

Draft Submittal

(Pink Paper)

E. I. HATCH NUCLEAR PLANT EXAM 2002-301

50-321 & 50-366

**OCTOBER 16 - 18, 21 - 25, &
OCTOBER 30, 2002,**

1. Operating Test Simulator Scenarios

Facility: <u>E.I.Hatch</u>	Scenario No.: <u>1</u>	Op-Test No.: _____	
Examiners: <u>R. Baldwin</u>		Operators: _____	
<u>T. Kolb</u>		_____	
<u>G. Laska</u>		_____	
<p>Initial Conditions: <u>Unit is at 85% RTP, B RBCCW Pump tagged OOS for motor replacement, 2A RHR Pump OOS for maintenance, Instrument Maintenance performing HPCI Channel Functional Test surveillance. (Need to insert malfunction N21 99, E21 202A and R43 62A)</u></p> <p>Turnover: <u>Hold power constant. In Day 2 of 7 for TS 3.5.1. Perform Quarterly Surveillance for Inboard MSIV's.</u></p>			
Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) (SRO)	Perform MSIV Surveillance, 34SV-B21-001-2S for the Inboard MSIV's. The Outboard MSIV's are done.
2	C11_30A	C (RO) (SRO)	2A CRD Pump trip.
3	RfN21065	C (BOP) (SRO)	Loss of feedwater heating due to 4 th stage heater bypass inadvertent operation.
4		R (RO) (SRO)	Reduce Reactor power due to loss of feedwater heating.
5	E41_103	C (BOP) (SRO)	HPCI Inadvertent Start-Up.
6	N21_84A	I (RO) (SRO)	Feedwater Pump Minimum Flow Recirc Valve F117 & F118 Failure.
7	B21_48B	M (ALL)	Steam Line B Break (After Restrictor) (Var)
	R43_62A E21_202A	C (BOP)	2A D/G, 2A & 2B Core Spray Pumps Fail to Auto Start (Starts manually)

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

Op-Test No.: _____ Scenario No.: 1 Event No.: 1 Page 1 of 1

Event Description: Perform 34SV-B21-001-2S, MSIV Exercise and Closure Instrument Functional Test for the Inboard MSIV's. The surveillance is complete for the Outboard MSIV's.

Time	Position	Applicant's Actions or Behavior
	SRO	• Direct the BOP to perform the Quarterly MSIV functional surveillance for the Inboard MSIV's.
	BOP	• Review Precautions and Limitations. Instruct RO to monitor Rx Pressure and Main Steam Line Flow during valve stroking.
	BOP	• Confirm that applicable relays are energized and that MSIV AC and DC Coil LED's are illuminated.
	BOP	• Place/Confirm applicable MSIV control switch in OPEN SLOW TEST.
	BOP	• Take MSIV Vlv Test Switch to TEST and HOLD.
	BOP	• When appropriate relays de-energize OR precaution 5.1.2 is met, THEN release test switch.
	BOP	• Verify appropriate relays are energized.
	BOP	• If required, reset the Half Scram.
	SRO	• Review completed surveillance Acceptance Criteria.

Op-Test No.: _____ Scenario No.: 1 Event No.: 2 Page 1 of 1Event Description: 2A CRD Pump Trip. Execute malfunction C11 30A when directed by the Lead Examiner.

Time	Position	Applicant's Actions or Behavior
	ALL	<ul style="list-style-type: none"> Recognize the loss of the 2A CRD pump.
		1) Receive alarm "CRD Pump A Breaker Trip.
	RO	<ul style="list-style-type: none"> Dispatches operator to investigate reason for trip OR May immediately start 2B CRD pump per steps 3.1 and 3.3 of procedure 34AB-C11-001-2S. Loss of CRD System:
		Step 3.1 - Place CRD Flow Control, 2C11-R600, in Manual and DECREASE output to zero.
		Step 3.3 - Attempt to start 2B CRD Pump.
	SRO	<ul style="list-style-type: none"> After receiving report that 2A CRD pump cannot be restarted, direct operator to start the 2B CRD pump.
	RO	<ul style="list-style-type: none"> Per 34AB-C11-001-2S, starts and places 2B CRD pump in service as follows:
		1) Place CRD Flow Control, 2C11-R600, in Manual and DECREASE output to zero.
		2) Start 2B CRD Pump.
		3) Increase system flow to 59 GPM.
		4) Transfer controller to AUTO.
	SRO	<ul style="list-style-type: none"> Notify on-call personnel.
	BOP	<ul style="list-style-type: none"> Assist RO with plant oversight. Monitor CRD temperatures while both CRD pumps are off.

Op-Test No.: _____ Scenario No.: 1 Event No.: 3 Page 1 of 2Event Description: Loss of Feedwater Heating due to 4th Stage Heater Bypass opening.
Execute malfunction RfN21065 per Lead Examiner direction.

Time	Position	Applicant's Actions or Behavior
	BOP/Crew	<ul style="list-style-type: none"> Recognize Mwe is increasing and investigate.
		May receive 4 th and 6 th Stage heater high level alarms.
	BOP/Crew	<ul style="list-style-type: none"> Recognize 4th stage Feedwater Heater outlet temperature decreasing as indicated on SPDS or instr 2N21-R608.
	SRO	<ul style="list-style-type: none"> Direct actions of 34AB-N21-001-2S, Loss of Feedwater Heating by ordering RO to: <ol style="list-style-type: none"> 1) Reduce Recirc Flow to stay within Analyzed Region. 2) Track Feedwater temperature in accordance with 34SY-SUV-020-0S, Core Parameter Surveillance.
	RO	<ul style="list-style-type: none"> Reduce Rx Power with Recircs per 34GO-OPS-005-2S, "Power Changes."
	BOP	<ul style="list-style-type: none"> Notifies maintenance to investigate cause of heater bypass coming open. They will report that they were working on the wrong valve and accidentally shorted the control switch and it needs to be replaced.
	BOP/Crew	<ul style="list-style-type: none"> Refer to 34SO-N21-007-2S, "Condensate and Feedwater System" for operation with a feedwater heater bypassed and actions to restore heater to service.

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page 1 of 1Event Description: Reactivity Change due to loss of Feedwater Heating.

Time	Position	Applicant's Actions or Behavior
	SRO	• Direct power reduction due to loss of feedwater heating.
	RO	• Reduce reactor power with Recircs as directed by SRO.
		NOTE: Power may be reduced 10 to 20% depending on severity of feedwater temperature reduction.
	RO	• Reduce reactor power with Control Rods as directed by SRO.
		NOTE: This may not be necessary depending on where they end up on the Power/Flow map.
	BOP/Crew	• Monitor Power/Flow Map to determine need for inserting Control Rods due to entering Region for Potential Instability.
	SRO	• Notify Load Dispatcher, on-call personnel and Resident Inspector of load drop.
	SRO	• Review Power/Flow map requirements.

Op-Test No.: _____ Scenario No.: 1 Event No.: 5 Page 1 of 2Event Description: HPCI Inadvertent Start-up. Enter malfunction E41_103 when directed by Lead Examiner.

Time	Position	Applicant's Actions or Behavior
	BOP/Crew	<ul style="list-style-type: none"> Recognize and report HPCI has started from an invalid initiation signal.
	RO	<ul style="list-style-type: none"> Verify reactor water level stable. May receive APRM Hi Alarm and Rx Water Level Hi alarm.
	BOP	<ul style="list-style-type: none"> Verify Drywell Pressure is normal.
	SRO	<ul style="list-style-type: none"> Direct operator to secure HPCI per 34SO-E41-001-2S, High Pressure Coolant Injection (HPCI) System.
	BOP	<ul style="list-style-type: none"> Secure HPCI as follows: (Critical Task) <ol style="list-style-type: none"> Depress AND Hold the HPCI Turbine Trip push-button. When HPCI turbine has stopped, place HPCI Aux Oil Pump in PTL. When receive "HPCI Turbine Brg Oil Press Low" alarm then, release the HPCI Turbine Trip push-button.
	RO	<ul style="list-style-type: none"> Monitor reactor water level, pressure and power during the event and keep crew informed.
	SRO	<ul style="list-style-type: none"> Direct Instrument Maintenance to stop what they are doing. <p>NOTE: The IM's should inform the SRO that they inadvertently caused the initiation and damage has occurred that cannot be immediately repaired.</p>

Op-Test No.: _____ Scenario No.: 1 Event No.: 7 Page 1 of 6

Event Description: Steam Line B Break after the Flow Restrictor. Execute malfunction when directed by Lead Examiner. Failure of 2A D/G, 2A and 2B Core Spray to start on an Auto-start signal but may be started manually. Malfunctions R43 62A and E21 202A shall be inserted at the beginning of the scenario.

Time	Position	Applicant's Actions or Behavior
	Crew	<ul style="list-style-type: none"> • Recognize Drywell pressure and temperature increase.
		1) High Drywell Pressure alarm @ 0.65 psig.
		2) Entry into PC-1 and 2 @ Drywell Temp of 150°F.
		3) Enter 34AB-T23-002-2S, Small Pipe Break inside Primary Containment. Monitor containment.
	SRO	<ul style="list-style-type: none"> • Direct BOP to vent the Drywell per 34SO-T48-002-2S, Containment Atmosphere Control and Dilution Systems.
	BOP	<ul style="list-style-type: none"> • Vent the Drywell by performing the following: <ol style="list-style-type: none"> 1) Open SBGT A(B Fltr Inlet from Rx Bldg, 2T46-F001A(B) 2) Start SBGT A(B) Fan/Filter by placing in RUN. 3) Open 2T48-F334A(B), Drywell Vent Isol Vlv. 4) Open 2T48-F335A(B), Drywell Vent Isol Vlv. 5) Open Drywell Vent Flow Cntl Vlv using 2T48-R615A(B), Drywell Flow Controller for F336A(B).
	SRO	<ul style="list-style-type: none"> • Order Reactor SCRAM prior to 1.85 psig Drywell Pressure.
	RO	<ul style="list-style-type: none"> • Manually SCRAM the Reactor using SCRAM pushbuttons. <ol style="list-style-type: none"> 1) Place Mode Switch in S/D. 2) Verify and report all rods inserted past position 02. 3) Insert IRM's and SRM's. 4) Place SDV Isol Vlv Switch to "ISOL" and verify closed.

Op-Test No.: _____ Scenario No.: 1 Event No.: 7 Page 2 of 6Event Description: Steam Line B Break after the Flow Restrictor. Failure of 2A D/G, 2A and 2B Core Spray to start on an Auto-start signal but may be started manually.

Time	Position	Applicant's Actions or Behavior
		5) If not tripped, place Recircs to minimum speed.
	BOP	<ul style="list-style-type: none"> • Perform actions of RC-2 and RC-2 after Reactor SCRAM.
		1) Place RFPT controller in Auto controlling +3 to +15".
		2) Place SU/LCV controller in Auto controlling +3 to +15".
		3) Place FWLC Select Switch in Single Element.
		4) If not needed for level control, THEN: Trip 1 RFPT.
		2N21-F125 and CLOSE 2N21-F110.
		5) Monitor Reactor Pressure and maintain 800 -1080 psig.
	RO	<ul style="list-style-type: none"> • Determine leak is in the "B" Main Steam Line by observing increased Main Steam Line flow on the Steam Line Flow Indicator. Report to SRO/Crew.
	SRO	<ul style="list-style-type: none"> • Direct BOP to isolate "B" Main Steam Line.
	BOP	<ul style="list-style-type: none"> • Close INBD and OTBD MSIV's for "B" Main Steam Line.
	RO	<ul style="list-style-type: none"> • Reports to team leak is still present.
	SRO	<ul style="list-style-type: none"> • Enters the following EOP's:
		1) RC, PC-1 and PC-2 when reach 1.85 psig in Drywell.
		2) PC-1 and PC-2 if reach 150°F Drywell temperature.

Op-Test No.: _____ Scenario No.: 1 Event No.: 7 Page 3 of 6Event Description: Steam Line B Break after the Flow Restrictor. Failure of 2A D/G, 2A and 2B Core Spray to start on an Auto-start signal but may be started manually.

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> Direct BOP and RO to verify automatic actuations occurred when Drywell pressure exceeds 1.85 psig.
	RO/BOP	<ul style="list-style-type: none"> Verify and report the following occurred: <ol style="list-style-type: none"> 1) Failure of both Core Spray pumps to auto-start. 2) B, C and D RHR Pumps start. 3) Diesel Generators start and run unloaded except 2A Diesel Generator fails to start automatically. 4) Group II Isolation successful. 5) SGBT System starts.
	SRO	<ul style="list-style-type: none"> Direct BOP to place Torus Sprays in service.
	BOP	<ul style="list-style-type: none"> Place Torus Sprays in service by performing the following: <ol style="list-style-type: none"> 1) Place S17A/B, Cnt Spray Vlv Control Switch in MANUAL 2) Open 2E11-F028A(B), Torus Spray OR Test vlv. 3) Throttle OPEN 2E11-F027A(B), Torus Spray vlv. 4) Place RHRSW Pump Control Switch in Manual Override. 5) Depress RHRSW Lube Valves pushbutton and allow to operate for 1 minute. 7) Throttle disch vlv 2E11-F068A(B) approx. 40% open. 9) Throttle discharge valve to 4400 gpm while maintaining discharge pressure <450 psig.

Op-Test No.: _____ Scenario No.: 1 Event No.: 7Page 4 of 6Event Description: Steam Line B Break after the Flow Restrictor. Failure of 2A D/G, 2A and 2B Core Spray to start on an Auto-start signal but may be started manually.

Time	Position	Applicant's Actions or Behavior
	SRO	• Direct RO to maintain reactor water level +3 to +50 inches.
	RO	• Determines the Feedwater SU Level Control Valve has failed due to vessel level continueing to decrease. Notifies SS and maintenance. 1) Coordinates with BOP to maintain level band with RCIC OR uses Feedwater manually.
	BOP	• Helps maintain level band by controlling RCIC manually as needed by RO.
	BOP	• Reports all automatic actions occurred for +1.85 psig Drywell pressure with the exception that 2A D/G, 2A & 2B Core Spray pumps failed to auto-start.
	SRO	• Direct BOP to start 2A D/G and 2A & 2B Core Spray pumps.
	BOP	• Start 2A Diesel Generator by performing the following: 1) RESET the shutdown logic by depressing the Diesel Shutdown Relay pushbutton. 2) Momentarily place the Diesel Start switch to START. 3) Verify Diesel comes up to speed and voltage. 4) Report the Diesel is running to the SS.

Op-Test No.: _____ Scenario No.: 1 Event No.: 7 Page 5 of 6Event Description: Steam Line B Break after the Flow Restrictor. Failure of 2A D/G, 2A and 2B Core Spray to start on an Auto-start signal but may be started manually.

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> Start 2A and 2B Core Spray Pumps by performing the following: <ol style="list-style-type: none"> 1) Confirm 2E21-F031A(B). Minimum Flow Vlv is OPEN. 2) Start 2A Core Spray Pump. 3) Start 2B Core Spray Pump. 4) Confirm room cooler automatically starts.
	BOP/RO	<ul style="list-style-type: none"> Keeps SRO informed of trends on containment and reactor parameters.
	SRO	<ul style="list-style-type: none"> Directs BOP to commence a cooldown using bypass valves not to exceed 100°F/hr UNLESS cooldown rate has already been exceeded due to the leak. (Rx Press < 500 psig)
	BOP	<ul style="list-style-type: none"> Performs ONE of the following to establish <100°F cooldown rate using a Bypass Valve: <ol style="list-style-type: none"> 1) Depress the OPEN pushbutton on the Bypass Valve Opening Jack. 2) Reduce Pressure Regulator Setpoint.
	BOP/RO	<ul style="list-style-type: none"> Report to SRO that Torus Pressure is approaching 11 psig OR Drywell Temperature approaching 340°F.

Op-Test No.: _____ Scenario No.: 1 Event No.: 7Page 6 of 6Event Description: Steam Line B Break after the Flow Restrictor. Failure of 2A D/G, 2A and 2B Core Spray to start on an Auto-start signal but may be started manually.

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> Direct Drywell Spray Initiation when Torus Pressure is above 11 psig OR Drywell Temperature is approaching 340°F.
		1) Verify Drywell Temperature and Pressure within Drywell Spray Initiation Limit (Graph 8)
		2) Verify Torus Level is below 215".
	BOP	<ul style="list-style-type: none"> Initiate Drywell Sprays by performing the following:
		1) Verify/Trip Recirc Pumps.
		2) Trip Drywell Cooling fans.
		3) Open 2E11-F021A(B), Containment Spray INBD Valve.
		4) Throttle OPEN 2E11-F016A(B), Containment Spray OTBD Valve. Must provide at least 5000 gpm to ensure effective Drywell Pressure reduction. (Critical Task)
		5) Terminate Drywell and/or Torus Sprays before Drywell negative pressure is sustained. (Critical Task)
		END SCENARIO WHEN PROPER SPRAY FLOW IS ACHIEVED AND DRYWELL PRESSURE IS DECREASING
		EAL Classification - Alert based on > 50 gpm leakage.

Facility: <u>E.I.Hatch</u>	Scenario No.: <u>2</u>	Op-Test No.: _____	
Examiners: <u>R. Baldwin</u>	Operators: _____		
<u>T. Kolb</u>	_____		
<u>G. Laska</u>	_____		
Initial Conditions: <u>Unit is at 100% RTP "B" CRD pump is OOS for maintenance, HPCI System is OOS for maintenance in day 3 of 14 for TS 3.5.1. The RWCU System is isolated.</u>			
Turnover: <u>Place the RWCU System in operation per 34SO-G31-003-2S, section 7.6.2, RWCU System Quick Recovery. After that is complete then lower reactor power to 90% RTP for a rod shuffle per Reactor Engineer.</u>			
Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) (SRO)	Place the RWCU System in operation per RWCU System Quick Recovery. ("A" Pump)
2		R (RO) (SRO)	Lower Load to approx. 90% RTP per 34GO-OPS-005-2, Power Changes.
3	C11_31A	C (RO) (SRO)	CRD Flow Control Valve fails CLOSED.
4	C71_57B & C11_26	C (ALL)	Loss of RPS "B" with one Control Rod scrambling in due to blown fuse in other RPS Power supply.
5	N71_68B	C (ALL)	Loss of "B" Circ Wtr Pump. Loss of vacuum continues due to a vacuum leak.
6	C71_60B	M (ALL)	ATWS with control rods able to be inserted manually.
			*Scenario ends when operators begin to re-inject to increase water level after terminating and preventing injection sources. This is a critical task.

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

Facility: <u>E.I.Hatch</u>	Scenario No.: <u>3</u>	Op-Test No.: _____	
Examiners: <u>R. Baldwin</u>	Operators: _____		
<u>T. Kolb</u>	_____		
<u>G. Laska</u>	_____		
<p>Initial Conditions: <u>Plant is at a power level associated with approximately 7.0X10⁶ lbm/hr feedwater flow with 1 Feedwater Pump operating. Severe weather is predicted for the upcoming shift, RCIC Mechanical Overspeed Trip E51 61,G11-63B Fail to Isolate on Grp II, HPCI failure to start E41 107.</u></p>			
<p>Turnover: <u>Start the 2nd RFP and increase power to full load.</u></p>			
Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP) (SRO)	Start the 2 nd RFPT per 34SO-N21-007-2S section 7.1.11.
2		R (RO) (SRO)	Commence load increase after starting RFPT.
3	C51_14A	I (RO) (SRO)	"A" APRM fails INOP.
4	P64_193C	C(BOP) (SRO)	2A Drywell Chiller Compressor Failure.
5	B31_41A	C (ALL)	"A" Recirc Pump high vibes. Operator will trip.
6	S11_161 R43_168A	M(ALL) C(BOP)	Loss of off-site power due to storm. 2A D/G Tie Breaker Failure to Auto Close.
7	B31_210B	M(ALL)	Recirc suction piping leak. Small enough that crew can control parameters for loss of all high pressure feed.
			*Scenario ends with Emergency Depressurization and level restored above TAF.

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

Facility: <u>E.I.Hatch</u> Scenario No.: <u>4 (Spare)</u> Op-Test No.: _____			
Examiners: <u>R. Baldwin</u> Operators: _____			
<u>T. Kolb</u> _____			
<u>G. Laska</u> _____			
Initial Conditions: <u>Unit at 100% RTP making preparations to S/D for a refueling outage.</u>			
<u>D PSW Pump OOS, 2B Stator Cooling Pump OOS.</u>			
Turnover: <u>Swap EHC pumps to even out run times per System Engineer. When complete</u>			
<u>then initiate Reactor S/D for Refueling Outage.</u>			
Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Swap EHC Pumps from "A" to "B" per 34SO-N32-001-25, EHC Hydraulic System.
2		R (RO)	Commence a normal unit S/D for Refueling Outage.
3	E41_213	I (BOP)	HPCI Torus Level sensor fails high and suction valves remain open to cause Torus high level.
4	C51_17A	I(RO)	RBM "A" failure.
5	R25_185	C(BOP)	120/208 VAC Inst Bus 2A fault.
6	N21_87B	C(ALL)	2B RFP Trip.
7	B21_48B	M(ALL)	Steam Line leak in Drywell and crew has to initiate Torus and Drywell sprays. Isolate sprays on Torus high level. Drywell Spray valves do not work electrically and need to be aligned manually in the plant.

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