking sound all over the turbine building.
      (2) Further investigation shows the LP exhaust hood neck boot has failed

8. Failure to scram- **Initial condition**
   a. Role Play – Support EOP actions by activiating actions on the Pending page

9. SLC failure **- Initial condition**
   a. Role Play – respond to assist in recovery of SLC system but do not allow any recovery
10. RHR pump trip **-Initial condition**
   a. Role Play – Field operator finds breaker charging spring not charged calling GL for assistance

STEP 1, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
RP01 – Auto and Manual scram failure	MALF	TRUE					Initial	
Ann. 5019-6E, Lo Press Mn Stm	Malf	4					Initial	
PIC-NS02, Xrd to AS Controller STPT	REM	0					Initial	
C/S Xrnd to AS sys	OVER	TRUE					Initial	
C/S Xrnd to AS sys	OVER	False		00:10			Initial	
MC01 - Cndr Air Inleakage	MALF	10%	2:00				A	
SL03A – Fail Sq A fire CKT	MALF	TRUE					Initial	
SLC Pp B Sws Norm_A_Stop	OVER	TRUE					Initial	
RH02A – RH A Pp Trip	MALF	TRUE					Initial	
OG vault temp high alarm - blocked	MALF	4					Initial	

Condition A - Reactor Scram (NOT H_A02_A11_DS03_1) AND (NOT H_A02_A11_DS02_1)

STEP 2, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
RWCU F/D A Eff. For Cond	REM	93%					Initial	
H_A04_A30_DS36_1, ON/OFF	OVER	FALSE					Initial	
H_A04_A20_M16_1, XRD/MS To AS Sys	OVER	0					Initial	

STEP 3, Condensate pump trips *on remote 1*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
FW01A, CD Pp 1A TRIP	MALF	TRUE					1	3

STEP 4, RWCU filter demineralizer conductivity goes up *on remote 2*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
RWCU F/D Eff. Cond.	REM	50.9	1:00				2	5
CU101-RWCU F/D TRN A	REM	FALSE					Pend	5

STEP 5, Pending actions to support VP shift:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
YP_XREMT(660), VP "A"	OVER	TRUE					pend	1
YP_XREMT(661), VP "B"	OVER	FALSE					pend	1

STEP 6, GSE compressor high motor temperature *on remote 4:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
5019-2c, Hi Temp GSE	MALF	2					4	4

STEP 7, HPCS suppression pool level instrument fails high *on remote 5*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
5062-3E, Supp. Pool Hi	MALF	2					5	6

STEP 8, Loss of vacuum group 1 isolation *on remote 6*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
MC01, CDR Air Inleak	MALF	1%	00:30				6	7
MC01, CDR Air Inleak	MALF	10%	2:00	7:00			6	7

STEP 9, Pending Actions

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
EP203,	REM	TRUE		0:01:00			Pend	8
EP115,	REM	TRUE		0:05:00			Pend	8
EP113,	REM	TRUE		0:10:00			Pend	8
EP114	REM	TRUE		0:05:00			Pend	8
EP107A,	REM	TRUE		0:12:00			Pend	8
EP103	REM	TRUE		0:05:00			Pend	8
EP205,	REM	TRUE		0:05:00			Pend	8
EP206,	REM	TRUE		0:05:00			Pend	8

Exelon Nuclear

CLINTON POWER STATION

NRC Simulator Dynamic #3

ILT0101

Revision Number: 01

Exam Date: 7/29/02

Developed By:	**B. Price**	**7/5/02**
	Instructor	**Date**
Validated By:	**P. O'Brien**	**7/6/02**
	SME or Instructor	**Date**
Review By:	**P. O'Brien**	**7/6/02**
	Operations Representative	**Date**
Approved By:	**B. Price**	**7/8/02**
	Training Department	**Date**

Facility: Clinton Power Station Scenario No.: Three Operating Test No.: **NRC0101-3**

Examiners: _____ Operators: _____

Initial Conditions: 27% power RR LFMG, OG Hydrogen Analyzer A is out of service, GC pump out of service failed motor bearing, Pulling rods to 30% power for Recirculation pump upshift. Auxiliary Steam is being provided by an Electrode Boiler. HPCS Pump is running pool to pool to heat the Suppression Pool for an RHR Heat Exchanger Performance Test.

Turnover:

1. Cycle Condensate tank is low and Radwaste doesn't have any CY grade water available to transfer, an MC to CY transfer is required
2. Pull rods

	Malf. No.	Event Type*	Event Description
1	NA	BOP-N	MC-CY transfer
2	NA	RO-R	Pull rods to raise power
3	3645I_Action3	RO-C	Rod drifts outward.
4	OVER	BOP-C	HPCS System Ground
5	MS04	BOP-I	SSE level control failure
6	YAFWL47	RO-C	CB pump "A" clogged oil filter/bearing oil deficiency
7	PC12	M	RPV Instrument line failure in the secondary containment
8	RP01	M	Auto and Manual scram failure

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

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Scenario No.: Three Operating Test No.: **NRC0101-3**

Narrative Summary

Event #	Description
1.	BOP operator will lineup and fills the CY tank by transferring MC water to CY.
2.	Allow rod withdrawal to raise power.
3.	During rod withdrawal a rod continues to move outward, Off-Normal CPS 4007.02 requires operator action to stop its outward movement. Once the rod is scrammed the rod will no longer withdraw. LCO 3.1.3 action C.1&2 is entered.
4.	Division 3 Ground results in the manual Tripping of HPCS, start Ground Isolation.
5.	SSE level control fails causing level to go low requiring the manual level control to restore level on the SSE.
6.	CB pump "A" will experience a Clogged oil filter with a bearing oil deficiency requiring the startup of the standby pump and shutdown of the "A" pump.
7.	The RPV instrument line will break resulting in a partial lost of RPV instrumentation, a steam leak in the secondary containment and EOP-8 entry. Two areas in secondary containment will exceed Maximum Safe temperature requiring blowdown.
8.	When scrammed, rods will not move resulting in reactor remaining at power and entry to EOP-1A. This will require insertion of rods and the initiation of SLC to shutdown the reactor.

EOPS
8,1A,3

Critical tasks:

- Manually scram the reactor prior to one max safe temperature
  - Insert control rods and/or start SLC to shutdown the reactor
- Terminate and Prevent Injection prior to emergency depressurization
- Initiate emergency depressurization once two Max Safe temperatures are exceeded.
- Commence RPV feed to Restore level to the prescribed band when RPV pressure is below figure J.

Shift Turnover Information

⇒ **Day of week and shift**

- Today Day Shift

⇒ **Weather conditions**

- T-STORMS conditions expected over the next 24 hours

⇒ **(Plant power level)**

- 27% Power/48% FCL
- 937 MWt
- 281 MWe
- 31.1 Mlbm/hr CORE FLOW

⇒ **Thermal Limit Problems/Power Evolutions**

- Raise power by pulling rods to 30% then shift RR pumps to fast
- RE is present and available. High Xenon startup with burnout in progress. Gang is permissible, but continuos drive is NOT authorized
-

⇒ **Existing LCOs, date of next surveillance**

- 3.5.1 Action B.1 completed and B.2, 4 hours into a 14 day action
-

⇒ **Surveillances or major maintenance**

- HPCS running pool to pool
- .
-

⇒ **Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment**

- A OG hydrogen analyzer is out of service for CI maintenance
- GC pump out of service failed motor bearing

⇒ **Comments, evolutions, problems, etc.**

- Online Safety is Green
- Electrode Boiler is running providing AS
- CY tank is low, priority is to first transfer 4% from MC-CY

- A-2, step 40, 12-21 at 16
- CPS 3004.01, STEP 8.3.11
- RWCU A F/D is near its end of life, chemistry is monitoring

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Operator Actions

Event No.(s): 1 **Page** 1 **of** 1

Description: MC-CY transfer.

Initiation: Following shift turnover

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	BOP	Per Cycled and Makeup Condensate, CPS 3208.01 step 8.1.2.4: • Starts an MC pump • Verifies samples on MC tank • Opens 0CY007 • Shuts 0CY007 • Stops MC pump
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: MC water transferred to the CY tank

NOTES:

Operator Actions

Event No.(s): 2 **Page** 1 **of** 1

Description: **Pull rods to raise power**

Initiation: Following MC-CY transfer

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	RO	Per Turbine Startup and Generator Synchronization, CPS3004.01, step 8.3.11 and CPS 2202.01F001, Control Rod Sequence: • Withdraw rods to raise power to 30%
	BOP	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: Clearly observable plant response from change in power level.

NOTES:

Operator Actions

Event No.(s): 3 **Page** 1 **of** 1

Description: **Rod drifts outward**

Initiation: Once the reactivity manipulation is complete, when Rod 36-45 is being withdrawn from position 18 to 20

Cues: Rod Drift, 5006-4G alarms

Time	Position	Applicant's Actions or Behavior
	RO	Per Inadvertent Rod Movement, CPS 4007.02: Immediate actions • Select and fully insert the moving rod with the In Timer Skip button Subsequent actions; • Once fully inserted release the In Timer Skip button • Observe rod withdrawal • Reinsert rod with the In Timer Skip button Per CPS 5006-3D, OPRM Enabled: ▪ Monitor for core instabilities
	BOP	• Dispatch a field operator to the HCU for the rod • Directs field operator to Individually scram rod • Evaluates thermal limits • Evaluate MSL rad monitor values • Evaluates OG Rad levels • Monitors containment RE
	SRO	• Enters and direct actions per Inadvertent Rod Movement, CPS 4007.02 • Control Rod Operability, Tech. Spec. LCO 3.1.3 action C.1&2 • Tech. Spec. LCO 3.1.5 B.2.2 is entered once rod is scrammed • Contacts Shift Manager and recommends notifications.

Terminus: Once rod is fully inserted and individually scrammed

NOTES:

Operator Actions

Event No.(s): 4 **Page** 1 **of** 1

Description: **HPCS System Ground**

Initiation: Following completion rod failure on the signal of lead examiner

Cues: Ground HPCS System, 5062-6B alarms

Time	Position	Applicant's Actions or Behavior
	BOP	Per Ground HPCS System, CPS 5062-6B: • Shutdown the HPCS Pump • Remove HPCS control power fuses • Contact Maintenance for Ground Isolation • Trip or Inhibit Division 3 DG
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Directs actions listed above. • Evaluates Technical Specification LCO 3.8.1 Action B.1-4 for applicability due to the ground. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Contacts Shift Manager and recommends notifications.

Terminus: HPCS Pump has been tripped and Technical Specifications evaluated.

NOTES:

Operator Actions

Event No.(s): 5 **Page** 1 **of** 1

Description: SSE level control failure

Initiation: After crew has addressed HPCS System Ground problem and on the signal of lead examiner

Cues: Annunciator CPS 5019-3A alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 5019-3A, Hi/Lo SSE Shell, OA 2: • throttle open 1GS-S10, SSE Feed Water Bypass Vlv to restore level to the –2 ½ -+ 2 ½ • Direct field operator to investigate
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications.

Terminus: SSE level restored and alarm clear

NOTES:

FOR THE NEXT ACTIVITY WILL NEED TO DISTRACT OR BLOCK BOP OPERATOR FROM THE RO PANEL

Operator Actions

Event No.(s): 6 **Page** 1 **of** 1

Description: CB pump "A" clogged oil filter/bearing oil deficiency

Initiation: After SSE level control failure has been addressed, on the signal of lead examiner

Cues: Annunciator CPS 5001-1H alarming,

Time	Position	Applicant's Actions or Behavior
	RO	CPS 5001-1H, Clogged Oil Filter CB 1A: ▪ Directs field operator to turn Cuno filter CPS 5009-3H, PMS Alarm Display and observes CB A high bearing temperature on computer point CPS 3104.01, CD/CB step 8.2.2: • Startup standby CB pump • Shutdown leaking CB pump
	BOP	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• 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: Standby CB pump started and shutdown the CB pump with an oil deficiency

NOTES:

THIS ACTIVITY WILL NEED TO DISTRACT OR BLOCK BOP OPERATOR FROM THE RO PANEL

Operator Actions

Event No.(s): 7,8		**Page** 1 **of** 5
Description: RPV Instrument line failure in the secondary containment, Failure to scram		
Initiation: on the signal of lead examiner		
Cues: Multiple secondary containment area temperature and area radiation alarms, Rods fail to insert upon Scramming		
Time	**Position**	**Applicant's Actions or Behavior**

	RO	Reports EOP-8 entry on Hi temperature
		Performs EOP actions as directed by SRO
		• Initiate a manual reactor scram before first max safe temperature is exceeded Per CPS 4100.01, Reactor Scram:
		  • Place mode switch in Shutdown
		  • Check and report power unchanged
		  • Operate FW to control level 3 to 8
		  • Check rods, reports shutdown criteria is not met
		  • Report level and pressure are following expected trends
		  • Stabilize pressure <1065 psig
		• Coordinates with BOP operator to monitor and control RPV level and press

	BOP	• Reports secondary containment high temperature and rad alarms to SRO • Makes plant announcement for reactor scram • Should make plant announcement to evacuate Fuel/Aux buildings. Performs EOP actions as directed by SRO • Verifies operation of area coolers • Verifies operation of VF, Fuel Bldg Vent. • Evacuates affected areas of Secondary Containment • Monitors area temperatures, levels and radiation levels • Reports a secondary containment Max Safe temperature being approached to SRO • Reports two secondary containment Max Safe temperatures are being exceeded to SRO • Coordinates with RO to monitor and control RPV level and press

NOTES:

Event No.(s): 7,8		Page 2 of 5
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	Directs entry into EOP-8 and EOP actions as entry conditions are met: 1. Operate VF 2. Operate area coolers 3. Hold floor drain sump levels below max. normal 4. Isolate all discharges into the affected area except systems needed for: • EOP Actions • Fire Fighting 5. Per EOP-8/CPS 4001.01, Reactor Coolant Leakage: • Directs BOP to isolate the source of leakage 6. Direct a scram prior to exceeding Maximum safe temperature 7. Enters EOP-1 Directs additional actions: 1. Notification of Radiation Protection (RP) Department 2. Evacuate affected areas of Secondary Containment Directs and verifies performance of appropriate actions per EOP-1: 1. Mode Switch to SHUTDOWN • Per EOP-1 enters EOP-1A Enters EOP-3 and direct Blowdown once exceeding Maximum safe temperature in two areas

NOTES:

Event No.(s): 7,8 **Page** 3 **of** 5

Time	Position	Applicant's Actions or Behavior

	RO	Performs EOP actions as directed by SRO:
		• Arms and depresses MANUAL SCRAM push-buttons.
		• Initiates ARI.
		• CPS No. 4411.08, Alternate Control Rod Insertion
		  • Inserts control rods until RPC lockup
		  • Directs defeating RPC for futher rod insertion
		• Verifies RR downshifts at Level 3, and trips at Level 2.

	Critical Task	• **Terminates and prevents injection CB/FW systems CPS 4411.02**
	Critical Task	• **When RPV level reaches –60", control RPV water level between TAF and –60" using only the listed Preferred ATWS Systems**

	BOP	Performs EOP-1A actions as directed by SRO:
		• Inhibits ADS.
		• Verifies needed auto actions.
		  • Isolations
		  • DG Start
		  • Dispatches area operator to monitor DGs

	Critical Task	• **Starts and verifies injection of SLC trains 'A' and 'B'.**

	Critical Task	• **Terminates and prevents injection systems CPS 4411.02**
		  1. HPCS
		  2. RCIC
		  3. LPCS
		  4. LPCI
		
		Stabilizes RPV pressure below 1065 psig

NOTES:

Event No.(s):		7,8	**Page** 4 **of** 5
Time	**Position**	**Applicant's Actions or Behavior**	
	SRO	Directs entry into EOP-1A and EOP actions as entry conditions are met:	
		1. Inhibit ADS	
		2. Arm and depress MANUAL SCRAM push-buttons	
		3. Initiate ARI	
Critical Task		**5. Determines Power to be greater than 5% and Directs injection of SLC**	
		6. Insert control rods manually per CPS No. 4411.08, Alternate Control Rod Insertion	
		7. Verifies needed auto actions. • Isolations • DG Start	
Critical Task		**8. Terminate and prevent injection of Detail F1 CPS 4411.02**	
Critical Task		**9. When RPV level reaches –60", control RPV water level between TAF and –60" using only the listed Preferred ATWS Systems**	
		10. Enters EOP-6 for High Drywell Temperature 11. Directs crew to stabilize RPV pressure below 1065 psig Monitor status and hold condition of identified parameters below (within) specified values. • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.	

NOTES:

Event No.(s): 7,8		**Page** 5 **of** 5
Time	**Position**	**Applicant's Actions or Behavior**
Critical Task	RO	Performs EOP-3 actions as directed by SRO • **Termination and prevention of injection of all F1 systems** **1. CB/FW** At less then 138 psig: • **Refeed to level band OF –60 to -TAF**
Critical Task	BOP	Performs EOP-3 actions as directed by SRO • **termination and prevention of injection of all F1 systems** **1. LPCS** **2. LPCI**
Critical Task		• **initiation of ADS and verify 7 ADS valves open**
4 Critical Tasks	SRO	Enters EOP-3 and direct Blowdown once exceeding Maximum safe temperature in two areas • **Directs termination and prevention of injection of all F1 systems** • **Directs initiation of ADS and verify 7 ADS valves open** • **Directs Refeed at 138 psig** • **Directs level band at –60 to -TAF**

Terminus:

- Eop-8 actions initiated
- SLC started
- Rod Insert commenced
- RPV level lowered
- ADS initiated
- Level restored and stabilized
- Upon approval of lead examiner

NOTES:

Simulator Operator Instructions

Initial Setup

1. Verify daily lamp test completed
2. Reset to IC-22 (Verify/Adjust Power to 27% with rods and to match turnover).
3. Load the lesson plan for this scenario
4. Place simulator in RUN
5. Select the FWLC level instrument B and verify the Startup level controller is set to 20"
6. OG A Hydrogen analyzer placed into Manual and Zero Purge
7. GC A Pump C/S PTL with an Info tag
8. Place HPCS in Pool-to-Pool full flow test operation and place its OOS switch in OOS
9. Turn on and advance recorders
10. Verify Load set is at 600 MWe
11. Verify the AR/PR server is running and stabilize AR/PR
12. Ensure CY Tank Level is near 15 %
13. Hang OOS tags per turnover
14. Identify T/S issues associated with OOS and turnover
15. Verify simulator conditions match the turnover
16. CPS 9000.09 marked up step 40, 12-21 at 16
17. Provide marked up CPS 3004.01 complete to step 8.3.10.

Event Triggers and Role Play

Event #

1. MC-CY transfer
   a. **No triggers**
   b. Role play as chemistry that sample is SAT on MC tank, as ROC no CY grade water

2. Pull rods to raise power
   a. **No triggers**
   b. RE - High Xenon startup with burnout in progress. Gang is permissible, but continuos drive is NOT authorized

3. Rod drifts outward.
   a. **Remote trigger 1** – When Rod 36-45 is being withdrawn from position 18 to 20.
   b. No problem lights at the RGDC or RACCs
   c. Role Play – Field operator reports no indications of problem at the HCU.
   d. RE – 3D ran thermal limits have not been approached or exceeded. If scram times are asked for Rod 36-45 they are : to position 43 in .27 seconds, 29 in .65 seconds, and 13 in 1.13 seconds at 950 psig.
   e. When directed to scram the rod remove the drift malfunction and activate the pending action to scram the rod and report it completed. When asked accumulator N2 pressure is 1200 psig after rod is scrammed

4. HPCS System Ground
   a. **Remote trigger 2** on request from lead evaluator
   b. Role play – Field Operator to locate the source of the ground. When directed Rack out HPCS motor breaker and place DG in MAINTENANCE
   c. Respond as maintenance to do ground location/isolation

5. SSE level control failure
   a. ***remote Trigger* 3** on request from lead evaluator
   b. Role play As field operator no indications locally that would explain failure.
   c. Controller is set at 0 inches, but level control valve is shut.

6. CB pump "A" clogged oil filter/bearing oil deficiency
   a. **Remote trigger 4** on request from lead evaluator
   b. Watch computer point CBBA044 for temperature to rise to 185 °F then activiate the pending PMS Alarm Display
   c. Role play – Field Operator to turn the Cuno filter for the CB A pump and report it done, leave this alarm in. Support startup of the standby CB pump

More Event Triggers and Role Play on the next page

7. RPV Instrument line failure in the secondary containment
   a. **Remote trigger 5** on request from lead evaluator
   b. When the XL3 printout is requested provide attachment 1
   c. Role play as personnel in the field
      (1) When an operator is dispatched to the 781 East Gas Control Boundary report that the area appears to have a steam leak. You are unable to enter.

8. Auto and Manual scram failure
   a. **Triggers** – already active
   b. Perform Pending actions when requested

STEP 1, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
EG106-Arm Rev Pwr Trip	REM	TRUE					Initial	
OG A H2 anal. Man Light	OVER	false					Initial	
OG A H2 ZERO Purge Light	OVER	False					Initial	
5130-5E, OG H2 Anal.High or Loss Pwr	MALF	2					Initial	
RP01-AUTO/MANUAL SCRAM FAIL	MALF	TRUE					Initial	8
DW LVL Cont	MALF	19.00					Initial	
CST LVL Cont	MALF	3.65					Initial	

STEP 2, Rod drifts outward *on remote 1*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
ROD 3645-will drift	MALF	TRUE					1	3
ROD 3645- Single rod scram	MALF	TRUE					Pend	3
Scram Valve PB on RCIS OCM	OVER	TRUE					pend	3

STEP 3, HPCS System Ground *on remote 2*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
5062-6B, HPCS System Ground	MALF	2					2	4

STEP 4, SSE level control failure *on remote 3:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
MS04-GSEWFV Fail to	MALF	10.0%					A	5

STEP 5, CB pump "A" clogged oil filter/bearing oil deficiency *on remote 4:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
CB A Pmp bearing eff.	MALF	30%	6:00				4	6
5001-1H, Clogged Oil Filter CB Pp 1A	MALF	2					4	6
5009-3H, PMS Alarm Display	MALF	2					PEND	6

STEP 6, RPV Instrument line failure in the secondary containment *on remote 5*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
PC-12-Ref. Leg Leak in FB	MALF	true					5	7

STEP 7, Pending Actions

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
YP_XREMT(732) - EP203 - DEFEAT TB MCC-IM SHNT -	REM	TRUE		0:01:00			Pending	
YP_XREMT(776) - EP205 - DIV1 H202/POST LOCA M	REM	TRUE		0:02:30			Pending	
YP_XREMT(777) - EP206 - DIV2 H202/POST LOCA M	REM	TRUE		0:02:30			Pending	
YP_XREMT(750) - EP115 - INSERT ROD BLOCKS; FAL	REM	TRUE		0:05:00			Pending	
YP_XREMT(748) - EP113 - RPS LOGIC TRIPS; FALSE	REM	TRUE		0:10:00			Pending	
YP_XREMT(749) - EP114 - ARI LOGIC TRIPS; FALSE	REM	TRUE		0:05:00			Pending	
YP_XREMT(739) - EP107A-IA AND GRP 1 ISOLATION	REM	TRUE		0:12:00			Pending	

TEAR THIS PIECE OFF AND GIVE TO OPERATOR CHECKING FP ALARM

Attachment 1

61-17 AB-781 East Col 121-124 AC ALARM

61-18 AB-781 East Col 121-124 AC ALARM

61-19 AB-781 East Col 121-124 AC ALARM

61-20 AB-781 East Col 121-124 AC ALARM

Exelon
Nuclear

CLINTON POWER STATION

NRC Simulator Dynamic #4

ILT0101

Revision Number: 01

Exam Date: 7/29/02

Developed By:	**B. Price**	**7/5/02**
	Instructor	**Date**
Validated By:		**7/6/02**
	SME or Instructor	**Date**
Review By:	**P. O'Brien**	**7/6/02**
	Operations Representative	**Date**
Approved By:	**B. Price**	**7/8/02**
	Training Department	**Date**

Facility: Clinton Power Station Scenario No.: Four Operating Test No.: NRC0101-4

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 90% power, A OG hydrogen analyzer is out of service, GC pump out of service failed motor bearing.

Turnover:
Unit Sub 1H needs to be cross tied to 1I for breaker PM

Event No,	Malf. No.	Event Type*	Event Description
1	NA	BOP-N	Cross tie unit sub 1H to 1I
2	NA	RO-R	Reduce power with flow
3	Override	RO-C	CRD temp high
4	HP13D	BOP-I	SRV open
5	PC09B	BOP-C	FC pump trip
6	FW12A	RO-I	RFP flow input signal fails
7	RR14	M	Instrument line failure
8	RR15	M	Loss of all RPV level instrumentation
9	PC14	M	Leak between the DW and containment

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

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Scenario No.: Four Operating Test No.: **NRC0101-4**

Narrative Summary

Event #	Description
1.	The 480 VAC unit sub 1H is cross-tied to 1I and its supply breaker is open to support maintenance.
2.	Power will be reduced with RR flow to support surveillance testing
3.	CRD High temperature requires the RO to insert the fully withdrawn rod to position 46 to allow the rod to return to normal temperature CPS No. 3304.01.
4.	An SRV opens requires entry to CPS 4009.01. The SRV shuts when the A & B solenoid fuses are removed. The ADS SRV is declared inoperable LCO action LCO 3.5.1 Action E.1 entered. The SRV opening results in a loss of FW heating requiring power to be held stable CPS 4005.01.
5.	When the FC pump trips the FC007, 8, 37 and 38 are required to be shut to isolate the supply and return flow paths to retain water in the upper containment pools. Enters ORM 2.5.2 Action 3.5.2 for Test Prep Switch in Test.
6.	The A RFPT flow signal fails high resulting in mismatch in automatic control of the two feed pumps. The RFPT will need to be placed in manual to stabilize level control.
7,8&9.	RPV instrument line fails resulting in a loss of one division of RPV water level indication. This will result in a coolant leak into the Drywell causing Drywell pressure and temperature to rise(EOP1,6). A leak from the Drywell to the containment will result in containment pressure to rise requiring containment spray. The water from containment sprays will cause an electrical fault that results in a loss of one division of RPV water level indications. As the Drywell heats up and RPV pressure drops the remainder of the RPV instruments will fail high due to degassing and become non-functional resulting in a RPV level being unknown. This will require entry into EOP-2.

EOP 1,6,2

Critical tasks:

- Inserts a manual scram when the restricted zone is entered
- Initiate containment sprays
- Initiate ADS
- Inject until the RPV is flooded to the Main Steam lines

Shift Turnover Information

⇒ **Day of week and shift**

- Today Day Shift

⇒ **Weather conditions**

- T-STORMS conditions expected over the next 24 hours

⇒ **(Plant power level)**

- 89.5% Power/90% FCL
- 3113 MWt
- 1042 MWe
- 81.7 Mlbm/hr CORE FLOW

⇒ **Thermal Limit Problems/Power Evolutions**

- Need to reduce power with flow to 85% power

⇒ **Existing LCOs, date of next surveillance**

- None

⇒ **Surviellances or major maintenance**

- TG Control Valve testing, CPS 9031.07, to be performed by Off-shift personnel who will brief this outside the MCR

⇒ **Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment**

- OG hydrogen analyzer A is out of service for CI maintenance
- GC pump "A" out of service failed motor bearing

⇒ **Comments, evolutions, problems, etc.**

- Online Safety is Green
- Unit Sub 1H needs to be cross tied to 1I for breaker PM is scheduled to be completed before commencing power reduction
- RWCU F/D A is near its end of life, chemistry is monitoring

- A-2, step 49@ 18

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Operator Actions

Event No.(s): 1 **Page** 1 **of** 1

Description: Cross tie unit sub 1H to 1I

Initiation: Following shift turnover

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 3502.01, 480V Distribution, Step 8.1.4: • Verifies there is < a 5° phase angle difference between the two sources • Close The 480V Unit Sub 1H to 1I Tie Breaker • Open the 480V Unit Sub 1I Main Breaker
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: US 1H to 1I are crosstied with the US C main feeder open

NOTES:

Operator Actions

Event No.(s): 2 **Page** 1 **of** 1

Description: **Reduce power with flow**

Initiation: Following Cross tie unit sub 1H to 1I

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS3005.01, Unit Power Changes step 8.2.4: • Reduce power with flow
	BOP	• Notifies Chemistry and RP of power reduction • Checks OG Pre and Post treat monitors • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions
	SRO	• Directs power reduction

Terminus: Clearly observable plant response from change in power level.

NOTES:

Operator Actions

Event No.(s): 3 **Page** 1 **of** 1

Description: CRD temp high

Initiation: Following Reduce power with flow, on the signal of lead examiner

Cues: annunciator 5006-1G alarmed

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS:3304.01, Control Rod Drive Hydraulics: • Step 8.3.2, insert control rod to position 46
	BOP	• Dispatch field operator to RD temp recorder and the rod's HCU • Monitors reactor to ensure operations remain within established bands Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.

Terminus: Rod with high temperature inserted to 46 and alarm cleared

NOTES:

Operator Actions

Event No.(s): 4 **Page** 1 **of** 1

Description: SRV 1B21-F041D open.

Initiation: Following Drive temp hi on the signal of lead examiner

Cues: Annunciator 5067-8L, 5066-5B alarmed

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS4005.01, Loss of Feedwater Heating: • Reduce flow to maintain power
	BOP	• Per CPS 4009.01, Inadvertently Opened SRV: • Cycle SRV 1B21F041D C/S to Open then OFF on P601 and back panel, P642 • Shuts SRV by removing fuses at: Panel 1H13-P661: • **A Solinoid - Bay-(B-A145), Fuse – (XF2),Device – (B21C-F05A)** • **A Solinoid - Bay-(B-A147), Fuse – (XF2),Device – (B21C-F06A)** Panel 1H13-P662: • **B Solinoid - Bay (C-A145), Fuse – (XF2),Device – (B21C-F05B)** • **B Solinoid - Bay (C-A147), Fuse – (XF02),Device – (B21C-F06B)**
	SRO	• Enters CPS 4005.01, Loss of Feedwater Heating & 4009.01, Inadvertently Opened SRV and directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Declares ADS SRV 1B21F41D Inoperable and applies Technical Specification LCO 3.5.1 Action E.1

Terminus: Clearly observable plant response from change in power level.
SRV fuses out resulting the SRV going shut and Technical Specification LCO 3.5.1 Action E.1 entered

NOTES:

Operator Actions

Event No.(s): 5 **Page** 1 **of** 1

Description: FC pump trip.

Initiation: After crew has addressed SRV failure, on the signal of lead examiner

Cues: Annunciator 5040-1E, 5040-5F alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 3317.01, Fuel Pool Cooling and Cleanup steps: • 8.1.3.2 Isolate flow to upper containment pools per Section 8.1.4.13 before continuing on with this section • 8.1.4.13 Direct field operator to route a CY hose per Section 8.1.4.12 Secure FC return flow from Containment pools by closing at least one of the following valves: • 1FC007, FC Cnmt Outlt Inbd Vlv. (Div 2) OR • 1FC008, FC Cnmt Outlt Outbd Vlv. (Div 1) After 1FC007/1FC008 are closed, then secure FC supply by closing at least one of the following valves: • 1FC037, FC Supp Cnmt Inbd Isol Vlv. (Div 2) OR • 1FC036, FC Supply Cnmt Outbd Isol Vlv. (Div 1)
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Operations standards and approved procedures. • Determines that there is adequate upper pool level to satisfy Tech Spec. LCO 3.6.2.4 no entry to Action A.1 required. • Enters ORM 2.5.2 Action 3.5.2 for Test Prep Switch in Test. • Contacts Shift Manager and recommends notifications.

Terminus: Upper pool supply and return isolated, SRO directed actions accordingly and SRO has addressed T/S's and ORM.

NOTES:

Operator Actions

Event No.(s): 6 **Page** 1 **of** 1

Description: RFP flow input signal fails

Initiation: After resolving FC pump trip on the signal of lead examiner

Cues: Annunciator 5002-2Q, 5009-5B alarmed

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS5002-2Q, RPV Water level Hi/Lo: • Diagnose and determine RFPT A is operating erratically • Place RFPT A into Manual to stabilize level control
	BOP	• Determines GETARS Alarm • Dispatches field operator to the A RFP • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Enters CPS 4002.01, Abnormal RPV Level/Loss of Feedwater at Power and directs above actions

Terminus: RFPT shifted to A Manual, B on STARTUP level control

NOTES:

Operator Actions

Event No.(s): 7 **Page** 1 **of** 2

Description: Instrument line failure

Initiation: After completion actions for FWLC failure has been addressed, on the signal of lead examiner

Cues: Annunciators 5063-7H, 5002-2P alarming, radiation alarms, Drywell pressure rising

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS 4008.01, Abnormal Coolant Flow: • On RR pump downshift verify entry to the Resticted Zone and inserts a Manual scram Per CPS 4100.01, Reactor Scram: ° Place mode switch in Shutdown ° Check and report power 1% and trending down ° Trip one RFPT when level is rising ° Start MDRFP ° Trip second RFPT ° Operate FW to control level 3 to 8 ° Check rods, reports shutdown criteria is met ° Report level and pressure are following expected trends ° Verify turbine and generator are tripped ° Stabilize pressure <1065 psig • Coordinates with BOP operator to monitor and control RPV level and press • Observes and reports loss of Division 1 Level indication • Per CPS 3302.01, Reactor Recirculation step 8.2.3 Shutdown RR pumps on a loss of CCW cooling
	BOP	1. Makes plant announcement for reactor scram 2. Should make plant announcement to evacuate the Containment. • Monitors Containment parameters • Observes and reports loss of Division 1 Level indication • EOP-1 actions/verifies automatic action upon Hi D/W pressure ° DG startup ° ECCS startup ° Automatic Isolations ° Prevents LPCS and LPCI injection EOP-6 actions: ° H_2O_2 monitors started ° Start H_2 mixers ° Monitor Containment parameters

NOTES:

Operator Actions

Event No.(s): 7		**Page** 2 **of** 2
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	• Directs actions listed above. • Enters EOP-1 and directs the above actions • Enters EOP-6 and directs the above actions • Enters CPS 4100.01, Reactor Scram and directs the above • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures.
Terminus: Reactor is manually scrammed, EOP-1 Entered, RR shutdown		

NOTES:

Operator Actions

Event No.(s): 8,9 **Page** 1 **of** 2

Description: **Loss of all RPV level instrumentation, Leak between the DW and containment**

Initiation: Upon initiation of Containment sprays and dropping RPV pressure

Cues: SPDS , level indications not tracking

Time	Position	Applicant's Actions or Behavior
	RO	Performs EOP actions as directed by SRO Reports Containment pressure rising
Critical Task		**Injects with following to flood the MSLs CPS 4411.03 Inj/Flooding Sources** • Condensate/Condensate booster Coordinates with BOP operator to monitor and control RPV flooding.
Critical Task	BOP	• **Initiates Containment Sprays CPS 3312.01, Residual Heat Removal, step 8.1.6** • **Arm and depress both Cntmt Spray Pushbuttons** • **INITIATES ADS, CPS 3101.01, ADS, step 8.2.2** • Observes and reports 6 SRVs open • Manually opens 1 SRV • Shuts: 1. MSIV, 2. MSL drains 3. RCIC steam isolation valves
Critical Task		• **Injects with following to flood the MSLs CPS 4411.03 Inj/Flooding Sources** 1. HPCS 2. LPCS 3. LPCI

NOTES:

Event No.(s): 8,9 **Page 2 of 2**

Time	Position	Applicant's Actions or Behavior
	SRO	Monitors Containment pressure approaching Figure N, Pressure Suppression Pressure
Critical Task		• **Directs initiation of Containment Sprays prior to exceeding Figure N, CPS 3312.01, Residual Heat Removal**
		Directs entry into EOP2 and EOP actions as entry conditions are met:
Critical Task		1. **Initiate ADS, CPS 3101.01, ADS**
		2. Determine 7 ADS/SRVs are open.
		3. Direct shutting the • MSIV, • MSL drains • RCIC steam isolation valves
Critical Task		4. **Directs RPV injection to flood the MSLs CPS 4411.03 Inj/Flooding Sources with:** MDRFP Condensate/Condensate booster CRD HPCS LPCS LPCI
		5. Monitors for indications of MSL flooded: ▪ Acoustic Monitors activated ▪ SRV/ADS Tail Pipe Temp lowers ▪ RPV pressure ~ 10 psig ↑ ▪ RPV pressure Sudden large ↑ indicates solid ▪ MSL - Flow / Hi Flow dP ▪ SP Level ↑ after initial drop ▪ Drastic step changes on level ▪ Fill Rate vs. Leak/Usage Rate
		General: • On transient, positions himself as command authority on the unit. • Acknowledges immediate operator actions and directs subsequent actions. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.

Terminus:
- Containment sprays initiated
- ADS has been initiated
- MSLs, drains and RCIC steam isolated
- RPV Flooded to the MSLs
- Upon approval of lead examiner

NOTES:

Simulator Operator Instructions

Initial Setup

1. Verify daily lamp test completed
2. Reset to IC-1 (Verify/Adjust Power to 90% with rods and/or flow to match turnover).
3. Load the lesson plan for this scenario
4. Place simulator in RUN
5. Select the FWLC B level instrument
6. OG Hydrogen analyzer A placed into Manual and Zero Purge
7. Document rod postion on a CPS 9000.01D002.
8. Turn on and advance recorders
9. Verify the AR/PR server is running and stabilize AR/PR
10. Hang OOS tags per turnover
11. Identify T/S issues associated with OOS and turnover
12. Verify simulator conditions match the turnover
13. Provide CPS 3005.01.

Event Triggers and Role Play

Event #

1. Cross tie unit sub C to D
   a. No trigger.
2. Reduce power with flow
   a. No triggers

3. CRD temp high
   a. **Remote trigger 1**
   b. Role Play-Field Operator rod 40-49 is 280 degrees and rising no indication of problems at HCU. As RE acceptable to insert to 46.
   c. Delete shortly after rod is inserted to 46, 40-49 is 220°F trending down
4. SRV open
   a. **Remote trigger 2** on request from lead evaluator
   b. When directed operate the pending SRV controls, MAKE SURE examinee correctly identifies fuses, otherwise pull fuses that are directed to be pulled!
   c. SRV tailpipe temperature is 410 degrees for B21F041D, all lights on for the acoustic monitor for F041D
   d. Allow the SRV to shut by removing the malfunction upon pulling both sets of the CORRECT fuses.
   e. Once closed the temperature for B21F041D is dropping
5. FC pump trip
   a. **Remote trigger 4** on request from lead evaluator
   b. Role Play-Filed Operator - Over current trip on pump, motor is warm, cooling water flow is 27 gpm. Upper pools level is stable at 826' 6"
   c. Support MCR with FC pump shutdown and startup activities

6. RFP flow input signal fails
   a. **Remote trigger 3** on request from lead evaluator
   b. Role Play as field operator that there is a small leak on the RFP flow element piping
   c. GETARS tripped on Ch 91 Narrow Range HI/LO tripped, reset GETARS upon request
7. Instrument line failure
   a. **Remote trigger 5** on request from lead evaluator
   b. Role play as operators and people directed to assist upon request

8. Loss of all RPV level instrumentation
   a. **Triggers** are automatic as scenario progresses.

9. Leak between the DW and containment
   a. **Trigger** is automatic as scenario progresses

10. Pending action
    a. **Manually Trigger** when requested by operator
    b. Provide SRV tailpipe temperatures that would demonstrate SRVs open following depressurization and subsequent RPV floodup with water flowing out the SRVs

STEP 1, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
EG106-Arm Rev Pwr Trip	REM	TRUE					Initial	
OG A H2 anal. Man Light	OVER	false					Initial	
OG A H2 ZERO Purge Light	OVER	False					Initial	
5130-5E, OG H2 Anal.High or Loss Pwr	MALF	2					Initial	

STEP 2, CRD temp high *on remote 1*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
5006-1G, CRD Temp High	MALF	2					1	3

STEP 3, SRV open *on remote 2*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
HP13D, F041D ADS VLV FAIL open	MALF	100%	10:00	1:00			2	4
HP101O-41D Sol B	REM	2					Pend	4
HP101O-41D Sol B	REM	1					Pend	4
HP117AO-41D Sol A	REM	TRUE					Pend	4
HP117A0-F041D Sol B	REM	TRUE					pend	4

STEP 4, RFP flow input signal fails *on remote 3:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
FW12A-C34N011A FW flow sensor	MALF	52.19					3	6

STEP 5, FC pump trip *on remote 4:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
PC09B-FCPp B trip	MALF	true					4	5

STEP 6, Instrument line failure *on remote 5*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
MS05A-MS Line B Rupt. In D/W	MALF	7%					5	7
RR14-Inst. Line Ref. Leg	MALF	TRUE					5	7
PC14-Leak between D/W & CNTMT	MALF	.1%					A	7
PR023, DW Rad. Monitor ch1	REM	2E-1		2:00			5	7
PR023, DW Rad Monitor Ch 2	REM	7E-3		2:00			5	7

CONDITION A D-1 ECCS LOG INITIATED

STEP 7, D-3 Loss of RPV level instrumentation *on conditions*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
YPXMALSE(550) - RR15B-LT B21-N080C RX LVL X	MALF	92.0%					B	7
YPXMALSE(559) - RR15K - B21-N073C RX LVL X	MALF	92.0%					B	7
YPXMALSE(552) - RR15D - B21-N073G RX LVL X	MALF	92.0%					B	7
YPXMALSE(560) - RR15L - B21-N081C RX LVL X	MALF	92.0%					B	7
YPXMALSE(566) - RR15R - B21-N400B RX LVL X	MALF	90.0%					B	7
YPXMALSE(558) - RR15J - B21-N044C RX LVL X	MALF	100.0%					B	7
YPRR15AC - RR15AC - C34-N004C FW LVL SENSO	MALF	98%					B	7

CONDITION B RPV Pressure drops to 455 psig

STEP 8 Division 2 Level Transmitter Failure on condition with a 00:25 delay:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
YPXMALSE(561) - RR15M-LT B21-N095B RX LVL X	MALF	0%					C	
YPXMALSE(562) - RR15N-LT B21-N080B RX LVL X	MALF	0%					C	
YPXMALSE(564) - RR15P-LT B21-N081B RX LVL X	MALF	0%					C	
YPXMALSE(565) - RR15Q-LT B21-N091B RX LVL X	MALF	9%					C	
YPXMALSE(563) - RR15O-LT B21-N091F RX LVL X	MALF	10%					C	
YPXMALSE(567) - RR15S-LT B21-N400F RX LVL X	MALF	0%					C	
YPXMALSE(568) - RR15T-LT B21-N027 RX LVL XM	MALF	0%					C	
YPRR15AB - RR15AB - C34N004B FW LVL SENSO	MALF	0%					C	
YPRR15Z - RR15Z-B21-N017 RX LVL XM	MALF	0%					C	

CONDITION C Containment spray

STEP 9,Alarms and lights on condition with a 00:25 delay:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
RH D2 ATM CAL/GR Status lit	OVER	TRUE					C	
5065-8B, RH B OOS	MALF	2					C	
5065-8C, RH C OOS	MALF	2					C	

STEP 10, Div 4 Level Instruments failure

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
YPXMALSE(570) - RR15V-LT B21-N080D RX LVL X	MALF	97.0					D	
YPXMALSE(572) - RR15X-LT B21-N073D RX LVL X	MALF	95.0					D	
YPXMALSE(571) - RR15W-LT B21-N073H RX LVL X	MALF	98.0					D	
YPXMALSE(573) - RR15Y-LT B21-N081D RX LVL X	MALF	97.0					D	
YPXMALSE(557) - RR15I-LT B21-N400E RX LVL X	MALF	96.0					D	
YPXMALSE(569) - RR15U-LT B21-N044D RX LVL X	MALF	100.0					D	

CONDITION D RPV Pressure drops to 495 psig

STEP 11, Pending EOP Actions

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
YP_XREMT(511) - MS102 AUX BOILER STATUS	REM	TRUE		20:00			Pending	10
YP_XREMT(776) - EP205 -DIV1 H2O2/POST LOCA	REM	TRUE		05:00			Pending	10
YP_XREMT(777) - EP206 -DIV2 H2O2/POST LOCA	REM	TRUE		05:00			Pending	10
YVFW LV DP(9) - STROKE VLV 1CD055	REM	80%					Pending	10
YP_XREMT(778) - LC107- CRDH SUCTION FILTERS	REM	TRUE		05:00			Pending	10
YP_XREMT(738) - EP106 -VP SYSTEM ISOLATIONS	REM	TRUE		07:00			Pending	10
YP_REMT(699) - ED118 - SHUNT RST/NOT	REM	TRUE		06:00			Pending	10
YP_XTREMT(742) - EP109 - HIGH RPV LEVEL (HPCS)	REM	TRUE		5:00			Pending	10

Exelon
Nuclear

CLINTON POWER STATION

NRC Simulator Dynamic #5

ILT0101

Revision Number: 01

Exam Date: 7/29/02

Developed By:	**B. Price**	**7/5/02**
	Instructor	**Date**
Validated By:	**P. O'Brien**	**7/6/02**
	SME or Instructor	**Date**
Review By:	**P. O'Brien**	**7/6/02**
	Operations Representative	**Date**
Approved By:	**B. Price**	**7/8/02**
	Training Department	**Date**

Facility: Clinton Power Station Scenario No.: Five Operating Test No.: NRC0101-5

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 83% power, A OG hydrogen analyzer is out of service, GC pump out of service failed motor bearing

Turnover:

Power ascension to 90%

The running RD pump needs shutdown to support scheduled work activity

Event No.	Malf. No.	Event Type*	Event Description
1	NA	RO-R	Raise power with flow
2	NA	BOP-N	Swap RD pumps
3	YACUL029	RO-C	RWCU leak in the heat exchanger room
4	YAMSAVFP(16)	BOP-C	MC pump coupling fails
5	OVERRIDE	RO-C	Spurious start of RFP 1C
6	ED02A	BOP-C	Loss of RAT
7	EG05B EG02	M	GC pump trip/generator lockout
8	HP13N	M	SRV opens on pressure transient and stays open
9	RI05	M	RCIC flow system isolates
10	HP03	M	HPCS motor breaker trips
11	RR06	M	RR pump seals failure

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

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Scenario No.: Five Operating Test No.: **NRC0101-5**

Narrative Summary

Event #	Description
1.	Raise reactor power with RR flow
2.	The standby RD pump will be started up and the running pump shutdown to support routine maintenance.
3.	The RWCU system develops a small leak causing containment airborne activity to elevate requiring RWCU shutdown and isolation.
4.	An MC pump coupling fails results in the loss of makeup condesate. This requires the startup of the standby pump.
5.	The RFP 1C, which is standby, will spuriously start causing Feed pump suction pressure to significantly drop requiring this pump to be shutdown and removed from service to stabilize the feed pump suction pressure.
6.	The RAT will become de-energized causing the safety buses to momentarily de-energize upon transfer to the ERAT. The Containment IA valves will shut due to the momentary loss of power, and needs to be reopened. Technical Specification 3.8.1 action A.1 entry required.
7.	The running GC pump will trip causing TG runback and generator lockout due to internal failure, resulting in unit scram.
8.	RPV pressure will spike and a SRV will open and stay open resulting in a continuous loss of RPV inventory.
9.&10.	RCIC will isolate upon startup. When HPCS is started it will trip on overcurrent. RPV level drops to the Top-of-Active fuel requiring blowdown and feed to recover level above the top of active fuel.
11.	RR pump seals failure resulting in RPV level drop due to loss of inventory.

EOPs
1,6,3

Critical tasks:

- Emergency Depressurize when RPV level reaches TAF
- Feed to restore level above TAF

D-2, Dynamic Simulator Scenario **five** EXAM DATE: 7/29/2002 **ILT0101-5**

Shift Turnover Information

⇒ **Day of week and shift**

- Today Day Shift

⇒ **Weather conditions**

- T-STORMS conditions expected over the next 24 hours

⇒ **(Plant power level)**

- 83% Power/92% FCL
- 2828 MWt
- 968 MWe
- 66.2 Mlbm/hr CORE FLOW
- CPS 3005.01, step 8.1.14
- A-2, step 49 complete

⇒ **Thermal Limit Problems/Power Evolutions**

- Power ascension to 90%.

⇒ **Existing LCOs, date of next surveillance**

- None

⇒ **Surviellances or major maintenance**

- None

⇒ **Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment**

- A OG hydrogen analyzer is out of service for CI maintenance
- GC pump out of service failed motor bearing
- The shift running RD pumps to support scheduled work activity

⇒ **Comments, evolutions, problems, etc.**

- Online Safety is Green
- RWCU A F/D is near its end of life, chemistry is monitoring

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Operator Actions

Event No.(s): 1	**Page** 1 **of** 1
Description: Raise power with flow	
Initiation: Following shift turnover	
Cues: Directed by SRO	

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS 3005.01, Unit Power Changes, step 8.1.16: • Raise power with Flow
	BOP	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Enforces OPS expectations and standards.

Terminus: Clearly observable plant response from change in power level.

NOTES:

Operator Actions

Event No.(s): 2 **Page** 1 **of** 1

Description: Swap RD pumps

Initiation: Following shift turnover

Cues: Directed by SRO

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 3304.01 Rod Drive Hydraulics step 8.1.2: • Direct field operator to perform supporting task • Start standby CRD Aux Oil Pump • Start standby CRD Pump • Verify CRD Pump is running and Aux Oil Pump has auto stopped • Stop off-going CRD Pump
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Enforces OPS expectations and standards.

Terminus: Standby RD pump started and running pump shutdown

NOTES:

Operator Actions

Event No.(s): 3 **Page** 1 **of** 1

Description: **RWCU leak in the heat exchanger room**

Initiation: Following RD evolution and on the signal of lead examiner

Cues: RWCU differential flow annunciator, CAM alarming, and field reports

Time	Position	Applicant's Actions or Behavior
	RO	Per CPS5000-1F, REACTOR WATER CLEANUP DIFFERENTIAL FLOW HIGH: ▪ Verify Automatic isolation ▪ Manually isolate upon failure to isolate requires to: • Trip the pumps • Shut the RWCU isolation valves 1. 1G33-F001, RWCU Suct Inbd Isol. 2. 1G33-F004, RWCU Suct Outbd Isol. 3. 1G33-F054, Pump Disch Outbd Isol. 4. 1G33-F053, Pump Disch Inbd Isol. 5. 1G33-F040, RWCU Inbd Rtn Isol. 6. 1G33-F039, RWCU Outbd Rtn Isol. 7. 1G33-F101, Bot Hd Drn Suct. Per CPS5140.41, 5140.33, Containment CAM alert alarms: • Enter CPS 4979.01, Abnormal Release Airborne Activity • diagnose leakage on RWCU
	BOP	• Respond to CAM alarms • Substitute computer points • Assists in diagnosing leakage on RWCU • Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Enters CPS 4979.01, CPS 4001.02 Automatic Isolation and directs actions listed above. • Directs isolation of RWCU. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications.

Terminus: RWCU isolation valves closed

NOTES:

Operator Actions

Event No.(s): 4 **Page** 1 **of** 1

Description: MC pump "B" coupling fails

Initiation: After crew has RWCU isolation, on the signal of lead examiner

Cues: Annunciator CPS 5014-2C alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 3208.01 MC/CY, STEP 8.1.1.1: • Direct shutting the discharge valve and reopen upon pump start • Start up the standby pump • Shutdown the failed pump
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Directs actions listed above. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications IAW OP-AA-101-501.

Terminus: Standby Pump started and shutdown of the failed pump

NOTES:

Operator Actions

Event No.(s): 5 **Page** 1 **of** 1

Description: **Automatic Start of RFP 1C.**

Initiation: Following MC pump problem and on the signal of lead examiner

Cues: 5002.01K, Auto Start RFP 1C and 5002.04F Low pressure RFP suction header

Time	Position	Applicant's Actions or Behavior
	RO	CPS 5002.04F Low pressure RFP suction header directs entry to CPS 4002.01 and 3103.01. Per CPS 3103.01, Feedwater, step 8.1.10.3 & 5 to remove the standby feedpump from automatic startup capability : • Press and hold the RFP 1C STOP pushbutton • Press the LOCKED pushbutton to shutdown the Aux. Oil Pump • Release the RFP 1C STOP pushbutton
	BOP	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	• Enters CPS 4002.01 and 3103.01, directs actions listed above. • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Enforces OPS expectations and standards. • Contacts Shift Manager and recommends notifications.

Terminus: RFP 1C and its Auxilary Oil pump are shutdown and locked out

NOTES:

Operator Actions

Event No.(s): 6 **Page** 1 **of** 2

Description: Loss of RAT

Initiation: After Automatic Start of RFP 1C.problem has been addressed, on the signal of lead examiner

Cues: Numerous annunciators along with 5003-5M alarming

Time	Position	Applicant's Actions or Behavior
	BOP	Per CPS 5003-5M OA 3 : Open: • 1IA005, IA Cnmt Isol • 1IA006, IA Cnmt Isol • 1IA007, D/W Isol • 1IA008, D/W Isol Per CPS 3316.01, Containment Combustible Gas Control, step 8.3: 1. VERIFY OPEN: • 1SX088B, SSW CNMT Outbd Isol Vlv • 1SX089B, SSW CNMT Inbd Isol Vlv • 1SX096B, SSW CNMT Inbd Isol Vlv • 1SX097B, SSW CNMT Outbd Isol Vlv • Places MOV Test Prep Switches into TEST 2. Start CGCS Hydrogen Cmpr 1B, 1HG02CB. • Record start time IAW CPS 9094.01D001 3. Verify 1HG009B, CGCS Cmpr 1B Suct Vlv opens. 4. Verify 1SX095B, SSW CGCS Rm Clr Coil Outlt Vlv opens. SECURING DRYWELL BURPING 1. Stop CGCS Hydrogen Cmpr 1B, 1HG02CB. • Record stop time IAW CPS 9094.01D001 2. Verify 1HG009A(B), CGCS Cmpr1B Suct Vlv shuts. 3. Shut/verify shut 1SX095B, SSW CGCS Rm Clr Coil Outlt Vlv. Places MOV Test Prep Switches into NORMAL Per CPS 3317.01, Fuel Pool Cooling and Cleanup steps: • 8.1.3.2 Isolate flow to upper containment pools per Section 8.1.4.13 before continuing on with this section • 8.1.4.13 Direct field operator to route a CY hose per Section 8.1.4.12 Secure FC return flow from Containment pools by closing at least one of the following valves: • 1FC007, FC Cnmt Outlt Inbd Vlv. (Div 2) OR • 1FC008, FC Cnmt Outlt Outbd Vlv. (Div 1)

Event No.(s): 6 **Page** 2 **of** 2

Time	Position	Applicant's Actions or Behavior
	BOP	After 1FC007/1FC008 are closed, then secure FC supply by closing at least one of the following valves: • 1FC037, FC Supp Cnmt Inbd Isol Vlv. (Div 2) OR • 1FC036, FC Supply Cnmt Outbd Isol Vlv. (Div 1) Direct field operator to investigate and support MCR actions • Per CPS 3404.01 Fuel HVAC step 8.1, Restart VF • Reports VP chiller tripped
	RO	• Monitors reactor to ensure operations remain within established bands • Monitors control room panels and notifies the SRO of any unusual or unexpected conditions.
	SRO	Enters CPS 4200.01, LOSS OF AC POWER directs actions listed above. • Declares RAT and secondary containment inoperable. • Complies with action statement(s) for T.S. Section 3.8.1, Action A.1 to complete SR 3.8.1.1 in one hour and A.2 to restore Operability in 72 hour • Enforces OPS expectations and standards • Ensures operations are conducted within the bounds of Tech Specs and IAW Operations standards and approved procedures. • Contacts Shift Manager and recommends notifications.

Terminus: Containment IA valves reopened, commenced actions to restore VF operation, commenced 9082.01 and SRO has addressed T.S. requirements.

NOTES:

Operator Actions

Event No.(s): 7, 8,9,10,11 **Page** 1 **of** 2

Description: GC pump trip/generator lockout and SRV opens on pressure transient and stays open, RCIC flow system isolates, HPCS motor breaker trips

Initiation: After RAT trip has been addressed, on the signal of lead examiner

Cues: Multiple alarms, Generator lockout, Scram and Group 1 isolation, RCIC isolates, HPCS pump tripped

Time	Position	Applicant's Actions or Behavior
	RO	Reports Scram, loss of Non Vital Busses • Place mode switch in Shutdown • Check and report power 1% and trending down • Report level and pressure are following expected trends • Verify turbine and generator are tripped • Stabilize pressure <1065 psig with SRVs Performs EOP/ON actions as directed by SRO • Reports SRV still open • Starts both trains of SLC • ADS inhibited when timers start Critical Task • **Initiation of ADS verifies 7 valves open, CPS 3101.01, ADS** • Restores to Level 3-8 Coordinates with BOP operator to monitor and control RPV level and press.
	BOP	Performs EOP/ON actions as directed by SRO • Makes plant announcement for reactor scram and to evacuate containment • Verify all rods in • Initiates/Verifies initiation of HPCS/RCIC • Per CPS 5062-4B, HPCS MOTOR OVERCURRENT: • Direct field operator to investigate • Attempt to restart HPCS • Reports trip of HPCS pump • Starts up RCIC and report isolation • Per CPS4001.02, Automatic Isolation: • Verifies isolation • Reports RCIC status • Verifies: DG startup ECCS startup Automatic Isolations • Takes actions for stuck open SRV • Starts the Auxiliary seal injection pump Critical Task • **Maximize injection with LPCS, LPCI to restore RPV level above TAF, CPS 4411.03 Injection/Flood Systems** Coordinates with RO operator to monitor and control RPV level and press.

NOTES:

Event No.(s): 7, 8,9,10,11 **Page** 2 **of** 2

Time	Position	Applicant's Actions or Behavior
		•

	SRO	Directs entry into EOP-1 and actions as entry conditions are met.
		• Directs restoration of RPV level with HPCS and/or RCIC
		• Contacts maintenance to investigate HPCS trip
		• Directs a pressure band <1065 PSIG using SRVs
		• Determines that level cannot be maintained above TAF directs:
		  • Starts both trains of SLC
		  • May inhibit ADS when timers start based on plant conditions
		  • **Maximize injection with LPCS, LPCI to restore RPV level above TAF, CPS 4411.03 Injection/Flood Systems**
		  • Directs control level at Level 3-8

	Critical Task	
	Critical Task	Directs entry into EOP-3 and actions as entry conditions are met • **Initiation of ADS, verifies 7 valves open, CPS 3101.01, ADS** Directs entry into EOP-6 and actions as entry conditions are met: 1) H202 monitors started 2) Start H2 mixers 3) Addresses need for DW cooling 4) Hydrogen igniters started Enters CPS 4200.01, LOSS OF AC POWER directs actions listed above • direct startup of the Auxiliary Seal Injection pump Enters 4100.01, Reactor Scram, directs actions listed above Enters 4009.01, Inadvertent Opened SRV, directs actions listed above

Terminus:
- ADS is initiated
- RPV level is recover above TAF
- RPV level stable and under control in required band
- Upon approval of lead examiner

NOTES:

Simulator Operator Instructions

Initial Setup

1. Verify daily lamp test completed
2. Reset to IC-3 (Verify/Adjust Power to 83% with rods and/or flow to match turnover).
3. Load the lesson plan for this scenario
4. Place simulator in RUN
5. Select the B FWLC level instrument
6. GC pump switch to PTL and tagged
7. OG A Hydrogen analyzer placed into Manual and Zero Purge
8. Turn on and advance recorders
9. Verify the AR/PR server is running and stabilize AR/PR
10. Hang OOS tags per turnover
11. Identify T/S issues associated with OOS and turnover
12. Verify simulator conditions match the turnover
13. Fill out a CPS 9000.09D002, A-2, step 49 cmplete
14. Provide marked up CPS 3005.01 complete to step 8.1.14.

Event Triggers and Role Play

Event #

1. Raise power with flow
   a. **No triggers**

2. Swap RD pumps
   a. **No trigger**
   b. Role play As field operator, following along in the RD procedure supporting Swap of RD pumps, such as oil system is primed, suction gauge is isolated, pump discharge valve is shut, and opening upon pump start.

3. RWCU leak in the heat exchanger room
   a. ***remote Trigger* 1**
   b. Role Play – NONE

4. MC pump coupling fails, **VERIFY THE MALFUNCTION IS ON THE RUNNING MC PUMP!**
   a. **Remote trigger 3** on request from lead evaluator
   b. Role Play – MC coupling is failed and support the startup of the other MC pump. The efficency actions are to make the pump appear its discharge valve is shut, by starting at 100% then letting it go to zero on a time delay to establish normal MC pressure

5. RFP 1C automatic startup
   a. ***remote Trigger* 2**
   b. Role play - field operator support shutdown of the pump.

6. Loss of RAT
   a. ***remote Trigger* 4** on request from lead evaluator
   b. Role play – Call as Security that a lightening Bolt struck the switch yard. When LD is called, report "The problem is at your end and maybe storm related, I'll send any help that you request."
      1) . Upon investigation of P803, provide ATTACHMENT 1 of alarms activated
      2) When operators and EMs check the relay house, there are directional transfer trips of the North Bus, indicating a problem in the CPS Switchyard. Will call the LD with the data.
      3) EMs report no obvious problems, they will need to troubleshoot. EMs confirm that the problem is at CPS, will request a relay expert, it will take 15 or 20 minutes to get one there.
   c. Upper containment pool level is 826 ft 6 inches
   d. If directed to check on the reason for the RAT SVC being out of service report the RAT is de-energized.

More Event Triggers and Role Play on the next page

7. GC pump trip/generator lockout
   a. ***remote Trigger* 5** on request from lead evaluator
   b. Role play As field operator that the GC pump has a locked rotor shaft
   c. RACCs 1 & 2 FI light is ON.

8. SRV opens on pressure transient and stays open
   a. **Trigger** is automatic on SRV operation
   b. When directed perform the pending actions to support closure of the SRV

9. RCIC flow system isolates
   a. **Trigger** is automatic on RCIC startup
   b. Role Play – As field operator RP assistance is needed to go in the room

10. HPCS motor breaker trips
    a. **Trigger** is automatic on HPCS startup

2. Role Play – As field operator there is an overcurrent FLAG on the breaker, the breaker has an overcurrent trip flag, the pump motor looks okay.

STEP 1, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
YP_XMFTB(4103) - HP03 - HPCS Pump Trip	MALF	TRUE					Initial	10
EG02-GEN Trip	MALF	TRUE					A	7
Cndr Tube Fouling Ht Trans Prop	REM	100%					A	7
RI05-RCIC Sys Isol	MALF	TRUE					B	9
EG106-Arm Rev Pwr Trip	REM	TRUE					Initial	6
RAT CKT SWS RED LIT	OVER	TRUE						6
RAT CKT SWS GREEN LIT	OVER	FALSE					Initial	6
345 VOLTS LIT	OVER	TRUE					Initial	6
5010-1A, Auto trip	MALF	4					Initial	6
5067-1G FPM Low flow	MALF	4					Initial	

CONDITION A - SCRAM

CONDITION B - Startup of RCIC

STEP 21, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
5014-4B, Not fully closed CDS	MALF	4					Initial	

STEP 3, RWCU leak in the heat exchanger room ***remote Trigger 1:***

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
EOP105, RWCU isol. defeated	MALF	TRUE					1	2
RT leak between RHX & NRHX	MALF	.1%	5:00				1	2
CAMPR001 CH1	MALF	0.004	1:00				1	2
CAMPR026 CH1	MALF	.07	1:00				1	2
CAMPR028 CH1	MALF	.06	1:00				1	2
CAMPR030 CH1	MALF	.069	2:00				1	2
5000-1E blocked	MALF	4					Initial	

STEP 4, MC pump coupling fails ***remote Trigger 3:***

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
MC Pp B Sheared shaft	MALF	TRUE					3	4
MC A Pp EFF	MALF	100%					Pend	4
MC A Pp EFF	MALF	0	1:00				pend	4

STEP 5, RFP 1C Auto Start ***on remote Trigger 2***

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
5002-1K, Auto Start RFP1C	MALF	1					2	
RFP 1C PB	Over	true					2	5

STEP 6, Loss of RAT ***remote Trigger 4****:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
ED02A-NORTH BUS 345KV RLY	MALF	TRUE						6

STEP 7, GC pump trip/generator lockout *on* ***remote Trigger 5***

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
EG05B-GC PpB trip	MALF	TRUE						7
EG02-GEN trip	MALF	TRUE		00:35				7

STEP 8, SRV F051D Sol B SW OPEN on ***condition/PEND****:*

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
HP13N -F051C LLS VALVE FAILURE	MALF	55%					C	8
HP101H -F051C LLS B SOL	REM	2					pend	8
HP13N -F051C LLS VALVE FAILURE	REM	1					Pend	8
HP13N -F051C LLS VALVE FAILURE	REM	TRUE					Pend	8
HP13N -F051C LLS VALVE FAILURE	REM	FALSE					Pend	8
HP13N -F051C LLS VALVE FAILURE	REM	TRUE					Pend	8
HP13N -F051C LLS VALVE FAILURE	REM	FALSE					Pend	8

CONDITION C - Actuation of LLS for SRV

STEP 9, RR seal failure linked to step 8:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
RR06A – RR PP A seal A1 fail	MALF	100%	1:00	05:00				
RR06B – RR PP A seal A2 fail	MALF	100%	1:00	05:00				
RR06C – RR PP B seal B1 fail	MALF	100%	1:00	05:00				
RR06D – RR PP B seal B21 fail	MALF	100%	1:00	05:00				

STEP 10, Instructor Actions Already Active:

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
OG A H2 anal. Man Light	OVER	false					Initial	
OG A H2 ZERO Purge Light	OVER	False					Initial	
5130-5E, OG H2 Anal.High or Loss Pwr	MALF	2					Initial	

STEP 11, Loss of RAT ***scram Trigger:***

INSTRUCTION	TYPE	DEMAND VALUE	RAMP TIME	DELAY TIME	TIME ON	TIME OFF	COND	NOTE
ED02A-NORTH BUS 345KV RLY	MALF	TRUE					A	6

CONDITION A - SCRAM

ATTACHMENT 1

MCR Panel H13-P803
Ann Panel 5110

	A	B	C	D	E	F	G
1	AUTO TRIP 345 KV BREAKER 4502				TRIP/TROUBLE LINE 4535 RLY SYS 1	TRIP/TROUBLE LINE 4545 RLY SYS 1	TRIP/TROUBLE LINE 4571 RLY SYS 1
2	AUTO TRIP 345 KV BREAKER 4518				LOSS OF SIGNAL LINE 4535 TRANSFER TRIP	LOSS OF SIGNAL LINE 4545 TRANSFER TRIP	LOSS OF SIGNAL LINE 4571 TRANSFER TRIP
3	AUTO TRIP 345 KV BREAKER 4522			START/TROUBLE OSCILLOGRAPH			
4	TROUBLE 345 KV BREAKER 4522						SCAB TRANSFORMER TROUBLE
5	TROUBLE 345 KV BREAKER 4502	RLY HSE CONT 345 KV BREAKER 4502	DOOR OPEN 345 KV SWYD RELAY HOUSE	HIGH-HIGH LEVEL RELAY HOUSE SUMP PIT			
6	TROUBLE 345 KV BREAKER 4518	RLY HSE CONT 345 KV BREAKER 4518	LOSS OF AC POWER 345 KV SWYD AUXILIARIES	LOSS OF DC POWER 345 KV SWYD AUXILIARIES			