Scenario Outline

Facility:	HB	ROBINSON	Scenario No.: 1	Op Test No.:					
Examin	ers:		Operators:	SRO -					
				RO -					
				BOP -					
Initial Co	onditions:	"A" MDAFW	OL, 15697 MWD/MTU, 95 pump inoperable with the b nderstorm watch is in effec						
Turnove			ent power level						
Critical <sup>-</sup>	Tasks:			the RCS					
		<ul> <li>Start SI Pump "C" to provide injection to the RCS</li> <li>Establish flow path to at least one S/G</li> </ul>							
			•	n 15 minutes or isolate seals					
Event No.	Maif. No.	Event Type*		Event cription					
1		(C) RO, BOP, SRO	Loss of Instrument Bus #1						
		(TS) SRO							
		(N) BOP (R) RO	Restore Normal Letdown						
2		(N) BOP, SRO	Heater Drain Pump A trip	s / Load Reduction					
3		(I) BOP, SRO (TS) SRO	S/G "C" LT-496 fails HIG	H					
4		(C) RO, SRO (TS, TRM) SRO	Seismic event causes RC	CS leakage.					
5		(M) ALL	Small Break LOCA.						
6	<u> </u>		Loss of SUT on Generato	pr Lockout					
		(C) RO	SI Pump "C" fails to Auto	-Start and SI Pump "A" trips					
		(C) BOP	AFW Pump discharge val B, C fail to open on auto s	lves V2-14A, B, C and V2-16A, start of pumps					
* (	N)ormal,	(R)eactivity, (I)r	strument, (C)omponent,	(M)ajor					

### ILC-11-2 NRC SCENARIO 1 SUMMARY DESCRIPTION

The crew will assume the watch with the plant at 100% steady state power. MDAFW Pump "A" is out of service for scheduled lube oil cooler replacement. The motor breaker has been racked out and the pump has been isolated and cleared for maintenance. Shift instructions are to maintain current reactor power.

On cue from the Chief Examiner, a loss of Instrument Bus #1 will occur due to the normal supply breaker on MCC-5 being inadvertently opened by cleaning personnel. The crew will perform the immediate actions for the loss of Instrument Bus #1 IAW AOP-024, Loss of Instrument Bus. The crew will verify that letdown is isolated and reduce charging flow to minimum while maintaining minimum RCP seal injection. Once the cause of the loss of Instrument Bus #1 is determined the bus will be re-energized. RCS Makeup will be restored along with various automatic controllers. Letdown will be placed back into service and pressurizer level will be restored to normal band. The SRO will identify that ITS LCO 3.8.7, Condition A, was in effect while the normal supply breaker to Instrument Bus #1 was open. This LCO requires that the AC Instrument Bus Power Source be restored to Operable status within 24 hours. Additionally, ITS LCO 3.8.9, Condition B, was in effect while Instrument Bus #1 was de-energized. This LCO requires that the AC instrument bus subsystem be restored to Operable status within 2 hours. ITS LCO 3.4.9, Condition A may be entered if pressurizer level is allowed to rise above 63.3%. The LCO requires that the plant be in Mode 3 with reactor trip breakers open within 6 hours and Mode 4 within 12 hours. ITS LCO 3.4.1, Condition A may be entered if pressurizer pressure is allowed to lower below 2205 psig. This LCO requires that pressurizer pressure be restored within 2 hours or be in Mode 2 in 6 hours.

On cue from the Chief Examiner, lightning strike results in a trip of "A" Heater Drain Pump. The crew will perform the immediate actions for a Main Feedwater Malfunction IAW AOP-010, Main Feedwater / Condensate Malfunction. The crew will identify the need to reduce turbine load to achieve less than 85% power in accordance with Attachment 1 of AOP-010.

On cue from the Chief Examiner, "C" S/G LT-496 fails HIGH, affecting the automatic operation of Feedwater Regulating Valve FCV-498 for S/G "C". The operator will have to take manual control of the FRV and restore the S/G to program level. The crew will perform the immediate actions for LT-496 failure IAW AOP-025, RTGB Instrument Failure, Section D. The failed S/G level transmitter will be removed from service IAW OWP-027, SGL-9. The SRO will implement ITS 3.3.1-1 Item 13 which requires 3 S/G Level channels with Condition E – Place channel in trip within 6 hours or Be in Mode 3 in 12 hours and ITS 3.3.8-1 Item 1 which requires 3 S/G Level channels or Be in Mode 3 in 12 hours and ITS 3.3.8-1 Item 1 which requires 3 S/G Level channel in trip within 6 hours or Be in Mode 3 in 12 hours and ITS 3.3.8-1 Item 1 which requires 3 S/G Level channels or Be in Mode 3 in 12 hours and ITS 3.3.8-1 Item 1 which requires 3 S/G Level channels with Condition C - Place channel in trip within 6 hours or Be in Mode 3 in 12 hours AND Mode 4 in 18 hours.

On cue from the Chief Examiner, a seismic event will occur. APP-036-I5, Seismic Monitor, alarm will be received along with a call from the Load Dispatcher reporting a seismic event report from the US Geological Department. The crew will take actions IAW AOP-021, Seismic Disturbances. The seismic event will cause damage to the RCS piping inside containment that will result in RCS leakage rising to a rate of 1000 gpm over a 10 minute time period. The crew will take actions IAW AOP-016, Excessive Primary Plant Leakage, to address the RCS leakage. The RCS leakage will also result in APP-036-D8, Process Monitor HI Rad, alarm due to high radiation levels on R-11. The crew will implement the actions of AOP-005, Radiation Monitoring

System. If dispatched, an operator will report that the DBE/SSE ALARM on Seismic Monitor "A" is illuminated. The SRO will identify that the plant has exceeded the TRM 3.17 Seismic Shutdown limits of 0.10g horizontal acceleration and 0.067g vertical acceleration and that the plant must be placed in Mode 3 in 6 hours and Mode 5 in 36 hours.

AOP-016 will be unsuccessful in controlling PZR level and the crew will trip the reactor, enter PATH-1 and initiate safety injection. One minute after the reactor trip a generator lockout will occur and the Startup Transformer will fail resulting in a loss of off-site power. Both E-buses will be energized by their respective EDGs. "C" SI Pump will fail to Auto-start and "A" SI Pump will trip while attempting to start. The operator must recognize this condition and manually start "C" SI pump. Also, AFW pump discharge valves V2-14A, B, C and V2-16A, B, C fail to open on auto start of the AFW pumps. This condition must be recognized and action taken to establish AFW flow to at least one S/G. Also, after the loss of off-site power the "A" Battery Charger will fail to restart when power is restored to 480V Bus E-1. A modification was added during the last refueling outage that has the Battery Chargers auto-start upon restoration of power to the E-bus. This failure must be recognized by the crew during the performance of PATH-1 and an operator must be dispatched to manually start "A" Battery Charger.

Once in PATH-1, Foldout A will identify the need to enter AOP-018, RCP Malfunctions, due to meeting the Loss of RCP Seal Cooling Criteria. AOP-018 will direct the operators to establish thermal barrier cooling by starting one CCW pump and verifying proper valve alignment. The procedure will then direct the operator to start one charging pump and align valves as necessary to establish adequate seal injection flow.

PATH-1 will be continued to the transition to EPP-8, Post LOCA Cooldown and Depressurization. Scenario may be terminated at the transition to EPP-8 or at the discretion of the Chief Examiner.

### ILC-11-2 NRC SCENARIO 1 SIMULATOR SETUP

#### IC/SETUP:

- IC-801, SCN: 008\_11\_2\_NRC\_Exam\_1
- "A" MDAFW Pump inoperable with the breaker racked out. Switch RED capped.
- Status board updated to reflect IC-21.
- Switchyard access is RESTRICTED.

### PRE-LOADED EVENTS:

The following events should occur on the reactor trip:

Event 6: Loss of SUT on Generator Lockout "A" SI Pump trips "C" SI Pump fails to auto-start AFW Valves V2-14A,B,C and V2-16A,B,C fail to open on auto start of pumps "A" Battery Charger fails to Auto-Start upon restoring power to 480V Bus E-1

## **EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: Loss of Instrument Bus #1
- Event 2: "A" Heater Drain Pump trips
- Event 3: "C" S/G Level Transmitter LT-496 fails HIGH
- Event 4: Seismic Event causes RCS Leakage
- Event 5: Small Break LOCA

### EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:

- AOP-024
- AOP-010
- AOP-025 Main Body and Section D
- OWP-027, Section SGL-9
- AOP-021
- AOP-016
- AOP-005
- PATH-1
- Foldout A
- AOP-018
- Foldout B
- EPP-8

Op Test No.:	1	Scenario # _1 Page _5 of _41
Event Descrip	tion:	Loss of Instrument Bus #1
Time	Position	Applicant's Actions or Behavior
BOOTH OF	PERATOR:	When directed, insert Event 1, Loss of Instrument Bus #1
EVENT IND		):
Rack #1 Nu	ıclear Inst	ruments Lost (N-31, N-35, N-41)
Bistable St	atus Pane	I B Extinguished
FR-478 Ext	inguished	
		AOP-024 LOSS OF INSTRUMENT BUS
	BOP	Immediate Action Step
		Place The Main Turbine in Manual
	BOP	Immediate Action Step
	BOP	Verify S/G(s) Maintained At Program Level
	RO	Immediate Action Step
	RU	Place Rods in M (Manual)
	SRO	Enters AOP-024 and verifies Immediate Actions.
	RO	Maintain Reactor Power ≤100%
		Continuous Action Step
		Determine if RCS Makeup needs to be stopped:
	RO	Check Auto Makeup, Boration OR Dilution – In Progress (NO) (Auto Makeup may or may not be in progress, but could occur.)
		OR
		Check Instrument Bus 2 AND Instrument Bus 7 – De-energized (NO
	RO	Place the RCS Makeup System Switch to STOP.

# **Operator Action**

Form ES-D-2

Time	Position								
THILE	FOSILION	Applicant's Actions or Behavior							
	RO	Control PZR Hea desired control ba	ters and Sprays to restore RCS Pressure to the and.						
		(No control of PZ energized due to	R heaters and sprays until Instrument Bus is the controllers locked up.)						
	CREW	Make PA Announ	cement For Procedure Entry						
	RO	Control Charging	and Letdown Flow to Maintain PZR Level.						
		(Letdown cannot	be restored until Instrument Bus is energized.)						
	RO	Verify RCP Seal I	njection Flow Between 8 GPM and 13 GPM.						
	BOP	Available i     OR     Table Belo	indications						
		Instrument Bus	Indication to Check						
		1	FR-478, "A" S/G Level						
		Continuous Acti	on Step						
	BOP	Check Emergence 4160V BUSSES (	y Busses E-1 AND E-2 - ENERGIZED FROM THE YES)						
	RO/BOP	Continuous Action Step Check Affected Instrument Bus – Energized (NO) Check LCV-460A & B, LTDN LINE STOP – CLOSED (YES)							
	RO								
	RO	Diago The Select	or Switch For LCV-460A & B In The Closed Positi						

Op Test No.:	_1	Scenario #	1	Event #	_1	Page	7	of	41	
Event Descrip	otion:	Loss of Instru	ment Bu	s #1						
Time	Position			An	nlicant's Actic	ons or Behavior				<del> </del>
				· · · · ·	phoant a Auto	IS OF BEHAVIOR				

	RO	Check RCP Seal Injection Flow between 8 GPM and 13 GPM
	RO	Adjust HCV-121, Charging Flow OR Throttle Seal Water Flow Control valves • CVC-297A • CVC-297B • CVC-297C IF the normal Seal Injection Range can NOT be maintained, THEN an expanded range of between 6 gpm and 20 gpm may be used.
	BOP	<ul> <li>Check Affected Instrument Bus – ENERGIZED (NO)</li> <li>Locally perform the applicable step below:</li> <li>IB-1 through IB-4</li> <li>IF the cause is known AND NOT a fault, THEN attempt to reset and close the open Instrument Bus normal supply breaker. (YES)</li> <li>IF MCC-8 is supplying an Instrument Bus, THEN Go To Step 74. (NO)</li> <li>Transfer the affected Instrument Bus to the alternate (MCC-8) power supply. (If not placed back on normal supply breaker.)</li> </ul>
Examiner's	Note: L	CO 3.4.1 for PZR Pressure < 2205 psig.
Booth Ope	rator R	e-energize Instrument Bus 1 from Normal Power Supply
	SRO	Stop All Radioactive Batch Releases
	BOP	Check Status Of Local Actions: a. Check Local Actions Of Step 19 RNO – REQUIRED (YES) b. Check Local Actions Of Step 19 RNO – ATTEMPTED (YES)

Appendix	D
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Time	Position	Applicant's Actions or Behavior
	ВОР	Continuous Action Step Check Affected Instrument Bus – ENERGIZED (YES)
	RO/BOP	Restore Affected Controllers On The RTGB To AUTO Mode (All Controllers go to Auto EXCEPT FC-605 which has no instrument air aligned to it normally)
5.	RO	Restore RCS Makeup Control – IN AUTO Place the RCS MAKEUP SYSTEM Switch in STOP Verify the RCS MAKEUP MODE Switch in AUTO Momentarily place the RCS MAKEUP SYSTEM Switch to START (If Charging Pump Suction has been allowed to swap to the RWST, then APP-003-D5, BA FLOW DEV and APP-003-E5, MAKEUP WATER DEV, will be received and FCV-113B will automatically close Crew should identify that FCV-114B will need to be opened to allow for Makeup to be routed to the top of the VCT.)
	RO	Continuous Action Step Restore Rod Control To Automatic As Follows: a. Check Power - GREATER THAN 15% (YES) b. Check Automatic Rod Control – AVAILABLE (YES) c. Check Tavg – WITHIN -1.5 TO +1.5°F OF TREF d. Place the Rod Control Selector Switch to A (Automatic)
	BOP	Check Emergency Busses E-1 AND E-2 – ENERGIZED (YES)
	BOP	Continuous Action Step Check Emergency Busses E-1 AND E-2 - ENERGIZED FROM THEII 4160V BUSSES (YES)
	SRO	Implement The EALs

Appendix D	)
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Form ES-D-2

Time	Position	Annligentie Actions on Delawing
		Applicant's Actions or Behavior
	BOP	Continuous Action Step         Check Status Of Turbine:         • Check Instrument Bus 4 – ENERGIZED (YES)         • Place Turbine Controls in Automatic
	RO	Check CCW Pumps – More than one running (NO)
	BOP	Check RMS-1, RMS-2, RMS-3 AND RMS-4 – ALL OPEN (YES)
	BOP	Continuous Action Step Check Affected Instrument Bus - ENERGIZED (YES)
	RO	Check PZR Heater Status - DEENERGIZED (YES) (May have been energized earlier as directed to control heaters and spray.)
	RO	<ul> <li>Reset PZR Heaters As Follows:</li> <li>a. Place PZR HTR CONTROL GROUP Control Switch to OFF position AND return to ON position</li> <li>b. Place PZR HTR BACK-UP GROUP A Control Switch to OFF position AND return to AUTO OR ON position as desired</li> <li>c. Place PZR HTR BACK-UP GROUP B Control Switch to OFF position AND return to AUTO OR ON position as desired</li> </ul>
	RO	Check Normal Letdown - ISOLATED (YES)
	RO	Restore Normal Letdown Using Attachment 15, Restoration of Norma Letdown.
DTE: The	following are	e the steps to restore normal letdown using Attachment 15 of AOP-024.

### **Operator Action**

Time	Position	
	Position	Applicant's Actions or Behavior
	RO / BOP	A Phase "A" Containment Isolation signal is <b>NOT</b> present.
		Present.
	RO / BOP	The Residual Heat Removal System is <b>NOT</b> in service.
		VERIFY the following valves are CLOSED:
		CVC-204A, LETDOWN LINE ISO
		CVC-204B, LETDOWN LINE ISO
	RO / BOP	LCV-460A, LTDN LINE STOP
		LCV-460B, LTDN LINE STOP
		<ul> <li>CVC-200A, LETDOWN ORIFICE ISOLATION</li> <li>CVC-200B, LETDOWN ORIFICE ISOLATION</li> </ul>
		CVC-200C, LETDOWN ORIFICE ISOLATION     CVC-200C, LETDOWN ORIFICE ISOLATION
	RO / BOP	VERIFY FULL OPEN HIC-121, CHARGING FLOW (CR 95-01752)
	RO / BOP	Check Pressurizer level is greater than <b>OR</b> equal to program level. (YES)
	RO / BOP	IF desired, THEN PLACE TCV-143, VCT/DEMIN. DIVERSION, in the VCT position.
	RO / BOP	PLACE PC-145, PRESSURE, in MANUAL.
<u> </u>		SET DC 145 to throttle DCV/ 145 to 45% to 55%
	RO / BOP	SET PC-145 to throttle PCV-145 to 45% to 55% open to ensure the Letdown line is NOT overpressurized.
	RO / BOP	OPEN CVC-204A, LETDOWN LINE ISO.
	RO / BOP	OPEN CVC-204B, LETDOWN LINE ISO.
		PERFORM the following:
	RO / BOP	OPEN LCV-460A&B by placing switch CVC-460A&B LTDN
		<ul> <li>LINE STOP to OPEN.</li> <li>PLACE LTDN LINE STOP CVC-460 A&amp;B switch to AUTO.</li> </ul>

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Op Test No.:	_1	Scenario #	_1	_ Event #	1	Page	11	of	41	
Event Descri	ption:	Loss of Instru	ment Bu	ıs #1						
Time	Position			Ap	plicant's Act	ions or Behavior				

RO / BOP	PLACE TC-144, NON-REGEN HX OUTLET TEMP, in MANUAL AND adjust as necessary to ensure Letdown temperature does NOT increase above 127°F when letdown is reestablished.
RO / BOP	While MAINTAINING Charging Pump discharge pressure as indicated on RTGB instrument PI-121 LESS THAN 2500 psig, <b>ADJUST</b> charging pump speed to the expected letdown flow to be established in the next step.
RO / BOP	OPEN one LTDN ORIFICE valve: CVC-200A, CVC-200B or CVC-200C
RO / BOP	PLACE PC-145 in AUTO AND CHECK letdown pressure as indicated on PI-145, LOW PRESS LTDN PRESS, is being maintained between 300 psig and 320 psig.
RO / BOP	PLACE TC-144, NON-REGEN HX OUTLET TEMP, in AUTO.
RO / BOP	<u>IF</u> TCV-143 was selected to the VCT, <u>THEN</u> Position TCV-143 as directed by the CRS/SM.
RO / BOP	<ul> <li>IF Charging flow is changed, <u>THEN</u> establish RCP Seal Injection Flow between 8 GPM and 13 GPM by throttling the following:</li> <li>CVC-297A, RCP "A" SEAL WATER FLOW CONTROL VALVE</li> <li>CVC-297B, RCP "B" SEAL WATER FLOW CONTROL VALVE</li> <li>CVC-297C, RCP "C" SEAL WATER FLOW CONTROL VALVE</li> </ul>

Operator Action

Form ES-D-2

Op Test No.:	1	Scenario #	_1	Event #	_1	Page	12	of	41	
Event Descrip	tion:	Loss of Instru	ment Bu	s #1						
Time	Position									
	FUSILION	Applicant's Actions or Behavior								
Event Descrip	tion: Position	Loss of Instru	ment Bu		plicant's Ac	tions or Behavior				

		IF increased letdown flow is desired, THEN place additional letdown orifices in service as follows:					
		Verify HIC-121, Charging Flow is Full Open.					
		<ul> <li>Verify Charging Pump discharge pressure as indicated on RTGB instrument PI-121 less than 2500 psig.</li> </ul>					
		<ul> <li><u>IF</u> required, <u>THEN</u> start the second Charging Pump on MINIMUM SPEED.</li> </ul>					
I	RO / BOP	<ul> <li><u>IF</u> required, <u>THEN</u> while maintaining Charging Pump discharge pressure as indicated on RTGB instrument PI-121 LESS THAN 2500 psig, ADJUST charging pump speed to meet flow requirement.</li> </ul>					
		Place PC-145, PRESSURE, in MANUAL.					
		<ul> <li>Slowly Throttle Open PC-145 to achieve 180-200 psig on PI- 145 to ensure the Letdown Line is NOT overpressurized.</li> </ul>					
		OPEN one additional LTDN ORIFICE valve.					
		<ul> <li>Place PC-145 in AUTO and Check letdown pressure as indicated on PI-145, LOW PRESS LTDN PRESS, is being maintained between 300 psig and 320 psig.</li> </ul>					
		<ul> <li>Verify Seal Injection Flow between 8 GPM and 13 GPM by throttling the following: CVC-297A, B, C.</li> </ul>					
NOTE:		Decision on additional letdown flow may be dependent on PZR Level. PZR Level at > 63.3% is ITS LCO 3.4.9, Condition A.					
	RO / BOP	Notify RC that letdown flow has been restored and the affected areas should be monitored for changing radiological conditions.					
	BOP	Check All Radiation Monitor Alarms - EXTINGUISHED (YES)					
		Check R-11 OR R-12 IN SERVICE (YES)					
	BOP	RMS-1,2,3,4 - OPEN (YES) AND					
		R-11 and R-12 Vacuum Pump Operating (YES)					

Appendix D	)
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Op Test No	o.: <u>1</u>	Scenario # _1 Event # _1 Page _13_ of _41						
Event Desc		Loss of Instrument Bus #1						
Time	Position	Applicant's Actions or Behavior						
	<u> </u>							
	BOP	Check R-20 IN SERVICE (YES)						
	+							
	BOP	Check R-21 IN SERVICE (YES)						
	BOP	Check Control Room Ventilation - ALIGNED FOR PRESSURIZATION MODE (NO)						
	001	<ul> <li>Go To Step 43.</li> </ul>						
	RO Check PZR PRV Safety Acoustic Monitor Lights - ILLUMINATED							
		(YES)						
		Locally Reset PZR Safety Acoustic Monitors At INSTRUMENT CABINET A In The Computer Room By Performing The Following:						
	RO • Depress RESET RC-551A Pushbutton.							
		<ul> <li>Depress RESET RC-551B Pushbutton.</li> <li>Depress RESET RC-551C Pushbutton.</li> </ul>						
Booth Op	erator I	Reset PZR Safety Valve Acoustic Monitors when requested.						
NOTE:		The crew may choose to unsaturate PZR Pressure Controller PC-444J						
		Continuous Action Step						
		Check Instrument Busses 1, 2, 3, AND 4 - ENERGIZED FROM THEIR						
	BOP	NORMAL SOURCE (As Indicated Below): IB-1: MCC-5 (Via E-1) (YES)						
		IB-2: INVERTER A						
		<ul> <li>IB-3: INVERTER B</li> <li>IB-4: MCC-6</li> </ul>						
	BOP	Check Status of EDGs – START SIGNAL RECEIVED (NO)						
		<ul> <li>Observe the NOTE prior to Step 65 and Go To Step 65.</li> </ul>						

Op Test No.: Event Descri	·	Scenario #         1         Page         14         of         41           Loss of Instrument Bus #1
Time	Position	Applicant's Actions or Behavior
	Γ	
	BOP	Check ALL Safety Related Electrical Buses - ENERGIZED (YES)
	SRO	<ul> <li>Check Technical Specifications For Applicable LCOs</li> <li>ITS LCO 3.8.1, AC Sources – Operating (None)</li> <li>ITS 3.8.7, Condition A, One AC Instrument Bus power source inoperable – Restore AC Instrument Bus Power Source to operable status within 24 hours</li> <li>ITS 3.8.9 Condition B, One AC instrument bus subsystem inoperable – Restore AC instrument bus subsystem to operation operable – Restore AC instrument bus subsystem to operation operable – Restore AC instrument bus subsystem to operation operable – Restore AC instrument bus subsystem to operation opera</li></ul>
	RO	Check Annunciator APP-005-A3, PR DROP ROD - ILLUMINATED (YES)
-	RO	Reset Dropped Rod Alarm By Momentarily Placing DROPPED RO MODE Selector Switch For The Affected Power Range Drawer To RESET Position and then back to NORMAL (N-41 Only)
	BOP	Check APP-006-F5, Steam Dump Armed - Illuminated (NO)
	RO	Check APP-005-F5, AMSAC TROUB/BYP- Illuminated (YES)
2	RO	Reset AMSAC TROUB/BYP Alarm by depressing the System Reset Pushbutton on AMSAC Front Panel. (Key 52 is required.)
Booth Ope	erator	Reset AMSAC Trouble Alarm when requested.
с. т	SRO	Return to Procedure and Step in Effect.

Appendix D	A	ppe	ndi	ix [	)
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Op Test No.:	_1	Scenario #	1	Event #	2	Page	15	of	41	
Event Descri	ption:	Heater Drain	Pump "A	" Trips / Loa	d Reduc	tion				
Time Position Applicant's Actions or Behavior										

	PERATOR:	When directed, ins	ert Event 2, Hea	ter Drain Pum	np "A" Trip				
EVENT IN	DICATIONS	S:							
		P A Motor OVLD/TRI	P						
	B6 HDT HI/L								
Heater Dra	ain Pump A	GREEN off indicatio	n ILLUMINATE	כ					
		AOP-010 MAIN	FEEDWATER/C	ONDENSATE	MALFUNCTION				
		Immediate Action Step							
	BOP	Check Feedwat	er Regulating Va	lves - OPERAT	TING PROPERLY				
		(MANUAL OR A							
		• FCV-478							
		• FCV-488							
		• FCV-498							
		• FCV-490							
	BOP	<ul> <li>Continuous Action Step</li> <li>Check Reactor Trip Setpoint - BEING APPROACHED (NO)</li> <li>IF a Reactor Trip Setpoint is approached, THEN trip the Reactor and Go to PATH-1.</li> <li>Go to Step 4.</li> </ul>							
	CREW	Make PA Announce	ment For Proced	lure Entry					
	BOP	Go To The Appropri Heater Drain	ate Step from Th Pump Trip	e Table Below Step 1					
		Reduce Turbine Loa Achieve Reactor Por Following Table:	wer Less Than T	5%/MIN Using he Target Pow	<b>Attachment 1</b> To er Per The				
	SRO	PUMPS RUNNING			Target Power				
	SKU	Main FWP 2	Cond2	Htr Drn 1	Percent 85%				
		(OP-301, Section 8. of Event 2 if the cre	2.8 Quick Borat	tion Checklist	included at end				

		Heater Drain Pump "A" Trips / Load Reduction									
Time	Position	Applicant's Actions or Behavior									
	· · · · · · · · · · · · · · · · · · ·										
	BOP	Check Main FW Pumps - TWO PUMPS RUNNING (YES)									
		Continuous Action Step Check HCV-1459, LP HEATERS BYP – OPEN (NO)									
		OFEN (NO)									
		Perform the following:									
	BOP	<ul> <li>a. Monitor Feed Water Pump suction pressure (Local Indication)</li> <li>PI-1433 - "A" FW PUMP SUCTION PRESSURE</li> </ul>									
		PI-1434 - "B" FW PUMP SUCTION PRESSURE									
		b. IF pressures lower to less than the applicable setpoint. THEN verify									
11. See		<ul> <li>OPEN HCV-1459.</li> <li>Any HDP Running - 300 psig</li> </ul>									
		No HDPs Running - 350 psig (NO)									
		Check APP-007-B6, HDT HI/LO LVL – EXTINGUISHED (NO)									
		Perform the following:									
		a. Dispatch an operator to check operation of HDT Level Control									
	BOP	Valves									
		<ul> <li>LCV-1530A, HDT LEVEL CONTROL VALVE</li> <li>LCV-1530B, HEATER DRAIN PUMPS SUCTION DUMP</li> </ul>									
		TO CONDENSER									
		b. IF either HDT level Control Valve is failed open, <u>THEN</u> contact									
		I&C to initiate repairs.									
	DOD	Continuous Action Step									
	BOP	Check HCV-1459, LP HEATERS BYP – CLOSED (YES)									
	BOP	Check S/G Level - AT OR TRENDING TO PROGRAM (YES)									
	RO	Check Tavg - AT OR TRENDING TO Tref (YES)									
	CREW	Contact Maintenance To Troubleshoot And Correct The Feedwater									
		Problem									
	SRO	Implement the EAL e									
		Implement the EALs									

Event Descr		Heater Drain Pump "A" Trips / Load Reduction
Time	Position	Applicant's Actions or Behavior
	BOP	Check current loading for the following pumps - LESS THAN MAXIMUM (YES) Main Feedwater Pump - 0.715 KAMPS Condensate Pumps - 370 AMPS Heater Drain Pumps - 90 AMPS
POOTUO	DEDATOD	
<ul> <li>Ma</li> <li>Co</li> </ul>	in Feedwate	Report the following AMPS as the current readings.         er Pump       560 AMPS         umps       310 AMPS         ump       75 AMPS
	SRO	Continuous Action Step Determine Iodine Sampling Requirements As Follows: (NO) a. Check Power Change - GREATER THAN 15% IN ONE HOUR • Go To Step 44 • IF YES, then implement SR 3.4.16.2
	RO	Continuous Action Step Check APP-005-B5, ROD BANKS A/B/C/D LO LIMIT – EXTINGUISHED (YES)
	RO	Monitor Axial Flux Difference To Ensure Compliance With ITS 3.2.3 (YES)
	CREW	Notify Load Dispatcher Of The Unit's Load Capability
	SRO	Return To Procedure And Step In Effect
Power Ree	duction Rec	uired by "A" Heater Drain Pump Trip
	BOP	AOP-010 Attachment 1, Turbine Load Reduction Check Turbine Control Mode – AUTOMATIC (YES)
	BOP	Depress the IMP IN Pushbutton
	BOP	Set The Desired Load In The SETTER

A	ppen	dix	D
			_

Op Test No.:	_1	Scenario #	_1	Event #	_2	P	age	<u>18</u>	of	_41
Event Description:		Heater Drain	Pump "A	" Trips / Loa	ad Reduct	ion				
Time Position Applicant's Actions or Behavior										

	BOP	Set The Desired Load Rate
	BOP	Depress The GO Pushbutton END- AOP-010 Attachment 1
	BOP	IF a Power Limit Warning is received, reduce power by lowering the turbine governor valve limiter.
NOTE:		OP-301, Section 8.2.8 Quick Boration Checklist (shaded area) is included in the following steps, but may be used following the commencement of the plant down power.
		Expect about 55 - 60 gallons of Boric Acid to be added
х 10.12	RO	<b>DETERMINE</b> the amount of Boric Acid to add to the RCS and <b>OBTAIN</b> an independent check of the volume required
	RO	OBTAIN permission from the CRS OR the SM to add the amount of boric acid previously determined.
	RO	PLACE the RCS MAKEUP MODE selector switch in the BORATE position.
	RO	SET YIC-113, BORIC ACID TOTALIZER to the desired quantity.
		IF desired, THEN PLACE FCV-113A, BORIC ACID FLOW, in MAN
N N	RO	AND manually ADJUST controller FCV-113A, BORIC ACID FLOW, using the UP and DOWN pushbuttons.

Event Descri	ption:	Scenario # <u>1</u> Event # <u>2</u> Page <u>19</u> of <u>41</u> Heater Drain Pump "A" Trips / Load Reduction
Time	Position	Applicant's Actions or Behavior
	RO	<ul> <li>IF any of the below conditions occur, THEN momentarily place the RCS MAKEUP SYSTEM switch in the STOP position:</li> <li>Rod Motion is blocked OR is in the wrong direction</li> <li>T<sub>AVG</sub> goes up</li> <li>Boric Acid addition exceeds the desired value</li> </ul>
62	RO	<ul> <li>WHEN the desired amount of Boric Acid has been added to the RCS, THEN verify the following:</li> <li>FCV-113A, BORIC ACID FLOW, closes.</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>IF in Auto, THEN the operating Boric Acid Pump stops.</li> <li>The RCS MAKEUP SYSTEM is OFF.</li> </ul>
	RO	<ul> <li>IF desired, THEN FLUSH the Boric Acid flow as follows:</li> <li>PLACE the RCS MAKEUP MODE selector switch in the ALT DILUTE position.</li> <li>SET YIC-114, PRIMARY WTR TOTALIZER to 15-20 gallons.</li> <li>PLACE FCV-114B, BLENDED MU TO VCT to the CLOSE position.</li> <li>Momentarily PLACE the RCS MAKEUP SYSTEM switch to the START position.</li> <li>IF any of the below conditions occur, THEN momentarily place the RCS MAKEUP SYSTEM switch in the STOP position: <ul> <li>Unanticipated Rod Motion</li> <li>Primary Water addition reaches the desired value</li> </ul> </li> <li>WHEN the desired amount of Primary Water has been added to the RCS, THEN verify the following: <ul> <li>FCV-114A, PW TO BLENDER, closes.</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>IF in Auto, THEN the operating Primary Water Pump stops.</li> <li>The RCS MAKEUP SYSTEM is OFF.</li> </ul> </li> </ul>
	RO	<ul> <li>RETURN the RCS Makeup System to automatic as follows:</li> <li>VERIFY FCV-114A, PW TO BLENDER, is in AUTO.</li> <li>PLACE FCV-114B, BLENDED MU TO VCT to the AUTO position.</li> <li>PLACE the RCS MAKEUP MODE switch in AUTO.</li> <li>VERIFY FCV-113A, BORIC ACID FLOW, is in AUTO.</li> <li>Momentarily PLACE the RCS MAKEUP SYSTEM switch in the START position.</li> </ul>

Appendix D	Ap	pen	dix	D
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**Operator Action** 

Op Test No.:	1	Scenario #	_1	Event #	2	Page	20	of	41	
Event Descrip	tion:	Heater Drain	Pump "A"	' Trips / Loa	d Reductio	n				
Time	Position			Ар	olicant's Ac	tions or Behavior				

RO	<b>RECORD</b> , in AUTO LOG, as indicated by PRIMARY WATER TOTALIZER, YIC-114 AND Boric Acid TOTALIZER, YIC-113 the total amount of Primary Water AND Boric Acid added during the boration.
 RO	<b>MONITOR</b> parameters for the expected change in reactivity <b>AND</b> inform the CRS <b>OR</b> the SM the results of the boration.
 	(END OP-301 Section 8.2.8)

Appendix D

Appendix	D
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Op Test No		Scenario # _1 _ Event # _3 Page _21 _ of _41
Event Desc	-	S/G "C" LT-496 fails HIGH
Time	Position	Applicant's Actions or Behavior
300TH 0	PERATOR	: When directed, initiate Event 3, S/G "C" LT-496 fails HIGH
EVENT IN	NDICATION	S:
APP-006- APP-006-	·C2, S/G C ( ·C3, S/G C I	
APP-006-	F2, S/G C N	NAR RANGE HI LEVEL
FR-498, F	Pen 3 failing	J HIGH
		AOP-025 RTGB Instrument Failure
	SRO	Go To The Appropriate Section For The Failed Transmitter:
	SRU	
		S/G NARROW RANGE LEVEL SECTION D Page 14
	1 August Paral and a star	
	BOP	Immediate Action Step Place The Affected FRV In MAN
		<ul> <li>FCV-498 (FRV "C") (YES)</li> </ul>
	BOP	Immediate Action Step
		Restore Affected S/G Level To Between 39% And 52%
	RO	Make BA Appoundement For Dress due F /
		Make PA Announcement For Procedure Entry
		Remove The Affected Level Channel From Service Using OWP-027:
	BOP	
		CHANNEL OWP
		LT-496 SGL-9
		OWP-027 SGL-9
		Precaution:
		Refer to ITS Table 3.3.1-1 Item 13 for RPS OPERABILITY
		requirements in MODES 1 and 2.
	BOP	<ul> <li>Refer to ITS Table 3.3.3-1 Item 13 for PAM OPERABILITY requirements in MODES 1, 2, and 3. (NONE)</li> </ul>
		Refer to ITS Table 3.3.8-1 Item 1 for AFW instrumentation
		OPERABILITY requirements in MODES 1, 2, and 3.
		<ul> <li>Ensure only one S/G "C" level channel is out of service at any one time.</li> </ul>
		i one time

Appendix D		Operator Action						Form ES-D		
Op Test No.:	1	Scenario #	1	Event #	_3	Page	22	of	41	
Event Descripti	ion:	S/G "C" LT-49	6 fails	HIGH						
Time	Position			Арг	olicant's Actio	ns or Behavior				
<u></u>										
	BOP	AMSAC (AMSAC	PROC	CESSOR "A EL)	N" LEVEL 3	NORMAL/B	YPAS	SS S	WITCH	
	BOP	AMSAC I (AMSAC	PROC PANI	ESSOR "B EL)	" LEVEL 3	NORMAL/B	YPAS	S S	WITCH	
	BOP		E SWI pped	TCH BS 49	06-1 RACK	#16				
	BOP		E LIGI minat		3 HI LEVE	L LC496-1				
	BOP		E SWI	TCH BS 49	6A-1 RAC	K #16				
	BOP		E LIGH		3 LO-LO L	EVEL LC49	6A1			
	BOP	FCV-498 C • Mai	nual							
	SRO	AOP-025 Go To Pro	cedur	e Main Bod	y, Step 2					
	SRO	Implement	The E	EALs						
	SRO	ITS 3.3.1 Condition 12 hours ITS 3.3.8-	-1 Iter E – P 1 Iterr chanr	n 13 which lace chann n 1 which re nel in trip wi	requires 3 el in trip wi equires 3 S	Tech. Specs S/G Level c thin 6 hours /G Level cha s or Be in M	hanne or Be Innels	in N wit	Aode 3 in h Conditio	

Appendix [	)	Operator Action		Form ES-D-2
Op Test No.: Event Descrip		Scenario # <u>1</u> Event # <u>3</u> Page S/G "C" LT-496 fails HIGH	23	of <u>41</u>
Time	Position	Applicant's Actions or Behavior	·····	
-	SRO	Return To Procedure And Step In Effect END AOP-025		

Op Test No.:	_1	Scenario #		Event #	4 and 5	Page	24	of	41
Event Description:		Seismic even Startup Trans	t that ca former ι	uses RCS le Ipon Genera	akage to rise to <sup>-</sup> tor Lockout.	1000 GPM ov	ver 10	minu	utes, Loss of
Time	Position			Ap	plicant's Actions	or Behavior			

BUUTHU	PERATOR:	When directed, insert Event 4, Seismic event causes RCS leakage to rise to 1000 gpm over 10 minutes.
APP-036- Load Dis tremors f RR-1 Wat APP-036- RCS Pres PZR Leve	reit in the co rning for R-	S: Alarm orts a seismic event report from US Geological Department. No ontrol room. 11 s Monitor HI Rad (R-11) ring
	SRO	Enters AOP-021 for Seismic Disturbances.
	SRO	Dispatch an Operator to the Seismic Monitors to check local alarms.
-	Crew	Make PA Announcement
	Crew	Compare Current RTGB Indications with the Operating Logs to Detect any abnormal trends.
	SRO	Check Either Event Below – Has Occurred <ul> <li>Noticeable Tremors or Vibrations (NO)</li> <li>OR</li> <li>Report by Outside Agency (YES)</li> </ul>
	SRO	<ul> <li>Notify the Manager – Operations of the following:</li> <li>A Seismic event has occurred.</li> <li>Any abnormal plant conditions that have been identified.</li> </ul>
	SRO	Implement the EALs
	SRO	Implement Applicable Technical Specification LCOs. TRM 3.17 Seismic Shutdown Limits. Place plant in Mode 3 in 6 hours
<u></u> .		and Mode 5 in 36 hours.

Op Test No.:		Scenario # <u>1</u> Event # <u>4 and 5</u> Page <u>25</u> of <u>41</u>
Event Descrip	ption:	Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.
Time	Position	Applicant's Actions or Behavior
	· · ··································	
	RO	Continuous Action Step Check RCS Pressure – Greater than 1000 psig. (YES) Check the following: PZR Level – Less than 10% <u>AND</u> lowering in an uncontrolled manner (NO) OR RCS Subcooling – Less than 35°F (NO)
		<u>IF</u> PZR Level can <u>NOT</u> be maintained greater than 10% <u>OR</u> Subcooling can <u>NOT</u> be maintained greater than 35°F, <u>THEN</u> trip the Reactor and Go to PATH-1.
	Crew	Make PA Announcement for Procedure Entry
	RO	Continuous Action Step Check VCT Level - LESS THAN 12.5 INCHES (NO) • IF VCT level lowers to less than 12.5 inches, THEN perform Step 5. Go To Step 6
	RO	<ul> <li>Check Charging Pump Status –LESS THAN TWO RUNNING (NO)</li> <li>Go To Step 11.</li> <li>NOTE: May have only one Charging Pump Running due to previous loss of Instrument Bus. Step below annotated with a "@" is included i only one charging pump is running.</li> </ul>
		@Check Charging Pump Status – NONE RUNNING (NO)
		IF an additional Charging Pump is available, THEN perform the following:
	RO	a. Start one additional Charging Pump.
		b. Observe charging flow on FI-122A, CHARGING LINE FLOW.
	·	c. Go To Step 11.
	RO	Place running Charging Pump Speed Controllers in MAN AND adjust output to maximum

Event Descrij		Seismic event that causes RC Startup Transformer upon Ge	CS leakage to rise to 1000 GP nerator Lockout.	M over 10 minutes, Loss of
Time	Position		Applicant's Actions or Behav	vior
	·	Chook BCS Lovel		
	RO	(YES)	OWERING IN AN UNCO	
	RO	Check Any Letdown -	IN SERVICE (YES)	
2	RO	<ul> <li>LCV-460A &amp; E</li> <li>HIC-142, PUR 0%</li> <li>HIC-137, EXC 0%</li> </ul>	wpaths Isolated As Folic , LTDN LINE STOP Val IFICATION FLOW Contr ESS LTDN FLOW Contr CESS LTDN STOP - CLO	ves - CLOSED roller - ADJUSTED TO roller - ADJUSTED TO
	RO		OWERING IN AN UNCO	
	RO	Check RCS Pressure	– GREATER THAN 100	0 PSIG (YES)
	RO	Trip The Reactor AND	Go To PATH-1	
		a. Make PA Anno	uncement For Procedur rmed Attachment(s) List	e Entry
	BOP	Radiation Channel	Process Monitor	Attachment Number
		R-11 & R12	PROCESS MONITOR R-11/R- 12 CV AIR AND PLANT VENT	12
	BOP	Check R-11/R-12 Sele	ctor Switch - SELECTE	D TO CV (YES)
	BOP	Check RCS Temperate	ure – GREATER THAN 2	200°F (YES)

Event Descri		Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss o Startup Transformer upon Generator Lockout.
Time	Position	Applicant's Actions or Behavior
	BOP	Check EOP Network Procedures – IMPLEMENTED (NO)
	BOP	Check Personnel – IN CV (NO)
	BOP	Check CONTAINMENT VENTILATION ISOLATION Valves – CLOSED (YES)
	BOP	Place the following CV IODINE REMOVAL FAN Control Switches to PREPURGE Position: • HVE-3 • HVE-4
	BOP	Request RC to perform a background radiation check at Radiation Monitors R-11 and R-12.
	BOP	<ul> <li>Determine if primary system leakage is occurring, as follows:         <ul> <li>Check RCS Level – Unexplained Lowering Level (YES) OR</li> <li>RCS Leak – Locally Identified (NO) OR</li> <li>VCT Auto Makeups – Excessive (YES) OR</li> <li>Charging Pump Speed – Rising (YES)</li> </ul> </li> </ul>
	BOP	Go to AOP-016, Excessive Primary Plant Leakage, while continuing with this procedure.
	SRO	Refer to Technical Specification 3.3.6 and ODCM Table 3.10-1, Radioactive Gases
	BOP	Go to the Main Body, Step 1.b, of this procedure.
	BOP	Return to Procedure And Step In Effect (END AOP-005)

Appendix [	D
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Op Test No.:		Scenario #	1	Event #	4 and 5	Page	28	of	_41
Event Descri	ption:	Seismic even Startup Trans	t that cau former u	ises RCS le pon Genera	eakage to rise to ator Lockout.	1000 GPM ov	/er 10	minu	utes, Loss of
Time	Position			Ap	plicant's Actions	or Behavior			

BOOTH	DEDATOD	No Action Dequired All molfunctions are here to the the
		No Action Required. All malfunctions are pre-loaded for the reactor trip and SI Actuation.
·		START OF PATH-1 ACTIONS
		PATH-1 Actions
	RO	Immediate Action Step
		Reactor tripped (YES)
		Immediate Action Step
	BOP	Turbine tripped (YES)
		Immediate Action Step
	BOP	E1 & E2 energized (YES)
		Continuous Action Step
	BOP	IF Dedicated Shutdown Bus is Deenergized THEN Place Dedicated Shutdown Diesel Generator In Service Using EPP-25.
воотн о	PERATOR:	Ensure the actions of AOP-018 to restore seal cooling to the RCPs have been completed prior to re-energizing the DS Bus. At a minimum wait at least 10 minutes from request prior to energizing the DS Bus.
		Immediate Action Step
	RO	SI initiated (YES – SI was manually initiated due to entry into PATH-1 from AOP-016)
	SRO	Open Foldout A
	l	

Op Test No.:		Scenario #	1	Event #	4 and 5	Page	29	of	41
Event Descri	ption:	Seismic even Startup Trans	t that cau former up	ses RCS le con Genera	akage to rise to 1 tor Lockout.	000 GPM ov	ver 10	minı	utes, Loss of
Time	Position			Ар	plicant's Actions	or Behavior			

	BOP	<ul> <li><u>MSR ISOLATION CRITERIA</u></li> <li><u>IF</u> ANY Purge OR Shutoff Valve does not indicate fully closed, <u>THEN</u> place the associated RTGB Switch to CLOSE.</li> <li><u>IF</u> ANY Purge OR Shutoff Valve can <u>NOT</u> be closed from the RTGB <u>AND</u> RCS temperature is less than 540°F and lowering, <u>THEN</u> close the MSIVs <u>AND</u> MSIV BYPs.</li> <li><u>IF</u> a loss of power prevents isolation of the MSRs, <u>THEN</u> close the MSIVs <u>AND</u> MSIV BYPs</li> </ul>
	RO	LOSS OF RCP SEAL COOLING CRITERIA IF both the conditions below are met, <u>THEN</u> perform AOP-018, Reactor Coolant Pump Abnormal Conditions to restore RCP Seal Cooling : • APP-001-B2, LABYRINTH SEAL LOW ΔP – ILLUMINATED (YES) <u>AND</u> • APP-001-D1, THERMAL BARRIER LO FLOW – ILLUMINATED (YES) (AOP-018 Actions are located following the PATH-1 Actions)
ВООТН ОР		Ensure the actions of AOP-018 to restore seal cooling to the RCPs have been completed prior to re-energizing the DS Bus. At a minimum wait at least 10 minutes from request prior to energizing the DS Bus.
	RO	Verify Phase A valves closed (YES)
	BOP	Verify FW isolation valves closed (YES)
	BOP	Verify both FW pumps tripped (YES)
	BOP	Verify both MDAFW pumps running (NO) MDAFW Pump A Inoperable due to initial conditions.

Appe	endix	D
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Op Test No.:	1	Scenario #	_1	Event #	4 and 5	Page	30	of	41
Event Descri	ption:	Seismic event Startup Transf			eakage to rise to 1 itor Lockout.	1000 GPM ov	/er 10	minu	ites, Loss of
Time	Position			Ap	plicant's Actions	or Behavior			

	RO	Verify IVSW System initiated (YES)
	RO	Verify CV Fans HVH-1,2,3&4 running (YES)
	BOP	All SW & SW booster pumps running (YES)
	RO	Verify Open Thermal Barrier Flow Control FCV-626 Unless Closed Due to Ruptured Thermal Barrier. (FCV-626 Verified Open)
CRITICAL	TASK:	Start one CCW pump to restore Seal Cooling to the RCPs within 15 minutes. (May have already been performed IAW AOP-018)
Critical Task	RO	Start CCW Pump (YES)
	RO	CV Spray Initiated (NO)
	· · · · · · · · · · · · · · · · · · ·	
	RO	E-1 AND E-2 Energized by Offsite Power (NO)
	RO	At least one CCW pump running (NO)
	RO	Verify SI valves properly aligned (YES)
N = 10 0	RO	Verify both RHR pumps running (YES)
CRITICAL	TASK:	Start "C" SI Pump to provide injection to the RCS.
Critical Task	RO	Manually Start "C" SI Pump "A" SI Pump trips while attempting to manually start.
		Verify two SI pumps running (NO)

Op Test No.	.: _1	Scenario # _1 Event # _4 and 5 Page _31 of _41
Event Desci	ription:	Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.
Time	Position	Applicant's Actions or Behavior
	RO	Verify CV ventilation isolation (YES)
	BOP	<ul> <li>Verify control room ventilation aligned for pressurization mode (YES)</li> <li>Operator to verify the following: <ul> <li>Verify CONT RM AIR EXHAUST Fan, HVE-16 - STOPPED</li> <li>Verify CLEANING Fan HVE-19 A/B – RUNNING</li> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1A-SA - CLOSED</li> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1B-SB - CLOSED</li> <li>IF CR-D1A-SA OR CR-D1B-SB have lost power, THEN locally verify position in the Control Room Kitchen.</li> </ul> </li> </ul>
	BOP	Verify both EDGs running (YES)
	BOP	Continuous Action Step Restart Battery Chargers within 30 minutes of Power Loss using OP- 601 ("A" Battery Charger failed to automatically restart. Operator must be dispatched to locally restart the battery charger.)
	RO	Continuous Action Step CV pressure remained below 10 psig (YES)
	BOP	Automatic Steam Line Isolation Initiated (NO)
	BOP	Automatic Steam Line Isolation Required (NO)
	BOP	Locally open the breaker for HVS-1 at MCC-5 within 60 minutes of SI Initiation
воотн		Open the breaker for HVS-1 3 minutes after directed by the Control Room.

Event D		Scenario # _1 Event # _4 and 5 Page 32 of _41
Event Descri	•	Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.
Time	Position	Applicant's Actions or Behavior
	RO	RCS pressure greater than 1350 psig [1250 psig] (NO)
	RO	SI flow verified (YES)
	RO	RCS pressure >125 psig (YES)
	BOP	At least 300 gpm AFW flow available (YES)
	· · · · · ·	
Critical	BOP	Verify AFW Valves Properly Aligned (NO) (AFW Valves must be manually aligned. May have been performed as an early action.)
Task	DOP	
rask		
		(Critical Task is to establish flow to at least one S/G.)
		(Critical Task is to establish flow to at least one S/G.)
CRITICAL	TASK:	
	TASK:	(Critical Task is to establish flow to at least one S/G.)
	TASK: BOP	(Critical Task is to establish flow to at least one S/G.) Establish feed flow to at least one S/G.
		(Critical Task is to establish flow to at least one S/G.)
	BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%
		(Critical Task is to establish flow to at least one S/G.) Establish feed flow to at least one S/G.
	BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated
	BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)
	BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated
	BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)
	BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)         Place Steam Dump Mode switch to Steam Pressure
	BOP RO BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)
	BOP RO BOP RO	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)         Place Steam Dump Mode switch to Steam Pressure         RCS temperature stable at or trending to 547°F (NO)
	BOP RO BOP	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)         Place Steam Dump Mode switch to Steam Pressure
	BOP RO BOP RO	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)         Place Steam Dump Mode switch to Steam Pressure         RCS temperature stable at or trending to 547°F (NO)
	BOP RO BOP RO	(Critical Task is to establish flow to at least one S/G.)         Establish feed flow to at least one S/G.         Control AFW flow to maintain S/G levels between 8% [18%] and 50%         RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)         Place Steam Dump Mode switch to Steam Pressure         RCS temperature stable at or trending to 547°F (NO)

Op Test No.: 1	Scenario # 1 Event # 4 and 5 Page 33 of 41
Event Description:	Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.
Time Positio	n Applicant's Actions or Behavior
<u>لي من </u>	
BOP	<ul> <li>IF RCS Cooldown continues and is not due to SI flow, THEN CLOSE MSIVs and MSIV Bypasses.</li> <li>MSIV and MSIV Bypasses are closed.</li> </ul>
RO	PZR PORVs Closed (YES)
RO	PZR Spray & Aux Spray valves closed (YES)
RO	At least one RCP running (NO)
BOP	Any S/G with uncontrolled depressurization (NO)
BOP	Any S/G Completely Depressurized (NO)
BOP	R-19s, R-31s, R-15 Rad levels normal (YES)
BOP	R-2, R-32A, R-32B Rad Levels Normal (YES)
RO	CV Pressure Normal (NO)  GO TO PATH-1 Entry Point C
RO	Reset SPDS and initiate monitoring CSFSTs
CREW	Open Foldout B. (No actions needed from this Foldout.)
BOP	Request Periodic Activity Samples of All S/Gs
RO	At Least One RCP Running (NO)

Appendix	D
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Op Test No.:	_1	Scenario # _1Event #4 and 5 Page34 of41
Event Descri		Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.
Time	Position	Applicant's Actions or Behavior
	BOP	Any S/G with Uncontrolled Depressurization (NO)
· · · · · · · · · · · · · · · · · · ·		
	BOP	Any S/G Completely Depressurized (NO)
		Any 0/0 completely Depressuitzed (NO)
	BOP	Control AFW Flow to Maintain S/G Levels between 8% [18%] and 50%
	BOP	Any S/G with Uncontrolled Level Rise (NO)
	BOP	R-19s, R-31s, AND R-15 Rad Levels Normal (YES)
	RO	PZR PORVs Closed (YES)
	RO	Open at least one PORV Block unless Closed to Isolate an Open PZR PORV
	RO	Continuous Action Step
		IF PZR PORV Opens on High Pressure, THEN Verify Reclosure at or
		Below 2335 PSIG. Close PORV Blocks as Necessary.
	RO	Reset SI
		Continuous Action Step
	CREW	IF_Offsite Power is Lost, THEN Restart Emergency Safeguard
		Equipment
	RO	Reset CV Spray
	RO	Reset Phase A AND Phase B
		NOSCET HASE A AND PHASE B

Op Test No.:	_1	Scenario # <u>1</u> Event # <u>4 and 5</u> Page <u>35</u> of <u>41</u>		
Event Description:		Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.		
Time	Position	Applicant's Actions or Behavior		
	RO	Establish Instrument Air to CV. <u>IF</u> Compressor Not Running, <u>THEN</u> Start Compressor.		
	BOP	Offsite Power Available to Charging Pumps (NO)		
	BOP	<u>IF</u> Adequate diesel capacity not available to run charging pumps <u>THEN</u> shed non-essential loads using Supplement F.		
	RO	At Least One Charging Pump Running (YES)		
	RO	Establish Charging Flow as Necessary		
8	RO	CV Spray Pumps Running (NO)		
	RO	RCS Subcooling Greater Than 35°F [55°F] (NO)		
	RO	Continuous Action Step WHEN Below 10 <sup>-10</sup> Amps, THEN Energize Source Range detectors and monitor recorder.		
	RO	RCS Pressure Greater Than 275 PSIG [400 PSIG] (YES)		
	RO	RCS Pressure Stable or Rising (NO) May be answered as YES depending on PATH-1 timing. Steps annotated with a "@" are listed if answered YES.		
	RO	@Stop RHR Pumps		

Event Description:		Scenario #       1       Event #       4 and 5       Page       36       of       41         Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.	
Time	Position	Applicant's Actions or Behavior	
	RO	@ Continuous Action Step @If RCS Pressure lowers below 275PSIG [400 PSIG], THEN Restar RHR Pumps	
α.	BOP	Any S/G with Uncontrolled Depressurization in Progress (NO)	
	RO	RCS Pressure Rising (NO)	
	BOP	E-1 AND E-2 Energized by Offsite Power (NO)	
	BOP	Attempt to restore offsite power to E-1 AND E-2	
	BOP	Restart Battery Chargers within 30 min of power loss using OP-601.	
0 V	BOP	Verify EDGs Properly Loaded (YES)	
1	BOP	Verify Emergency Oil Pump Running (YES)	
	BOP	Locally verify Air Side Seal Oil Backup Pump running. (YES)	
	BOP	IF Diesel Capacity is not adequate to run Instr Air Compressors AND Battery Chargers, <u>THEN</u> shed non-essential loads using Supplement F.	
	BOP	Locally Load Instr Air Compressors AND Battery Chargers	
	BOP	E-1 <u>OR</u> E-2 Energized by Offsite Power (NO)	
	RO	Supplement D components capable of Recirc (YES)	

Op Test No.:	_1	Scenario # _1Event #4 and 5Page37 of41
Event Descrip	otion:	Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.
Time	Position	Applicant's Actions or Behavior
	RO	Aux. Building Radiation Normal (YES)
	RO	RCS Pressure Greater Than 275 PSIG [400 PSIG] (YES)
	RO	Obtain RCS Boron, Activity, AND Hydrogen Samples
	CREW	Exit PATH-1 to EPP-8
		AOP-018, Reactor Coolant Pump Abnormal Conditions
	RO/BOP	Make PA announcement for procedure entry
	RO/BOP	Evaluate plant conditions AND Go to the appropriate section for RCP malfunction not yet addressed: Section C, Loss of Seal Injection.
	RO/BOP	Check APP-001-D1, RCP THERM BAR COOL WTR LO FLOW alarm – ILLUMINATED (YES)
		Check elapsed time since all RCP Seal Cooling was lost – GREATER THAN 15 MINUTES (NO)
	RO/BOP	<ul> <li>If RCP Seal Cooling is NOT or can NOT be restored in less than 15 minutes, THEN Go To Step 3.</li> </ul>
		Go To Step 10

Op Test No	o.: <u>1</u>	Scenario # <u>1</u> Event # <u>4 and 5</u> Page <u>38</u> of <u>41</u>							
Event Desc		Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Loss of Startup Transformer upon Generator Lockout.							
Time	Position	Applicant's Actions or Behavior							
		Establish Thermal Barrier Cooling as follows:							
		a. Verify the following component alignment:							
		1. At least ONE CCW Pump – RUNNING (YES)							
		2. CC-716A, CCW TO RCP ISO – OPEN (YES)							
	RO/BOP	3. CC-716B, CCW TO RCP ISO – OPEN (YES)							
		4. FCV-626, THERM BARRIER OUTLET – OPEN (YES)							
		5. CC-735, THERM BARRIER OUTLET – OPEN (YES)							
		b. Check at least One Charging Pump – RUNNING (NO)							
		Observe the NOTE prior to Step 11 and Go To Step 11							
		Determine if a charging pump can be started:							
	RO/BOP	<ul> <li>a. Check Charging system piping – RUPTURED (NO)</li> <li>Go To Step 12</li> </ul>							
	RO/BOP	Check SI – INITIATED (YES)							
	RO/BOP	Reset SI							
	RO/BOP	Verify at least ONE Charging Pump - RUNNING							
	RO/BOP	Check Seal Injection to RCPs: • ANY seal injection flow – LESS THAN 6 GPM AND • ANY thermal barrier Delta P – LESS THAN 5 inches							
	RO/BOP	Check seal injection - ALIGNED							
	RO/BOP	Adjust any OR all of the following to restore seal injection flow <ul> <li>HIC-121, CHARGING FLOW</li> <li>Charging Pump Speed</li> <li>CVC-297A, B, C</li> </ul>							
Report Interaction									

Event Description: Seismic event that causes RCS leakage to rise to 1000 GPM over 10 minutes, Lo Startup Transformer upon Generator Lockout.		of <u>41</u>	) of	3	Page	4 and 5	Event #		Scenario #	1	Op Test No.:
	iss of	ninutes, Lo	0 min	over	000 GPM (	akage to rise to ator Lockout.	uses RCS I ipon Gener	it that ca sformer u	Seismic ever Startup Trans	on:	Event Descriptio
Time Position Applicant's Actions or Behavior				•	or Behavio	plicant's Action	A			Position	Time

RO/BOP	Check Seal Injection to RCPs: • ANY seal injection flow – LESS THAN 6 GPM (NO) AND • ANY thermal barrier Delta P – LESS THAN 5 inches (NO) • Go To Step 47
RO/BOP	Establish Charging flow on FI-122A, CHARGING LINE FLOW – GREATER THAN 35 GPM (YES)
RO/BOP	Check Normal Letdown – IN SERVICE (NO) If desired, THEN restore normal letdown using Attachment 4, Restoration of Normal letdown
RO/BOP	Control Charging and Letdown flow to maintain Pressurizer level as follows: • Within +/- 5% of reference level OR • PZR level between 30% and 40% with RCP C stopped.
RO/BOP	Establish normal seal injection a. Check RCP seal injection – ALIGNED (YES) b. Check RCP seal injection flow – BETWEEN 8 GPM AND 13 GPM
RO/BOP	Check seal injection flow – ESTABLISHED TO ALL RCPs (YES)
SRO	Implement the EALs
SRO	Refer to Technical Specification for ant applicable LCOs. • 3.4.13 – RCS Operational Leakage • 3.4.17 – CVCS • 3.4.9 – PZR Level • 3.4.4, 3.4.5, & 3.4.6 – RCS Loops
RO/BOP	Check RCP Seal Cooling ISOLATED (NO) <ul> <li>Observe the NOTE prior to Step 2 and go to the Main Body, Step 2 of this procedure.</li> </ul>

Appendix	D		Oper	ator Actio	n			Form ES-D-2
Op Test No.	: _1	Scenario #		Event #	4 and 5	Page	<u>40</u> of	41
Event Descr	iption:	Seismic even Startup Trans			akage to rise to tor Lockout.	1000 GPM o	over 10 mi	nutes, Loss of
Time	Positio	n		Ap	olicant's Actions	or Behavior	. <u> </u>	and the second

RO/BOP	Evaluate plant conditions AND Go to the appropriate section for RCP malfunction not yet addressed: None
	Return to procedure and step in affect.

The Chief Examiner may terminate the scenario anytime after the transition to EPP-8 has been made or at his discretion.

### ILC-11-2 NRC SCENARIO 1 TURNOVER SHEET

POWER LEVEL:	100% RTP
Core Burnup:	15697 MWD/MTU
EFPD:	448 EFPD
Boron:	95 PPM
Xenon:	EQ Xenon
Tavg:	575.9°F
Bank D Rods	218 Steps

### **EQUIPMENT UNDER CLEARANCE:**

• "A" MDAFW Pump OOS and Breaker Racked Out

### **EQUIPMENT STATUS:**

- Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.
- Switchyard access is RESTRICTED.

### **INSTRUCTIONS FOR THE WATCH:**

• Maintain current power level

## **Unit 2 Status Board**

	Date:	Today	Time:	6:00:00 A	M Cycle:	27	MWD/MT:	15697	Design:	16590
1.1.1	EFPD	448	Design	473.5			N.46			
нит	Level %		Otatura			Tank	Level %		Status	
CVCS-A	20	Cillin .	Status		-	Monitor A	10		Standby	1
CVCS-A	10	Filling Standby				Monitor B	38		Standby	1
CVCS-C	86	Standby			- 65	WCT A	37		Standby	
WHUT	#NAME?	Filling				WCT B	7		Standby	
W1101	HINAUVIE I	Fining				WCT C	9		Standby	
	Data Linked t	n Pl				WCT D	10		Standby	
WGDTS	Pressure	PSIG	<u>Sta</u>	tus	-	WCTE	9		Standby	
A	#NAME?	PSIG	On cover		-					
		-			-	J	C	EMINERALIZ	ERS	Desir
B	#NAME?	PSIG	In Service		8 L. I.		PPM	In Service	Date	Resin Replaced
С	#NAME?	PSIG	Isolated			MB A	2194	YES	7/17/2010	5/4/2010
D	#NAME?	PSIG	Standby			MB B	2265	NO	7/17/2010	3/29/2010
						CATION	1021	NO	9/17/2010	12/9/2009
Shu	tdown Requi	rement	Temp	Boron		DEB A	0	NO	New	2/3/2010
	1.77% =∆K		547 F Hot	258	1900	DEB B	0	NO	3/28/2010	+
	1.77% =∆K	κ	<u>&gt;</u> 350 F	611	2000	SFP	1963	NO	9/23/2008	4/22/2008
	2.6% =∆K/	ĸ	100 F Cold	776						
	6% =∆K/K		N/A	1950		1. 2 3 1. 1.			SGBD	
		100			Co	ondenser Air Inle	akage	Target	/alue GPM	Status
		/ Settings			A	13	CFM	A	50	Flash Tanl
Setti	ng Date	POT	GP-3 Psig	1221	в	0	CFM	В	50	With Heat
A	7/18/2010	3.21	1000	and services	Known	8	CFM	C	50	Recovery
B	7/18/2010	3.12	1040		Total	5	CFM	N2 Flow	8	SCFM
c	7/18/2010	3.44	1000							
-							diation Moni	tor Setpoints		
RCS I	Leakage	0.00	Unidentified	144.5.19	Rad	Current	Alert V	alue 200X	NUE Value	Contract to the second
				18 A. M.	Monitor	Setpoint			2X	
Total	-	0.03	GPM		R-14C	1.01E+04		N/A	2.020E+04	
PRT		0.02	GPM		R-20	7.40E+03		N/A	1.480E+04	-
RCDT Leal		0.01	GPM		R-18	1.00E+06	2.00	0E+08	2.000E+06	
	kage	0.01							2.100E+04	
		0	GPM			1 05E+04	2 10		12. IUUETU4	
Charging L	.eakoff	-	GPM		R-19A	1.05E+04	2.10			- (
Charging L Misc Identi	.eakoff ified	0 0	GPM GPM		R-19A R-19B	9.72E+03	1.94	4E+06	1.944E+04	
Charging L Misc Identi Primary/Se	.eakoff ified econdary	0 0 0	GPM GPM GPD		R-19A R-19B R-19C	9.72E+03 9.58E+03	1.94 1.91	4E+06 6E+06	1.944E+04 1.916E+04	•
Charging L Misc Identi Primary/Se	.eakoff ified econdary	0 0	GPM GPM		R-19A R-19B	9.72E+03 9.58E+03 8.53E+03	1.94 1.91 1.70	4E+06 6E+06 6E+06	1.944E+04 1.916E+04 1.706E+04	
Charging L Misc Identi Primary/Se	Leakoff ified econdary / Loss	0 0 0	GPM GPM GPD GPM		R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu	1.94 1.91 1.70 nally Entered I	4E+06 6E+06 6E+06 Data	1.944E+04 1.916E+04 1.706E+04 Linked to C	Contraction of the local division of the loc
Charging L Misc Identi Primary/Se	Leakoff ified econdary / Loss	0 0 17.3	GPM GPM GPD GPM		R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM	1.94 1.91 1.70 nally Entered I Date	4E+06 6E+06 6E+06 Data PPM	1.944E+04 1.916E+04 1.706E+04	hem data bas PPM
Charging L Misc Identi Primary/Se Secondary	Leakoff ified condary Loss Hi Flux A	0 0 17.3	GPM GPM GPD GPM		R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS	1.94 1.91 1.70 ally Entered I Date Today	4E+06 6E+06 0ata PPM 95	1.944E+04 1.916E+04 1.706E+04 Linked to C Date	PPM
Charging L Misc Identi Primary/Se Secondary	eakoff ified condary Loss Hi Flux A Previous A	0 0 17.3	GPM GPD GPM GPM		R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A	1.94 1.91 1.70 sally Entered I Date Today 9/16/2010	4E+06 6E+06 Data PPM 95 21,535	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME?	PPM #NAME?
Charging L Misc Identi Primary/Se Secondary	eakoff ified condary Loss Hi Flux A Previous A 50	0 0 17.3	GPM GPD GPD GPM Setpoint 150		R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-A BAST-B	1.94 1.91 1.70 Pally Entered I Date Today 9/16/2010 9/16/2010	4E+06 6E+06 Data PPM 95 21,535 21,032	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME?	PPM #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary	eakoff ified condary Loss Hi Flux A Previous A 50 60	0 0 17.3	GPM GPD GPD GPM Setpoint 150 180		R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-A BAST-B SFP	1.94 1.91 1.70 sally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME?
Charging L Misc Ident Primary/Se Secondary NI-31	eakoff ified condary Loss Hi Flux A Previous A 50 60	0 0 17.3 At Shutdown	GPM GPD GPD GPM Setpoint 150 180	% BAND	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-A BAST-B SFP RWST	1.94 1.91 1.70 Pally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME?
Charging L Misc Ident Primary/Se Secondary NI-31 NI-31 NI-32	eakoff ified condary Loss Hi Flux A Previous A 50 60	0 0 17.3 At Shutdown RI Counts	GPM GPD GPD GPM Setpoint 150 180	% BAND 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-A BAST-B SFP RWST Accum-A	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary NI-31 NI-32 NI-32	eakoff ified condary Loss Hi Flux A Previous A 50 60 UPPER	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER	GPM GPD GPD GPM Setpoint 150 180 rents TARGET	+	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-A BAST-B SFP RWST Accum-A Accum-B	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary VI-31 VI-32 VI-32 VI-41 VI-42	eakoff ified condary Loss Hi Flux A Previous A 50 60 UPPER 144	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER 136	GPM GPD GPD GPM Setpoint 150 180 rents TARGET 0.0212 0.0212	5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206 2230	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary VI-31 VI-32 VI-32 VI-41 VI-42 V-43	Leakoff ified econdary Loss Hi Flux / Previous Al 50 60 UPPER 144 126	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER 136 125	GPM GPD GPD GPM Setpoint 150 180 rents TARGET 0.0212	5 +/- 5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary VI-31 VI-32 VI-32 VI-41 VI-42 V-43 V-44	Leakoff ified econdary Loss Hi Flux A Previous A 50 60 UPPER 144 126 121	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER 136 125 113 108	GPM GPD GPD GPM Setpoint 150 180 Tents TARGET 0.0212 0.0212 0.0212	5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206 2230	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary VI-31 VI-32 VI-32 VI-41 VI-42 V-43 V-44	eakoff ified condary Loss Hi Flux A Previous A 50 60 UPPER 144 126 121 112	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER 136 125 113 108	GPM GPD GPD GPM Setpoint 150 180 Tents TARGET 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206 2230	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary VI-31 VI-32 VI-32 VI-41 VI-32 VI-41 VI-42 VI-43 VI-44	eakoff ified condary Loss Hi Flux A Previous A 50 60 UPPER 144 126 121 112 AX Rev# 2.1.	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER 136 125 113 108	GPM GPD GPD GPM Setpoint 150 180 Tents TARGET 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206 2230	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Charging I Misc Identi Primary/Se Secondary NI-31 NI-32 N-41 N-42 N-43 N-44 POWERTR FA	eakoff ified condary Loss Hi Flux A Previous A 50 60 UPPER 144 126 121 112 AX Rev# 2.1.	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER 136 125 113 108 0 RNP	GPM GPD GPD GPM Setpoint 150 180 TARGET 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 8/30/2010 8/30/2010 8/30/2010	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206 2230	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary NI-31 NI-32 NI-32 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-32 NI-41 NI-42 NI-43 NI-43 NI-43 NI-43 NI-43 NI-44 NI-42 NI-43 NI-43 NI-44 NI NI-44 NI NI-44 NI NI-44 NI NI-44 NI NI-44 NI NI-44 NI NI NI-44 NI NI NI NI NI NI NI NI NI NI NI NI NI	eakoff ified condary Loss Hi Flux / Previous Al 50 60 UPPER 144 126 121 112 AX Rev# 2.1.	0 0 17.3 At Shutdown RI Counts Normal Curr LOWER 136 125 113 108 0 RNP Test/Hrs	GPM GPD GPD GPM Setpoint 150 180 TARGET 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010 Notes/Add	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206 2230 2221	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Charging L Misc Identi Primary/Se Secondary NI-31 NI-32 N-41 NI-32 N-41 N-42 N-43 N-44 POWERTR FA HVE HVE HVE	eakoff ified condary Loss Hi Flux A Previous A 50 60 UPPER 144 126 121 144 126 121 14X Rev# 2.1. NS -1A/B	0 0 17.3 At Shutdown RI Counts Normal Curri LOWER 136 125 113 108 0 RNP Test/Hrs 35640.6	GPM GPD GPD GPM Setpoint 150 180 TARGET 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/- 5 +/-	R-19A R-19B R-19C	9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	1.94 1.91 1.70 rally Entered I Date Today 9/16/2010 9/16/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010 Notes/Add	4E+06 6E+06 Data PPM 95 21,535 21,032 2246 2219 2211 2206 2230 2221	1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?

### ILC-11-2 NRC SCENARIO 1 TURNOVER SHEET

POWER LEVEL:	100% RTP
Core Burnup:	15697 MWD/MTU
EFPD:	448 EFPD
Boron:	95 PPM
Xenon:	EQ Xenon
Tavg:	575.9°F
Bank D Rods	218 Steps

### **EQUIPMENT UNDER CLEARANCE:**

• "A" MDAFW Pump OOS and Breaker Racked Out

#### **EQUIPMENT STATUS:**

- Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.
- Switchyard access is RESTRICTED.

### **INSTRUCTIONS FOR THE WATCH:**

Maintain current power level

# **Unit 2 Status Board**

	Date:	Today	Time:	10.00.05						
	EFPD	448	Design	473.5	AM Cycle:	27	MWD/M	T: 15697	Design:	16590
HUT	11					Tank	Level %		Statu	IC.
CVCS-A	Level %	Cillin .	Status			Monitor A	10	_	Stand	
CVCS-B	10	Filling Standby				Monitor B	38		Stand	
CVCS-C	86	Standby			_	WCT A	37		Stand	by
WHUT	#NAME?				_	WCT B	7		Stand	
		285. D. (b. )				WCT C WCT D	9		Stand	-
	Data Linked	to Pl				WCTE	10 9		Stand	
WGDTS	Pressure	PSIG	S	itatus			9		Standl	by
Α	#NAME?	PSIG	On cover					DEMINERAL	IZEDE	
В	#NAME?	PSIG	In Service				РРМ	In Service		Resin
c	#NAME?	PSIG	Isolated			MB A	2194	YES	7/17/2010	Replaced
D	#NAME?	PSIG	Standby			MB B	2265	NO	7/17/2010	5/4/2010
	15. Sale=da					CATION	1021	NO	9/17/2010	3/29/2010
	down Requ		Temp	Boron		DEB A	0	NO	New	2/3/2009
	1.77% =△K		547 F Hot	258	-	DEB B	0	NO	3/28/2010	21312010
	1.77% =∆K 2.6% =∆K		≥350 F	611		SFP	1963	NO	9/23/2008	4/22/2008
	2.8% =∆K/		100 F Cold	776						
	0/0 - AN	178010 C 7 041 7	N/A	1950		a a cal	A SURALES	8	SGBD	
	POP	V Settings				ondenser Air Ini	eakage	Targe	t Value GPM	Status
Settin	g Date	POT		1.	Α	13	CFM	A	50	Flash Ta
A	7/18/2010	3.21	GP-3 Psig 1000		В	0	CFM	В	50	With Hea
в		10.21	11000		Known	8				_
	7/18/2010	3.12					CFM	С	50	Recover
с	7/18/2010	3.12 3.44	1040		Total	5	CFM	C N2 Flow	8	Recover SCFM
			1040	]		5	CFM	N2 Flow	8	
	7/18/2010		1040		Total Rad	5 Effluent Ra Current	CFM adiation Moni	N2 Flow	8 s NUE Value	
С	7/18/2010	3.44	1040 1000	a	Total Rad Monitor	5 Effluent Ra Current Setpoint	CFM adiation Moni Alert V	N2 Flow tor Setpoint alue 200X	8 S NUE Value 2X	
C RCS L	7/18/2010	3.44 0.00	1040 1000 Unidentifie		Total Rad Monitor R-14C	5 Effluent Ra Current Setpoint 1.01E+04	CFM adiation Moni Alert V	N2 Flow tor Setpoint alue 200X	8 s NUE Value 2X 2.020E+04	
C RCS Le Total	7/18/2010 eakage	3.44 0.00 0.03	1040 1000 Unidentifie GPM	a 	Total Rad Monitor R-14C R-20	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03	CFM adiation Moni Alert V	N2 Flow tor Setpoint alue 200X N/A V/A	8 NUE Value 2X 2.020E+04 1.480E+04	
C RCS Lo Total PRT	7/18/2010 eakage age	3.44 0.00 0.03 0.02	1040 1000 Unidentifie GPM GPM GPM		Total Rad Monitor R-14C R-20 R-18	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06	CFM adiation Moni Alert V	N2 Flow tor Setpoint alue 200X N/A N/A 0E+08	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06	
C RCS Le Total PRT RCDT Leaka	7/18/2010 eakage age eakoff	3.44 0.00 0.03 0.02 0.01	1040 1000 Unidentifie GPM GPM GPM GPM	d 	Total Rad Monitor R-14C R-20 R-18 R-19A	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04	CFM adiation Moni Alert V 1 2.00 2.10	N2 Flow tor Setpoint alue 200X N/A V/A 0E+08 0E+06	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04	
C RCS Lo Total PRT RCDT Leaka Charging Le	7/18/2010 eakage age eakoff ied	3.44 0.00 0.03 0.02 0.01 0	1040 1000 Unidentifie GPM GPM GPM GPM GPM		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03	CFM adiation Moni Alert V 1 2.00 2.10 1.94	N2 Flow tor Setpoint alue 200X N/A N/A 0E+08 0E+06 4E+06	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04	
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi	7/18/2010 eakage age eakoff ied ondary	3.44 0.00 0.03 0.02 0.01 0 0	1040 1000 GPM GPM GPM GPM GPM GPM GPM GPD		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03	CFM adiation Moni Alert V 1 2.00 2.10 1.94 1.91	N2 Flow tor Setpoint alue 200X N/A OE+08 OE+06 4E+06 6E+06	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04	
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec	7/18/2010 eakage age eakoff ied ondary .oss	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3	1040 1000 GPM GPM GPM GPM GPM GPM GPD GPM		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03	CFM adiation Moni Alert V 2.00 2.10 1.94 1.91 1.70	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04	SCFM
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr	1040 1000 Unidentifie GPM GPM GPM GPM GPM GPD GPM		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 Manu	CFM adiation Moni Alert V 2.00 2.10 1.94 1.91 1.70 nally Entered D	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 02ta	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C	SCFM
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A Previous AF	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr	1040 1000 GPM GPM GPM GPM GPM GPM GPD GPM Setpoint		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03	CFM adiation Moni Alert V 1 2.00 2.10 1.94 1.91 1.700 ally Entered D Date	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 02ta PPM	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04	SCFM
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L	7/18/2010 eakage age aakoff ied ondary .oss Hi Flux A Previous AF 50	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr	1040         1000         Unidentifie         GPM         GPM         GPM         GPM         GPM         GPM         GPM         Setpoint         150		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 8.53E+03 Manu Boron PPM RCS BAST-A	CFM adiation Moni Alert V 2.00 2.10 1.94 1.91 1.700 ally Entered D Date Today	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 02ta	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C	SCFM
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A Previous AF	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr	1040 1000 GPM GPM GPM GPM GPM GPM GPD GPM Setpoint		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B	CFM Adiation Moni Alert V 2.00 2.10 2.10 1.94 1.91 1.70 ally Entered D Date Today 9/16/2010	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 0ata PPM 95	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C Date	SCFM
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A Previous AF 50	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr RI Counts	1040         1000         Unidentifie         GPM         GPM         GPM         GPM         GPM         GPM         GPM         Setpoint         150         180		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP	CFM adiation Moni Alert V 2.00 2.10 1.94 1.91 1.70 ally Entered D Date Today 9/16/2010 9/15/2010	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 6E+06 0ata PPM 95 21,535	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME?	SCFM hem data bas PPM #NAME?
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L § Secondary L	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A Previous AF 50 50	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr RI Counts	1040 1000 GPM GPM GPM GPM GPM GPD GPD GPD Setpoint 150 180		Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST	CFM adiation Moni Alert V 2.00 2.10 2.10 1.94 1.91 1.70 ally Entered D Date Today 9/16/2010 9/15/2010 9/16/2010	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 6E+06 0ata PPM 95 21,535 21,032 2246 2219	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME?	SCFM hem data bas PPM #NAME? #NAME?
C RCS Le Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L Secondary L I NI-31 5 NI-32 6	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A Previous AF 50 50 N JPPER	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr RI Counts formal Currents	1040 1000 GPM GPM GPM GPM GPM GPD GPD GPM Setpoint 150 180 TARGET	% BAND	Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A	CFM Adiation Moni Alert V 2.00 2.10 1.94 1.91 1.70 ally Entered E Date Today 9/16/2010 9/16/2010 9/16/2010 8/30/2010	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 6E+06 0ata PPM 95 21,535 21,032 2246 2219 2211	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME?	SCFM hem data bas PPM #NAME? #NAME? #NAME?
C RCS Le Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L NI-31 5 NI-32 6 NI-32 6	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A Previous AF 50 50 N JPPER 44	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr RI Counts formal Current LOWER 136	1040         1000         Unidentifie         GPM         GPM         GPM         GPM         GPM         GPM         GPM         Setpoint         150         180         TARGET         0.0212	% BAND 5 +/-	Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B	CFM Adiation Moni Alert V 2.00 2.10 2.10 1.94 1.91 1.70 ally Entered D Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 6E+06 0ata PPM 95 21,535 21,032 2246 2219 2211 2206	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	SCFM hem data bas PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L Secondary L I-31 5 NI-32 6 L L L-41 1 I-42 1	7/18/2010 eakage age eakoff ied ondary .oss Hi Flux A Previous AF 50 50 50 N JPPER 44 26	3.44 0.00 0.03 0.02 0.01 0 0 0 17.3 t Shutdowr RI Counts formal Current	1040         1000         Unidentifie         GPM         TARGET         0.0212	% BAND 5 +/- 5 +/-	Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C R-37	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C	CFM Adiation Moni Alert V Alert V 2.00 2.10 1.94 1.91 1.70 ally Entered E Date Today 9/16/2010 9/16/2010 9/16/2010 8/30/2010 8/30/2010	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 0ata PPM 95 21,535 21,032 2246 2219 2211 2206 2230	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME?	SCFM hem data bas PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
C RCS Lo Total PRT RCDT Leaka Charging Le Misc Identifi Primary/Sec Secondary L Secondary L I-31 5 NI-32 6 L L L-41 1 I-42 1 I-43 1	7/18/2010 eakage age aakoff ied ondary .oss Hi Flux A Previous AF 50 50 50 50 N PPPER 44 26 21 12	3.44 0.00 0.03 0.02 0.01 0 0 17.3 t Shutdowr RI Counts cormal Currents Counts 136 125 113 108	1040           1000           Unidentifie           GPM           Iso           Iso	% BAND 5 +/- 5 +/- 5 +/-	Total Rad Monitor R-14C R-20 R-18 R-19A R-19B R-19C R-37	5 Effluent Ra Current Setpoint 1.01E+04 7.40E+03 1.00E+06 1.05E+04 9.72E+03 9.58E+03 8.53E+03 8.53E+03 Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR	CFM Adiation Moni Alert V Alert V 2.00 2.10 1.94 1.91 1.70 ally Entered E Date Today 9/16/2010 9/16/2010 9/16/2010 8/30/2010 8/30/2010	N2 Flow tor Setpoint alue 200X N/A 0E+08 0E+06 4E+06 6E+06 6E+06 6E+06 21,535 21,032 2246 2219 2211 2206	8 NUE Value 2X 2.020E+04 1.480E+04 2.000E+06 2.100E+04 1.944E+04 1.916E+04 1.706E+04 Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	SCFM hem data bas PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
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Scenario Outline

Facility	: H	B ROBINSON	Scenario No.: 2 Op Test No.:			
Examin	iers:		Operators: SRO -			
			RO -			
			BOP -			
Initial C	onditions:	<ul> <li>"A" MDAFW</li> </ul>	OL, 9000 MWD/MTU, 775.5 ppm Boron pump inoperable with the breaker racked out understorm watch is in effect for Darlington and Chesterfield			
<ul> <li>Plant is at 75% power following maintenance on "A" HDP. Operations</li> <li>Management and RES have reported unusually high vibrations on "A" MFP and recommend a power reduction be performed and "A" MFP secured as soon as possible.</li> </ul>						
Critical <sup>-</sup>	Tasks:	<ul> <li>Isolation of "</li> <li>Tripping "C"</li> </ul>	C" S/G RCP within 5 minutes of Reactor Trip			
Event No.	Malf. No.	Event Type*	Event Description			
1		(C) BOP, SRO (TS) SRO	Service Water Pump "D" trips			
2	· · · · · · · · · · · · · · · · · · ·	(N) BOP, SRO (R) RO	"A" MFP Vibrations / Reduce Power			
3		(C) RO, SRO	Control Bank "D" Rods unwarranted rod motion			
4		(C) BOP, SRO	Feedwater Reg. Valve FCV-478 slowly drifts open			
5		(I) RO, SRO (TS) SRO	Pressurizer Level Transmitter LT-459 fails LOW			
6		(N) BOP, SRO	Restore normal letdown			
7		(C) RO, SRO	RCP "C" High Vibrations			
8 ×		(M) ALL	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip			
9	·····- <u>-</u> ·····		"C" S/G PORV fails OPEN / Tube Rupture size rises			
		(C) RO	RHR Pumps "A" and "B" fail to auto-start			
		(C) BOP	FW Isolation Valve V2-6C fails to close on SI Signal			
		(C) RO	<b>Conditional:</b> Seal Failure on "C" RCP if "C" RCP not secure within 5 min. of reaching 20 mils vibration on "C" RCP.			
* (N	i)ormal,	(R)eactivity, (I)n	strument, (C)omponent, (M)ajor			

### ILC-11-2 NRC SCENARIO 2 SUMMARY DESCRIPTION

The crew will assume the watch with the unit being maintained at 75% RTP following the completion of maintenance on "A" Heater Drain Pump. The control room has received a report from the Operations Manager that the RES system engineer has reported that vibrations on "A" MFP have become abnormally high. RES recommends that "A" MFP be secured within the next hour. MDAFW Pump "A" is out of service for scheduled lube oil cooler replacement. The motor breaker has been racked out and the pump has been isolated and cleared for maintenance. Shift instructions are to maintain current power level while RES is monitoring performance of "A" Heater Drain Pump following maintenance.

On cue from the Chief Examiner, "D" Service Water Pump will trip. Various alarms will be received on APP-002 and APP-008. APP-008-F4, SW PMP A/B/C/D OVLD, will direct the operator to start a Standby Pump and verify 40 to 50 psig in the SW Headers. The SRO will direct entry into ITS LCO 3.7.7, Condition A, which requires that the train of SW be restored to Operable status within 72 hours. Once the Chief Examiner is satisfied with the ITS compliance he may cue the next event.

Once the crew has lowered power by at least 5% a malfunction will be inserted such that when "D" Bank Control Rods are moved, either in Auto or Manual, they will continue to insert until the immediate actions of AOP-001, Malfunction of Reactor Control System, are completed. The crew will perform the necessary actions in AOP-001.

On cue from the Chief Examiner, Feedwater Regulating Valve FCV-478 will slowly drift open. The crew will perform the immediate actions for the Main Feedwater malfunction IAW AOP-010, Main Feedwater / Condensate Malfunction. The operator will take manual control of FCV-478 and restore "A" S/G to its programmed level band. The crew will contact maintenance to begin troubleshooting and repair efforts while continuing to operate the plant with one FRV in manual. Once the Chief Examiner is satisfied with the actions of the crew and stability of the plant, he can cue the next event.

On cue from the Chief Examiner, Pressurizer Level Transmitter, LT-459 fails LOW causing normal letdown to isolate, de-energizing of pressurizer control group heaters and charging pump speed to rise for the pump in Auto. The crew will select the alternate channel for control and implement OWP-030, Section PLT-1, and remove LT-459 from service. ITS Table 3.3.1-1 Item 8, Pressurizer Water Level – High, Condition M requires that the channel be placed in trip within 6 hours or reduce thermal power to less than P-7 within 12 hours. Once the level transmitter has been removed from service and the Chief Examiner is satisfied with the Tech Specs compliance and plant restoration, the Chief Examiner will cue the next event.

On cue from the Chief Examiner, "C" RCP will begin experiencing high vibrations. The crew will enter AOP-018, Reactor Coolant Pump Abnormal Conditions, and determine that, based on current vibration levels, that a reactor trip is warranted. The crew will initiate a reactor trip, trip "C" RCP and then continue in PATH-1. A 500 gpm tube rupture in "C" S/G will be ramped in over 1 minute when "C" RCP is secured. The crew should identify the 500 gpm tube rupture and initiate safety injection while performing the immediate actions of PATH-1. Neither RHR Pump "A" nor "B" will auto-start on the safety injection signal. The operator will manually start

both pumps once identified. Also, FW Isolation Valve V2-6C will fail to close on the safety injection signal and must be manually closed by the operator.

If the operator fails to trip "C" RCP within 5 minutes of reaching 20 mils vibration on "C" RCP a seal failure will occur on "C" RCP. The crew will enter AOP-018, Reactor Coolant Pump Abnormal Conditions, and perform Section A, Reactor Coolant Pump Seal Failure.

Approximately 2 minutes after initiation of safety injection the "C" S/G Steam Line PORV will fail OPEN and the tube rupture will rise to 775 gpm over a 1 minute time period.

The crew will continue in PATH-1, performing the actions of Foldout A to isolate auxiliary feedwater flowpaths to "C" S/G and begin performing Supplement G, Steam Generator Isolation, for "C" S/G. EPP-11, Faulted Steam Generator Isolation, will be transitioned to from PATH-1. EPP-11 will direct the crew to transition to PATH-2, Entry Point J.

PATH-2 will verify the isolation of "C" S/G and perform rapid cooldown of the RCS to lower the RCS pressure to a point that will stop the primary to secondary leakage. After the cooldown is secured it will be determined that the ruptured S/G pressure is continuing to lower and RCS subcooling cannot be maintained with the ruptured / faulted S/G. PATH-2 will direct the crew to transition to EPP-17, SGTR with Loss of Reactor Coolant: Subcooled Recovery. EPP-17 will provide guidance to continue with RCS cooldown along with SI flow reduction, eventually leading up to placing the plant in a cold shutdown condition.

The Chief Examiner may terminate the scenario when the crew has made the determination that EPP-17, SGTR with Loss of Reactor Coolant: Subcooled Recovery, is the appropriate mitigation strategy, or at his discretion.

### ILC-11-2 NRC SCENARIO 2 SIMULATOR SETUP

### IC/SETUP:

- IC-802, SCN:008\_11\_2\_NRC\_Exam\_2
- "A" MDAFW Pump inoperable with the breaker racked out
- Status board updated to reflect IC-42.
- Switchyard access is RESTRICTED.

### PRE-LOADED EVENTS:

The following event should occur when "C" RCP is secured:

Event 8: "C" S/G Tube Rupture (500 gpm) RHR Pumps "A" and "B" fail to auto-start on SI Signal FW Isolation Valve V2-6C fails to close on SI Signal

### **EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: Service Water Pump "D" trips
- Event 2: "A" MFP Vibrations / Reduce Power
- Event 3: Control Bank "D" Rods unwarranted rod motion
- Event 4: Feedwater Reg. Valve FCV-478 slowly drifts OPEN
- Event 5: Pressurizer Level Transmitter LT-459 fails LOW
- Event 6: Restore normal letdown
- Event 7: RCP "C" High Vibrations

Event 9: "C" S/G Steam Line PORV fails OPEN and Tube Rupture size rises (775 gpm) Conditional: Seal Failure on "C" RCP if "C" RCP not secure within 5 min. of reaching 20 mils vibration on "C" RCP.

### EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:

- APP-008-F4
- OP-105
- AOP-001
- AOP-010
- AOP-025 Main Body and Section B
- OWP-030, PLT-1
- AOP-018
- PATH-1
- Foldout A
- Supplement G
- EPP-11
- PATH-2
- Foldout C
- EPP-17

Appendix [	2		Ope	erator Actio	rator Action			Form ES-D-2			
Op Test No.:	1	Scenario #	2	Event #	1	Page	5	of	47		
Event Descrip		SW Pump "D			<u>-</u>	1 age	<u> </u>	. 01			
Time	Position			Ар	plicant's	Actions or Behavior					

<b>BOOTH OPERATOR</b>	R: When directed, insert Event 1, SW Pump "D" Trips
EVENT INDICATION	IS:
APP-008-F4, SW PN	/P A/B/C/D OVLD 8, D8 HVH-1, 2, 3, 4 WTR OUTLET LO FLOW
Service Water Pum	p "D" has dual indication on the RTGB
BOP	Receives annunciator APP-008-F4, SW PMP A/B/C/D OVLD and
DOF	Identifies that SW Pump "D" has tripped.
ВОР	If an operating SW Pump has tripped, THEN PERFORM the following: Start a Standby Pump.
BOP	If an operating SW Pump has tripped, THEN PERFORM the following: Dispatch operator to check breaker and current limiter fuses for SW Pump D – 480V Bus E2 (CMP 25B)
Booth Operator:	Report that SW Pump D breaker indicates that it tripped on over- current.
BOP	If an operating SW Pump has tripped, THEN PERFORM the following: THROTTLE CCW Heat Exchanger Return Valves, as necessary, to maintain 40 to 50 psig in the SW Headers.
	Directs entry into ITS LCO:
SRO	3.7.7, Condition A, One SWS train inoperable. Restore SWS train to Operable status within 72 hours.
	3.6.6, Condition D, Two containment cooling trains inoperable. (Due to receiving the HVH-1,2,3,4 WTR OUTLET LO FLOW). Restore one containment cooling train to Operable status within 72 hours.
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Ap	pendix	D
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Op Test No		
Event Desc		Scenario # <u>2</u> Event # <u>2</u> Page <u>6</u> of <u>47</u>
Time	Position	Main Feedwater Pump A high vibrations and power reduction to secure pump.
Time	Position	Applicant's Actions or Behavior
BOOTH O	PERATOR:	Following a 5% power reduction, insert the failure of the control rods to continue to insert (dependant on whether the control rods
	SRO	are in AUTO or MANUAL) Notify the Load Dispatcher that unit load will be reduced (SOER 02-3 Large Power Transformer Reliability)
	SRO	Notify RC that higher radiation levels should be expected in the CV Pump Bays and in Pipe Alley due to normal shutdown crud bursts.
	RO	Monitor the highest operable Power Range Channel and the highest operable Intermediate Range Channel on NR-45.
	SRO/RO	IF Reactor Engineering has not provided technical guidance, THEN use the most recent OST-947 data to determine the reactivity change required.
	SRO	For each power change which is greater than or equal to 10%, UPDATE the Power Change Log in the Reactor Startups-Shutdowns- Trips book.
	RO	<ul> <li>IF additional letdown flow is desired, THEN PERFORM the following:</li> <li>Start additional Charging Pumps as necessary, IAW OP-301.</li> <li>Place additional letdown orifice in service IAW OP-301.</li> </ul>
	RO	IF a significant change in RCS Boron concentration occurs (10 ppm or more), THEN energize additional PZR heaters as needed.
	RO	<b>DETERMINE</b> the amount of Boric Acid to add to the RCS and <b>OBTAIN</b> an independent check of the volume of boric acid required.
	RO	<b>OBTAIN</b> permission from the CRS <b>OR</b> the SM to add the amount of boric acid previously determined.
		PLACE the RCS MAKEUP MODE selector switch in the BORATE

A	pper	ndix	D

Op Test No.:	_1	Scenario #	2	Event #	_2	Page	7	of	47	
Event Descrip	otion:	Main Feedwat	er Pum	o A high vibr	ations and	power reduction to	secu	re pu	imp.	
Time	Position			Ар	olicant's Ad	ctions or Behavior				

	RO	SET YIC-113, BORIC ACID TOTALIZER to the desired quantity.
	RO	IF desired, THEN PLACE FCV-113A, BORIC ACID FLOW, in MAN AND manually ADJUST controller FCV-113A, BORIC ACID FLOW, using the UP and DOWN pushbuttons.
1		
	RO	Momentarily <b>PLACE</b> the RCS MAKEUP SYSTEM switch to the START position.
	RO	<ul> <li>IF any of the below conditions occur, THEN momentarily place the RCS MAKEUP SYSTEM switch in the STOP position:</li> <li>Rod Motion is blocked or in the wrong direction</li> <li>T<sub>AVG</sub> goes up</li> <li>Boric Acid addition exceeds the desired value</li> </ul>
	RO	<ul> <li>WHEN the desired amount of Boric Acid has been added to the RCS, THEN verify the following:</li> <li>FCV-113A, BA TO BLENDER, closes.</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>IF in Auto, THEN the operating Boric Acid Pump stops.</li> <li>The RCS MAKEUP SYSTEM is OFF.</li> </ul>

Event Descri	ption:	Main Feedwater Pump A high vibrations and power reduction to secure pump.
Time	Position	Applicant's Actions or Behavior
	RO	<ul> <li>IF desired, THEN FLUSH the Boric Acid flow as follows:</li> <li>PLACE the RCS MAKEUP MODE selector switch in the ALT DILUTE position.</li> <li>SET YIC-114, PRIMARY WTR TOTALIZER to 15-20 gallons.</li> <li>PLACE FCV-114B, BLENDED MU TO VCT to the CLOSE position.</li> <li>Momentarily PLACE the RCS MAKEUP SYSTEM switch to the START position.</li> <li>IF any of the below conditions occur, THEN momentarily place the RCS MAKEUP SYSTEM switch in the STOP position: <ul> <li>Unanticipated Rod Motion</li> <li>Primary Water addition reaches the desired value.</li> </ul> </li> <li>WHEN the desired amount of Primary Water has been added to the RCS, THEN verify the following: <ul> <li>FCV-114A, PW TO BLENDER, closes.</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>IF in Auto, THEN the operating Primary Water Pump stops.</li> <li>The RCS MAKEUP SYSTEM is OFF.</li> </ul> </li> </ul>
	RO	<ul> <li>RETURN the RCS Makeup System to automatic as follows:         <ul> <li>VERIFY FCV-114A, PRIMARY WTR FLOW DILUTE MODE is in AUTO.</li> <li>PLACE FCV-114B, BLENDED MU TO VCT to the AUTO position.</li> <li>PLACE the RCS MAKEUP MODE switch in the AUTO position.</li> <li>VERIFY FCV-113A, BORIC ACID FLOW, is in AUTO.</li> <li>Momentarily PLACE the RCS MAKEUP SYSTEM switch in the START position.</li> </ul> </li> </ul>
	RO	<b>RECORD</b> , in AUTO LOG, as indicated by PRIMARY WATER TOTALIZER, YIC-114 <b>AND</b> Boric Acid TOTALIZER, YIC-113 the total amount of Primary Water <b>AND</b> Boric Acid added during the boration.
	RO	<b>MONITOR</b> parameters for the expected change in reactivity <b>AND</b> inform the CRS <b>OR</b> the SM the results of the boration.

Time	Destit	Main Feedwater Pump A high vibrations and power reduction to secure pump.
	Position	Applicant's Actions or Behavior
	BOP	<ul> <li>IF EH Turbine Control is in OPER AUTO, THEN reduce turbine load as follows:</li> <li>Place the EH Turbine Control in the desired position: IMP IN or IMP OUT (Per RNP Standing Instruction IMP OUT preferred.)</li> <li>Set the desired load in the SETTER.</li> <li>Select the desired Load Rate.</li> <li>Depress the GO pushbutton.</li> </ul>
	RO	WHEN Reactor Power is <90% as indicated on NR-45, THEN CHECK that APP-005-D6 is received. (N/A, initial reactor power at 75%)
5 <u> </u>	RO	VERIFY proper programming of the following: Tavg tracks within 5°F of Tref. PZR level tracks within 5% of reference level.
	RO	Maintain the control rods above the minimum allowable rod height by borating the RCS IAW OP-301.
5	BOP	Maintain Gland Seal Steam Header Pressure in the normal operating band (3 to 6 psig) (PI-4004, PI-1382 or ERFIS Pt GSP2095A)
	BOP	WHEN PI-1458, COND PUMPS HEADER PRESS indicates between 575 psig and 600 psig, THEN PERFORM the following: SECURE the following as needed for feedwater flow requirements: One Main Feedwater Pump may be secured when reactor power is less than or equal to 60%.

Op Test N	o.: <u>1</u>	Scenario # _2 Event # _3 Page _10 of _47
Event Des	cription:	Control Bank D rods unwarranted rod motion
Time	Positior	Applicant's Actions or Behavior
EVENT I Control	NDICATION	NS: lue to insert (AUTO or MANUAL)
Step cou Tave < T	Inters audi	
	RO	Immediate Action Step Check unexpected rod motion – IN PROGRESS (YES)
	RO	Immediate Action Step Check Reactor Power – GREATER THAN 15% (YES)
	RO	Immediate Action Step         Check Turbine Load –         CONTROL RODS STEPPING IN (YES)         AND         UNEXPECTED LOAD REDUCTION IN PROGRESS(NO)         OR         UNEXPECTED LOAD REDUCTION HAS OCCURRED (NO)         RNO -         a. IF ROD BANK SELECTOR switch position in A (AUTO), THEN         place the ROD BANK SELECTOR switch in M (Manual)         b. IF ROD BANK SELECTOR switch position in M (Manual) OR         Individual Bank Select, THEN place the ROD BANK         SELECTOR switch in A (AUTO)         Go To Step 5
	BOP	Make PA Announcement For Procedure Entry

**Operator Action** 

Event Desc	ription:	Control Bank D rods unwarranted rod motion
Time	Position	Applicant's Actions or Behavior
	RO	Check ROD BANK SELECTOR switch position when problem occurred – INDIVIDUAL BANK SELECT (NO) RNO – Go To Step 4
	RO	Stop any boron dilution in progress.
	RO	Check APP-005-B5, ROD BANKS A/B/C/D LO LIMIT – EXTINGUISHED (YES)
	RO	Check reactor power – LESS THAN OR EQUAL TO 100% (YES)
	RO	<ul> <li>NOTE: The following step depends on what mode the rod control system was in when the failure occurred.</li> <li>Check Rod Bank Selector Switch Position – AUTO (NO)</li> <li>RNO – Perform the following:</li> <li>Maintain Tavg within -1.5 to +1.5°F of Tref using manual rod control OR</li> <li>Maintain Tavg within -1.5 to +1.5°F of Tref by adjusting turbine load using Attachment 1, Turbine Load Adjustment.</li> <li>Attachment 1 – Turbine Load Adjustment</li> <li>1. Check Turbine Control Mode - AUTOMATIC RNO: Momentarily depress the GV (up/down) buttons on the EH Control Panel as needed to adjust Turbine Load. Return to Step In Effect.</li> <li>2. Check Turbine Load Adjustment In IMP IN Desired RNO: Perform the following <ul> <li>a. Verify IMP OUT light – ILLUMINATED</li> <li>b. Go To Step 4</li> </ul> </li> <li>3. Depress the IMP IN Pushbutton</li> <li>4. Set The Desired Load Rate</li> <li>6. Depress the GO and HOLD Pushbuttons as necessary</li> </ul>
	SRO	Contact I&C and Reactor Engineering to troubleshoot and correct the problem.

Appendix	D
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Op Test No.:	1	Scenario #	2	Event #	_3	Page	12	of	47
Event Descrip	otion:	Control Bank	D rods u	nwarranted	rod motior	า			
Time	Position			Ар	plicant's A	ctions or Behavior			

	SRO	Implement The EALs
	SRO	Review Technical Specifications to assure all applicable LCO requirements have been met: (NONE are applicable) ITS 3.1.4 – Rod Alignment ITS 3.1.5 – Shutdown Bank RIL ITS 3.1.6 – Control Bank RIL and Overlap ITS 3.1.7 – IRPI ITS 3.2.1 – Fq(Z) ITS 3.2.2 – F Delta h ITS 3.2.3 – AFD ITS 3.2.4 – QPTR ITS 3.3.1 - NIS
OTE: Cre itiate rep	w should no airs, and no	otify WCC SRO and/or I&C to write a work request, investigate and otify the Operations Manager.
	SRO	Return To Procedure And Step In Effect

Appendix	D	Operator Action Fo	rm ES-I
Op Test No Event Desc		Scenario # <u>2</u> Event # <u>4</u> Page <u>13</u> of <u>4</u> Feedwater Regulating Valve FCV-478 slowly drifts open.	7
Time	Position		
BOOTH C Regulatir		At the discretion of the Chief Examiner, insert Event 4, Fe V-478 slowly drifts open.	edwate
EVENT IN FR-478 fe	DICATION	S: ow and S/G level rising	
	BOP	<ul> <li>Immediate Action Step</li> <li>Check feedwater regulating valves - OPERATING PROPER (MANUAL OR AUTO) (NO)</li> <li>RNO - <ul> <li>a. Verify FRV for the affected S/G(s) in manual control (placed in manual)</li> <li>b. Attempt to stabilize S/G level using FRV and/or FRV to valves by matching steam flow with feed flow.</li> <li>c. Stop any load change in progress.</li> <li>d. IF unable to control S/G level, THEN trip the reactor A To PATH-1 OR EOP – E-0, REACTOR TRIP or SAFE INJECTION.</li> <li>e. Go To Step 37.</li> </ul> </li> </ul>	FCV-47 oypass ND Go
2.2	RO	Make PA announcement for procedure entry unless previous	ly made
	BOP	Check S/G level – AT OR TRENDING TO PROGRAM (YES)	
	RO	Check Tavg – AT OR TRENDING TO Tref (YES)	
	SRO	Contact maintenance to troubleshoot and correct the feedwat problem.	er
	1		

	cription:	Feedwater Regulating Volve FOV 470 ct = 1 ctr
Time		Feedwater Regulating Valve FCV-478 slowly drifts open.
nne	Position	Applicant's Actions or Behavior
		Check current loading for the following pumps – LESS THAN
	BOP	<ul> <li>Main Feedwater Pump – 0.715 KAMPS</li> <li>Condensate Pumps – 270 AMPS</li> </ul>
		<ul> <li>Condensate Pumps – 370 AMPS</li> <li>Heater Drain Pumps – 90 AMPS</li> </ul>
юотн с	<b>OPERATOR:</b>	When requested, respond that the current readings on the
	y pamps ar	
• Ma	ain Feedwat	er Pump – 0.575 KAMPS
• 00	ondensate P	umps – 320 AMPS
• He	ater Drain F	Pumps – 75 AMPS
	T	Determine leding and l
		Determine Iodine sampling requirements as follows:
	DO	a. Check power change – GREATER THAN 15% IN ONE HOUF (NO)
	RO	RNO – WHEN the power change is greater than 15% in one hour,
		THEN perform step 43.b
		Go To Step 44
		Check APP-005-B5, ROD BANKS A/B/C/D LO LIMIT -
	RO	EXTINGUISHED (YES)
	RO	Monitor axial flux difference to ensure compliance with ITS 3.2.3.
	RO	Monitor axial flux difference to ensure compliance with ITS 3.2.3.
	RO SRO	Monitor axial flux difference to ensure compliance with ITS 3.2.3. Notify load dispatcher of the unit's load capability.
	SRO	Notify load dispatcher of the unit's load capability.
	SRO SRO	Notify load dispatcher of the unit's load capability. Return to procedure and step in effect.
DTE: Crev	SRO SRO	Notify load dispatcher of the unit's load capability. Return to procedure and step in effect.
)TE: Crev iate repa	SRO SRO	Notify load dispatcher of the unit's load capability.
	SRO SRO w should no airs for the	Notify load dispatcher of the unit's load capability. Return to procedure and step in effect.

Event De		_ Scenario # _ 2 Event # _ 5 and 6 Page _ 15 of _ 47
	scription:	PZR level transmitter LT-459 fails LOW
Time	Position	
		Applicant's Actions or Behavior
\PP-00; \PP-00; \PP-00; \PP-00;	3-B7 PZR PF 3-E8 PZR CC	MP HI SPEED ROT LO LEVEL DNTROL HI/LO LVL DVL HTR OFF & LTDN SECURE
l-459A hargin RZR L(	fails to 0% g Pump C (i	n AUTO) rises to full speed 459A2 bistable illuminated
	RO	AOP-025 RTGB INSTRUMENT FAILURE Go To The Appropriate Section For The Failed Transmitter: • Pressurizer Level - Section B, Page 7
	RO	Check LCV-460 A&B, LTDN LINE STOP – CLOSED (YES)
	RO	Place LCV-460A&B switch in the CLOSE position.
	RO	Place LCV-460A&B switch in the CLOSE position.

**Operator Action** 

Op Test No.: <u>1</u>	Scenario # _ 2 _ Event # _ 5 and 6 Page _ 16 of _ 47
Event Description:	PZR level transmitter LT-459 fails LOW
Time Position	Applicant's Actions or Behavior
RO	<ul> <li>Check RCP seal injection flow – BETWEEN 8 GPM AND 13 GPM (NO)</li> <li>RNO – Locally throttle RCP SEAL WATER FLOW CONTROL VALVE(s) to obtain flow to each RCP between 8 gpm and 13 gpm - CVC-297A, B, C</li> <li>IF required to maintain minimum flow, THEN throttle HIC-121, CHARGING FLOW valve while maintaining Charging Pump discharge pressure less than 2500 PSIG.</li> <li>IF the normal seal injection range can NOT be maintained, THEN an expanded range of between 6 gpm and 20 gpm may be used.</li> </ul>
RO	Check Number Of Operable PZR Level Channels - GREATER THAN ONE (YES)
RO	Place LM-459, PZR LEVEL, In The Switch Position For The Alternate Channel Below:         Failed Channel       Switch Position         LT-459       461 REPL 459
RO	Verify Selector Switch LR-459 - SELECTED TO THE CONTROLLING CHANNEL • REC 461

Appendix D	
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Op Test No. Event Descr		Scenario # <u>2</u> Event # <u>5 and 6</u> Page <u>17</u> of <u>47</u>
		PZR level transmitter LT-459 fails LOW
Time	Position	Applicant's Actions or Behavior
	RO	<ul> <li>Continuous Action Step Restore PZR Level Control To Automatic As Follows:         <ul> <li>a. Check Normal Letdown – ISOLATED</li> <li>b. Restore Letdown to service using Attachment 1, Restoration of Normal Letdown.</li> <li>c. Start additional Charging Pump as desired</li> <li>d. Check PZR level - WITHIN ±1% OF PROGRAMMED REFERENCE LEVEL                 <ul> <li>RNO - WHEN PZR level is within ±1% of programmed reference level, THEN restore PZR Level Control to Automatic.</li> <li>Go To Step 11.</li> <li>Restore PZR Level control to Automatic</li> </ul> </li> </ul> </li> </ul>
	RO	<ul> <li>(Steps for Attachment 1, Restoration of Normal Letdown, are located at end of this section)</li> <li>Reset PZR Heaters As Follows:         <ul> <li>Check affected PZR Level - FAILED LOW (YES)</li> <li>Place PZR HTR CONTROL GROUP Control Switch to OFF position AND return to ON position</li> <li>IF required, THEN place PZR HTR BACK-UP GROUP A Control Switch to OFF position AND return to AUTO OR ON position as desired</li> <li>IF required, THEN place PZR HTR BACK-UP GROUP B Control Switch to OFF position AND return to AUTO OR ON position as desired</li> </ul> </li> </ul>
	RO	Check RCP Seal Injection Flow – BETWEEN 8 GPM AND 13 GPM (YES)
	RO	Remove The Affected Transmitter From Service Using OWP-030: Channel OWP LT-459 PLT-1
xaminer No	ote: T	he next step may have been performed earlier

**Operator Action** 

Op Test No.:	1	Scenario # _2 Event # _5 and 6 Page _18 of _47
Event Descripti		PZR level transmitter LT-459 fails LOW
Time	Position	
		Applicant's Actions or Behavior
	RO	Press. Prot. & (LM-459) Control Switch 461 REPLACE 459
BOOTH OPE	RATOR:	Trip the bistables per the crew direction IAW OWP-030, PLT-1
	SRO	Go To Procedure Main Body, Step 2
	SRO	Implement The EALs
	SRO	<ul> <li>Check Technical Specifications (ITS) For Applicable LCOs</li> <li>ITS Table 3.3.1-1 Item 8, Pressurizer Water Level – High, Condition M requires that the channel be placed in trip within 6 hours or reduce thermal power to less than P-7 within 12 hours.</li> </ul>
	SRO	Return To Procedure And Step In Effect
		AOP-025, Attachment 1, Restoration of Normal Letdown
F	RO/BOP	Check normal charging flow through the Regenerative Heat Exchanger is in service.
R	RO/BOP	Check Phase "A" Containment Isolation signal <b>NOT</b> present.
R	RO/BOP	Check RHR System <b>NOT</b> in service.

Appendi	хD
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Time	Position	Applicant's Actions or Behavior
3	RO/BOP	Verify Closed the following valves: CVC-204A, LETDOWN LINE ISO CVC-204B, LETDOWN LINE ISO LCV-460A, LTDN LINE STOP LCV-460B, LTDN LINE STOP CVC-200A, LETDOWN ORIFICE ISOLATION CVC-200B, LETDOWN ORIFICE ISOLATION CVC-200C, LETDOWN ORIFICE ISOLATION
	RO/BOP	Verify HIC-121, CHARGING FLOW is full open.
	RO/BOP	Check PZR level is greater than OR equal to program level.
	RO/BOP	IF desired, THEN PLACE TCV-143, VCT/DEMIN, in the VCT position
	RO/BOP	PLACE PCV-145, PRESSURE in MANUAL.
	RO/BOP	Set PC-145 to throttle PCV-145 to 45% to 55% open to ensure the Letdown line is NOT overpressurized.
5	RO/BOP	OPEN CVC-204A, LETDOWN LINE ISO.
	RO/BOP	OPEN CVC-204B, LETDOWN LINE ISO.
2	RO/BOP	Perform the following: a. OPEN LCV-460A&B by placing switch LCV-460A&B LTDN LINE STOP to OPEN. b. PLACE LTDN LINE STOP LCV-460 A&B switch to AUTO.

**Operator** Action

Op Test No.:	<u> </u>	Scenario # _2 Event # _5 and 6 Page _20 of _47
Event Descrip	otion: F	PZR level transmitter LT-459 fails LOW
Time	Position	Applicant's Actions or Behavior
	RO/BOP	<ul> <li>Establish cooling to the NON-REGEN HX as follows:</li> <li>a. PLACE TC-144, NON-REGEN HX OUTLET TEMP, in MANUAL</li> <li>b. ADJUST TC-144, NON-REGEN HX OUTLET TEMP as necessary to ensure Letdown temperature does NOT increase above 127°F when letdown is reestablished.</li> </ul>
	RO/BOP	While MAINTAINING Charging Pump discharge pressure as indicated on RTGB instrument PI-121 LESS THAN 2500 psig, ADJUST charging pump speed to the expected letdown flow to be established in the next step.
	RO/BOP	OPEN one LTDN ORIFICE valve: - CVC-200A, LETDOWN ORIFICE ISOLATION - CVC-200B, LETDOWN ORIFICE ISOLATION - CVC-200C, LETDOWN ORIFICE ISOLATION
	RO/BOP	PLACE PC-145 in AUTO AND CHECK letdown pressure as indicated on PI-145, LOW PRESS LTDN PRESS, is being maintained between 300 psig and 320 psig.
	RO/BOP	PLACE TC-144, NON-REGEN HX OUTLET TEMP, in AUTO.
		IF TCV-143 was selected to the VCT, THEN POSITION TCV-143 as
	RO/BOP	directed by the CRS/SM.
	RO/BOP	<ul> <li>Verify RCP seal injection flow between 8 GPM and 13 GPM by throttling the following:</li> <li>CVC-297A, RCP "A" SEAL WATER FLOW CONTROL VALVE</li> <li>CVC-297B, RCP "B" SEAL WATER FLOW CONTROL VALVE</li> <li>CVC-297C, RCP "C" SEAL WATER FLOW CONTROL VALVE</li> </ul>

Operator Action

Time	Position	Applicant's Actions or Behavior
	RO/BOP	<ul> <li>IF increased letdown flow is desired, THEN place additional letdown orifices in service as follows: <ul> <li>a. VERIFY HIC-121, CHARGING FLOW is FULL OPEN</li> <li>b. VERIFY Charging Pump discharge pressure as indicated on RTGB instrument PI-121 LESS THAN 2500 psig.</li> </ul> </li> <li>c. IF required, THEN start the second Charging Pump on MINIMUM SPEED.</li> <li>d. IF required, THEN while maintaining Charging Pump discharge pressure as indicated on RTGB instrument PI-121 LESS THAN 2500 psig, ADJUST charging pump speed to meet flow requirements</li> <li>e. Place PC-145, PRESSURE, in MANUAL.</li> <li>f. Slowly throttle open PC-145 to achieve 180-200 psig on PI-145 to ensure the letdown line is NOT overpressurized.</li> <li>g. OPEN one additional LTDN ORIFICE valve.</li> <li>h. Place PC-145 in AUTO and check letdown pressure as indicated on PI-145, LOW PRESS LTDN PRESS, is being maintained between 300 psig and 320 psig.</li> <li>i. Verify RCP seal injection flow between 8 gpm and 13 gpm by throttling the following:     <ul> <li>o. CVC-297A</li> <li>o. CVC-297B</li> <li>o. CVC-297C</li> </ul> </li> </ul>
	RO/BOP	Notify RC that letdown flow has been restored and the affected areas should be monitored for changing radiological conditions.

**Operator Action** 

Form ES-D-2

		Scenario # <u>2</u> Event #		rage	<u>22</u> of	4/
Event Descr	-	RCP "C" High Vibrations				
Time	Position		Applicant's Actions	or Behavior	· · · · · · · · · · · · · · · · · · ·	
High Vibr EVENT IN APP-001-	ations IDICATION B5, RCP HI					, RCP "C"
	BOP	APP-001-B5 Actions: Checks affected RCP a 1. Check the alarm 2. Momentarily De 3. Alarm will reset 4. If the alarm is va 5. While alarm is a increase on una	alarm valid as fo ning monitor for press the RES and then return alid, then refer t actuated, Monito	ollows: flashing "/ button for n. Alarm is to AOP-01 or RCP Vit	Alert". the alarm s valid. 8.	-
	SRO	Announces entry into A	OP-018.			
	BOP	Make PA Announceme	nt for procedure	entry.		
	SRO	Determines that Section the appropriate section.		or Coolan	t Pump V	/ibration, is
	BOP	Check The Following V Required: Frame - GREATER TH Frame - GREATER TH MILS/HOUR CU <u>OR</u> Shaft - GREATER THA <u>OR</u> Shaft - GREATER THA PER HOUR CU	AN 5 MILS AN 3 MILS <u>ANE</u> URRENTLY <u>OR</u> N 20 MILS N 15 MILS <u>ANE</u>	<u>2</u> RISING / <u>R</u> PRIOR T <u>2</u> RISING /	AT A RA TO ALARI AT A RA	TE OF 0.2 M TE OF 1 N

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	)	Operator Action Form ES-D-
Op Test No.: Event Descrip		Scenario # _2 Event # _7 Page _23 of _47 RCP "C" High Vibrations
Time	Position	Applicant's Actions or Behavior
	RO	Trips the reactor and verifies the reactor tripped.
Critical Task	RO	Trip "C" RCP
		: Insert Seal Failure on "C" RCP if "C" RCP is not tripped within 5 or reaching 20 mils on "C" RCP.
Examiners	Note:	AOP-018 steps to address the conditional seal failure on "C" RC are listed at the end of the scenario guide.
ВООТН ОР	ERATOR	Insert Event 8, S/G "C" Tube Rupture when the "C" RCP is tripped
		Immediate Action Step:
	RO	Reactor Tripped. (YES)
		Immediate Action Step:
	BOP	Turbine Tripped. (YES)
		Immediate Action Step:
	BOP	E-1 AND E-2 energized (YES)
		Continuous Action Step:
	BOP	IF DS Bus is deenergized THEN place DSDG in service using EPP-25
		Immediate Action Step:
	RO	Immediate Action Step: SI initiated. (NO)
	RO	

Appendix D	Operator Action Form ES-D-2
	Scenario # _2 Event # _7 Page _24 of _47 RCP "C" High Vibrations
Time Position	Applicant's Actions or Behavior
RO	Immediate Action Step: Initiate SI (YES) (NOTE: Initial diagnosis may not determine that an SI is required.)
BOOTH OPERATOR: is "C" S/G PORV fails	Insert Event 9 approximately 2 minutes after SI is initiated. Event 9 OPEN / "C" S/G Tube Rupture size rises.
SRO	Enters PATH-1 and verifies PATH-1 Immediate Actions.
Examiners Note:	Following the performance and verification of PATH-1 Immediate Actions, the crew will continue with AOP-018. These steps may be handed off to the RO/BOP to perform independently. The remaining steps of AOP-018, Section B, High RCP Vibration are listed below.
RO/BOP	Check RCP B or C – Running (YES)
RO/BOP	Check RCP B – Running (YES)
RO/BOP	Check RCP C – Running (NO)
RO/BOP	Place PCV-455B controller to MAN AND adjust controller output to ZERO.
RO/BOP	Maintain PZR level between 30% and 40% to provide adequate PZR spray.
RO/BOP	Check RCP OIL RESERV HI/LO LVL Alarms – EXTINGUISHED: (YES) APP-001-D8 - RCP A APP-001-E8 - RCP B APP-001-F8 - RCP C

Appendix D	)	Operator Action Form ES-D-
Op Test No.:	1 S	cenario # _2 _ Event # _7 Page _25 _ of _47
		CP "C" High Vibrations
Time	Position	Applicant's Actions or Behavior
	RO/BOP	Check All RCP #1 Seal Leakoff Flows - BETWEEN 1 GPM <u>AND</u> 5 GPM (YES)
	RO/BOP	Check RCP Seal Injection Flow - BETWEEN 8 GPM <u>AND</u> 13 GPM (NO)
50 20 20 20 20 20 20 20 20 20 20 20 20 20	RO/BOP	Locally throttle RCP SEAL WATER FLOW CONTROL VALVE(s) to obtain flow to each RCP between 8 gpm and 13 gpm • CVC-297A • CVC-297B • CVC-297C IF required to maintain minimum flow, <u>THEN</u> throttle HIC-121, CHARGING FLOW Valve while maintaining Charging Pump Discharge pressure less than 2500 PSIG.
	SRO	Notify Manager – Operations OR Designee of RCP Performance
	SRO	Implement the EALs
	SRO	Refer to ITS for any applicable LCOs • 3.4.4, 3.4.5 and 3.4.6
	SRO	Go to the Main Body, Step 2 of AOP-018.
Examiners I	Note:	This is the end of AOP-018 steps. PATH-1 steps commence on th next page.

Op Test No.:	_1	Scenario #	2	Event #	8 and 9	Page	26	of	47
Event Descri	ption:	"C" S/G Tube after SI initiati	Rupture on, "C" S	when RCP S/G PORV fa	"C" is secured fo ails OPEN / Tube	llowing manu rupture size	ual rea rises.	ictor	trip. 2 minutes
Time	Position			Ар	plicant's Actions	or Behavior			

SRO	Open Foldout A
	MSR ISOLATION CRITERIA
	Perform the following to isolate the MSRs:
BOD	IF ANY Purge <u>OR</u> Shutoff Valve does not indicate fully closed, <u>THEN</u> place the associated RTGB Switch to CLOSE. (YES)
BOP	<u>IF</u> ANY Purge <u>OR</u> Shutoff Valve can <u>NOT</u> be closed from the RTGB <u>AND</u> RCS temperature is less than 540°F and lowering, <u>THEN</u> close the MSIVs <u>AND</u> MSIV BYPs. (NO)
	IF a loss of power prevents isolation of the MSRs, <u>THEN</u> close the MSIVs <u>AND</u> MSIV BYPs. (NO)
BOP	<ul> <li>FAULTED S/G ISOLATION CRITERIA</li> <li>IF the both the conditions below are met, <u>THEN</u> perform the following: <ul> <li>Any S/G pressure is lowering in an uncontrolled manner OR Any S/G has completely depressurized.</li> <li>AND</li> <li>At least ONE S/G is intact.</li> </ul> </li> <li>a. Reset SI.</li> <li>b. CLOSE the appropriate Auxiliary Feedwater isolation valves to the faulted S/Gs AND OPEN the associated breaker for the valves closed.</li> <li>S/G "C"</li> <li>V2-14C, SDAFW PUMP DISCH (MCC-10, CMPT-4M)</li> <li>V2-16C, AFW HDR DISCH (MCC-9, CMPT-3J)</li> <li>c. WHEN the faulted S/Gs dry out, <u>THEN</u> dump steam from intact S/G to control RCS repressurization.</li> </ul>

Op Test No	.: <u>1</u>	Scenario # _2Event # _8 and 9 Page 27of _47
Event Desc	ription:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minutes after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	Applicant's Actions or Behavior
	BOP	RUPTURED S/G ISOLATION CRITERIA (BOP may not recognize the ruptured S/G during initial Foldout A entry.)         IF the conditions below are met, THEN perform the following:         The Ruptured S/G is identified by observing an uncontrolled level rise         OR abnormal radiation level on the R-19s or R-31s.         AND         The Ruptured S/G Level is Greater than 8% [18%]         a. Reset SI.         b. CLOSE the appropriate Auxiliary Feedwater isolation valves to the Ruptured S/Gs.         S/G "C"         • V2-14C. SDAFW PUMP DISCH         • V2-16C. AFW HDR DISCH         • V2-16C. AFW Perform Supplement G, Steam Generator Isolation
"C" S/G le "C" S/G le PZR level	continues	g up at a faster rate than "A" and "B" S/Gs. Jes to trend up when feed secured to "C" S/G
Examiner	Note:	BOP may recognize that V2-6C failed to close on SI and take early action to manually close V2-6C.
NOTE:		Candidate may direct that Supplement G be performed to isolate S/G C. Supplement G steps begin on Page 42.
	SRO	Foldout A is in effect.
	RO	Verify Phase A Isolation valves closed (YES)
	BOP	Verify FW isolation valves closed (NO) Manual action is taken to close V2-6C, if not previously performed.

Event Descrip	otion:	Scenario # <u>2</u> Event # <u>8 and 9</u> Page <u>28</u> of <u>47</u>
		"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minut after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	Applicant's Actions or Behavior
	BOP	Verify both FW pumps tripped (YES)
	BOP	Verify both MDAFW pumps running (NO)
	вор	MDAFW Pump "A" inoperable from initial conditions.
	BOP	If Additional Feedwater is required, <u>THEN</u> Start SDAFW Pump
		(Running)
	RO	Verify two SI pumps running (YES)
		Verify both RHR pumps running (NO)
	RO	Manual action is taken to start both RHR pumps, if not previously
		performed.
+	RO	
		Verify SI valves properly aligned (YES)
	RO	At least one CCW pump running (YES)
	BOP	All SW & SW booster pumps running (NO)
		SW Pump "D" Inoperable
	BOP	Attempt to start all SW and SWB Pumps
	BOP	North OR South OM/URD LO REFERENCE
		North OR South SW HDR LO PRESS alarms illuminated (NO)
	RO	Verify CV Fans HVH-1,2,3 & 4 running (YES)

Op Test No.:	_1	Scenario #	2	Event #	8 and 9	Page	29	of	47
Event Descri		"C" S/G Tube after SI initiat	Rupture ion, "C" S	when RCP /G PORV f	"C" is secured fol ails OPEN / Tube	lowing mani rupture size	ual rea rises.	actor	trip. 2 minutes
Time	Position			Ар	plicant's Actions of	or Behavior			

RO	Verify IVSW initiated (YES)
	Verify CV ventilation isolation (YES)
	Verify the following valves – CLOSED:
	- V12-6, CONT PURGE VALVE
	- V12-7, CONT PURGE VALVE
	- V12-8, CONT PURGE VALVE
RO	- V12-9, CONT PURGE VALVE
	- V12-10, CONTAINMENT PRESSURE RELIEF
	- V12-11, CONTAINMENT PRESSURE RELIEF
	- V12-12, CONTAINMENT VACUUM RELIEF
	- V12-13, CONTAINMENT VACUUM RELIEF
	Verify control room ventilation aligned for pressurization mode (YES Operator to verify the following:
	- Verify CONT RM AIR EXHAUST Fan, HVE-16 - STOPPED
	- Verify CLEANING Fan HVE-19 A/B - RUNNING
BOP	<ul> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1A-SA - CLOSED</li> </ul>
· ·	<ul> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1B-SB - CLOSED</li> </ul>
	<ul> <li><u>IF</u> CR-D1A-SA <u>OR</u> CR-D1B-SB have lost power, <u>THEN</u> locally verify position in the Control Room Kitchen.</li> </ul>
BOP	Verify both EDGs running (YES)
	Continuous Action Step
BOP	Restart Battery Chargers within 30 minutes of Power Loss using OP- 601 (Not Required)

Op Test No.:	1	Scenario # _ 2 Event # _ 8 and 9 Page _ 30 of _ 47				
Event Description:		"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minutes after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.				
Time	Position	Applicant's Actions or Behavior				
	RO	Continuous Action Step CV pressure remained below 10 psig (YES)				
	BOP	Automatic steam line isolation initiated (NO)				
	BOP	Automatic Steam Line Isolation Required (NO)				
	BOP	Locally open the breaker for HVS-1 at MCC-5 within 60 minutes of SI Initiation				
Booth Opera	itor	Wait 3 minutes and open the breaker as requested by the operators and report the action completed.				
	RO	RCS pressure greater than 1350 psig [1250 psig] (NO)				
	RO	SI flow verified (YES)				
	RO	RCS pressure >125 psig (YES)				
	BOP	At least 300 GPM AFW flow available (YES)				
	BOP	Verify AFW valves properly aligned (YES)				
	BOP	Control AFW flow to maintain S/G levels between 8% [18%] and 50%				
	RO	RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated (NO)				

	otion:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minute
Time	Position	and of initiation, C 3/G PORV fails OPEN / Tube rupture size rises.
	Position	Applicant's Actions or Behavior
	BOP	Place Steam Dump Mode switch to Steam Pressure
	RO	RCS temperature stable at or trending to 547°F (NO)
	RO	RCS Temperature greater than 547°F (NO)
	BOP	Attempt to limit cooldown.
		IF PCS cooldown continues AND :
	BOP	IF RCS cooldown continues AND is not due to SI Flow THEN close MSIVs AND MSIV Bypasses. (Candidates may determine that cooldown is due to the stuck open PORV and decide not to close the MSIVs on the intact S/Gs.)
	RO	PZR PORVs Closed (YES)
	RO	PZR Spray & Aux Spray velves also de (V/50)
		PZR Spray & Aux Spray valves closed (YES)
· · · · · · · · · · · · · · · · · · ·	RO	At least one RCD manine (VCD)
		I ALIEASI UNE KUP FUNNING (YES)
		At least one RCP running (YES)
	RO	At least one SI Pump Running (YES)
	RO	
	RO	
		At least one SI Pump Running (YES)

Op Test No.:	_1	Scenario # _ 2 Event # _ <u>8 and 9</u> Page <u>32</u> of _47
Event Descrij	ption:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minute after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	Applicant's Actions or Behavior
	RO	Reset SPDS and monitor CSFSTs.
	SRO	Transition to EPP-11.
	BOP	Maintain At Least One S/G Available For RCS Cooldown
	BOP	Check S/G Status: a. Identify intact S/Gs as follows: • ANY S/G PRESSURE STABLE OR INCREASING (YES) b. Identify faulted S/Gs as follows: • ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER (YES)
		OR  ANY S/G COMPLETELY DEPRESSURIZED
	BOP	Isolate Faulted S/Gs Using Supplement G, S/G Isolation
		(Supplement G actions are included following this section.)
		Maintain A Foulted C/O In The Later is a
	BOP	Maintain A Faulted S/G In The Isolated Condition During Subsequent Recovery Actions Unless Needed For Cooldown
	BOP	Check CST Level - GREATER THAN 10% (YES)
	BOP	Check Available Secondary Radiation Monitors – NORMAL (NO)
	SRO	Go to PATH-2, Entry Point J.
	RO	Reset SPDS AND Initiate Monitoring of Critical Safety Function Status

Ap	pend	lix D
· · · · · ·		

Op Test No.:	_1	Scenario # _2 Event # _8 and 9 Page _33 of _47						
Event Descript		"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minute after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.						
Time	Position	on Applicant's Actions or Behavior						
	CREW	Open Foldout C (No steps apply)						
	RO	Continuous Action Step When Below 10 <sup>-10</sup> AMPS, THEN Energize Source Range Detectors AND Transfer Recorder						
	BOP	Request Periodic Activity Samples of All S/Gs						
	BOP	Place Steam Dump Mode Switch to Steam Pressure						
	BOP	Open QCV-10426 to bypass Condensate Polishers						
	BOP	Close C-48A AND C-48B to isolate Hotwell return to CST						
-	RO	At Least One RCP Running (YES)						
	RO	At Least One SI Pump Running (YES)						
	RO	RCS Subcooling Less than 35°F [55°F] (NO)						
	BOP	Ruptured S/G Identified (YES)						
	BOP	Maintain at Least One S/G Available for RCS Cooldown						

Op Test No.:	1	Scenario # _2 Event # _8 and 9 Page _34 of _47
Event Descrip	otion:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minut after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	Applicant's Actions or Behavior
	BOP	Verify Ruptured Steam Line PORV Setpoint at 1035 PSIG using Status Board
	BOP	Verify RCS Temperature Less Than 547°F Prior to MSIV Closure
	BOP	Close Ruptured S/G MSIV and MSIV Bypass
	BOP	Ruptured S/G MSIV and MSIV Bypass Closed (YES)
	BOP	Continuous Action Step When Ruptured S/G Pressure lowers Below 1035 PSIG THEN Verify Ruptured Steam Line PORV Closed
	BOP	IF MDAFW Pump is not Available, THEN Maintain at least One S/G supply to SDAFW Pump
	BOP	Close Ruptured S/G Steam Shutoff to SDAFW Pump
	BOP	Verify S/G Blowdown Isolation and Sample Valves Closed
	BOP	Locally Close Warmup Steam Supply From Ruptured S/G to SDAFW Pump
ooth Opera	tor	Close Warmup Steam Supply Valve (MS-38) and Report action 3 Minutes after requested
	BOP	Locally Close MSIV Above and Below Seat Drains from Ruptured S/G

Op Test No.:	1	Scenario # _ 2 _ Event # _ 8 and 9 Page _ 35 _ of _ 47
Event Descri	•	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minutes after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	Applicant's Actions or Behavior
Booth Ope	erator	Report Above and Below Seat Drains are closed 3 Minutes after requested
	BOP	Isolate Feed Flow to Any Ruptured S/G that is Faulted Unless Needed for RCS Cooldown
		Continuous Action Step
	BOP	When Ruptured S/G Level Greater Than 8% [18%] THEN Isolate Feed Flow
		Continuous Action Step
	BOP	Open Breakers for any V1-8, V2-14 AND V2-16 Valve Closed to

Booth Operator	Wait 3 minutes to Open Breakers as requested and report action complete.				
	é				
BOP	Control Feed Flow to Maintain Intact S/G Level Between 8% [18%] and 50%				
BOP	Any Other S/G with Uncontrolled Level Rise (NO)				
RO	PZR PORVs Closed (YES)				
RO	Open At Least One PORV Block Unless Closed to Isolate an Open PZR PORV				
	Continuous Action Step				
RO	IF PZR PORV Opens on High Pressure, THEN Verify Reclosure at or Below 2335 PSIG. Close PORV Blocks as Necessary				

Op Test No.:	_1	Scenario #	_2	Event #	8 and 9	Page	<u>36</u>	of	47	
Event Descrip		"C" S/G Tube after SI initiati	Rupture on, "C" S	when RCP /G PORV fa	"C" is secured fo ails OPEN / Tube	ollowing manu e rupture size	ual rea rises.	actor (	trip. 2 min	utes
Time	Position			Ap	plicant's Actions	or Behavior				

	RO	Reset SI
	RO/BOP	Continuous Action Step IF Offsite Power is Lost, THEN Restart Emergency Safeguard Equipment
	RO	Reset CV Spray
	RO	Reset Phase A and Phase B
	RO	Establish Instrument Air to CV. IF Compressor not Running, THEN Start Compressor
2	BOP	All AC Busses Energized by Offsite Power (YES)
	RO	RCS Pressure Greater Than 275 PSIG [400 PSIG] (YES)
	RO	Stop RHR Pumps
	RO	Continuous Action Step IF RCS Pressure Lowers Below 275 PSIG [400 PSIG], THEN Restart RHR Pumps

App	end	ix D
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Op Test No.	.: <u>1</u>	Scenario #	2 Event #	8 and 9	Page	<u>37</u> of	47
Event Desci		"C" S/G Tube F after SI initiatio	Rupture when RCP ' n, "C" S/G PORV fa	"C" is secured fo ils OPEN / Tube	llowing manu rupture size	ual reactor rises.	trip. 2 minutes
Time	Position		Apr	olicant's Actions	or Behavior		
Critical BOP 0		Th - \ - M - F - F - V cla - \ - V - \ - V - V - S - N - S - S	<ul> <li>tured S/G Isolated (YES)</li> <li>The following must be Isolated to satisfy isolation:</li> <li>V1-3C, MSIV</li> <li>MS-353C, MSIV V1-3B BYP</li> <li>FRV "C" (Not needed if V2-6C closed.)</li> <li>FRV "C" BYP</li> <li>V2-6C, FW HDR SECTION (Not needed if FRV and FRV BYP closed.)</li> <li>V2-14C, SDAFW PUMP DISCH Valve</li> <li>V2-16C, AFW HDR DISCH Valve</li> <li>V1-8C, SDAFW STEAM SHUTOFF Valve</li> <li>S/G C Blowdown AND Blowdown Sample Valves</li> <li>MS-38 (No indication in Control Room)</li> <li>S/G "C" MSIV Above and Below Seat Drain Valves (No indication in Control Room.)</li> </ul>				
	BOP	Ruptured	S/G Pressure G	reater Than 2	20 PSIG (	YES)	
	BOP	At Least C	One Intact S/G A	vailable for R	CS Cooldo	own (YES	S)
	RO/BOP	NOTE: Aft Steam Lin Exceeded	er the Low Stea e Isolation will o	m Line Press ccur if Hi Stea	ure SI Sigi am Line Fl	nal is Blo ow Rate	ocked, Main Setpoint is
		Determine	Required Core	Exit Tempera		Table-3	
	RO/BOP	Ruptured Greater ti 900-1000 800-899 700-799 600-699		PSIG) Re (°F 490 480 465 450	quired Cor	e Exit Te	emperature

Op Test No.:		Scenario # _2 Event # _8 and 9 Page _38 of _47
Event Descrip	otion:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minute after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	Applicant's Actions or Behavior
		Continuous Active Ot
	RO	Continuous Action Step When PZR Pressure Lowers to Less Than 2000 PSIG, THEN Block PZR Pressure/High Steam Line DP Signals
	RO	IF RCPs are NOT Running, THEN Do Not Monitor CSF-4
Examiner N	lote:	Steam Dumps may be available if the MSIVs were left open on the intact S/G's. If this is the case then the cooldown will be performed via the steams dumps vice the Steam Line PORVs.
	BOP	Condenser Available For Steam Dump (NO)
	RO	Verify T-AVG less Than 543°F AND Block T-AVG SI Signal Prior to Maximum Steam Dump
	BOP	Dump Steam Using Intact Steam Line PORV Maximum Rate. - AFW flow may need to be raised.
	RO	At Least One Charging Pump Running (YES)
	RO	Align Charging Pump Suction To RWST
	RO	Establish Charging Flow to Maintain PZR Level
	)	
	RO	Core Exit Temperature Less Than Required Temperature (NO) (PATH-2 begins a loop until CET is less than Required Temperature)
	BOP	Reduce Steam Flow to Stabilize RCS Temperature

Op Test No.:	1 Scenario # <u>2</u> Event # <u>8 and 9</u> Page <u>39</u> of <u>47</u>
Event Description:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minutes after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time Po	sition Applicant's Actions or Behavior
CF	REW Allow RCS Temperature to Stabilize from cooldown prior to continuing
В	OP Ruptured S/G pressure stable or rising (NO)
B	OP Ruptured S/G Pressure lowers to less than 250 psig above pressure o intact S/Gs used for cooldown. (YES)
SI	RO Transition to EPP-17.
SF	RO Open Foldout E (No steps apply.)
R	O Reset SAFETY INJECTION
R	O Reset CONTAINMENT ISOLATION PHASE A AND PHASE B
BC	DP Continuous Action Step Check Loss Of Offsite Power – IN PROGRESS (NO)
R	Continuous Action Step Establish Instrument Air To CV As Follows: Check APP-002-F7, INSTR AIR HDR LO PRESS – EXTINGUISHED (YES) Momentarily place IA PCV-1716, INSTRUMENT AIR ISO TO CV Switch, to RESET Check INST AIR VALVE TO CV PCV-1716 – OPEN (YES)
RC	<ul> <li>Continuous Action Step</li> <li>Determine If CV Spray Should Be Stopped As Follows:         <ul> <li>Check CV Spray Pumps – RUNNING (NO)</li> </ul> </li> </ul>

Op Test No.:	· _!	Scenario # _2 _ Event # _8 and 9 Page _40 of _47
Event Descri	ption:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minutes after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	Applicant's Actions or Behavior
	BOP	Continuous Action Step Control Ruptured S/G Level As Follows : • Check ruptured S/G level - LESS THAN 8% [18%] (NO) • Stop feed flow to ruptured S/Gs.
	RO	Continuous Action Step Determine If RHR Pumps Should Be Stopped a. Check RCS pressure: • GREATER THAN 275 PSIG [400 PSIG] (YES) <u>AND</u> • STABLE <u>OR</u> INCREASING b. Verify RHR Pumps – Stopped c. Check RCS pressure – Less than 275 psig [400 PSIG] (NO)
	RO	Initiate Evaluation Of Plant Status : a. Check Auxiliary Building radiation monitors – NORMAL (YES) b. Contact Chemistry to obtain the following periodic samples : • RCS for boron and activity • Ruptured S/G(s) for boron • Pressurizer for boron c. Contact Plant Operations Staff to determine additional actions to evaluate plant status, while continuing with this procedure
	RO	<ul> <li>Establish Charging Flow As Follows :</li> <li>Check Charging Pumps – ALL STOPPED (NO)</li> <li>Verify charging flow on FI-122A – Greater than 35 GPM</li> </ul>
	RO	<ul> <li>Align Charging Pump Suction To RWST as follows:</li> <li>a. From the RTGB, verify LCV-115B, EMERG MU TO CHG SUCT - OPEN</li> <li>b. Verify LCV-115C, VCT OUTLET - CLOSED</li> <li>c. Start all available Charging Pumps</li> <li>d. Increase running Charging Pumps speed to maximum</li> <li>e. Verify maximum charging flow on FI-122A (YES)</li> </ul>

	otion:	"C" S/G Tube Rupture when RCP "C" is secured following manual reactor trip. 2 minute after SI initiation, "C" S/G PORV fails OPEN / Tube rupture size rises.
Time	Position	
	Position	Applicant's Actions or Behavior
	BOP	Identify Faulted S/Gs As Follows: a. Check pressure in all S/Gs: • ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER (YES) <u>OR</u> • ANY S/G COMPLETELY DEPRESSURIZED (NO)
	BOP	Check Faulted S/Gs – PREVIOUSLY ISOLATED (YES)
	BOP	<ul> <li>Control Intact S/G Levels As Follows :</li> <li>Check intact S/G levels – ANY GREATER THAN 8% [18%]</li> <li>Control feed flow to maintain intact S/G levels between 8% [18%] and 50%</li> <li>Check intact S/G levels – ANY INCREASING IN AN UNCONTROLLED MANNER (NO)</li> </ul>
	RO	Continuous Action Step Ensure Adequate Shutdown Margin Exists As Follows: • Check boron sample results – AVAILABLE (NO)
	BOP	<ul> <li>Initiate RCS Cooldown To Cold Shutdown As Follows:</li> <li>Maintain cooldown rate in RCS cold legs less than 100°F in the last 60 minute</li> <li>Maintain RCS temperature and pressure within limits of Curve 3.4, Reactor Coolant System Pressure – Temperature Limitations For Cooldown</li> <li>Check intact S/Gs - AT LEAST ONE AVAILABLE FOR RCS COOLDOWN (YES)</li> <li>Check steam dump to Condenser – Available (NO)</li> <li>Dump steam using Steam Line PORVs</li> </ul>

On T( 111	· · · · · · · · · · · · · · · · · · ·	
Op Test No.	.: <u>1</u>	Scenario # _2 Event # _8 and 9 Page _42 of _47
Event Desci	ription:	Isolation of S/G "C" IAW Supplement G
Time	Position	Applicant's Actions or Behavior
		SUPPLEMENT G Steps
	SRO	Directs the BOP to perform Supplement G to isolate S/G "C"
		Go To Appropriate Step From Following Table:
	BOP	S/G TO BE ISOLATED STEP S/G C 34
		J4
	BOP	Check S/G C – FAULTED (YES).
	BOP	Verify V1-3C, MSIV – CLOSED (YES)
i	BOP	Verify MS-353C, MSIV V1-3C BYP – CLOSED (YES)
	BOP	Verify FRV C – Closed (YES)
	BOP	Verify FRV C BYP – Closed (YES)
	BOP	
	BOP	Verify V2-6C, FW HDR SECTION Valve – CLOSED. (YES)
	BOP	Verify V2-14C, SDAFW PUMP DISCH Valve – CLOSED. (YES)
	BOP	Verify V2-16C, AFW HDR DISCH Valve CLOSED. (YES)
	BOP	Verify Steam Line DODY OLOGET WAS
		Verify Steam Line PORV – CLOSED (NO)

Operator Action

Form ES-D-2

Op Test No.:	_1	Scenario # _2 _ Event # _8 and 9 Page _43 of _47
Event Descript	tion:	Isolation of S/G "C" IAW Supplement G
Time	Position	Applicant's Actions or Behavior
	BOP	<ul> <li><u>IF</u> the PORV will <u>NOT</u> close from the RTGB, <u>THEN</u> isolate air via one of the methods below:</li> <li>Close BOTH isolation valves for the individual controller:         <ul> <li>IA-3273, IA TO PIC-497 UPPER I/P</li> <li>IA-3274, IA TO PIC-497 LOWER I/P</li> <li><u>OR</u></li> <li>Close IA-298, IA to PORVs (Before Dryer)</li> </ul> </li> </ul>
	BOP	Verify V1-8C, SDAFW STEAM SHUTOFF Valve – CLOSED. (YES)
	BOP	Verify S/G C Blowdown <u>AND</u> Blowdown Sample Valve Status Light Indication – CLOSED (YES)
	BOP	Dispatch Operator to the Pipe Jungle to Close MS-38, SG "C" Bypass Drn & Warm-up Line to AFW Pump
Booth Opera	tor	Close Warmup Steam Supply Valve (MS-38) and Report action 3 Minutes after requested
	BOP	Check S/G "C" MSIV Above And Below Seat Drain Valves – CLOSED (YES)
Booth Operator		Report Above and Below Seat Drains are closed 3 Minutes after requested.
-	BOP	<ul> <li>Dispatch Operator To The E-1/E-2 To Perform The Following:</li> <li>At MCC-9, verify V2-16C closed AND open breaker V2-16C, MDAFW PUMP HEADER DISCHARGE TO S/G C (CMPT-3J)</li> <li>At MCC-6, verify V1-8C closed AND open breaker V1-8C, SDAFW PUMP STEAM ISOLATION (CMPT-18M)</li> </ul>
	BOP	<ul> <li>Dispatch Operator To The Aux. Bldg. To Perform The Following:</li> <li>At MCC-10, verify V2-14C closed AND open breaker V2-14C, SDAFW PUMP TO S/G C (CMPT-4M)</li> </ul>

****		Isolation of S/G "C" IAW Supplement G
Time	Position	Applicant's Actions or Behavior
Booth Op	erator	Wait 3 minutes to Open Breakers as requested and report action complete.
	BOP	Check All Faulted AND Ruptured S/Gs ~ ISOLATED (YES)
	BOP	WHEN the faulted S/Gs dry out, THEN dump steam from intact S/G t control RCS repressurization.
	BOP	Check Any S/G – RUPTURED (YES)
	BOP	Perform the following to minimize Secondary system contamination:
		Direct AO to start Auxiliary Boilers.
		IF Condensate Polishers are in service:
		<ul> <li>Verify QCV-10426, SECONDARY BYPASS – OPEN. (YES</li> </ul>
		<ul> <li>Locally depress the OFF Pushbutton on Condensate Polisher Vessels A, B, C, D, E and F.</li> </ul>
		<ul> <li>Secure ANY evolution that passes water through the beds, such as a low volume rinse.</li> </ul>
	BOP	Verify Hotwell return to CST isolated as follows:
	·	Locally verify C-48A, LCV-1417B INLET – CLOSED.
		<ul> <li>Locally verify C-48B, LCV-1417B DISCHARGE - LOCKED CLOSED.</li> </ul>
	BOP	Dispatch An Operator To Close GS-36, MANUAL GLAND STEAM DUMP.

Op Test N Event Des		Scenario # 2 Event # Conditional Page 45 of 47
		Seal Failure on "C" RCP
Time	Position	Applicant's Actions or Behavior
This sec	tion is to add	dress a Seal Failure on "C" RCP due to the Operator not tripping "
RCP wit	hin 5 minutes	s of reaching 20 mils vibration on "C" RCP.
	RO/BOP	Make PA Announcement for Procedure Entry
	RO/BOP	Evaluate Plant Conditions AND Go to the Appropriate Section for RC Malfunction Not Yet Addressed: Reactor Coolant Pump Seal Failure Section A
	RO/BOP	Check any RCP #1 Seal Leakoff Flow – Greater than 5.7 GPM (YES
	RO/BOP	<ul> <li>Check Either of the following Conditions Exist:         <ul> <li>RCP #1 Seal Leakoff flow On Unaffected RCP(s) – Reduced (YES)</li> <li><u>OR</u></li> <li>RCP Thermal Barrier △P On Affected RCP(s) - Reduced (YES)</li> </ul> </li> </ul>
	RO/BOP	Check Plant Status – Mode 1 OR Mode 2 (YES)
	RO/BOP	<ul> <li>a. Trip the reactor</li> <li>b. Trip the affected RCP(s).</li> <li>c. Go to Path-1 while continuing in AOP-018.</li> </ul>
	RO/BOP	Check Time Elapsed since stopping the affected RCP(s) – Greater Than 3 Minutes (NO) RNO: When at least 3 minutes elapsed since tripping the affected RCP(s), THEN go to step 6.
	RO/BOP	Close Seal Leakoff Valve(s) for affected RCP(s): CVC-303C
	RO/BOP	Check SI – Actuated (Conditions will be degrading such that an SI will be required.

**Operator** Action

Form ES-D-2

Op Test No.:	_1 S	cenario # _ 2 _ Event # <u>Conditional</u> Page <u>46</u> of <u>47</u>
Event Descripti	ion: S	eal Failure on "C" RCP
Time	Position	Applicant's Actions or Behavior
	RO/BOP	<ul> <li>Establish Instrument Air to CV as follows:</li> <li>a. Check APP-002-F7, INSTR AIR HDR LO PRESS – EXTINGUISHED (YES)</li> <li>b. Reset SAFETY INJECTION</li> <li>c. Reset CONTAINMENT ISOLATION PHASE A</li> <li>d. Momentarily place IA PCV-1716 to RESET position</li> <li>e. Check PCV-1716 – OPEN (YES)</li> </ul>
	RO/BOP	Check RCP(s) B OR C – Running (YES)
	RO/BOP	Check RCP B – Running (YES)
	RO/BOP	<ul> <li>Check RCP C- Running (NO)</li> <li>RNO: <ul> <li>a. Place PCV-455B Controller to MAN AND adjust controller output to ZERO.</li> <li>b. Maintain PZR level between 30% and 40% to provide adequate PZR spray.</li> </ul> </li> </ul>
	RO/BOP	Check RCP Seal Injection Flow – Between 8 GPM and 13 GPM. RNO a. Locally throttle CVC-297A,B,C to obtain between 8 – 13 gpm. b. IF required the maintain minimum flow, THEN throttle HIC-121.
	RO/BOP	Check FCV-626, THERM BAR FLOW CONT VALVE – Closed (NO)
	RO/BOP	Implement EALs

#### ILC-11-2 NRC SCENARIO 2 TURNOVER SHEET

POWER LEVEL:	75% RTP
Core Burnup:	9000 MWD/MTU
EFPD:	257 EFPD
Boron:	775.5 PPM
Xenon:	Approaching EQ – 22 pcm/hr and lowering
Tavg:	567.5°F
Bank D Rods	183 Steps

#### EQUIPMENT UNDER CLEARANCE:

- "A" MDAFW Pump OOS and Breaker Racked Out
- Switchyard access is RESTRICTED.

#### **EQUIPMENT STATUS:**

• Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.

#### **INSTRUCTIONS FOR THE WATCH:**

• Plant is at 75% power following maintenance on "A" HDP. Operations Management and RES have reported unusually high vibrations on "A" MFP and recommend a power reduction be performed and "A" MFP secured as soon as possible.

# **Unit 2 Status Board**

	Date:	Today	Time:	6:00:00	AM Cycle:	27	MWD/M	T: 9000	Desis	40555
	EFPD	257	Design	473.5					Design:	16590
нит	Lorel of	_			and a second second	Tank	Level %		64.1	
CVCS-A	Level %	Cilling	Status			Monitor A	10	-+	Statu Stand	
CVCS-A	10	Filling				Monitor B	38			
CVCS-C	86	Standb				WCT A	37		Stand	
WHUT	#NAME?	Standby	/			WCT B	7		Stand Stand	
WIIOT	#INAWIE (	Filling				WCTC	9		Stand	
	Data Linked	4- DI				WCT D	10	_		
WGDTS	Statement and a local division of the local		-			WCTE	9		Standi	
	Pressure		St	atus				1.1.1.1.1.1	Standt	by
Α	#NAME?	PSIG	On cover					DEMINERAL	IZERS	
B	#NAME?	PSIG	In Service				РРМ	In Service		Resin
C	#NAME?	PSIG	isolated			MB A	2194	V/50	_	Replaced
D	#NAME?	PSIG	Standby		3111	MB B	2194	YES	7/17/2010	5/4/2010
-						CATION		NO	7/17/2010	3/29/2010
Shu	tdown Requ		Temp	Boron			1021	NO	9/17/2010	12/9/2009
	1.77% =∆K		547 F Hot	795	-	DEB A	0	NO	New	2/3/2010
	1.77% =∆K		>350 F	1053	-	DEB B	0	NO	3/28/2010	
	2.6% =∆K/	ĸ	100 F Cold		-	SFP	1963	NO	9/23/2008	4/22/2008
	6% =∆K/k		N/A	1182	-		100			
				1950					SGBD	
	POR	V Settings				ondenser Air In			Value GPM	Status
Setti	ng Date	POT	GP-3 Psig	1000	A	13	CFM	A	50	Flash Tank
4	7/18/2010	3.21	1000		B	0	CFM	В	50	With Heat
3	7/18/2010	3.12	1040	1416 8	Known	8	CFM	С	50	Recovery
2	7/18/2010	3.44	1040	-	Total	5	CFM	N2 Flow	8	SCFM
		14.44		1						
BCC	eeks		1.	1			adiation Mon	itor Setpoints		
RUSL	eakage	0.00	Unidentified	1.063	Rad	Current	Alort \	/alue 200X	NUE Value	
otal		0.03	CDM		Monitor	Setpoint			2X	
RT			GPM		R-14C	1.01E+04		N/A	2.020E+04	-1
CDT Leak		0.02	GPM		R-20	7.40E+03		N/A	1.480E+04	-1
	•	0.01	GPM		R-18	1.00E+06		00E+08		-
harging Lo		0	GPM		R-19A	1.05E+04		00E+06	2.000E+06	-
lisc Identif		0	GPM	1.2	R-19B	9.72E+03			2.100E+04	Section.
rimary/Sec		0	GPD		R-190			14E+06	1.944E+04	1.31.5.5.0
		17.3	GPM			9.58E+03		16E+06	1.916E+04	
econdary l	LOSS	17.3			R-37	8.53E+03	1.70	06E+06	1.706E+04	
econdary i	_OSS	17.3								
	Hi Flux A	t Shutdow				Manu	ally Entered	the second s	Linked to C	hem data base
		t Shutdow	n			Boron PPM	Date	PPM	Linked to C Date	hem data base
	Hi Flux A	t Shutdow	n Setpoint			Boron PPM RCS	Date Today	PPM 775.5	Linked to C Date	
-31	Hi Flux A Previous AF	t Shutdow	n Setpoint 150			Boron PPM RCS BAST-A	Date Today 9/16/2010	PPM 775.5 21,535	Linked to C Date #NAME?	
-31	Hi Flux A Previous AF 50	t Shutdow	n Setpoint			Boron PPM RCS BAST-A BAST-B	Date Today 9/16/2010 9/16/2010	PPM 775.5 21,535 21,032	Date	PPM
-31	Hi Flux A Previous AF 50 60	t Shutdowi RI Counts	n Setpoint 150 180			Boron PPM RCS BAST-A BAST-B SFP	Date Today 9/16/2010 9/16/2010 9/15/2010	PPM 775.5 21,535	Date #NAME?	PPM #NAME?
-31  -32	Hi Flux A Previous AF 50 60 N	t Shutdown RI Counts ormal Curr	n Setpoint 150 180 rents	V PAND	1	Boron PPM RCS BAST-A BAST-B SFP RWST	Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010	PPM 775.5 21,535 21,032	Date #NAME? #NAME?	PPM #NAME? #NAME? #NAME?
I-31 I-32	Hi Flux A Previous AF 50 60 N UPPER	t Shutdown RI Counts ormal Curr LOWER	n Setpoint 150 180 rents TARGET	% BAND		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A	Date Today 9/16/2010 9/16/2010 9/15/2010	PPM 775.5 21,535 21,032 2246 2219	Date #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME?
-31 -32	Hi Flux A Previous AF 50 60 WPPER 125	t Shutdown RI Counts ormal Curr LOWER 119	n Setpoint 150 180 rents TARGET -1.5	5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B	Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010	PPM 775.5 21,535 21,032 2246 2219	Date #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME?
I-31 I-32	Hi Flux A Previous AF 50 60 UPPER 125 110	t Shutdown RI Counts ormal Curr LOWER 119 109	n Setpoint 150 180 rents TARGET -1.5 -1.5	5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A	Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010	PPM 775.5 21,535 21,032 2246 2219 2211	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
-31 -32 41 42 43	Hi Flux A Previous AF 50 60 UPPER 125 110 105 5	t Shutdown RI Counts ormal Curr LOWER 119 109 99	n Setpoint 150 180 rents TARGET -1.5 -1.5 -1.5	5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B	Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010	PPM 775.5 21,535 21,032 2246 2219 2211 2206 2230	Date #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME?
-31 -32 41 42 43 44	Hi Flux A Previous AF 50 60 UPPER 125 110 105 88	t Shutdown RI Counts Formal Curr LOWER 119 109 99	n Setpoint 150 180 rents TARGET -1.5 -1.5 -1.5 -1.5	5 +/- 5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal	Date Today 9/16/2010 9/15/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	PPM 775.5 21,535 21,032 2246 2219 2211 2206	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
-31 -32 41 42 43 44	Hi Flux A Previous AF 50 60 UPPER 125 110 105 5	t Shutdown RI Counts Formal Curr LOWER 119 109 99	n Setpoint 150 180 rents TARGET -1.5 -1.5 -1.5 -1.5	5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Date Today 9/16/2010 9/15/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	PPM 775.5 21,535 21,032 2246 2219 2211 2206 2230	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
-31 -32 41 42 43 43 44 5 WERTRA	Hi Flux A Previous AF 50 60 UPPER 125 110 105 98 X Rev# 2.1.0	t Shutdown RI Counts ormal Curr LOWER 119 109 99 94 RNP	n Setpoint 150 180 rents TARGET -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5	5 +/- 5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal	Date Today 9/16/2010 9/15/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	PPM 775.5 21,535 21,032 2246 2219 2211 2206 2230	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
-31 -32 41 42 43 44 5 WERTRAX	Hi Flux A Previous AF 50 60 UPPER 125 110 05 88 4 ( Rev# 2.1.0 S 1	t Shutdown RI Counts ormal Curr LOWER 119 109 99 94 RNP Fest/Hrs	n Setpoint 150 180 TARGET -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5	5 +/- 5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Date Today 9/16/2010 9/15/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	PPM 775.5 21,535 21,032 2246 2219 2211 2206 2230	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
-31 -32 41 42 43 44 5 WERTRAX FAN HVE-1	Hi Flux A Previous AF 50 60 UPPER 125 110 105 88 5 ( Rev# 2.1.0 S 1 A/B 3	t Shutdown RI Counts ormal Curr LOWER 119 109 99 94 RNP Fest/Hrs 5640.6	n Setpoint 150 180 rents TARGET -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2	5 +/- 5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Date Today 9/16/2010 9/15/2010 9/15/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010	PPM 775.5 21,535 21,032 2246 2219 2211 2206 2230	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
41 42 43 44 50 5 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	Hi Flux A Previous AF 50 60 UPPER 125 110 105 8 4 K Rev# 2.1.0 S 1 A/B 3 5 A 1	t Shutdown RI Counts Formal Curr LOWER 119 109 99 94 RNP Fest/Hrs 5640.6 8643.5	n Setpoint 150 180 rents TARGET -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -3/8/10 3/18/10	5 +/- 5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Date Today 9/16/2010 9/15/2010 9/15/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010	PPM 775.5 21,535 21,032 2246 2219 2211 2206 2230 2221 2221	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
41 42 43 44 50 50 50 50 50 50 50 50 50 50 50 50 50	Hi Flux A Previous AF 50 60 UPPER 125 110 105 8 4 K Rev# 2.1.0 S 1 A/B 3 5 A 1	t Shutdown RI Counts ormal Curr LOWER 119 109 99 94 RNP Fest/Hrs 15640.6 8643.5 1928.3	n Setpoint 150 180 rents TARGET -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -1.5 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2	5 +/- 5 +/- 5 +/- 5 +/-		Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Date Today 9/16/2010 9/15/2010 9/15/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010 Notes/Add	PPM 775.5 21,535 21,032 2246 2219 2211 2206 2230 2221	Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?

# ILC-11-2 NRC SCENARIO 2 TURNOVER SHEET

POWER LEVEL: Core Burnup: EFPD: Boron: Xenon: Tavg: Bank D Rods

75% RTP 9000 MWD/MTU 257 EFPD 775.5 PPM Approaching EQ – 22 pcm/hr and lowering 567.5°F 183 Steps

## **EQUIPMENT UNDER CLEARANCE:**

- "A" MDAFW Pump OOS and Breaker Racked Out
- Switchyard access is RESTRICTED.

### **EQUIPMENT STATUS:**

Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.

## INSTRUCTIONS FOR THE WATCH:

• Plant is at 75% power following maintenance on "A" HDP. Operations Management and RES have reported unusually high vibrations on "A" MFP and recommend a power reduction be performed and "A" MFP secured as soon as possible.

# **Unit 2 Status Board**

	Date: EFPD	Today		6:00:0	0 AM Cycle:	27	MWD/M	IT: 9000	Desta	140755
	EFPD	257	Design	473.5				19000	Design:	16590
HUT	Level %		<u></u>			Tank	Level %		C4-4	
CVCS-		Filling	Status			Monitor A	10		Stat	
CVCS-		Standb				Monitor B	38		Stand	
cvcs-		Standb				WCTA	37		Stand	
WHUT	#NAME?	Filling	<u>y</u>			WCT B	7		Stand	
27.281	1	i ming	electric in the			WCT C	9		Stand	
	Data Linked	to PI	<u> </u>			WCTD	10		Stand	
WGDTS				1.6		WCTE	9		Stand	
A	#NAME?	PSIG		itatus				a contens	Otario	Jy
		PSIG	On cover					DEMINERAL	IZERS	
в	#NAME?	PSIG	In Service				0004		· · · · · · · · · · · · · · · · · · ·	Resin
с	#NAME?	PSIG					PPM	In Service	Date	Replaced
D	#NAME?	PSIG	Isolated			MB A	2194	YES	7/17/2010	5/4/2010
	particular 1	F310	Standby			MB B	2265	NO	7/17/2010	3/29/2010
Sh	utdown Requ	inoment			112.00	CATION	1021	NO	9/17/2010	
			Temp	Boron	10.00	DEB A	0	NO	New	12/9/2009
	1.77% = AK		547 F Hot	795	1 5.8	DEB B	0	NO		2/3/2010
	1.77% =∆K		<u>≥</u> 350 F	1053	31	SFP	1963	NO	3/28/2010	
	2.6% =∆K		100 F Cold	1182		State State State	1000		9/23/2008	4/22/2008
	6% =∆K/k	(	N/A	1950						
				जन्म जन जन्म	Co	ondenser Air In	leakage	Terrer	SGBD	
	POR	V Settings			A	13			Value GPM	Status
	ting Date	POT	GP-3 Psig	-	в	0	CFM	A	50	Flash Tank
Α	7/18/2010	3.21	1000	-	Known	8	CFM	В	50	With Heat
B	7/18/2010	3.12	1040	-	Total	5	CFM	С	50	Recovery
<u> </u>	7/18/2010	3.44	1000		Total	0	CFM	N2 Flow	8	SCFM
RCS	Leakage	0.00	Unidentified	1	Rad Monitor	Current Setpoint	adiation Moni Alert V	alue 200X	NUE Value	
PRT		0.03	GPM		R-14C	1.01E+04		N/A	2.020E+04	
		0.02	GPM	E 1 1 2	R-20	7.40E+03		N/A	+	- 100 100
CDT Lea		0.01	GPM		R-18	1.00E+06		0E+08	1.480E+04	
harging		0	GPM		R-19A	1.05E+04			2.000E+06	100 100 100 100
lisc Ident		0	GPM		R-19B	9.72E+03		0E+06	2.100E+04	
rimary/Se	condary	0	GPD		R-19C			4E+06	1.944E+04	
econdary	Loss	17.3	GPM			9.58E+03	1.91	6E+06	1.916E+04	
		-	101.111		R-37	8.53E+03	1.70	6E+06	1.706E+04	
		Shutdow	1				ally Entered D		Linked to C	hem data base
tus (Carolina)	Hi Flux A	CONDUCTOW					Date	PPM	Date	PPM
	Hi Flux A Previous AR	Counts		6		Boron PPM				
-31	Previous AR 50	I Counts	Setpoint			RCS	Today	775.5		1
-31 -32	Previous AR	Counts				RCS BAST-A	Today 9/16/2010	775.5 21,535	#NAME?	#NAME?
	Previous AR 50	Counts	Setpoint 150			RCS BAST-A BAST-B	Today 9/16/2010 9/16/2010	775.5 21,535 21,032		#NAME? #NAME?
	Previous AR 50 60	l Counts	Setpoint 150 180			RCS BAST-A BAST-B SFP	Today 9/16/2010 9/16/2010 9/15/2010	775.5 21,535 21,032 2246	#NAME?	
-32	Previous AR 50 60 No	ormal Curro	Setpoint 150 180 ents	% BAND		RCS BAST-A BAST-B SFP RWST	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010	775.5 21,535 21,032 2246 2219	#NAME? #NAME?	#NAME?
-32	Previous AR 50 60 No UPPER L	l Counts	Setpoint 150 180 ents TARGET	% BAND		RCS BAST-A BAST-B SFP RWST Accum-A	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010	775.5 21,535 21,032 2246 2219	#NAME? #NAME? #NAME?	#NAME? #NAME?
-32	Previous AR 50 60 UPPER L 125 1	Drmal Curro OWER	Setpoint 150 180 ents TARGET -1.5	5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-B	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010	775.5 21,535 21,032 2246 2219 2211	#NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
-32 41 42	Previous AR 50 60 UPPER L 125 1 110 1	ormal Curro OWER 19 09	Setpoint           150           180           ents           TARGET           -1.5	5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	775.5 21,535 21,032 2246 2219 2211 2206	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44	Previous AR 50 60 UPPER L 125 1 110 1 105 9 98 9	l Counts Drmal Curre OWER 19 09 9	Setpoint           150           180           ents           TARGET           -1.5           -1.5	5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	775.5 21,535 21,032 2246 2219 2211 2206	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44	Previous AR 50 60 UPPER L 125 1 110 1 105 9 98 9	Dormal Curro Dormal Curro DOWER 19 09 9 4	Setpoint           150           180           ents           TARGET           -1.5           -1.5           -1.5           -1.5           -1.5	5 +/- 5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-C RHR Refuel Canal	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	775.5 21,535 21,032 2246 2219 2211 2206 2230	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44	Previous AR 50 60 UPPER   125 1 110 1 105 9	Dormal Curro Dormal Curro DOWER 19 09 9 4	Setpoint           150           180           ents           TARGET           -1.5           -1.5           -1.5           -1.5           -1.5	5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-C RHR Refuel Canal Refuel Cavity	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	775.5 21,535 21,032 2246 2219 2211 2206 2230	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44 WERTRA	Previous AR 50 60 UPPER   1 125   1 110   1 105   9 98   9 X Rev# 2.1.0	Drmal Curro OWER 19 09 9 4 RNP	Setpoint           150           180           ents           TARGET           -1.5           -1.5           -1.5           -1.5           -1.5           -1.5           -1.5           -1.5	5 +/- 5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-C RHR Refuel Canal	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	775.5 21,535 21,032 2246 2219 2211 2206 2230	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44 WERTRA FAN	Previous AR 50 60 UPPER L 125 1 110 1 105 9 98 9 X Rev# 2.1.0	I Counts ormal Curro .OWER 19 09 9 4 RNP est/Hrs	Setpoint           150           180           ents           TARGET           -1.5           -1.5           -1.5           0           200 APL           Date/Tst	5 +/- 5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-C RHR Refuel Canal Refuel Cavity	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	775.5 21,535 21,032 2246 2219 2211 2206 2230	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44 WERTRA FAN HVE-1	Previous AR           50           60           UPPER           125           110           110           98           98           S           IS           T           IA/B	I Counts Drmal Curro OWER 19 09 9 4 RNP est/Hrs 5640.6	Setpoint           150           180           ents           TARGET           -1.5           -1.5           -1.5           9% APL           Date/Tst           3/8/10	5 +/- 5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-C RHR Refuel Canal Refuel Cavity	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010	775.5 21,535 21,032 2246 2219 2211 2206 2230 2221	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44 WERTRA HVE HVE HVE	Previous AR           50           60           UPPER           125           110           15           98           98           S           IA/B           15A	I Counts Drmal Curre OWER 19 09 9 4 RNP est/Hrs 5640.6 3643.5	Setpoint           150           180           ents           TARGET           -1.5           -1.5           -1.5           9% APL           Date/Tst           3/8/10           3/18/10	5 +/- 5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-C RHR Refuel Canal Refuel Cavity	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 7/6/2010 2 Notes/Addit	775.5 21,535 21,032 2246 2219 2211 2206 2230 2221 2221	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?
-32 41 42 43 44 WERTRA HVE-1 HVE-1 HVE-1	Previous AR           50           60           UPPER           125           110           15           98           98           S           IA/B           15A	I Counts Dormal Current LOWER 19 09 9 4 RNP est/Hrs 5640.6 3643.5 28.3	Setpoint           150           180           ents           TARGET           -1.5           -1.5           -1.5           9% APL           Date/Tst           3/8/10	5 +/- 5 +/- 5 +/- 5 +/-		RCS BAST-A BAST-B SFP RWST Accum-A Accum-A Accum-C RHR Refuel Canal Refuel Cavity	Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010	775.5 21,535 21,032 2246 2219 2211 2206 2230 2221 2230 2221	#NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	#NAME? #NAME? #NAME? #NAME? #NAME?

Scenario Outline

Form ES-D-1

Facility	r: H	B ROBINSON	Scenario No.: 4 Op Test No.:					
Examir	ners:		Operators: SRO -					
			BOP -					
Initial C	conditions:	• 1E-8 amps I	BOL, 150 MWD/MTU, 1531 ppm Boron					
		Currently the counties	understorm watch is in effect for Darlington and Chesterfield					
Turnov	er:	Raise React	or Power to the POAH and continue with plant startup					
Critical	Tasks:		SI injection valve SI-870A or SI-870B					
			ontainment Isolation					
		Align CR ver	ntilation to pressurization mode					
Event No.	Malf. No.	Event Type*	Event Description					
	<u> </u>	(R) RO						
1		(N) SRO	Withdraw controls rods to POAH					
2		(C) BOP, SRO (TS) SRO	"B" CCW Pump Trips and FCV-626 closes					
3		(C) BOP, SRO (TS) SRO	North SW Header break at the intake structure					
4		(TS) SRO	Failure of N-35 Compensation Voltage					
5		(C) RO, SRO	Leak on CC-703B at 25 gpm and rises to 750 gpm					
6		(M) ALL	Large Break LOCA on Reactor Trip					
		(C) RO	SI-870A and B fail to open on SI signal					
		(C) RO	FP-248, 249, 256 and 258 fail to close on CIV signal					
		(C) BOP	Control Room Ventilation fails to transfer to pressurization mode					
		(C) RO	Stop CV Spray Pump(s) and Close Discharge Valve(s)					
1) *	N)ormal,	(R)eactivity, (I)n	strument, (C)omponent, (M)ajor					

## ILC-11-2 NRC SCENARIO 4 SUMMARY DESCRIPTION

The crew will assume the watch with the plant at 1E-8 amps. GP-005, Power Operation, has been completed up to Step 8.2.2. Shift instructions are to adjust control rod position as necessary to raise reactor power to the POAH in anticipation of continuing with plant startup. Once the Chief Examiner is satisfied with the control of the reactor and RCS temperature is stable, the Chief Examiner may cue the next event.

On cue from the Chief Examiner, "B" CCW Pump will trip, CCW Pumps "A" and "C" will auto start on low pressure and valve FCV-626 will close. The crew will take actions IAW APP-001-F4 or -C1 and reopen FCV-626. The SRO will direct entry into ITS LCO 3.7.6, Condition A, for one required CCW train being inoperable. The LCO requires that the inoperable CCW train be restored to operable status within 72 hours. The crew may take actions IAW OP-306 to secure one of the two operating CCW pumps.

On cue from the Chief Examiner, the North Service Water Header will experience a break at the intake structure on the SW piping downstream of SW-8, SW Pump "D" Discharge Valve. The crew will take actions IAW AOP-022, Loss of Service Water, and will isolate the ruptured header and disable the service water pumps on the isolated header. This will result in the affected Emergency Diesel Generator being declared inoperable due to all the service water pumps supporting that EDG being disabled. The SRO will declare entry into ITS LCO 3.7.7, Condition A, due to one SW train inoperable. This LCO requires that the inoperable SW train be restored to operable status within 72 hours. The SRO will also declare entry into ITS LCO 3.8.1, Condition B, which requires the following: (1) Perform SR 3.8.1.1 for offsite circuit within 1 hour and once per 12 hours thereafter (OP-604, Section 8.4.9, Emergency Diesel Generator Inoperability), (2) Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s), (3) Determine Operable DG is not inoperable due to common cause failure within 24 hours and perform SR 3.8.1.2 for Operable DG within 96 hours and, (4) restore DG to Operable status within 7 days OR be in Mode 3 in 6 hours and Mode 5 in 36 hours. Due to CCW Pump "B" being inoperable and EDG "B" being declared inoperable due to all of its supporting Service Water Pumps being disabled, ITS 3.8.1.B.2 requires that CCW Pump "C" be declared inoperable within the next four hours. This will place the plant in LCO 3.0.3 due to not meeting ITS 3.7.6 for CCW System operability requirements. Once the Chief Examiner is satisfied with the stability of the plant and ITS compliance he may cue the next event.

On cue from the Chief Examiner, N-35, Intermediate Range NI, will experience a loss of compensation voltage and APP-005-B2, N35 Loss of Comp Voltage, will be received. The APP will direct the crew to remove N-35 from service IAW OWP-011, NI-7. ITS Table 3.3.1-1, Item 3, Intermediate Range Neutron Flux, Condition F, Thermal Power > P-6 and < P-10, requires that thermal power be reduced to less than P-6 or increased to greater than P-10 within 2 hours. N-36 will be selected to provide SUR signal by repositioning the Start Up Rate Channel Select switch. Once OWP-011 has been briefed, the crew may begin briefing GP-006 to reduce power to less than P-6 to meet the 2 hour ITS requirement. Once the Chief Examiner is satisfied with the ITS compliance he may cue the next event.

On cue from the Chief Examiner, a leak will develop on the downstream side of CC-703B, CCW Pump "B" Discharge Valve, at a rate of 25 gpm. The crew will take actions IAW AOP-014, Component Cooling Water System Malfunction, Section A, Loss of CCW Inventory. AOP-014 will direct the crew to commence making up to the CCW surge tank in an effort to maintain normal surge tank control band and dispatch operators to perform a CCW Leak Search. Once leak will rise to 750 gpm over a 5 minute time period. The crew will make efforts to maintain surge tank level by starting a second primary water pump. Eventually, it will be determined that the CCW Surge Tank level cannot be maintained and the crew will initiate a reactor trip, stop all RCPs and go to PATH-1 while continuing with AOP-014.

On initiation of the manual reactor trip the plant will experience a Large Break LOCA. The crew will implement PATH-1 due to the reactor trip and safety injection. Manual actions will have to be taken to open either SI-870A or SI-870B since neither automatically opens on the SI signal. The operators must also identify that FP-248, 249, 256 and 258 fail to close automatically on the CIV signal and must be manually closed. The operators must identify that CR ventilation does not transfer to pressurization mode and must be manually realigned. The Turbine Building equipment will be secured in accordance with Supplement M, Component Alignment for Loss of SW to Turbine Building, due to service water being isolated to the turbine building as directed by PATH-1 due to the North SW Header low pressure alarm being illuminated. FRP-P.1, Response to Imminent Pressurized Thermal Shock, will be entered due to the rapid RCS depressurization and cooldown but exited due to the presence of a Large Break LOCA. Due to the loss of N-35, Source Range NIs will have to be manually energized. The crew will eventually transition to EPP-15, Loss of Emergency Coolant Recirculation, due to having no CCW pumps available to provide cooling to the ECCS equipment. EPP-15 will direct actions to make up to the RWST using Supplement P, Emergency Makeup to the RWST and eventually reduce ECCS flow to minimize the demand on the RWST.

The scenario may be terminated once direction is given to secure one SI Pump and one RHR Pump and/or at the Chief Examiners' discretion.

Appendix D

## ILC-11-2 NRC SCENARIO 4 SIMULATOR SETUP

#### **IC/SETUP:**

- IC-804, SCN: 008\_11\_2\_NRC\_Exam\_4
- Status board updated to reflect IC-1

#### PRE-LOADED EVENTS:

The following events should occur on the reactor trip:

Event 6: Large Break LOCA on Reactor Trip SI-870A and B fail to open on SI signal FP-248, 249, 256 and 258 fail to close on CIV signal Control Room Ventilation fails to transfer to pressurization mode

## EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:

- Event 1: Withdraw controls rods to POAH
- Event 2: "B" CCW Pump Trips and FCV-626 closes
- Event 3: North SW Header break at the intake structure
- Event 4: Failure of N-35 Compensation Voltage
- Event 5: Leak on CC-703B starts at 25 gpm and rises to 750 gpm

## EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:

- GP-005
- OP-306
- AOP-022
- OP-604, Section 8.4.9
- APP-005-B2
- OWP-011, NI-7
- GP-006-1
- AOP-014, Main Body, Section A, Attachment 1 and Attachment 3
- PATH-1
- Foldout A
- Supplement M
- FRP-P.1
- Foldout B
- EPP-15
- Supplement P

Appendix D
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Op Test No.:	_1	Scenario #	_4	Event #	1	Page	5	of	37	
Event Descri	ption:	Withdraw con	trol rods	to the POAH	4					
Time	Position			Ар	olicant's A	ctions or Behavior				

None		IE additional later until the test second
	RO	<ul> <li>IF additional letdown flow is desired, THEN PERFORM the following IAW OP-301 section for Charging and Letdown Operations with Normal Pressurizer Level:</li> <li>START additional Charging Pumps as necessary.</li> <li>PLACE additional letdown orifice in service</li> </ul>
		ENERGIZE all available Pressurizer heaters to equalize boron
	RO	concentration in the Pressurizer. – PZR HTR CONTROL GROUP
		- PZR HTR BACK-UP GROUP "A" - PZR HTR BACK-UP GROUP "B"
OTE: The	e Point Of Ac	Iding Heat (POAH) is that power level identified by NO control rod
mo	buon and:	Iding Heat (POAH) is that power level identified by <b>NO</b> control rod
• If N	ATC is negat	ive, then SUR will be LOWERING
<ul> <li>If N</li> <li>If N</li> <li>If N</li> <li>On</li> <li>rise</li> </ul>	ATC is negat ATC is positives ATC is positives set of RCS to e, Reduction	ive, then SUR will be LOWERING ve, then SUR will be RISING emperature rise, Onset of PZR pressure rise, Onset of PZR level in AUTO Charging Pump speed demand
<ul> <li>If M</li> <li>If M</li> <li>On rise</li> <li>Rise</li> <li>President</li> </ul>	ATC is negat ATC is positive set of RCS to be, Reduction sing indication consume, when	ive, then SUR will be LOWERING ve, then SUR will be RISING
<ul> <li>If M</li> <li>If M</li> <li>On rise</li> <li>Rise</li> <li>President</li> </ul>	ATC is negat ATC is positive set of RCS to be, Reduction sing indication consume, when	ive, then SUR will be LOWERING we, then SUR will be RISING emperature rise, Onset of PZR pressure rise, Onset of PZR level in AUTO Charging Pump speed demand. n of AUTO Steam Dump demand on PC-464B, Steam Header Steam Dumps are being used for RCS Temperature Control. eam Generator Steam flow.
<ul> <li>If N</li> <li>If N</li> <li>On rise</li> <li>Rise</li> <li>Pression</li> <li>Sm</li> </ul>	ATC is negat ATC is positive set of RCS to be, Reduction sing indication essure, when all rise in Ste	ive, then SUR will be LOWERING ve, then SUR will be RISING emperature rise, Onset of PZR pressure rise, Onset of PZR level in AUTO Charging Pump speed demand. n of AUTO Steam Dump demand on PC-464B, Steam Header Steam Dumps are being used for RCS Temperature Control
<ul> <li>If N</li> <li>If N</li> <li>On rise</li> <li>Ris Pre</li> <li>Sm</li> </ul>	ATC is negat ATC is positive set of RCS to be, Reduction sing indication essure, when all rise in Ste ate shall not end Of Adding He	ive, then SUR will be LOWERING we, then SUR will be RISING emperature rise, Onset of PZR pressure rise, Onset of PZR level in AUTO Charging Pump speed demand. n of AUTO Steam Dump demand on PC-464B, Steam Header Steam Dumps are being used for RCS Temperature Control. eam Generator Steam flow. CAUTION exceed 1.0 dpm. Maximum Reactor power is 5%.
<ul> <li>If N</li> <li>If N</li> <li>On rise</li> <li>Ris Pre</li> <li>Sm</li> </ul>	ATC is negat ATC is positive set of RCS to be, Reduction sing indication essure, when all rise in Ste ate shall not end Of Adding He	ive, then SUR will be LOWERING we, then SUR will be RISING emperature rise, Onset of PZR pressure rise, Onset of PZR level in AUTO Charging Pump speed demand. n of AUTO Steam Dump demand on PC-464B, Steam Header Steam Dumps are being used for RCS Temperature Control. eam Generator Steam flow. CAUTION exceed 1.0 dpm. Maximum Reactor power is 5%.

Ap	pendix	D
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Op Test No.:	_1	Scenario # _4 _ Event # _1 Page _6 of _37
Event Descri	ption:	Withdraw control rods to the POAH
Time	Position	Applicant's Actions or Behavior
	RO	<ul> <li>ADJUST control rods as necessary to achieve the following while continuing with this procedure:</li> <li>RCS Tavg between 547°F and 551°F</li> <li>Maintain Reactor Power ≤ 5%.</li> </ul>
	SRO	WHEN Reactor power is greater than 1%, THEN NOTIFY Reactor Engineering to COMMENCE logging data required by EST-067.
Booth Ope	erator	Insert Event #2, "B" CCW Pump trips and FCV-626 closes, on cue from the Chief Examiner.

<b>-</b> · -	o.: <u>1</u>	_ Scenario # _4 Event # _2 Page _7_ of _37
Event Des	cription:	"B" CCW Pump trips and FCV-626 closes
Time	Position	Applicant's Actions or Behavior
BOOTH	OPERATOR	R: At the discretion of the Chief Examiner, insert Event 2 – B CCW
		Fump trips and FCV-626 closes
	NDICATION	
A and C	CCW Pumr	lual indication os auto start
APP-001	-A8. CCW T	TO CRDM LO FLOW
APP-001	-B1, RCP B	RG COOL WTR LO FLOW
APP-001	-C1, RCP T	HERM BAR COOL WTR HIFLOW
4PP-001	-D1, RCP TI	
466-001	-F4, CCW P	MP MOTOR OVLD/TRIP (Locked in)
1001-	-⊦5, CCW P	MP LO PRESS
466-002-	-eo, oi pivip	COOL WTR LO FLOW
	· · · · · · · · · · · · · · · · · · ·	
		APP-001-F4 actions
	RO	IF alarm is due to intentional operator actions, THEN no further action
		required.
		APP-001-F4 actions
	RO	IF the running CCW Pump has tripped, THEN VERIFY Standby CCW
		Pump STARTED.
-	1	
		APP-001-F4 actions
	RO	IF Standby CCW Pump can NOT be started THEN REFER TO AOP
	RO	IF Standby CCW Pump can NOT be started THEN REFER TO AOP
	RO	
	RO	IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal).
	RO	IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal). APP-001-F4 actions
		IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal).
	RO	IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal). APP-001-F4 actions IF FCV-626, THERM BAR FLOW CONT, closes due to pump start, THEN PERFORM the following:
		<ul> <li>IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal).</li> <li>APP-001-F4 actions</li> <li>IF FCV-626, THERM BAR FLOW CONT, closes due to pump start, THEN PERFORM the following:</li> <li>1) CHECK R-17 for increasing trends OR alarm</li> </ul>
		IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal). APP-001-F4 actions IF FCV-626, THERM BAR FLOW CONT, closes due to pump start, THEN PERFORM the following:
		<ul> <li>IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal).</li> <li>APP-001-F4 actions</li> <li>IF FCV-626, THERM BAR FLOW CONT, closes due to pump start, THEN PERFORM the following:</li> <li>1) CHECK R-17 for increasing trends OR alarm</li> </ul>
		<ul> <li>IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal).</li> <li>APP-001-F4 actions</li> <li>IF FCV-626, THERM BAR FLOW CONT, closes due to pump start, THEN PERFORM the following:</li> <li>1) CHECK R-17 for increasing trends OR alarm</li> </ul>
	RO	IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal). APP-001-F4 actions IF FCV-626, THERM BAR FLOW CONT, closes due to pump start, THEN PERFORM the following: 1) CHECK R-17 for increasing trends OR alarm. 2) IF no adverse trend on R-17, THEN REOPEN FCV-626. APP-001-F4 actions IF CCW Pump tripped due to electrical fault. THEN DISPATCH an
		<ul> <li>IF Standby CCW Pump can NOT be started, THEN REFER TO AOP- 014 (A and C CCW Pumps auto started on low pressure signal).</li> <li>APP-001-F4 actions</li> <li>IF FCV-626, THERM BAR FLOW CONT, closes due to pump start, THEN PERFORM the following:</li> <li>1) CHECK R-17 for increasing trends OR alarm.</li> <li>2) IF no adverse trend on R-17, THEN REOPEN FCV-626.</li> </ul>

Append	IIX D	Operator Action Form ES-
Op Test N		Scenario # _4 Event # _2 Page _8 of _37
Event Des	scription:	"B" CCW Pump trips and FCV-626 closes
Time	Position	Applicant's Actions or Behavior
<b>F</b>		
Examine	er Note:	AOP-014 may be entered by the crew to address the event rather than using the APP actions. AOP 014 characters
		than using the APP actions. AOP-014 steps are listed below.
	SRO	
		Implement the EALs.
	RO/BOP	Make PA announcement for Procedure Entry.
	SRO	Go to Appropriate Section for Indicated Malfunction: Section C (CCW
	+	Pump Discharge Pressure Low)
	RO/BOP	Check Spray AND Blackout Signal – Actuated (NO)
		Start Standby CCW Pump As Follows:
		a. Check El <u>AND</u> E2 BUSSES - ENERGIZED BY OFFSITE POWER (YES)
		b. Start one CCW Pump (NO two pumps rupping)
	RO/BOP	<ul> <li>c. Check CCW Pump status – AT LEAST ONE RUNNING (YES)</li> <li>d. Check APP-001-F5, CCW PMP LO PRESS – EXTINGUISHED (YES)</li> </ul>
		e. Check FCV-626, THERM BAR FLOW CONT – CLOSED DUE TO STARTING PUMP (YES)
		t. Open FCV-626 (Operator opens ECV-626)
		g. Go to the MAIN BODY, Step 4, of this procedure.
	RO/BOP	Check RCS temperature – LESS THAN 350°F (NO)
		IF CCW HX outlet temperature is greater than 105°F, THEN go to step 3. (NO)
	RO/BOP	OR
		IF CCW HX outlet temperature is less than 105°F. THEN as to at
		4.c. (YES)
	PO/POD	Check CCW HX outlet temporature
	RO/BOP	Check CCW HX outlet temperature – STABLE OR DECREASING (YES)

Op Test No.:	1	Scenario #	_4	Event #	2	Page	9	of	37	
Event Descri	ption:	"B" CCW Pum	np trips a	ind FCV-626	closes					
Time	Position			Ар	olicant's Ac	tions or Behavior				

RO/E	OP Check APP-001-F5, CCW PMP LO PRESS – EXTINGUISHED (YES)
SR	Refer to Technical Specifications for Applicable LCOs T.S. 3.4.17 – CVCS (N/A) T.S. 3.5.2 – ECCS – Operating (N/A) T.S. 3.5.3 – ECCS – Shutdown (N/A) T.S. 3.6.6 – Containment Spray and Cooling Systems (N/A) T.S. 3.7.6 – Component Cooling Water (CCW) System (See below)
RC	<ul> <li>APP-001-C1 actions</li> <li>IF CCW AND Seal Injection are lost to any RCP, THEN REFER TO AOP-018.</li> </ul>
RC	APP-001-C1 actions IF result of CCW Pump start only, THEN REOPEN FCV-626.
SRC	Direct entry into ITS LCO 3.7.6, Condition A, for one required CCW train inoperable. LCO requires that the inoperable CCW train be restored to operable status within 72 hours.
Booth Operator	When Tech Specs are identified and at Chief Examiner's discretion, proceed to Event #3.

		Operator Action Form ES-
Op Test N	lo.: 1	Scenario # 4 Event # 3 Page 10 of 27
·		
Event Des	scription:	North Service Water Header break at the Intake Structure.
Time	Positior	n Applicant's Actions or Behavior
POOTU	OPERATO	
BUUIN	OPERATO	R: At the discretion of the Chief Examiner, insert Event 3, North
	INDICATION	
	B-F7, SOUTI	H SW HDR LO PRESS
APP-008	3-67. S SW	H SW HDR LO PRESS HDR STRAINER PIT HI LEVEL
800-444	8-E8, N SW I	HDR STRAINER PIT HILLEVEL
4PP-008	5-D7, S SW	
₩-1616.	North SW	HDR STRAINER PIT HI-HI LVL (Delayed) Header pressure lowering
PI-1684,	South SW I	Header pressure lowering
State State	18 DECEMBER OF	
		Immediate Action Step Check the following alarms – EXTINGUISHED:
		APP-008-E7, S SW HDR STRAINER PIT HI LEVEL (NO)
		APP-008-E8, N SW HDR STRAINER PIT HI LEVEL (NO)
	BOP	
		RNO – Perform the following:
		a. Close the following valves:
		<ul><li>a. Close the following valves:</li><li>V6-12B</li></ul>
		<ul> <li>a. Close the following valves:</li> <li>V6-12B</li> <li>V6-12C</li> </ul>
		<ul><li>a. Close the following valves:</li><li>V6-12B</li></ul>
	BOP	<ul> <li>a. Close the following valves:</li> <li>V6-12B</li> <li>V6-12C</li> </ul>
	BOP	a. Close the following valves: • V6-12B • V6-12C b. Go To Section F. Verify PA announcement for procedure entry performed
		<ul> <li>a. Close the following valves: <ul> <li>V6-12B</li> <li>V6-12C</li> <li>b. Go To Section F.</li> </ul> </li> <li>Verify PA announcement for procedure entry performed</li> </ul>
	BOP	<ul> <li>a. Close the following valves:</li> <li>V6-12B</li> <li>V6-12C</li> <li>b. Go To Section F.</li> </ul> Verify PA announcement for procedure entry performed
		<ul> <li>a. Close the following valves: <ul> <li>V6-12B</li> <li>V6-12C</li> <li>b. Go To Section F.</li> </ul> </li> <li>Verify PA announcement for procedure entry performed</li> </ul>
	BOP	<ul> <li>a. Close the following valves: <ul> <li>V6-12B</li> <li>V6-12C</li> <li>b. Go To Section F.</li> </ul> </li> <li>Verify PA announcement for procedure entry performed</li> </ul> <li>Verify SW X-CONN Valves – CLOSED <ul> <li>V6-12B</li> <li>V6-12C</li> </ul> </li> <li>Evaluate Control Room Indications AND Perform Local</li>
		<ul> <li>a. Close the following valves: <ul> <li>V6-12B</li> <li>V6-12C</li> <li>b. Go To Section F.</li> </ul> </li> <li>Verify PA announcement for procedure entry performed</li> </ul>

**Operator Action** 

Form ES-D-2

Op Test No	o.: <u>1</u>	Scenario # _4 Event # _3 Page _ <u>11</u> of _37
Event Desc	ription:	North Service Water Header break at the Intake Structure.
Time	Position	Applicant's Actions or Behavior
	BOP	Verify The Following a. SW PUMP A - RUNNING b. SW PUMP B - RUNNING c. SW PUMP C - STOPPED d. SW PUMP D - STOPPED
	BOP	<ul> <li>Evaluate SW Header Pressure Indications As Follows:</li> <li>Check North SW Header pressure on PI-1616 – LOWERING (YES)</li> <li>Check South SW Header pressure on PI-1684 – STABLE OR RISING (YES)</li> </ul>
Examiners	s Note:	With Service Water Pumps "C" AND "D" isolated, EDG "B" is inoperable. ITS 3.8.1 requires SR 3.8.1.1 to be performed within 1 hour.
	BOP	Close V6-12D, SW NORTH HDR ISO
	BOP	Verify The Following Valves At The Intake Structure - CLOSED: • SW-839 • SW-845
	BOP	
		Check Flooding Status – STOPPED (YES)
	BOP	Check South SW Header Pressure On PI-1684 - GREATER THAN 40 PSIG (YES)
	BOP	Remove Control Power Fuses From The Following Breakers At 480V Bus E-2: • SERVICE WATER PUMP C (CMPT-24A) • SERVICE WATER PUMP D (CMPT-25B)
	BOP	Determine If A SW Booster Pump Should Be Started: a. Check SW Booster Pumps ALL STOPPED (NO) RNO - a. Verify only ONE SW Booster Pump is running (YES)

Op Test No.:	: _1	Scenario # _4Event # _3 Page12 of37
Event Descri	iption:	North Service Water Header break at the Intake Structure.
Time	Position	Applicant's Actions or Behavior
	BOP	
		Check Circulating Water Pump Status - ANY RUNNING (YES)
		Determine If Adequate Seal Water Is Available To Circulating Water
		Pumps As Follows:
		<ul> <li>APP-008-E4, CW PMP A SEAL WTR LOSTEXTINGUISHED (YES)</li> </ul>
	BOP	APP-008-E5, CW PMP B SEAL WTR LOST –EXTINGUISHED
		(YES)
		APP-008-E6, CW PMP C SEAL WTR LOST –EXTINGUISHED
		(YES)
		Determine Maximum Allowable CCW Temperature As Follows:
	RO	a. Check RCS temperature – LESS THAN OR EQUAL TO 350°F (NO)
		RNO - Maintain CCW Heat Exchanger outlet temperature indicated on
		TI-607 less than or equal to 105°F.
		Perform The Following:
	SRO	a. Inspect the area of the leak
		<ul> <li>b. Report findings to the Control Room</li> <li>c. Identify and isolate the source of the SW leak</li> </ul>
		Contact Maintenance To Install Tomasson Duran T
	SRO	Contact Maintenance To Install Temporary Pumps To Dewater Service Water Pits
		Contact Engineering To Perform The Following:
	SRO	<ul> <li>Evaluate operability of equipment affected by flooding</li> </ul>
		<ul> <li>Provide corrective actions for flooding</li> </ul>

Op Test No.: 1	Sconorio # 4 5 4 5
Event Description:	Scenario #Event #Page13_ of37
Time Posit	North Service Water Header break at the Intake Structure.
	ion Applicant's Actions or Behavior
	The SPO will declare onto interil of the second
	The SRO will declare entry into the following LCOs:
	ITS LCO 3.7.7, Condition A, due to one SW train inoperable. This LCO requires that the inoperable SW train be restored to operable status within 72 hours.
	ITS LCO 3.8.1, Condition B, which requires the following: (1) Perform SR 3.8.1.1 for offsite circuit within 1 hour and once per 12 hours thereafter (OP-604, Section 8.4.9, Emergency Diesel Generato Inoperability)
SRO	<ul> <li>(2) Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable within 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</li> </ul>
	<ul> <li>(3) Determine Operable DG is not inoperable due to common cause failure within 24 hours and perform SR 3.8.1.2 for Operable DG within 96 hours and</li> <li>(4) restore DG to Operable atotics within 7 hours and</li> </ul>
	(4) restore DG to Operable status within 7 days OR be in Mode 3 in 6 hours and Mode 5 in 36 hours.
	Due to CCW Pump "B" being inoperable and EDG "B" being declared inoperable due to all of its supporting Service Water Pumps being disabled, ITS 3.8.1.B.2 requires that CCW Pump "C" be declared inoperable within 4 hours. This will place the plant in LCO 3.0.3 due to not meeting ITS LCO 3.7.6 for CCW System operability requirements.
	, , , , , , , , , , , , , , , , , , ,
SRO	Implement The EALs
SRO	Return To Procedure And Step In Effect
OTE:	Crew should notify WCC apparties to the
	Crew should notify WCC SRO and/or I&C to write a work request, investigate and initiate repairs, and notify the Operations Manager.
ooth Operator:	Initiate Event #4, Failure of N-35 Compensation Voltage, after ITS entry and on cue from the Chief Examiner.

**Operator Action** 

Form ES-D-2

Op Test No		Scenario #Event #4Page14_ of37
Event Desc	ription:	Failure of N-35 Compensation Voltage.
Time	Position	Applicant's Actions or Behavior
		Applicant's Actions or Benavior
BOOTH (	<b>DPERATO</b>	R: At the discretion of the Chief Examiner, insert Event 4, Failure of I 35 Compensation Voltage
		35 Compensation Voltage.
EVENT IN	DICATION	S:
APP-005-	82, N-35 L	OSS OF COMP VOLT
		ects higher that original reading
Examiner	Note:	
	NOLC.	Due to JPM overlap, the next event should be inserted once it has
		been identified that OWP-011, NI-7 needs to be implemented and a plant shutdown performed.
		DO NOT HAVE CREW IMPLEMENT THE OWP.
		CALIFY IN LEWENT THE OWP.
	RO	APP-005-B2 N 35 LOSS OF COMPLYAL
		APP-005-B2, N-35 LOSS OF COMP VOLT, is received.
		APP 005 P2
	RO	APP-005-B2 action
		IF N-35 has failed, THEN REMOVE NI-35 from service in accordance with OWP-011.
		APP-005-B2 action
	RO	IF a unit shutdown occurs, THEN Source Range NIS will require
		manual activation.
		DO NOT HAVE CREW IMPLEMENT THE OWP. OWP-011, NI-7 actions:
		- Refer to ITS Table 3.3.1.1 for Internet 11.1
		<ul> <li>Refer to ITS Table 3.3.1-1 for Intermediate Range applicability and operability requirements (ITS Table 3.3.1-1, Item 3)</li> </ul>
	SRO	- NEWOVE NI-35 from ERFIS SCAN NIN0035A
		- START UP RATE CHANNEL SELECT Switch
		Sciected to all NI Which is NOT removed from service (NIL 26)
		CEVEL INF SWICH - BYPASS
		- NIS TRIP BYPASS NI-35 Status Light - ILLUM
		The SRO will declare entry into the following LCO:
	SRO	113 1 able 3.3.1-1. Item 3. Intermediate Dange Mautum El
		$\Gamma$
		reduced to less than P-6 or increased to greater than P-10 w/in 2 hrs.
OTH OPE	RATOR	
		As soon as the crew has identified the need to implement OWP-11, NI-7 and determine the need for a line in the nee
		NI-7 and determine the need for a plant shutdown, and with concurrence of the Chief Examiner, insert Event 5, CCW system
		leakage.

Append	ix D
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Event Des	cription:	Leakage on CC-703B at 25 GPM and rising to 750 GPM.
Time	Position	
		Applicant's Actions or Behavior
BOOTH	OPERATOR	R: At the discretion of the Chief Examiner, insert Event 5, Leakage
		CC-703D at 25 GPW and rising to 750 CDM
		IS: SURGE TK HI/LO LVL
CW Su	rge Tank Le	evel indicator LI-614B lowering
PP-036	-H1, WDBR	P TROUBLE (Delayed several minutes)
		AOP-014, COMPONENT COOLING WATER SYSTEM
		MALFUNCTION
	SRO	Implement the EALs
<u> </u>	BOP	Make PA announcement for procedure entry
	SRO	Go To appropriate section for indicated malfunction:
		Loss of CCW Inventory – Go To Section A
		Continuous Action Step:
		Determine If Pump Cavitation is Occuring <i>OR</i> Imminent As Follows:
	RO	<ul> <li>Check Surge Tank Level - LESS THAN 5% (NO)</li> <li>Check CCW Pump Discharge Pressure (Local) <u>AND</u> Flow -</li> </ul>
		WIDE OSCILLATIONS (NO)
		BNO - IF CCW Surge Tank level lewan to the the strength
		RNO - IF CCW Surge Tank level lowers to less than 5% <u>OR</u> CCW Pump Cavitation occurs, THEN Go To Step 2.
		Verify at the RTGB, Primary Water Makeup To CCW As Follows:
	RO	i a. Primary vvater Pump - RUNNING
		b. CC-832, MAKEUP – OPEN
	RO	Check CCW Surge Tank level (LI-614B) - STABLE OR RISING (YES
	RO	Throttle CC-832 OR CC-711 To Maintain Surge Tank Level (LI-614B)

**Operator Action** 

		Leakage on CC-703B at 25 GPM and rising to 750 GPM.
Time	Position	Applicant's Actions or Behavior
	SRO	Dispatch Operator To Perform Attachment 3, CCW Leak Search, While Continuing With Procedure
	RO	Continuous Action Step         Check CV For CCW Break Using Control Room Indications As         Follows :         a. Monitor the following CV indications:         - ERFIS CV SUMP LEVEL         - CV WATER LEVEL (White Sump Lights)         - LI-801, CHANNEL I CV WATER LEVEL         - LI-802, CHANNEL II CV WATER LEVEL         - RCP Abnormal Conditions         b. Check CV – LOCATION OF CCW BREAK (NO)
	RO	<ul> <li>Continuous Action Step         Determine If Actions For Auxiliary Building Flooding Are Necessary As             Follows:</li></ul>
aminer's N	-	Go To Step 26. At this point, the CCW leakage will rise to 750 gpm. The crew will transition to Step 8 (Continuous Action Step) and proceed through the procedure to combat the clean step.

Ap	pendix	хD

Op Test No.: Event Descrip		Scenario # <u>4</u> Event # <u>5</u> Page <u>17</u> of <u>37</u> Leakage on CC-703B at 25 GPM and rising to 750 GPM.
Time	Position	Applicant's Actions or Behavior
	RO	Continuous Action Step Check CCW Surge Tank level (LI-614B) - STABLE OR RISING (NO) RNO - WHEN CCW Surge Tank level (LI-614B) is Stable OR Rising, THEN perform Step 9.
	RO	Start a Second Primary Water Pump
	RO	Check CCW Surge Tank level (LI-614B) – LOWERING (YES)
	SRO	Dispatch Operator To Perform Attachment 3, CCW Leak Search, While Continuing With Procedure
	RO	<ul> <li>Continuous Action Step</li> <li>Determine If Pump Cavitation is Occurring OR Imminent As Follows:</li> <li>Check Surge Tank Level - LESS THAN 5% (YES)</li> <li>Check CCW Pump Discharge Pressure (Local) AND Flow - WIDE OSCILLATIONS (YES)</li> </ul>
	RO	Check Reactor – CRITICAL (YES)
	RO	Verify Reactor – TRIPPED (Large Break LOCA will occur when the reactor trip breakers are opened)
	RO	Stop ALL RCPs
	SRO	Go To PATH-1 While Continuing With This Procedure (NOTE: AOP-014 actions are listed at the end of the scenario guide.)

Appendix D
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Op Test No.:	: <u>1</u>	Scenario # _4 Event # _6 Page _18_ of _37
Event Descri	iption:	Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
		START OF PATH-1 ACTIONS
	RO	Immediate Action Step Reactor tripped (YES)
	BOP	Immediate Action Step Turbine tripped (YES)
	BOP	Immediate Action Step E1 & E2 energized (YES)

BOP	Continuous Action Step IF Dedicated Shutdown Bus is Deenergized THEN Place Dedicated Shutdown Diesel Generator In Service Using EPP-25.
RO	Immediate Action Step SI initiated (YES)
SRO	Open Foldout A
RO	RCP TRIP CRITERIA         a. IF BOTH conditions below are met, THEN stop all RCPs:         • SI Pumps – AT LEAST ONE RUNNING AND CAPABLE OF DELIVERING FLOW TO THE CORE         • RCS Subcooling – LESS THAN 35°F [55°F]         b. IF the PHASE B Isolation valves are closed, THEN stop all RCPs. (YES)
	RO

Appendix [		Operator Action Form ES-D
Op Test No.: Event Descrij		Scenario # _4 _Event # _6 Page _19 of _37 _arge Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
<u> </u>	A <u></u>	
	BOP	EMERGENCY COOLING WATER SWITCHOVER CRITERIA IF normal cooling is lost to any of the following components, <u>THEN</u> establish emergency cooling water using the referenced procedure: Charging Pump Oil Coolers - Use Attachment 1 of AOP-014, Component Cooling Water System Malfunction. (YES)
		Verify Phase A valves closed (NO)
Critical Task	RO	FP-248, 249, 256 and 258 did not close automatically and will have to be manually closed from the CFPP.
	BOP	Verify FW isolation valves closed (YES)
	BOP	Verify both FW pumps tripped (YES)
	BOP	Verify both MDAFW pumps running (YES)
	BOP	If Additional Feedwater is required, <u>THEN</u> Start SDAFW Pump
	RO	Verify two SI pumps running (YES)
	RO	Verify both RHR pumps running (YES)
Critical Task	RO	Verify SI valves properly aligned (NO) Valves SI-870A and 870B did not open on the SI and at least one of the valves must be opened to provide an injection flow path to the core.

Appendix D		Operator Action Form ES-E
Op Test No.:	1	Scenario # _4 Event # _6 Page _20_ of _37
Event Descriptio	n:	Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
AOP will Dependin AOP-014	lockout a Ig on wh will affec	AOP-014 is in effect due to being a concurrent AOP. Actions in the all of the CCW Pumps due to the loss of inventory in the system. en an operator is assigned to perform the remaining actions in at the following steps that are preceded by a "@" symbol. are continued from previous section at the end of the scenario
	RO	@ At least one CCW pump running (NO)
	BOP	@ E-1 AND E-2 energized by offsite power (YES)
	RO	@ Start CCW Pump (Cannot be started.)
	RO	@ Verify open Therm Bar Flow Cont FCV-626 unless closed due to ruptured Therm Bar (Cannot be opened due to a Phase B signal)
	BOP	All SW & SW booster pumps running (NO)
	BOP	Attempt to start all SW and SWB Pumps
	BOP	NORTH or SOUTH SW HDR LO PRESS ALARMS ILLUMINATED (YES)
	BOP	CLOSE V6-16C OR V6-16A and V6-16B
	BOP	Secure Turbine Building equipment using Supplement M. (Supplement M actions included at the end of PATH-1 actions)
	RO	Verify CV Fans HVH-1,2,3 & 4 running (YES)

	Ap	pendix	D
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Op Test No.:	_1	Scenario #	_4	Event #	_6	Page	21	of	37
Event Descri	ption:	Large Break	LOCA on	Reactor Tri	р				
Time Position Applicant's Actions or Behavior									

	RO	Verify CV ventilation isolation (YES)
Critical Task	BOP	<ul> <li>Verify control room ventilation aligned for pressurization mode (NO)</li> <li>Operator to verify the following:         <ul> <li>Verify CONT RM AIR EXHAUST Fan, HVE-16 - STOPPED</li> <li>Verify CLEANING Fan HVE-19 A/B - RUNNING</li> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1A-SA - CLOSED</li> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1B-SB - CLOSED</li> <li>IF CR-D1A-SA OR CR-D1B-SB have lost power, THEN locally verify position in the Control Room Kitchen.</li> </ul> </li> </ul>
	BOP	Verify both EDGs running (YES)
	BOP	Continuous Action Step Restart Battery Chargers within 30 minutes of Power Loss using OP- 601
	RO	Continuous Action Step CV pressure remained below 10 psig (NO)
	RO	Verify CV Spray Initiated (YES)
	RO	Verify all CV Spray Pumps running with valves properly aligned (YES)
	RO	Verify appropriately 12 GPM Spray Additive tank flow (Valve SI-845C will be throttled to adjust flow to ~12 GPM as read on FI-949)
	RO	Verify Phase B Isolation Valves closed (YES)

Ap	oendix	D
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Op Test No.:	1	Scenario # _4 Event # _6 Page _22_ of _37
Event Descript	tion:	Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
	RO	Stop all RCPs (Previously secured IAW AOP-014)
	BOP	Verify all MSIVs and MSIV Bypasses Closed (YES)
	BOP	Locally open the breaker for HVS-1 at MCC-5 CMPT 7J within 60 minutes of SI Initiation
BOOTH OP	ERATOR	Open the breaker for HVS-1 3 minutes after directed by the Control Room.
	RO	RCS pressure greater than 1350 psig [1250 psig] (NO)
	RO	SI flow verified (YES)
	RO	RCS pressure >125 psig (NO)
	RO	RHR flow verified (YES)
	BOP	At least 300 gpm AFW flow available (YES)
	BOP	Verify AFW Valves Properly Aligned (YES)
	BOP	Control AFW flow to maintain S/G levels between 8% [18%] and 50%
		RCP Thermal Barrier Cooling Water Hi or Lo flow alarms illuminated
	RO	(YES)

Appendix D		Operator Action	Form ES-D
Op Test No.: Event Descript		Scenario # <u>4</u> Event # <u>6</u> Page Large Break LOCA on Reactor Trip	23_ of
Time	Position	Applicant's Actions or Behavior	
	RO	IF seal cooling is NOT restored within 15 minute Supplement R	es, THEN perform
	RO	At least one charging pump running (YES)	
	RO	Greater than 5 inches thermal barrier Delta P OF	R 6 GPM seal injection
		to all RCPs (YES)	
	RO	At least one Instrument Air Compressor running	(YES)
	RO	Stop RCP with Therm Bar Delta P less than 5 in injection less than 6 GPM (RCPs previously sec	ches AND seal ured).
	RO	Seal cooling established to all RCPs (YES)	
	BOP	Place Steam Dump Mode switch to Steam Press	sure
	RO	RCS temperature stable at or trending to 547°F (	(NO)
	RO	RCS temperature greater than 547°F (NO)	
	BOP	Attempt to limit cooldown	
	BOP	IF RCS Cooldown continues and is not due to SI MSIVs and MSIV Bypasses.	
		<ul> <li>MSIVs and MSIV Bypasses are closed du Isolation signal.</li> </ul>	le to Phase B

Appendix D		Operator Action Form ES-
Op Test No.: Event Descripti		Scenario # <u>4</u> Event # <u>6</u> Page <u>24</u> of <u>37</u> Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
	RO	PZR PORVs Closed (YES)
	RO	PZR Spray & Aux Spray valves closed (YES)
	RO	At least one RCP running (NO)
	BOP	Any S/G with uncontrolled depressurization (NO)
	BOP	Any S/G Completely Depressurized (NO)
	BOP	R-19s, R-31s, R-15 Rad levels normal (YES)
	BOP	R-2, R-32A, R-32B Rad Levels Normal (YES)
	RO	<ul><li>CV Pressure Normal (NO)</li><li>GO TO PATH-1, Entry Point C</li></ul>
	RO	Reset SPDS and initiate monitoring CSFSTs
	RO	FRP-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, has a RED Path due to the excessive RCS cooldown. FRP-P.1 actions to follow.

Appendix D	Operator Action Form ES-D-					
	Scenario # _4 Event # _6 Page _25 of _37					
Time Position	Applicant's Actions or Behavior					
BOP	<b>FRP-P.1 Actions</b> Check CST Level – LESS THAN 10% (NO) RNO – IF CST level lowers to less than 10%, THEN perform Step 2. Go To Step 3.					
RO	<ul> <li>FRP-P.1 Actions</li> <li>Determine if RCS cooldown is due to a Large Break LOCA as follows: <ul> <li>a. Check both of the following conditions exist:</li> <li>RCS pressure – LESS THAN 275 PSIG [400 PSIG] (YES)</li> <li>AND</li> <li>RHR flow on FI-605 – GREATER THAN 1200 GPM (YES)</li> <li>b. Reset SPDS and return to procedure and step in effect.</li> </ul> </li> </ul>					
SRO	Re-enter PATH-1 at Entry Point C					
SRO	Open Foldout B (No actions required)					
BOP	Request periodic activity samples of All S/Gs					
RO	At least one RCP running (NO)					
BOP	Any S/G with Uncontrolled Depressurization (NO)					
BOP	Any S/G Completely Depressurized (NO)					
BOP	Control AFW Flow to Maintain S/G Levels between 8% [18%] and 50%					

Appendix		Operator Action Form ES-
Op Test No. Event Descr		Scenario # _4 Event # _6 Page _26 of _37 Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
	1	
	BOP	Any S/G with Uncontrolled Level Rise (NO)
	BOP	R-19s, R-31s, <u>AND</u> R-15 Rad Levels Normal (YES)
	RO	PZR PORVs Closed (YES)
	RO	Open at least one PORV Block unless Closed to Isolate an Open PZ PORV
	RO	Continuous Action Step IF PZR PORV Opens on High Pressure, <u>THEN</u> Verify Reclosure at o Below 2335 PSIG. Close PORV Blocks as Necessary.
	RO	Reset SI
	CREW	Continuous Action Step IF Offsite Power is Lost, <u>THEN</u> Restart Emergency Safeguard Equipment
	RO	Reset CV Spray
	RO	Reset Phase A <u>AND</u> Phase B
	RO	Establish Instrument Air to CV. <u>IF</u> Compressor Not Running, <u>THEN</u> Start Compressor.
	BOP	Offsite Power Available to Charging Pumps (YES)

Appendix D		Operator Action Form Es				
Op Test No. Event Descr		Scenario # _4 Event # _6 Page _27 of _37 Large Break LOCA on Reactor Trip				
Time	Position	Applicant's Actions or Behavior				
	I					
	RO	At Least One Charging Pump Running (YES)				
	RO	Establish Charging Flow as Necessary				
	RO	CV Spray Pumps Running (YES)				
	RO	Continuous Action Step WHEN CV PRESS LOWERS BELOW 4 PSIG, THEN STOP CV SPRAY PUMPS AND CLOSE SI-880 VALVES				
	RO	RCS Subcooling Greater Than 35°F [55°F] (NO)				
	RO	Continuous Action Step WHEN Below 10 <sup>-10</sup> Amps, THEN Energize Source Range detectors and monitor recorder. (Due to failure of N-35, Source Range detectors will have to be manually re-energized)				
	RO	RCS Pressure Greater Than 275 PSIG [400 PSIG] (NO)				
	BOP	E-1 AND E-2 energized by offsite power (YES)				
	BOP	Starting Air Receivers repressurized to unloaded EDGs (YES)				
	BOP	Stop the unloaded EDGs				

## **Operator** Action

Event Descri		Scenario # _4Event # _6Page _28of _37           Large Break LOCA on Reactor Trip				
Time	Position	Applicant's Actions or Behavior				
	RO	Supplement D components capable of recirc (NO) No CCW Pumps are available				
	SRO	Exit PATH-1 to EPP-15, Loss of Emergency Coolant Recirculation				
	RO	Continuous Action Step: Check Emergency Coolant Recirculation Capability – RESTORED (NO)				
	RO	Reset SPDS <u>AND</u> Initiate Monitoring Critical Safety Function Status Trees				
	SRO	Foldout Pages Are Not Applicable During Performance Of This Procedure				
RO		Continuous Action Step: Check Suction Source To Any Of The Following Pumps – LOST (NO) SI Pumps RHR Pumps CV Spray Pumps				
	RO	Check Emergency Recirculation Equipment – AVAILABLE USING SUPPLEMENT D (NO) RNO – Try to restore at least one train while continuing with this procedure.				
	RO	Verify The Following CV RECIRC FANS – RUNNING (YES) • HVH-1 • HVH-2 • HVH-3 • HVH-4				

Appendix D	)
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Event Descri	ption:	Large Break LOCA on Reactor Trip					
Time	Position	Applicant's Actions or Behavior					
		Continuous Action Step:					
	RO	Check RWST Level - LESS THAN 9% (NO)					
		Oncor NVOT Level - LEGS THAN 9% (NO)					
	RO	Place The CONTAINMENT SPRAY Key Switch To The OVRD/RESE					
		Position					
		Determine CV Spray Pump Requirements					
		a. Determine Number Of CV Spray Pumps Required Using the Following Table:					
		RWST level greater than 27%					
		CV Pressure less than 4 psig					
		HVH-1, 2, 3, 4 operating					
	RO	CV Spray Pumps required – 0					
		<ul> <li>b. Check CV Spray Pump running – EQUAL TO NUMBER REQUIRED (YES, unless spray not previously secured.)</li> </ul>					
		IF a CV Spray Pump is required to be stopped, THEN close the discharge valves of any stopped pump:					
		CV Spray Pump A – SI-880A and B					
		CV Spray Pump B – SI-880C and D					
	RO	Makeup to RWST using Supplement P while continuing with this					
		procedure.					
	Dop	Continuous Action Step:					
	BOP	Check CST Level - LESS THAN 10% (NO)					
		Control Intact S/G Levels As Follows : a. Check intact S/G levels - ANY GREATER THAN 8% [18%]					
а 1	BOP	(YES)					
		<ul> <li>b. Control feed flow to maintain intact S/G levels - BETWEEN 8% [18%] AND 50%</li> </ul>					

Appendix D		· · · ·	Ope	erator Actio	n			Form ES-D
Op Test No.: Event Descript		Scenario # Large Break L	4	_ Event #	6	Page	<u>30</u> of	37
<u> </u>							-	
Time	Position			Арр	licant's Acti	ons or Behavior		
	RO	Following	<b>]</b> :	r Coolant S		dic Boron Sar	mples Of	The
	RO	Ensure A a. C RNO - W	dequa heck t HEN s	ooron samp sample resi	vn Margin de results ults availa	Exists As Fo – AVAILABL ble, THEN pe I <i>Go</i> To Step	E (NO) erform St	ep 18.b
	BOP	a. M IN b. M CI TE c. Ch	aintair THE aintair JRVE MPE NPE	n cooldown LAST 60 M n RCS temp 3.4, REAC RATURE L	rate in Re IINUTE berature a TOR CO IMITATIC n - ALIGN	itdown As Fol CS cold legs and pressure OLANT SYST DNS FOR CO IED FOR CO	- LESS T - WITHIN TEM PRE OLDOW	I LIMITS OI ESSURE - N
	BOP	Check int COOLDO			AST ONE	AVAILABLE	FOR RC	S
	BOP	Check ste RNO – Du Go To Ste	ump st	ump to Con team from	denser – S/Gs usin	AVAILABLE g STEAM LIN	(NO) IE PORV	/s.
	RO	Check RC	S Hot	t Leg Temp	eratures ·	LESS THAN	543°F (	YES)
	BOP	a. Ch	ieck st ntinue	RCS cool	to Conde Jown usin	enser – AVAIL g STEAM LIN	E POR	

Appendix [	C
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Event Descripti		Scenario # _4 Event # _6 Page _31_ of _37
	on:	Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
	RO	<ul> <li>Defeat Low Tavg Safety Injection Signal As Follows:</li> <li>a. Momentarily place SAFETY INJECTION T-AVG Selector Switch to BLOCK position</li> <li>b. Verify LO TEMP SAFETY INJECTION BLOCKED status light – ILLUMINATED (YES)</li> </ul>
	RO	Check RCS Pressure - LESS THAN 1950 PSIG (YES)
	RO	Defeat Low Pressure Safety Injection Signal As Follows: a. Momentarily place PZR PRESS/HI STM LINE DP Switch to BLOCK position b. Verify LO PRESS SAFETY INJECTION BLOCKED status light – ILLUMINATED (YES)
	RO	Reset SAFETY INJECTION
	BOP	Continuous Action Step Check Off-Site Power – AVAILABLE (YES)
	RO	Check Safeguards Pump Status - ANY RUNNING (YES) <ul> <li>SI Pumps</li> <li>OR</li> <li>RHR Pumps</li> </ul>
	RO	Establish One Train Of SI Flow As Follows: a. Verify SI PUMPS - ONLY ONE RUNNING b. Check RCS Pressure – LESS THAN 275 PSIG [375 PSIG]

Op Test N Event Des		Scenario #         4         Event #         6         Page         32         of         37           Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
		Supplement M, Component Alignment for Loss of SW to Turbing Building Actions
	BOP	Shutdown secondary as follows: a. Check S/Gs – ANY RUPTURED (NO) Go To Step 1.c
	BOP	Close all MSIVs AND MSIV Bypass Valves
	BOP	<ul> <li>Break vacuum to the Condenser as follows:</li> <li>1. Depress AND hold the THINK pushbutton</li> <li>2. Open VACUUM BREAKER VALVES:</li> <li>MS-70A</li> <li>MS-70B</li> <li>3. WHEN the valves are open, THEN release the THINK pushbutton.</li> </ul>
	BOP	Verify the following equipment is stopped: • FW PUMP A and B • COND PUMP A and B • HEATER DRAIN PUMP A and B • GOV FLUID PUMP A and B • VACUUM PUMP A and B
	BOP	Return to procedure and step in effect END of Supplement M steps

Append	dix D	
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Op Test No.:	_1	Scenario #	_4	Event #	6	Page	<u>33</u>	of	_37
Event Descrip	otion:	Large Break	LOCA on	Reactor Tri	D				
Time	Position			Ар	olicant's Act	ions or Behavior			

	AOP-014, Component Cooling Water System Malfunction ACTIONS
RO/	BOP Lockout CCW Pumps As Follows: a. Place AND hold all CCW Pump switches in STOP position b. Check APP-001-F5, CCW PMP LO PRESS - ILLUMINATED c. Release CCW Pump Switches d. Go To Step 13
RO/	BOP Dispatch Operator To Perform Attachment 3, CCW Leak Search, While Continuing With Procedure
RO/I	Continuous Action Step         Check CV For CCW Break Using Control Room Indications As         Follows :         a. Monitor the following CV indications:         • ERFIS CV SUMP LEVEL         • CV WATER LEVEL (White Sump Lights)         • LI-801, CHANNEL I CV WATER LEVEL         • LI-802, CHANNEL II CV WATER LEVEL         • RCP Abnormal Conditions         b. Check CV - LOCATION OF CCW BREAK (NO)         RNO - IF subsequent parameters indicate location of break in the CV THEN Go To Step 15.         Observe the NOTE Prior to Step 25 and Go To Step 25

Appen	dix D
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Time	cription:	
- Time	<u> </u>	Applicant's Actions or Behavior
		Continuous Action Step
		Determine if actions for Auxiliary Building flooding are necessary as follows:
		a. Check for any of the following indications of flooding:
		<ul> <li>Water level on Aux Bldg first floor – GREATER THAN 6 INCHES (NO)</li> </ul>
	RO/BOP	OR
		<ul> <li>APP-001-E4, RHR PIT A HI LEVEL – ILLUMINATED (NO)</li> </ul>
		OR
		APP-001-E5, RHR PIT B HI LEVEL – ILLUMINATED (NO)
		RNO – IF at any time flooding is indicated, THEN perform Attachment 4, Flood Control in the Auxiliary Building.
		Go To Step 26.
		Determine If RHR Must Be Stopped As Follows:
		a. Check CCW Pumps - ALL STOPPED (YES)
	RO/BOP	<ul> <li>b. Check RHR Pump status - ANY PUMP RUNNING IN CORE COOLING MODE (NO)</li> </ul>
		RNO – Go To Step 29.
		Verify Letdown Isolated As Follows :
	RO/BOP	<ul> <li>LCV-460 A&amp;B, LTDN LINE STOP - CLOSED</li> <li>HIC-142, PURIFICATION FLOW - SET TO 0%</li> </ul>
		CVC-387, EXCESS LTDN STOP - CLOSED
	RO/BOP	Determine If Charging Pump(s) Should Be Stopped As Follows:
		a. Check Charging Pumps – ANY PUMP RUNNING (YES) b. Check RCS temperature - GREATER THAN 150°F (YES)

**Operator Action** 

		Large Break LOCA on Reactor Trip
Time	Position	Applicant's Actions or Behavior
	RO/BOP	<ul> <li>Establish Alternate Cooling To Charging Pumps As Follows:</li> <li>a. Stop ALL but one Charging Pump</li> <li>b. Raise the speed of the running Charging Pump to at least 75% Demand Signal</li> <li>c. Dispatch an operator to perform Attachment 1, Emergency Cooling To Charging Pumps</li> </ul>
	RO/BOP	Check Attachment 1 – COMPLETE (NO) RNO - WHEN Attachment 1, EMERGENCY COOLING TO CHARGING PUMPS, has been completed, THEN perform steps 33, 34 and 35
		Go To Step 36
	RO/BOP	Notify Chemistry Personnel To Stop Any Primary Sampling In Progress
	RO/BOP	Determine If Emergency Cooling To Spent Fuel Pit Heat Exchanger Is Required As Follows: a. Check APP-036-B4, SPENT FUEL PIT HI TEMP – ILLUMINATED (NO) RNO - IF at any time APP-036-B4, SPENT FUEL PIT HI TEMP, illuminates, THEN perform Step 37.b. Go To Step 38.
	RO/BOP	Determine If CCW May Be Restored As Follows: a. Check CV – LOCATION OF CCW BREAK (NO) RNO – Go To Step 39.
	RO/BOP	Check leak source – LOCATED (YES)
		Check Leak Source – ISOLABLE (NO)
	RO/BOP	<ul> <li>RNO – Perform one of the following:</li> <li>IF CCW Pumps have ALL been stopped, THEN Go To Step 44.</li> </ul>

Appendix D
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Op Test No.:	_1	Scenario #	4	Event #	6	Page	36	of	37
Event Descripti	ion:	Large Break L	.OCA or	n Reactor Tri	p				
Time	Position			Ар	olicant's A	ctions or Behavior			

	RO/BOP	Initiate Action For Emergency Repair Of The Pipe Break
	RO/BOP	Check Repair Status – COMPLETE (NO) RNO - WHEN the repairs have been completed, THEN Go To Step 47.
Booth Op	erator:	After approximately 15 minutes of being requested, report that Attachment 1, Emergency Cooling to Charging Pumps, is completed.
<u>.                                    </u>	RO/BOP	Step 33: Reduce the Speed of the Running Charging Pump to Minimum
	RO/BOP	Step 34: Check RCP Thermal Barrier $\Delta P$ – Greater than 5 inches (YES) (IF NO, then locally throttle RCP Seal Water Flow Control Valves to obtain at least 6 gpm to each RCP.)
	RO/BOP	<ul> <li>Check RCP Parameters:</li> <li>RCP Thermal Barrier △P Greater Than 5 inches <u>OR</u></li> <li>RCP Seal Injection Flow – At least 6 gpm to each RCP (IF NO, then raise charging pump speed to establish RCP Thermal Barrier △P greater than 5 inches <u>OR</u> RCP seal injection flow at least 6 gpm to each RCP.)</li> </ul>

operation has been reduced to minimum pumps operating or at his discretion.

# ILC-11-2 NRC SCENARIO 4 TURNOVER SHEET

POWER LEVEL:1E-8 ampsCore Burnup:150 MWD/MTUEFPD:4.3 EFPDBoron:1531 PPMXenon:88 pcm (72 hours post trip)Tavg:547°FBank D Rods:99 Steps

EQUIPMENT UNDER CLEARANCE:

• NONE

#### **EQUIPMENT STATUS:**

• Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.

#### INSTRUCTIONS FOR THE WATCH:

• Raise reactor power to the POAH and continue with plant startup.

# **Unit 2 Status Board**

	Date:	Today	Time:	6:00:00 AN	Cycle:	27	MWD/MT:	150	Design:	16590
	EFPD	4.3	Design	473.5					Locigin	110000
					1.1	Tank	Level %		Status	
HUT	Level %		Status			Monitor A	10		Standby	/
CVCS-A	20	Filling				Monitor B	38		Standby	
CVCS-B	10	Standby				WCTA	37		Standby	
CVCS-C	86	Standby				WCT B	7		Standby	
WHUT	#NAME?	Filling				WCT C	9		Standby	
			_			WCT D	10		Standby	
	Data Linked t	o Pl				WCT E	9		Standby	1
WGDTS	Pressure	PSIG	Sta	itus						
Α	#NAME?	PSIG	On cover					EMINERALIZ	ERS	
B	#NAME?	PSIG	In Service				РРМ	In Service	Date	Resin Replaced
<u>с</u>	#NAME?	PSIG	Isolated		1 - EV	MB A	2194	YES	7/17/2010	5/4/2010
D	#NAME?	PSIG	Standby		111112	MB B	2265	NO	7/17/2010	3/29/2010
					1.1	CATION	1021	NO	9/17/2010	12/9/2009
Shu	tdown Requi	rement	Тетр	Boron	1	DEB A	0	NO	New	2/3/2010
	1.77% =∆K	K	547 F Hot	1051	1	DEB B	0	NO	3/28/2010	2/0/2010
	1.77% =∆K	κ.	≥350 F	1281		SFP	1963	NO	9/23/2008	4/22/2008
	2.6% =∆K/	K	100 F Cold	1430					312312000	412212008
	6% =∆K/K		N/A	1950	1.1				SGBD	
C 2					Co	ondenser Air Inle	akade	Tarmot	/alue GPM	Status
	POR	/ Settings		1	A	13	CFM			
Setti	ng Date	POT	GP-3 Psig	4	В	0	CFM	А В	50 50	Flash Tanl With Heat
A	7/18/2010	3.21	1000		Known	8	CFM	C	50	Recovery
В	7/18/2010	3.12	1040	-	Total	5	CFM	N2 Flow		
C	7/18/2010	3.44	1000		Total	15		INZ FIOW	8	SCFM
						Effluent Ra	diation Monit	or Setnoints		
DCC		0.00			Rad	Current			NUE Value	
RUSI	_eakage	0.00	Unidentified		Monitor	Setpoint	Alert Va	alue 200X	2X	
Total		0.03	GPM		R-14C			1/4	·	
PRT		0.02	GPM			1.01E+04		1/A	2.020E+04	
					R-20	7.40E+03	_	1/A	1.480E+04	
RCDT Leal		0.01	GPM		R-18	1.00E+06	2.00	0E+08	2.000E+06	
Charging L		0	GPM	10.2010	R-19A	1.05E+04	2.10	0E+06	2.100E+04	12.51
lisc Ident	fied	0	GPM		R-19B	9.72E+03	1.94	4E+06	1.944E+04	
	condary	0	GPD		R-19C	9.58E+03		6E+06	1.916E+04	
Primary/Se									1.706E+04	S. U.S.
		17.3	GPM		R-37	18 53E+03	1 70			
		17.3	GPM	1 1	R-37	8.53E+03 Manu	1.70			hom date har
	Loss Hi Flux A	t Shutdowr		1 I 1	<u>R-37</u>	Manu	ally Entered D	Data	Linked to C	
	Loss	t Shutdowr			<u>R-37</u>	Manu Boron PPM	ally Entered D Date	Data PPM		hem data base PPM
Secondary	Loss Hi Flux A	t Shutdowr	1		<u>R-37</u>	Manu Boron PPM RCS	Date	Data PPM 1531	Linked to C Date	PPM
Secondary	Loss Hi Flux A Previous Al	t Shutdowr	ı Setpoint		<u>R-37</u>	Manu Boron PPM RCS BAST-A	Date Date Today 9/16/2010	Data PPM 1531 21,535	Linked to C Date #NAME?	PPM #NAME?
Secondary	Loss Hi Flux A Previous A 50	t Shutdowr	Setpoint 150		<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B	ally Entered D Date Today 9/16/2010 9/16/2010	Data PPM 1531 21,535 21,032	Linked to C Date #NAME? #NAME?	PPM #NAME? #NAME?
Secondary	Loss Hi Flux A Previous Al 50 60	t Shutdowr	Setpoint 150 180		<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP	Date           Date           Today           9/16/2010           9/15/2010	Data           PPM           1531           21,535           21,032           2246	Linked to C Date #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME?
Secondary	Loss Hi Flux A Previous Al 50 60	At Shutdown RI Counts	Setpoint 150 180		<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST	Date           Today           9/16/2010           9/15/2010           9/15/2010           9/16/2010	Data PPM 1531 21,535 21,032 2246 2219	Linked to C Date #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME?
Secondary II-31 II-32	Loss Hi Flux A Previous Al 50 60	At Shutdown RI Counts Normal Curr	Setpoint 150 180 ents	% BAND	<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A	ally Entered [ Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME?
Primary/Se Secondary NI-31 NI-32 I-41 I-42	Loss Hi Flux A Previous A 50 60 N UPPER	At Shutdown RI Counts Normal Curr LOWER	Setpoint 150 180 ents TARGET 2.3	% BAND 5 +/-	R-37	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B	ally Entered I Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211 2206	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Secondary II-31 II-32 I-41 I-42	Loss Hi Flux A Previous A 50 60 UPPER 115	At Shutdown RI Counts Normal Curr LOWER 109 100	Setpoint 150 180 ents TARGET 2.3 2.3	% BAND 5 +/- 5 +/-	<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C	Bally Entered I           Date           Today           9/16/2010           9/16/2010           9/16/2010           9/16/2010           8/30/2010           8/30/2010           8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME?
ll-31 ll-32 l-41 l-42 l-43	Loss Hi Flux A Previous A 50 60 UPPER 115 101	At Shutdown RI Counts Normal Curr LOWER 109	Setpoint 150 180 TARGET 2.3 2.3 2.3	% BAND 5 +/- 5 +/- 5 +/-	<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR	Bally Entered I           Date           Today           9/16/2010           9/16/2010           9/16/2010           9/16/2010           8/30/2010           8/30/2010           8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211 2206	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Secondary	Loss Hi Flux A Previous Al 50 60 UPPER 115 101 96 91	At Shutdown RI Counts Normal Curr LOWER 109 100 89 87	Setpoint           150           180           rents           TARGET           2.3           2.3           2.3           2.3	% BAND 5 +/- 5 +/- 5 +/- 5 +/-	<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal	Bally Entered I           Date           Today           9/16/2010           9/16/2010           9/16/2010           9/16/2010           8/30/2010           8/30/2010           8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Secondary 11-31 11-32 1-41 1-42 1-43 1-44	Loss Hi Flux A Previous Al 50 60 UPPER 115 101 96	At Shutdown RI Counts Normal Curr LOWER 109 100 89 87	Setpoint 150 180 TARGET 2.3 2.3 2.3	% BAND 5 +/- 5 +/- 5 +/-	<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Bally Entered I           Date           Today           9/16/2010           9/16/2010           9/16/2010           9/16/2010           8/30/2010           8/30/2010           8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
econdary II-31 II-32 II 32 II-32 II 32 II	Loss Hi Flux A Previous Al 50 60 UPPER 115 101 96 91 AX Rev# 2.1.	At Shutdown RI Counts Normal Curr LOWER 109 100 89 87 D RNP	Setpoint           150           180           rents           TARGET           2.3           2.3           2.3           2.3           2.3           2.3           2.3	% BAND 5 +/- 5 +/- 5 +/- 5 +/-	R-37	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal	Bally Entered I           Date           Today           9/16/2010           9/16/2010           9/16/2010           9/16/2010           8/30/2010           8/30/2010           8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
econdary II-31 II-32 I-41 I-42 I-43 I-44 OWERTR/ FAI	Loss Hi Flux A Previous Al 50 60 UPPER 115 101 96 91 AX Rev# 2.1.	At Shutdown RI Counts Normal Curr LOWER 109 100 89 87 D RNP Test/Hrs	Setpoint           150           180           ents           TARGET           2.3           2.3           2.3           2.3           Date/Tst	% BAND 5 +/- 5 +/- 5 +/- 5 +/-	<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	ally Entered D Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230 2221	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Secondary II-31 II-32 I-41 I-42 I-43 I-44 OWERTR/ OWERTR/ FAI HVE	Loss Hi Flux A Previous Al 50 60 UPPER 115 101 96 91 AX Rev# 2.1.0 NS 1A/B	At Shutdown RI Counts Normal Curr LOWER 109 100 89 87 0 RNP Test/Hrs 35640.6	Setpoint           150           180           ents           TARGET           2.3           2.3           2.3           2.3           2.3           2.3           3/8/10	% BAND 5 +/- 5 +/- 5 +/- 5 +/-	<u>R-37</u>	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Ally Entered Date Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 7/6/2010 Notes/Add	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230 2221 itional Data	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
Secondary II-31 II-32 I-41 I-42 I-43 I-44 OWERTR/ FAI HVE HVE	Loss Hi Flux A Previous Al 50 60 0 UPPER 115 101 96 91 AX Rev# 2.1.0 NS 1A/B -15A	At Shutdown RI Counts Normal Curr LOWER 109 100 89 87 0 RNP Test/Hrs 35640.6 18643.5	Setpoint 150 180 ents TARGET 2.3 2.3 2.3 % APL Date/Tst 3/8/10 3/18/10	% BAND 5 +/- 5 +/- 5 +/- 5 +/-	R-37	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Ally Entered Date Date Today 9/16/2010 9/16/2010 9/15/2010 9/16/2010 8/30/2010 8/30/2010 7/6/2010 Notes/Add	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230 2221	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?
econdary	Loss Hi Flux A Previous Al 50 60 0 UPPER 115 101 96 91 AX Rev# 2.1.0 NS 1A/B -15A	At Shutdown RI Counts Normal Curr LOWER 109 100 89 87 0 RNP Test/Hrs 35640.6 18643.5 6928.3	Setpoint           150           180           ents           TARGET           2.3           2.3           2.3           2.3           2.3           2.3           3/8/10	% BAND 5 +/- 5 +/- 5 +/- 5 +/-	R-37	Manu Boron PPM RCS BAST-A BAST-B SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	Bally Entered Date           Date           Today           9/16/2010           9/16/2010           9/15/2010           9/16/2010           8/30/2010           8/30/2010           7/6/2010           Notes/Add           IC-1,	Data PPM 1531 21,535 21,032 2246 2219 2211 2206 2230 2221 itional Data	Linked to C Date #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?	PPM #NAME? #NAME? #NAME? #NAME? #NAME? #NAME?

# ILC-11-2 NRC SCENARIO 4 TURNOVER SHEET

POWER LEVEL:1E-8 ampsCore Burnup:150 MWD/MTUEFPD:4.3 EFPDBoron:1531 PPMXenon:88 pcm (72 hours post trip)Tavg:547°FBank D Rods:99 Steps

EQUIPMENT UNDER CLEARANCE:

• NONE

EQUIPMENT STATUS:

• Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.

INSTRUCTIONS FOR THE WATCH:

Raise reactor power to the POAH and continue with plant startup.

# **Unit 2 Status Board**

	Date:	Today	Time:	6:00:00	AM Cycle	: 27				
	EFPD	4.3	Design	473.5	- un cycle	2/	MWD/	VIT: 150	Design:	16590
нит						Tank				and the second
CVCS-A	Level %		Status			Monitor A	Level 9	6	Stat	
CVCS-A	20	Filling				Monitor B			Stan	
	10	Stand				WCTA			Stan	
CVCS-C	86	Stand	у			WCTB	37		Stan	
WHUT	#NAME?	Filling				WCTC	7		Stan	dby
				dies.		WCTD	9		Stand	dby
	Data Linkeo	to Pl					10		Stand	dby
WGDTS	Pressure	PSIG		Status	-	WCTE	9		Stand	lby
Α	#NAME?	PSIG	On cover						a states and the	ANNA STATIST
в	#NAME?	DOIO						DEMINERAL	IZERS	
		PSIG	In Service				PPM	In Servic		Resin
С	#NAME?	PSIG	Isolated					in Service	e Date	Replaced
D	#NAME?	PSIG	Standby		-	MB A	2194	YES	7/17/2010	5/4/2010
			- (clairdb)			MB B	2265	NO	7/17/2010	
Shut	down Requ	irement	Terra	1	_	CATION	1021	NO	9/17/2010	
	1.77% =∆H	///	Temp	Boron		DEB A	0	NO	New	
	1.77% =∆K		547 F Hot	1051		DEB B	0	NO		2/3/2010
	2.6% =∆K		<u>≥</u> 350 F	1281		SFP	1963	NO	3/28/2010	
			100 F Cold	1430		and the second second	1303		9/23/2008	4/22/2008
	6% =∆K/k		N/A	1950				-	the second	A
			a meet all gas	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		ondenser Air Ir	lookana		SGBD	)
		V Settings				13			Value GPM	Status
Settin	g Date	POT	GP-3 Psig	-	B		CFM	A	50	Flash Tank
	7/18/2010	3.21	1000		Known	0	CFM	в	50	With Heat
	7/18/2010	3.12	1040	-1		8	CFM	С	50	Recovery
;	7/18/2010	3.44	1000	-	Total	5	CFM	N2 Flow	8	SCFM
T (6.50)	See Star		11000		den reg	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	The second second	11	States and	00111
						Effluent R	adiation Mon	itor Setpoints		
RCS Le	akage	0.00	Unidentifie	d	Rad	Current	_			-
otal				u l	Monitor	Setpoint	Alert \	alue 200X	NUE Value	
RT		0.03	GPM		R-14C	1.01E+04		N/A	2X	
		0.02	GPM		R-20	7.40E+03	-+		2.020E+04	
CDT Leaka		0.01	GPM		R-18			N/A	1.480E+04	
harging Lea		0	GPM	-		1.00E+06	2.00	0E+08	2.000E+06	
isc Identifie	d	0	GPM	-	R-19A	1.05E+04	2.10	0E+06	2.100E+04	-
imary/Seco		0			R-19B	9.72E+03	1.94	4E+06	1.944E+04	
condary Lo		-	GPD		R-19C	9.58E+03		6E+06		
condary LC	bss	17.3	GPM		R-37	8.53E+03			1.916E+04	
	111 111 111						ally Entered I	6E+06	1.706E+04	And Proton St.
	HI Flux At	Shutdown				Boron PPM			Linked to C	hem data base
	revious AR	Counts	Setpoint			RCS	Date	PPM	Date	PPM
			150	1.000		BAST-A	Today	1531		
32 60			180			BAST-B	9/16/2010		#NAME?	#NAME?
		2 L 221				SFP		21,032	#NAME?	#NAME?
		rmal Curre	ents						#NAME?	#NAME?
			TARGET	% BAND		RWST		2219	#NAME?	#NAME?
			2.3	5 +/-		Accum-A		2211	#NAME?	#NAME?
1 11				5 +/-		Accum-B	8/30/2010			#NAME?
						Accum-C	8/30/2010			#NAME?
1 11	8			5 +/-		RHR		2221		
1 11 2 10 3 96 4 91	8	/	<b></b>	5 +/-		Refuel Canal				and the second second
1 11 2 10 3 96 4 91	87					Refuel Cavity				
1 11 2 10 3 96	87			112.55		incluci Gavily				
1 11 2 10 3 96 4 91 VERTRAX F	87 Rev# 2.1.0 F		% APL	112.55		SFP Canal	┝───┤			
1 11 2 10 3 96 4 91 VERTRAX F	87 Rev# 2.1.0 F	St/Hrs	% APL Date/Tst	112.55						
1 11 2 10 3 96 4 91 VERTRAX F FANS HVE-1A/I	87 Rev# 2.1.0 F Te B 35	St/Hrs [ 640.6 3	% APL	112.55			Notociad			
1 11. 2 10. 3 96 4 91 VERTRAX F FANS HVE-1A/I HVE-15/A	87 Rev# 2.1.0 F Te 3 35 18	St/Hrs [ 640.6 3	% APL Date/Tst	112.55			Notes/Addit			
1 11 2 10 3 96 4 91 VERTRAX F FANS HVE-1A/I	87 Rev# 2.1.0 F Te 3 35 4 18 B 69	St/Hrs [ 640.6 3 643.5 3 28.3 5	% APL Date/Tst 8/8/10	112.55			Notes/Addit IC-1, 2 BO	2, 40		

Scenario Outline

Facility:	HB	ROBINSON	Scenario No.: 5	Op Test No.:
Examiners:			Operators: S	SRO -
			 F	RO -
				30P -
Initial Co	onditions:	• 68% RTP EC	DL, 15697 MWD/MTU, 132 pp	om Boron
		• "A" MDAFW	pump inoperable with the bre	aker racked out
		Automatic Ro	od Control is inoperable	
		Currently thu counties	nderstorm watch is in effect fo	or Darlington and Chesterfield
Turnove	er:	"A" HDP rece current powe	ently started for PMT following r while RES is evaluating PM	g maintenance. Maintain T results.
Critical 7	Tasks:	Stop excessive	ve steam flow	
		Establish fee	dwater flow to at least one S/	G
Event No.	Malf. No.	Event Type*	Eve Descri	
1		(C) BOP, SRO	"A" CW Pump trips and V6- automatically	50A fails to close
2		(I) RO, SRO (TS) SRO	PZR Pressure Controller PC	C-444J Range Shifts
3		(I) BOP, SRO (TS) SRO	Steam Pressure Channel P	T-485 fails LOW
4		(C) BOP, SRO	Loss of Cooling to the Auxili	iary Transformer
5		(R) RO (N) BOP, SRO	Load Reduction to 50%	
6		(M) ALL	"B" S/G Feedwater Regulati and complete loss of feedwa	ng Valve FCV-488 fails closed ater
7		BOP	Turbine Trip Does Not Occu	ir
8		ВОР	"B" MDAFW and SDAFW Pu Received	umps Trip when Start Signal
9		BOP	Steam Dump Valves fail Op	en on Reactor Trip
10		BOP	MSIVs fail to close on auto-o	close signal
11		RO	RHR-744A and 744B fail to	auto-open on Safety Injection
* (1	N)ormal,	(R)eactivity, (I)n	strument, (C)omponent, (	M)ajor

#### ILC-11-2 NRC SCENARIO 5 SUMMARY DESCRIPTION

The crew will assume the watch with the plant at 68% RTP. MDAFW Pump "A" is out of service for scheduled lube oil cooler replacement. The motor breaker has been racked out and the pump has been isolated and cleared for maintenance. Bearing replacement has been completed on "A" HDP and PMT is in progress. Shift instructions are to maintain current power level while RES is evaluating the PMT results on "A" HDP.

On cue from the Chief Examiner, "A" CW pump will trip on overcurrent and discharge valve V6-50A will fail to close automatically. The crew will take immediate actions IAW AOP-012, Partial Loss of Condenser Vacuum or Circulating Water Pump Trip. The operator will take manual action to verify that V6-50A is closed. Condenser Vacuum will be minimally affected by the loss of "A" CW Pump. Once the Chief Examiner is satisfied with the crew's actions, the Chief Examiner will cue the next event.

PZR Pressure Controller PC-444J control range will shift causing the PZR Spray valves to open and lower PZR pressure. AOP-019, Malfunction of RCS Pressure Control, immediate actions will be taken and the procedure will take actions to restore pressure to the normal control band with PC-444J operated in manual control. ITS 3.4.1, Condition A, One or more RCS DNB parameters not within limits – Restore RCS DNB parameters to within limit within 2 hours, will be entered due to PZR Pressure being less than 2205 psig. Once the Chief Examiner is satisfied with the crew's actions and Tech Spec compliance, the Chief Examiner will cue the next event.

Steam Pressure Transmitter PT-485 will fail LOW, causing the controlling steam flow channel on S/G B to fail low and causing a transient on the Feedwater Regulating valve FCV-488. AOP-025, RTGB Instrument Failure, Section G immediate actions will be taken by the crew to stabilize the S/G level transient. The procedure will place an alternate control channel in service and direct the removal of the channel from service. ITS Table 3.3.1-1 Item 14 which requires 2 S/G Level channels (not affected by the failure) and 2 Steam Flow / Feedwater Flow mismatch channels with Condition E - Place channel in trip within 6 hours or Be in Mode 3 within 12 hours. ITS Table 3.3.2-1 Items 1e, 1g, and 4e for Safety Injection and Steam Line Isolation High Steam Line Flow with Low Tave or Low Steam Line Pressure - Condition D: Place channel in trip within 6 hours OR Be in Mode 3 in 12 hours AND Be in Mode 4 within 18 hours. ITS Table 3.3.3-1 Item 20 Post Accident Monitoring Instrumentation for Steam Generator pressure required channels is 2 per S/G which is currently met. ITS Table 3.3.6-1 Item 4 Safety Injection for Containment Ventilation Isolation Instrumentation refers to LCO 3.3.2 Functions 1.a-f (which have already been addressed) requirements will be reviewed by the SRO to ensure that all of the ITS specs are satisfied. Once the S/G level control has been stabilized and the Chief Examiner is satisfied with the Tech Spec compliance, he can cue the next event.

Auxiliary Transformer Trouble alarm (APP-009-C6) will be received on the RTGB. The report from the field is that all cooling fans and oil pumps on the transformer have been lost. Breaker 4BR on MCC-4 (Power supply to Power Cooler #1 and #2) has tripped and cannot be reset. AOP-037, Large Transformer Malfunctions, Attachment 4, will be implemented by the crew with the requirement to reduce load to less than 50% within 30 minutes and unload the transformer. The operator will have to manually insert control rods since the automatic rod insertion function has been disabled. Power reduction will commence and will continue until the UAT is unloaded or until the Chief Examiner cues the next event.

"B" S/G Feedwater Regulating Valve FCV-488 will fail CLOSED. This will cause an immediate reduction in the "B" S/G level and the crew will take immediate actions of AOP-010, Main Feedwater / Condensate Malfunction, and attempt to control FCV-488 in manual. This will be unsuccessful and the crew should manually trip the reactor due to lowering "B" S/G level. Once the reactor is tripped, the crew will enter PATH-1.

The turbine will not trip automatically or manually from the RTGB and the operator will have to manually runback the turbine with the EH controls until the governor valves are closed.

"B" MDAFW Pump and the SDAFW Pump will trip when the start signal is received.

Steam dump valves will fail open and cannot be closed from the RTGB. The MSIVs will fail to automatically close but can be closed manually from the RTGB control switches. If requested to locally close the Steam Dump valves, the task will be successful to close the valves.

RHR-744A and 744B fail to auto-open on the safety injection signal. The operator will have to manually open the valves from the RTGB.

The crew will transition to FRP-H.1, Response to Loss of Secondary Heat Sink, due to the inability to feed the S/Gs. During the procedure, all RCPs will be secured to remove the additional heat source to the RCS. FRP-H.1 will direct the operators to over-ride the Feedwater Isolation Signals and start one MFP to re-establish feedwater flow. Once feedwater flow is re-established the crew will be directed to reset SPDS and return to PATH-1.

The Chief Examiner may terminate the scenario after the crew has restored feedwater flow to at least one S/G or at his discretion.

# **ILC-11-2 NRC SCENARIO 5 SIMULATOR SETUP**

#### IC/SETUP:

- IC-805, SCN: 008\_11\_2\_NRC\_Exam\_5 ٠
- "A" MDAFW Pump inoperable with the breaker racked out
- Rods selected to Manual with automatic rod control defeated •
- Status board updated to reflect IC-17

#### PRE-LOADED EVENTS:

The following events should occur on the reactor trip and safety injection:

- Event 7: Turbine Trip does not occur
- Event 8: "B" MDAFW and SDAFW Pumps Trip when Start Signal Received Event 9:
- Steam Dump Valves fail Open on Reactor Trip
- Event 10: MSIVs fail to Close on Automatic Signal Event 11:
- RHR-744A and 744B fail to auto-open on Safety Injection

# **EVENTS/TRIGGERS INITIATED DURING THE SCENARIO:**

- Event 1: "A" CW Pump trips and V6-50A fails to close automatically
- Event 2: PZR Pressure Controller PC-444J Range Shifts Event 3:
- Steam Pressure Channel PT-485 fails LOW Event 4:
- Loss of Cooling to the Auxiliary Transformer Event 5:
- Load Reduction to 50% Event 6:
- "B" S/G Feedwater Regulating Valve FCV-488 fails closed

# EXPECTED PROCEDURE FLOWPATH OR COPIES NEEDED:

- AOP-012
- AOP-019
- AOP-025 Main Body and Section G
- OWP-025, SGP-8
- APP-046
- AOP-037
- AOP-010
- PATH-1
- Foldout A
- FRP-H.1

Appendix	D	Operator Action Form E	S-D
Op Test No.:	<u> </u>	Scenario # <u>5</u> Event # <u>1</u> Page <u>5</u> of <u>30</u>	
Event Descri	iption:	"A" CW Pump trips and V6-50A fails to close automatically.	
Time	Position	Applicant's Actions or Behavior	
BOOTH O	PERATOR:	When directed, insert Event 1, "A" CW Pump trips and V6-50A	A fai
APP-008-I CW Pump	A RTGB in	to close automatically. S: P A MOTOR/DISCH VLV TRIP/OVLD, is illuminated. Idication is Green (Pump Off). EN on the RTGB.	
	BOP	Immediate Action Step:	
	BOF	Check Circulating Water Pump – ANY TRIPPED (YES)	
		Immediate Action Step:	
	BOP	Verify The Tripped Circulating Water Pump Discharge Valve - CLOSED <u>OR</u> CLOSING (BOP takes action to manually close V6 from the RTGB.)	-50/
	SRO	Enters AOP-012, Partial Loss of Condenser Vacuum or Circulatin Water Pump Trip	g
	SRO	Verifies immediate actions complete.	
	BOP	Start any available CWPs. (All available are running.)	
	RO	Make PA Announcement for Procedure Entry.	
	BOP	Check Liquid Waste Batch Release – In Progress (NO)	

Op Test No	.: <u>1</u>	Scenario # _5 Event # _1 Page _6 of _30
Event Desc	ription:	"A" CW Pump trips and V6-50A fails to close automatically.
Time	Position	Applicant's Actions or Behavior
	BOP	Check Status of the tripped CWP Discharge Valves – Completed Closing (YES, V6-50A manually closed from RTGB.)
	BOP	Check Plant Conditions – In Modes 1 <u>OR</u> 2 (YES)
	BOP	Check Condenser Back Pressure On PI-1312 AND PI-1313 – APPROACHES RESTRICTED REGION OF ATTACHMENT 3, CONDENSER BACKPRESSURE LIMIT CURVE (NO)
	BOP	Check Condenser Vacuum Degrading (NO)
	SRO	Implement the EALs
NOTE:		Crew should notify WCC SRO and/or I&C to write a work request, investigate and initiate repairs, and notify the Operations Manager
Booth Oper		Insert Event #2 (PZR Pressure Controller PC-444J range shifts) on cue from the Chief Examiner.

	Operator Action Form ES-D-2				
Op Test No.: 1	Scenario # 5 Event # 2 Page 7 of 20				
Event Description:	Page 7 of 30 PZR Pressure Controller PC-444J Range Shifts				
Time Positio					
	Applicant's Actions or Behavior				
BOOTH OPERATO	R: At the discretion of the Chief Examiner, insert Event 2 – PZR				
EVENT INDICATION	r PC-444J Range Shifts				
APP-003-D8: PZR C	ONTROL HI/LO PRESS				
RO	Recognizes PZR Spray Valves are OPEN and PZR Pressure lowering below normal control band. Takes Immediate Actions of AOP-019, MALFUNCTION OF RCS PRESSURE CONTROL.				
	Immediate Action Step:				
	Determine if PZR PORVs should be CLOSED:				
RO	Check PZR Pressure less than 2335 PSIG. (YES)				
	Verify both PZR PORVs CLOSED. (YES)				
	IF any PZR PORV can NOT be CLOSED, THEN close its PORV BLOCK valve.				
	Immediate Action Step:				
RO	Control Heaters and Spray valves to restore RCS Pressure to desired control band.				
BOP	Make PA Announcement for Procedure Entry.				
RO	Continuous Action Step:				
	Check PZR Pressure under operator control. (YES)				
	Continuous Action Step				
RO	Check Pressurizer Pressure Transmitter PT-444 OR PT-445 FAILED (NO)				
1					

Op Test No.:	1	Scenario # _5 _ Event # _2 Page 8 _ of 30
Event Descript	lion:	PZR Pressure Controller PC-444J Range Shifts
Time	Position	Applicant's Actions or Behavior
	RO	Place PC-444J in MAN. (YES)
	RO	<u>IF</u> PC-444J is operating properly in manual, <u>THEN</u> Go To Step 9. (YES)
	RO	Operate PC-444J as follows: a. Check PZR SPRAY VALVE Controllers - IN AUTO (YES) b. Check PZR Heaters - IN NORMAL CONFIGURATION (YES) c. Manually adjust PC-444J to maintain PZR pressure. d. Check PZR pressure – UNDER CONTROL (YES)
	SRO	Implement the EALs
	SRO	Contact I&C to Make Repairs to the PZR Pressure Control System
	SRO	<ul> <li>Refer To ITS For Applicable LCOs</li> <li>LCO 3.4.11, PZR PORV (N/A)</li> <li>TRM 3.4, PZR Spray ∆T (N/A)</li> <li>LCO 3.4.4 AND 3.4.5, RCS Loops (N/A)</li> <li>ITS 3.4.1, Condition A, One or more RCS DNB parameters not within limits – Restore RCS DNB parameters to within limit within 2 hours, will be entered due to PZR Pressure being less than 2205 psig (The only applicable LCO.)</li> <li>LCO 3.4.9, PZR Level (N/A)</li> </ul>
ooth Operat		Insert Event #3 (Steam Pressure Channel PT-485 fails LOW) on cue from the Chief Examiner.

Apper	ndix D
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Event Do	escription:	Scenario #5Event #3Page9_ of30
Time		Steam Pressure Channel PT-485 fails LOW
<u> </u>	Position	Applicant's Actions or Behavior
BOOTI		
	H OPERATOR	R: At the discretion of the Chief Examiner, insert Event 3 – Stear PT-485 fails LOW
EVENT	INDICATION	PT-485 fails LOW
APP-00	06-A4 Steam	Line High ∆P
422-00	)6-B1 S/G B F	FW>STM Flow
<b>\PP-00</b>	)6-B2 S/G B S	STM>FW Flow (When histoples are trian to
	6-E3 S/G B V	Wide Range Hi/Lo Level
166-00	9-E5 Steam	Line I ow Pressure
1\-400,	, Pen #1 – Lo	owering and Pen #3 - Lowering
		AOP-025 RTGB INSTRUMENT FAILURE
	SRO	Go To The Appropriate Section For The Failed Transmitter:
		S/G Steam Processor
		S/G Steam Pressure Section G Page 21
Star Sections	Carlos Colorado a Competitiva	
		SECTION G - S/G Steam Pressure Transmitter Failure
		Immediate Action Step
	BOP	Place The Affected FRV In MAN
		<ul> <li>FCV-478 (FRV "A") (NO)</li> </ul>
		<ul> <li>FCV-488 (FRV "B") (YES)</li> </ul>
	相互的运行时间的问题	<ul> <li>FCV-498 (FRV "C") (NO)</li> </ul>
	ROP	Immediate Action Step
	BOP	Immediate Action Step Restore Affected S/G Level To Between 39% And 52%
	BOP	Immediate Action Step Restore Affected S/G Level To Between 39% And 52%
alte L		Restore Affected S/G Level To Between 39% And 52%
	BOP	Immediate Action Step Restore Affected S/G Level To Between 39% And 52% Make PA Announcement For Procedure Entry
		Restore Affected S/G Level To Between 39% And 52%
		Restore Affected S/G Level To Between 39% And 52%         Make PA Announcement For Procedure Entry
	RO	Restore Affected S/G Level To Between 39% And 52%         Make PA Announcement For Procedure Entry         Place The Affected S/G Steam Flow Selector Switch To The Sel
		Restore Affected S/G Level To Between 39% And 52%         Make PA Announcement For Procedure Entry         Place The Affected S/G Steam Flow Selector Switch To The Alterna Channel Below:
	RO	Restore Affected S/G Level To Between 39% And 52%         Make PA Announcement For Procedure Entry         Place The Affected S/G Steam Flow Selector Switch To The Sel

**Operator Action** 

Event Desci	.: <u>1</u>	Steam Pressure Channel PT-485 fails LOW
		Cicam ressure Channel P1-485 fails LOW
Time	Position	Applicant's Actions or Behavior
	BOP	Continuous Action Step Restore Affected Controller To Automatic As Follows: a. Check S/G level - WITHIN ±1% OF PROGRAMMED LEVEL b. Place the affected Controller in AUTO
	BOP	Remove The Affected Transmitter From Service Using OWP-025:         Channel       OWP         PT-485       SGP-8
		AM GENERATOR PRESSURE Pressure Transmitter PT-485 FR-488 (STM) Selected To 485
	BOP	<ul> <li>DELETE INPUT PT-485 FROM CALO PROCESSING. (MSP0421A) (Two Options)</li> <li>Option 1 – Remove via CALO ERFIS program. <ul> <li>Access Calorimetric on ERFIS by typing CALO</li> <li>Click on the DELETE INPUTS button. This will display the DELETE INPUT FROM CALORIMETRIC page.</li> <li>Select MSP0421A</li> <li>Click on the ENTER DATA button.</li> </ul> </li> <li>Option 2 – Delete the ERFIS point from scan. <ul> <li>Access the Delete function by typing DR.</li> <li>Click on DELETE SCAN</li> <li>Enter MSP0421A</li> </ul> </li> </ul>
	BOP	Trip the Bistables for PT-485 (END OWP-025)
ooth Oper		Trip the bistables for PT-485 in accordance with OWP-025, SGP-8, after the operator requests and report completed actions

Appendix D

Op Test No.:	1 Scenario	# <u>5</u>	Event #	3	Page	<u>11</u> of	_30
Event Description:	Steam Pro	essure Char	nel PT-485	fails LOW			
Time Po	sition		Ap	plicant's Ac	tions or Behavior		

SRO	<ul> <li>Check Technical Specifications (ITS) For Applicable LCOs</li> <li>ITS Table 3.3.1-1 Item 14 which requires 2 S/G Level channels (not affected by the failure) and 2 Steam Flow / Feedwater Flow mismatch channels with Condition E – Place channel in trip within 6 hours or Be in Mode 3 within 12 hours.</li> <li>ITS Table 3.3.2-1 Items 1e, 1g, and 4e for Safety Injection and Steam Line Isolation High Steam Line Flow with Low Tave or Low Steam Line Pressure – Condition D: Place channel in trip within 6 hours OR Be in Mode 3 in 12 hours AND Be in Mode 4 within 18 hours.</li> <li>ITS Table 3.3.3-1 Item 20 Post Accident Monitoring Instrumentation for Steam Generator pressure required channels is 2 per S/G which is currently met.</li> <li>ITS Table 3.3.6-1 Item 4 Safety Injection for Containment Ventilation Isolation Instrumentation refers to LCO 3.3.2 Functions 1.a-f (which have already been addressed)</li> </ul>
1	Crew should notify WCC SRO and/or I&C to write a work request, investigate and initiate repairs, and notify the Operations Manager.
SRO	Return To Procedure And Step In Effect
erator	Insert Event #4 (Loss of Cooling to the Auxiliary Transformer) on
	SRO

OPERATORAPP-46-4, Loss of AC Control Power 1X-1 (27-4)APP-46-7, Loss of Power Cooler #2 (27-2)APP-46-8, Loss of AC Control Power TX-2 (27-5)		D	Operator Action Form ES-D
Time       Position       Applicant's Actions or Behavior         BOOTH OPERATOR:       At the direction of the Chief Examiner, insert Event 4, Loss of Cooling to the Auxiliary Transformer.         EVENT INDICATIONS:       APP-409-06 AUX TRANSF TROUBLE         BOP       Dispatch an Operator to respond IAW APP-046.         BOOTH OPERATOR:       Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR:       Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR:       Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR:       Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR:       Acknowledge the request to check the alarms: APP-46-3, Loss of Normal 480Vac Power Source (18G) APP-46-3, Loss of Power Cooler #1 (27-4) APP-46-7, Loss of Power Cooler #2 (27-2) APP-46-8, Loss of AC Control Power TX-2 (27-5) Attempted to reset the alarms, alarms remained illuminated.         BOP       APP-046-11 actions are to REFER TO AOP-037.         BOP       BOP APP-046-11 actions are to REFER TO AOP-037.         SRO       Directs crew entry to AOP-037.         SRO       Go to Section B for Auxiliary Transformer         SRO       Go to Section B for Auxiliary Transformer         Dispatch	Op Test No.:	<u> </u>	Scenario # <u>5</u> Event # <u>4 and 5</u> Page <u>12</u> of <u>30</u>
Typesticol decision         BOOTH OPERATOR: At the direction of the Chief Examiner, insert Event 4, Loss of Cooling to the Auxiliary Transformer.         EVENT INDICATIONS: APP-009-C6 AUX TRANSF TROUBLE         BOP       Dispatch an Operator to respond IAW APP-046.         SOOTH OPERATOR: Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         Report the following alarms: APP-46-3, Loss of Normal 480Vac Power Source (18G) APP-46-3, Loss of Power Cooler #1 (27-1) APP-46-4, Loss of AC Control Power TX-1 (27-4) APP-46-7, Loss of Power Cooler #2 (27-2) APP-46-8, Loss of AC Control Power TX-2 (27-5)         Attempted to reset the alarms, alarms remained illuminated. Also, report that NO cooling or oil pumps are operating.         BOP       Directs crew entry to AOP-037.	Event Descri	ption:	Loss of Cooling to the Auxiliary Transformer
Cooling to the Auxiliary Transformer.         EVENT INDICATIONS:         APP-009-C6 AUX TRANSF TROUBLE         BOP       Dispatch an Operator to respond IAW APP-046.         BOOTH OPERATOR: Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         Report the following alarms: APP-46-11, Loss of Normal 480Vac Power Source (18G) APP-46-3, Loss of Power Cooler #1 (27-1) APP-46-4, Loss of AC Control Power TX-1 (27-4) APP-46-7, Loss of Power Cooler #2 (27-2) APP-46-8, Loss of AC Control Power TX-2 (27-5)         Attempted to reset the alarms, alarms remained illuminated.         Also, report that NO cooling or oil pumps are operating.         BOP       APP-046-11 actions are to REFER TO AOP-037.         SRO       Directs crew entry to AOP-037.         SRO       Go to Section B for Auxiliary Transformer         SRO       Go to Section B for Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to	Time	Position	Applicant's Actions or Behavior
APP-009-C6 AUX TRANSF TROUBLE         BOP       Dispatch an Operator to respond IAW APP-046.         BOOTH OPERATOR: Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR: Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR: Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR       Report the following alarms: APP-46-11, Loss of Normal 480Vac Power Source (18G) APP-46-3, Loss of Power Cooler #1 (27-1) APP-46-4, Loss of AC Control Power TX-1 (27-4) APP-46-8, Loss of AC Control Power TX-2 (27-5) Attempted to reset the alarms, alarms remained illuminated.         Also, report that NO cooling or oil pumps are operating.         BOP       APP-046-11 actions are to REFER TO AOP-037.         BOP       SRO       Directs crew entry to AOP-037.       SRO         SRO       Go to Section B for Auxiliary Transformer       Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to	BOOTH O	PERATOR	R: At the direction of the Chief Examiner, insert Event 4, Loss of Cooling to the Auxiliary Transformer.
BODTH OPERATOR: Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR: Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.         BOOTH OPERATOR:       Report the following alarms: APP-46-11, Loss of Normal 480Vac Power Source (18G) APP-46-3, Loss of Power Cooler #1 (27-1) APP-46-4, Loss of AC Control Power TX-1 (27-4) APP-46-7, Loss of Power Cooler #2 (27-2) APP-46-8, Loss of AC Control Power TX-2 (27-5) Attempted to reset the alarms, alarms remained illuminated. Also, report that NO cooling or oil pumps are operating.         BOP       APP-046-11 actions are to REFER TO AOP-037.         SRO       Directs crew entry to AOP-037.         SRO       Directs crew entry to AOP-037.         SRO       Directs of B for Auxiliary Transformer         BOP       Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to			
Report the following alarms:         APP-46-11, Loss of Normal 480Vac Power Source (18G)         APP-46-3, Loss of Power Cooler #1 (27-1)         APP-46-4, Loss of AC Control Power TX-1 (27-4)         APP-46-7, Loss of Power Cooler #2 (27-2)         APP-46-8, Loss of AC Control Power TX-2 (27-5)         Attempted to reset the alarms, alarms remained illuminated.         Also, report that NO cooling or oil pumps are operating.         BOP         BOP         APP-046-11 actions are to REFER TO AOP-037.         SRO         Directs crew entry to AOP-037.         SRO         Go to Section B for Auxiliary Transformer         BOP         BOP         BOP         Area         BOP         BOP         Area         BOP         Area         BOP         Area         BOP         Area         BOP         Area         BOP         Area         Area         BOP         Area         BOP         Area         BOP         Area         BOP         BOP <td< td=""><td></td><td>BOP</td><td>Dispatch an Operator to respond IAW APP-046.</td></td<>		BOP	Dispatch an Operator to respond IAW APP-046.
OOTH       APP-46-11, Loss of Normal 480Vac Power Source (18G)         APP-46-3, Loss of Power Cooler #1 (27-1)         APP-46-4, Loss of AC Control Power TX-1 (27-4)         APP-46-7, Loss of Power Cooler #2 (27-2)         APP-46-8, Loss of AC Control Power TX-2 (27-5)         Attempted to reset the alarms, alarms remained illuminated.         Also, report that NO cooling or oil pumps are operating.         BOP         BOP         APP-046-11 actions are to REFER TO AOP-037.         SRO         Directs crew entry to AOP-037.         SRO         SRO         Go to Section B for Auxiliary Transformer         SRO         Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to	OOTH OP	ERATOR:	Acknowledge the request to check the alarms at the Auxiliary Transformer and report the below listed conditions.
Also, report that NO cooling or oil pumps are operating.         BOP       APP-046-11 actions are to REFER TO AOP-037.         SRO       Directs crew entry to AOP-037.         Crew       Make PA Announcement for Procedure Entry         SRO       Go to Section B for Auxiliary Transformer         BOP       Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to	OOTH PERATO	R	APP-46-11, Loss of Normal 480Vac Power Source (18G) APP-46-3, Loss of Power Cooler #1 (27-1) APP-46-4, Loss of AC Control Power TX-1 (27-4) APP-46-7, Loss of Power Cooler #2 (27-2)
SRO       Directs crew entry to AOP-037.         Crew       Make PA Announcement for Procedure Entry         SRO       Go to Section B for Auxiliary Transformer         BOP       Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to			
Crew       Make PA Announcement for Procedure Entry         SRO       Go to Section B for Auxiliary Transformer         BOP       Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to		BOP	APP-046-11 actions are to REFER TO AOP-037.
SRO       Go to Section B for Auxiliary Transformer         Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to		SRO	Directs crew entry to AOP-037.
BOP Dispatch an Operator to the Auxiliary Transformer to determine the alarming function, acknowledge the alarm and attempt to		Crew	Make PA Announcement for Procedure Entry
BOP the alarming function, acknowledge the alarm and attempt to			
		SRO	

Appendix D
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Event Des	cription:	_ Scenario # _5 Event # _4 and 5 Page _13_ of _30 Loss of Cooling to the Auxiliary Transformer
Time	Position	
		Applicant's Actions or Behavior
	BOP	Chook Alore Function Design to the second
		Check Alarm Function – Remains Illuminated. (YES)
	SRO	NOTE: The APP-046 alarms in the table below are prioritized by importance.
	SRO	Observe the <u>NOTE</u> <u>OR</u> <u>CAUTION</u> prior to the step and go to the appropriate step based on the listed alarm function that is illuminated.
	BOP	APP-46-11, Loss of Normal 480Vac Power Source (18G) APP-46-3, Loss of Power Cooler #1 (27-1) APP-46-4, Loss of AC Control Power TX-1 (27-4) APP-46-7, Loss of Power Cooler #2 (27-2) APP-46-8, Loss of AC Control Power TX-2 (27-5)
		Alarms Illuminated. (YES)
	SRO	Caution: <u>IF</u> the Auxiliary Transformer is operated for more than 30 minutes with no fans or pumps, <u>THEN</u> damage to the Transformer could occur.
	BOP	Dispatch an Operator to Observe the Status of the Fans and Pumps
	SRO	NOTE: <u>IF</u> APP-046-11 or APP-046-12 are valid alarms, <u>THEN</u> there will be no fans OR pumps running and APP-046-3, APP-046-4, APP-046-7, and APP-046-8 will also be illuminated.
	BOP	Check Status of the Fans and Pumps – ALL LOST (YES)
	BOP	Check Status of 480 Volt Bus 3 – POWER LOST (NO) Go to Step 11

Appendix D	
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<b>F</b>		Scenario # _5 _ Event # _4 and 5 Page _14 of _30
Event Descri	ption:	Loss of Cooling to the Auxiliary Transformer
Time	Position	Applicant's Actions or Behavior
	BOP	Check Status of MCC-4 – POWER LOST (NO) Go to Step 17
	BOP	Check Status of MCC-4, Breaker 4BR – TRIPPED (YES)
	BOP	Attempt to Reset and Close MCC-4, Breaker 4BR One Time. (YES)
	BOP	Check Status of MCC-4, Breaker 4BR – Closed (NO)
	SRO	Initiate action to repair problem causing the tripped breaker.
	SRO	IF breaker MCC-4 (4BR) can <u>NOT</u> be reclosed promptly, <u>THEN</u> go to Step 28.
	BOP	Continuous Action Step Determine If Trip Required As Follows: - Check time elapsed since loss of all cooling – Greater than 30 min. (NO)
	SRO	IF the Auxiliary Transformer is <u>NOT</u> unloaded within 30 minutes, <u>THEN</u> perform Step 28.b.
	SRO	<u>Caution</u> Rapid power reductions at the beginning of core life may result in the axial flux difference exceeding the operating band values and require a power reduction to less than 50% to comply with ITS 3.2.3, Condition C.
	Crew	Reduce power to less than 50% using Attachment 4, Turbine Load Reduction

Appendix	D		Ope	erator Actio	n				Form ES-D-2
0.7.11									
Op Test No.:	<u></u>	Scenario #	_5	-	4 and 5	Page	<u>15</u>	of	
Event Descri	iption:	Loss of Coolin	g to the	e Auxiliary Tra	ansformer				
Time	Position			Ар	plicant's Actions	or Behavior			
	BOP	Grid - -	EDG EDG	the follow A (NO) B (NO) iesel (NO)	ing Diesel G	Generators	s – Pa	aral	leled to the
	RO	Check Po	wer	Less than	50% (NO) (G	o to Powei	Red	ucti	on.)
NOTE:		and the A	uxilia	ry Transfo	loop until p rmer Unloac (Attachmen	led. The f	ollow	/ing	steps are
	BOP/SRO	Notify Loa	d Disp	patcher of L	.oad Reductio	on to less t	han 5	60%	power.
	BOP	Check Tur	bine (	Control Mod	de – Automat	ic (YES)			
	BOP	Depress th	ne IMF	PIN Pushb	utton				
	BOP	Set the De	sired	Load in the	SETTER				
	BOP	Set the De	sired	Load Rate					
	BOP	Depress th	e GO	Pushbutto	n				
NOTE:		OP-301, Se included in downpowe	n the	1 8.2.8 Qui following s	ck Boration steps, as it w	Checklist vill be nee	(shac ded f	led or t	area) is he rapid
	RO	DETERMI OBTAIN a	NE th an inde	e amount c ependent c	of Boric Acid I heck of the v	to add to th olume requ	ne RC uired.	S a	nd

Appendix D		Operator Action		Form ES-D-2
Op Test No.: 1	Scenario #	5 Event #4 and 5	Page	<u>16</u> of <u>30</u>
Event Description:	Loss of Cooli	ng to the Auxiliary Transformer		

Time Position

Applicant's Actions or Behavior

NOTE:		~85 gallons of Boric Acid. (The crew will add Boric Acid in 2-4 batches.) (Values based on 3%/min load reduction rate)
	RO	<b>OBTAIN</b> permission from the CRS <b>OR</b> the SM to add the amount of boric acid previously determined, including the expected change in RCS temperature and Reactor Power.
	RO	PLACE the RCS MAKEUP MODE selector switch to in the BORATE position.
	RO	SET YIC-113, BORIC ACID TOTALIZER to the desired quantity.
	RO	IF desired, THEN PLACE FCV-113A, BORIC ACID FLOW, in MAN AND manually ADJUST controller FCV-113A, BORIC ACID FLOW, using the UP and DOWN pushbuttons flow rate.
	RO	Momentarily PLACE the RCS MAKEUP SYSTEM switch to the START position.
	RO	<ul> <li>IF any of the below conditions occur, THEN momentarily place the RCS MAKEUP SYSTEM switch in the STOP position:</li> <li>Rod Motion is blocked or in the wrong direction</li> <li>T<sub>AVG</sub> goes up</li> <li>Boric Acid addition exceeds the desired value</li> </ul>
	RO	<ul> <li>WHEN the desired amount of Boric Acid has been added to the RCS, THEN verify the following:</li> <li>FCV-113A, BORIC ACID FLOW, closes.</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>IF in Auto, THEN the operating Boric Acid Pump stops.</li> <li>The RCS MAKEUP SYSTEM is OFF.</li> </ul>

Op Test No.	: <u>1</u>	Scenario # <u>5</u> Event # <u>4 and 5</u> Page <u>17</u> of <u>30</u>
Event Desci	iption:	Loss of Cooling to the Auxiliary Transformer
Time	Position	Applicant's Actions or Behavior
*,	RO	<ul> <li>IF desired, THEN FLUSH the Boric Acid flow as follows:</li> <li>PLACE the RCS MAKEUP MODE selector switch in the ALT DILUTE position.</li> <li>SET YIC-114, PRIMARY WTR TOTALIZER to 15-20 gallons.</li> <li>PLACE FCV-114B, BLENDED MU TO VCT to the CLOSE position.</li> <li>Momentarily PLACE RCS MAKEUP SYSTEM switch to the START position.</li> <li>IF any of the below conditions occur, THEN momentarily place the RCS MAKEUP SYSTEM switch in the STOP position: <ul> <li>Unanticipated Rod Motion</li> <li>Primary Water addition reaches the desired value</li> </ul> </li> <li>WHEN the desired amount of Primary Water has been added to the RCS, THEN verify the following: <ul> <li>FCV-114A, PW TO BLENDER, closes.</li> <li>FCV-113B, BLENDED MU TO CHG SUCT, closes.</li> <li>IF in Auto, THEN the operating Primary Water Pump stops.</li> <li>The RCS MAKEUP SYSTEM is OFF.</li> </ul> </li> </ul>
	RO	<ul> <li>RETURN the RCS Makeup System to automatic as follows:         <ul> <li>VERIFY FCV-114A, PRIMARY WTR FLOW DILUTE MODE is in AUTO.</li> <li>PLACE FCV-114B, BLENDED MU TO VCT to the AUTO position.</li> <li>PLACE the RCS MAKEUP MODE switch in the AUTO position.</li> <li>VERIFY FCV-113A, BORIC ACID FLOW, is in AUTO.</li> <li>Momentarily PLACE the RCS MAKEUP SYSTEM switch in the START position.</li> </ul> </li> </ul>
	RO	<b>RECORD</b> , in AUTO LOG, as indicated by PRIMARY WATER TOTALIZER, YIC-114 <b>AND</b> Boric Acid TOTALIZER, YIC-113 the total amount of Primary Water <b>AND</b> Boric Acid added during the boration.
	RO	MONITOR parameters for the expected change in reactivity AND inform the CRS OR the SM the results of the boration.

Appendix D	)	Operator Action Form ES-D-2
Op Test No.: Event Descrip		Scenario # _5 _ Event # _4 and 5 Page _18 of _30 Loss of Cooling to the Auxiliary Transformer
Time	Position	Applicant's Actions or Behavior
	BOP	Stop the following components: 1. Circulating Water Pump "A" 2. Feedwater Pump "A" 3. Heater Drain Pump "A" 4. Condensate Pump "B"
	<u> </u>	
	BOP	Transfer loads from the Auxiliary Transformer to the Startup Transformer with the Unit at greater than 110 Mwe using Attachment 5, Transfer of Electrical Loads to the Startup Transformer.
NOTE:		The following steps are from Attachment 5, Transfer of Electrical Loads to the Startup Transformer.
	BOP	Notify the Load Dispatcher of the 4KV switching evolution
	BOP	Insert key into Startup Transf synchroscope switch AND turn switch to STARTUP BUS 2 position
	BOP	WHEN the synchroscope comes up to the 12 o'clock position, THEN close START-UP TO 4KV BUS 2 BKR 52/12
	BOP	WHEN breaker 52/12 indicates closed, THEN return switch to the mid- position AND verify UNIT AUX TO 4KV BUS 1 BKR 52/7 has opened.
	BOP	Insert key into 4KV TIES synchroscope switch AND turn switch to BUS 3 & 4 position.
	BOP	WHEN synchroscope comes up to 12 o'clock position, THEN close 4KV BUS 3-4 TIE BKR 52/19.
	BOP	WHEN breaker 52/19 indicates closed, THEN return switch to the mid position AND verify UNIT AUX TO 4KV BUS 4 BKR 52/20 has

Appendix D	···	Operator Action Form ES-D
Op Test No.: Event Descript		Scenario # <u>5</u> Event # <u>4 and 5</u> Page <u>19</u> of <u>30</u> Loss of Cooling to the Auxiliary Transformer
Time	Position	Applicant's Actions or Behavior
	1 Usition	Applicant's Actions of Benavior
	BOP	Turn synchroscope key switch to mid position.
	BOP	Check Auxiliary Transformer – Unloaded (YES)
	BOP	Check Auxiliary Transformer Alarm Status as Follows: a. Press and release the Reset pushbutton. b. Check all APP-046 Alarms extinguished. (NO)
	SRO	IF APP-046 Alarms are present that have not been addressed, THEN go to Step 3.
	SRO	Implement the EALs.
	SRO	Check Technical Specifications for Applicable Action Statements. 3.8.1 – AC Sources Operating (N/A) 3.8.2 – AC Sources – Shutdown (N/A) 3.8.9 – Distribution Systems – Operating (N/A) 3.8.10 – Distribution Systems – Shutdown (N/A)
NOTE:		Crew should notify WCC SRO and/or I&C to write a work request, investigate and initiate repairs for the loss of cooling to the transformer, and notify the Operations Manager.
	SRO	Check Status of Condition Causing Alarm – Corrected (NO)
воотн орг	RATOR:	As soon as the power reduction is ≥ 5% or at the discretion of the Chief Examiner, insert Event # 6 ("B" S/G Feedwater Regulating Valve FCV-488 fails closed.)

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Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	20	of	30
Event Description:					, Turbine Trip does close signal, RHR-				
Time	Positio	n	Applicant's Actions or Behavior						

		At the discretion of the Chief Examiner, insert Event 6, "B" S/G g Valve FCV-488 fails closed.
	DICATIONS	
		TM>FW FLOW
	B3, S/G B L E1 S/G B N	VL DEV AR RANGE LO/LO-LO LEVEL (Once low level is reached.)
		low Lowers to 0 PPH
FCV-488	ndicated Cl	LOSED on the RTGB
	DOD	Immediate Action Step (AOP-010)
	BOP	Check Feedwater Regulating Valve – Operating Properly (Manual OR Auto) (NO)
	BOP	Verify FRV for affected S/G in manual control. (Takes manual control
	вор	of FCV-488 and attempts to OPEN) (No response from controller.)
	BOP	Stop any load change in progress. (Turbine to Manual, if applicable)
		IF unable to control S/G level THEN trip the Reactor AND Go to
	BOP	PATH-1. (YES)
	RO	Immediate Action Step:
		Reactor Tripped. (YES)
		Immediate Action Step:
	ВОР	Turbine Tripped.(NO)
		Trip or Runback the Turbine. (YES, Runback was successful)
		The of Runback the Turbine. (TES, Runback was succession)
Booth Op	erator:	Manually trip the Turbine locally, if requested, after a 3 min time
		delay.
	1	

App	ndix	D
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Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	21	of	30
Event Description:		"B" S/G FRV I Open, MSIVs	<sup>=</sup> CV-48 fail to c	8 fails closed	, Turbine Trip does close signal, RHR-	not occur 744A/B fai	, Stea il to aı	- m Du Jto-op	imp Valves fail ben
Time	Position	Applicant's Actions or Behavior							

	BOP	Immediate Action Step: E-1 AND E-2 energized. (YES)
	BOP	Continuous Action Step IF DS Bus is deenergized THEN place DSDG in service using EPP- 25.
	RO	Immediate Action Step: SI Initiated. (YES)
	SRO	Enters PATH-1 and verifies Immediate Actions.
	CREW	Open Foldout A.
	BOP	MSR Isolation Criteria. IF ANY Purge OR Shutoff Valve does not indicate fully closed, THEN place the associated RTGB Switch to CLOSE.
NOTE:		Operators may identify that steam dump valves have failed open and cannot be closed and take action to close the MSIVs.
NOTE:		Operators may identify that RHR-744A and -744B failed to auto- open on SI and take action to open the valves.
Booth Ope	erator:	If requested to locally close the Steam Dumps, the task will be successful to close the valves. Begin isolating the steam dumps 5 minutes after requested.
	RO	Verify Phase A Isolation valves are closed. (YES)

Appendix I	D
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Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, <u>11</u>	Page	22	of	30
Event Description:		"B" S/G FRV F Open, MSIVs	CV-488 fail to cl	3 fails closed ose on auto-	Turbine Trip does close signal, RHR-	not occur 744A/B fai	, Stea il to aι	m Du Ito-op	imp Valves fail ben
Time	Position	Applicant's Actions or Behavior							

	BOP	
	BOP	Verify FW Isolation valves are closed. (YES)
	BOP	Verify both FW pumps are tripped. (YES)
	BOP	Verify both MDAFW pumps are running. (NO) (Unable to start any MDAFW pump from RTGB.)
	BOP	If additional Feedwater is required, start the SDAFW pump. (NO, SDAFW Pump started but tripped)
	SRO	WCC SRO or AO may be dispatched to investigate the cause of the MDAFW Pump B and SDAFW Pump trip.
1	RO	Verify 2 SI pumps running. (YES)
	RO	Verify Both RHR pumps running. (YES)
	RO	Verify SI valves are properly aligned. (NO) RHR-744A/B failed to auto-open on SI. Manual action must be taken to open the valves.
ž.		
	RO	At least one CCW pump is running. (YES)
	BOP	All SW and SW Booster pumps running. (YES)
	RO	Verify CV Fans HVH-1, 2, 3, 4 running. (YES)

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Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, <u>11</u>	Page	23	of	30
Event Description:		"B" S/G FRV F Open, MSIVs	CV-488 fail to cl	8 fails closed lose on auto-	Turbine Trip does close signal, RHR-	not occur 744A/B fai	, Stea il to aι	m Du ito-op	mp Valves fail ben
Time	Position			Apr	licant's Actions or	Behavior			<u> </u>

RO	Verify IVSW System Initiated. (YES)
	Verify CV Ventilation isolation. (YES) Verify the following valves – CLOSED: - V12-6, CONT PURGE VALVE
	- V12-7, CONT PURGE VALVE
RO	<ul> <li>V12-8, CONT PURGE VALVE</li> <li>V12-9, CONT PURGE VALVE</li> </ul>
	- V12-10, CONTAINMENT PRESSURE RELIEF
	- V12-11, CONTAINMENT PRESSURE RELIEF
	- V12-12, CONTAINMENT VACUUM RELIEF
	- V12-13, CONTAINMENT VACUUM RELIEF
	Verify Control Room Vent aligned for Pressurization Mode. (YES) Operator to verify the following:
	- Verify CONT RM AIR EXHAUST Fan, HVE-16 - STOPPED
	<ul> <li>Verify CLEANING Fan HVE-19 A/B - RUNNING</li> </ul>
BOP	<ul> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1A-SA - CLOSED</li> </ul>
	<ul> <li>Verify CONTROL ROOM AIR EXHAUST FAN DISCHARGE DAMPER, CR-D1B-SB - CLOSED</li> </ul>
	<ul> <li><u>IF</u> CR-D1A-SA <u>OR</u> CR-D1B-SB have lost power, <u>THEN</u> locally verify position in the Control Room Kitchen.</li> </ul>
BOP	Verify both EDGs running. (YES)

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Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	24	of	30
Event Description:					Turbine Trip does close signal, RHR-				
Time	Position	Applicant's Actions or Behavior							

		CONTINUOUS ACTION STEP:
	BOP	Restart battery chargers within 30 minutes of power loss using OP- 601.
	RO	CONTINUOUS ACTION STEP: CV Pressure has remained below 10 psig. (YES)
	BOP	Automatic Steam Line Isolation Initiated (NO)
	BOP	Automatic Steam Line Isolation Required (YES)
Critical Task	BOP	Verify all MSIVs AND MSIV Bypasses Closed MSIVs must be manually closed, if not performed earlier.
	SRO	Locally open breaker for HVS-1 at MCC-5 CMPT 7J within 60 min of SI Initiation.
Booth Ope	erator	Open the breaker for HVS-1 within approximately 3 minutes of request.
	RO	RCS pressure > 1350 psig. [1250 psig] (YES) (May be NO if manual turbine runback not started immediately or if the steam dump malfunction not identified. Contingency steps have been added should RCS pressure be less than 1350 psig and are annotated with a "@" symbol.)
	RO	@ SI Flow Verified (YES)

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Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	25	of	30
Event Descri	ption:	"B" S/G FRV I Open, MSIVs	CV-488 fail to cl	3 fails closed ose on auto-	, Turbine Trip does close signal, RHR-	not occur 744A/B fai	, Stea Il to au	m Du Ito-op	mp Valves fail ben
Time	Position			Ар	olicant's Actions or	Behavior			·

 RO	@ RCS pressure > 125 psig (YES)
 BOP	At least 300 GPM AFW flow available. (NO)
BOP	Level in at least one S/G greater than 8% [18%] (NO)
BOP	Align AFW valves.
 BOP	At least 300 GPM AFW flow verified (NO)
RO	Reset SPDS and Initiate Monitoring of Critical Safety Function Status Trees
 SRO	Transition to FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
BOP	Check Total Feed Flow less than 300 GPM due to operator action. (NO)
	Determine if Secondary Heat Sink is required:
	<ul> <li>Check RCS pressure greater than any non-faulted S/G pressure. (YES)</li> </ul>
RO	<ul> <li>Check RCS temperature greater than 350°F [310°F] (YES)</li> </ul>
	(May be NO if manual turbine runback not started immediately or if the steam dump malfunction not identified. Contingency steps have been added should RCS temperature be less than 350°F and are annotated with a "@" symbol.)

A	opei	ndix	D

Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	26	of	30
Event Descri	otion:	"B" S/G FRV F Open, MSIVs	-CV-48 fail to c	8 fails closed lose on auto-	, Turbine Trip does close signal, RHR-	not occur 744A/B fa	, Stea il to ai	m Du uto-op	imp Valves fail ben
Time	Position	1	Applicant's Actions or Behavior						

	SRO	@ Place RHR System in service using Supplement I.
	SRO	@ Consult Plant Operations Staff to determine if RHR should be placed in Core Cooling Mode.
Booth Op	perator	Operations Staff is not currently available for consultation.
	RO	@ Chook PHP System . To be used in some secling much. (1/50)
		@ Check RHR System – To be used in core cooling mode. (YES)
	RO	@ Check RCS Pressure – Less than 375 psig [350 psig] (NO)
	RO	@ <u>WHEN</u> RCS pressure less than 375 psig [350 psig], <u>THEN</u> go to Step 4.
Examiner		Crew should have realized at this point that Supplement I is not
		the appropriate mitigation strategy and transition back to FRP-H.1.
	BOP	the appropriate mitigation strategy and transition back to FRP-H.1. Continuous Action Step:
		the appropriate mitigation strategy and transition back to FRP-H.1.
		the appropriate mitigation strategy and transition back to FRP-H.1. Continuous Action Step:
	BOP	the appropriate mitigation strategy and transition back to FRP-H.1. Continuous Action Step: Check Any TWO S/G Wide Range Levels less than 10%. [19%] (NO) Continuous Action Step: Check CST level – Greater Than 10% (YES)
	BOP	the appropriate mitigation strategy and transition back to FRP-H.1. Continuous Action Step: Check Any TWO S/G Wide Range Levels less than 10%. [19%] (NO) Continuous Action Step:

Appendix D

Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	27	of	30
Event Descrip	otion:	"B" S/G FRV F Open, MSIVs	FCV-48 fail to c	8 fails closed lose on auto-	Turbine Trip does close signal, RHR-	not occur 744A/B fai	, Stea il to au	m Du ito-op	imp Valves fail ben
Time	Position			Apr	licant's Actions or	Behavior			
						Bonarior			

BOF	
	Check AFW Pump Breakers – Tripped (YES) ("B" MDAFW Tripped.)
	Attempt to reclose breaker on "B" MDAFW Pump as follows:
BOP	<ul> <li>Position the MDAFW Pump Control Switch to the STOP position.</li> </ul>
	b. Reset SI
	<ul> <li>Position the MDAFW Pump Control Switch to the START position.</li> </ul>
BOP	Check MDAFW Pump – RUNNING (NO)
SRC	Contact I&C to investigate the tripped breaker.
BOP	Attempt to Start SDAFW Pump as follows: Verify SDAFW Steam Shutoff Valves – OPEN (V1-8A,B,C opened and then re-close on SDAFW Pump trip.)
	<ul> <li>Locally investigate AND attempt to restore AFW Flow as follows:</li> <li>a. Verify "B" AFW Pump suction supply is available.</li> <li>b. Position the "B" MDAFW Pump LOCAL/REMOTE Switch to LOCAL</li> </ul>
BOP	<ul> <li>c. Attempt to start the "B" MDAFW Pump as follows:</li> <li>1) Depress the "B" MDAFW Pump local STOP Pushbuttor</li> <li>2) Depress the "B" MDAFW Pump local START Pushbutton</li> <li>3) Check "B" MDAFW Pump – STARTED (NO)</li> </ul>
	Place the LOCAL/REMOTE Switch to REMOTE.
BOP	Check AFW Flow to S/Gs – Greater than 300 gpm. (NO)

Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	28	of	30
Event Descrip	otion:	"B" S/G FRV I Open, MSIVs	FCV-48 fail to c	8 fails closed lose on auto-	, Turbine Trip does close signal, RHR-	not occur 744A/B fa	, Stea il to au	m Du uto-op	imp Valves fail ben
Time	Position		••••••	Apr	licant's Actions or	Behavior			· · · · · · · · · · · · · · · · · · ·

	RO	Stop ALL RCPs
	BOP	Check Condensate System IN SERVICE (YES)
	RO	Place ALL the Feedwater Isolation Key Switches in the OVRD/RESET Position
Critical Task	BOP	Attempt To Establish Feedwater Flow AS Follows: a. Verify the FW HDR SECTION Valves – CLOSED (YES) V2-6A V2-6B V2-6C b. Start one Main FW Pump (YES) c. Open the FRV Bypass Valves FCV-479 FCV-489 FCV-489 Criteria: Must be performed prior to 2 S/G WR Levels reaching less than 10%.
	BOP	Check S/G Levels As Follows: a. Level In At Least One S/G - GREATER THAN 8% [18%] (NO)
	BOP	<ul> <li>Determine If Feedwater Flow Is Adequate: <ul> <li>a. Check the following:</li> <li>Core Exit T/C Temperature – LOWERING (YES)</li> <li><u>OR</u></li> <li>S/G Wide Range Level - RISING IN AT LEAST ONE S/G (YES)</li> </ul> </li> <li>b. Maintain FW flow to restore S/G Level to greater than 8%[18%]</li> <li>c. Reset SPDS And Return To Procedure And Step In Effect</li> </ul>

Appendix D		Operator Action						Form ES-D-2		
Op Test No.:	1	Scenario #	5	Event #	6, 7, 8, 9, 10, 11	Page	29	of 30		
Event Descrip	otion:	"B" S/G FRV I Open, MSIVs	=CV-48 fail to c	8 fails closed, lose on auto-	Turbine Trip does	not occu 744A/B fa	r, Stea iil to au	m Dump Valve uto-open	s fail	
Time	Position	Applicant's Actions or Behavior								

The Chief Examiner may terminate the scenario anytime after FW flow has been established to at least one S/G, or at his discretion.

### ILC-11-2 NRC SCENARIO 5 TURNOVER SHEET

POWER LEVEL:68% RTPCore Burnup:15697 MWD/MTUEFPD:448 EFPDBoron:132 PPMXenon:Approaching EQ - 37 pcm/hr and lowering.Tavg:565.8°FBank D Rods168 Steps

#### EQUIPMENT UNDER CLEARANCE:

- "A" MDAFW pump inoperable with breaker racked out
- Switchyard access is RESTRICTED.

#### **EQUIPMENT STATUS:**

- Automatic Rod Control is not operable.
- Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.

INSTRUCTIONS FOR THE WATCH:

• "A" HDP recently started for PMT following maintenance. Maintain current power while RES is evaluating PMT results.

## **Unit 2 Status Board**

	Date:	Today	Time:	6:00:00 AM	I Cycle:	27	MWD/MT:	15697	Design:	16590
	EFPD	448	Design	473.5			-			110000
						Tank	Level %		Status	
HUT	Level %		Status		100.000	Monitor A	10		Standby	1
CVCS-A	20	Filling				Monitor B	38		Standby	
CVCS-B	10	Standby				WCT A	37		Standby	
CVCS-C	86	Standby			20.000	WCT B	7		Standby	
WHUT	#NAME?	Filling				WCT C	9		Standby	
						WCT D	10		Standby	
	Data Linked t	o Pl		THE TV-		WCTE	9		Standby	
WGDTS	Pressure	PSIG	Sta	itus						
Α	#NAME?	PSIG	On cover				D	EMINERALIZ	ZERS	
В	#NAME?	PSIG	In Service				РРМ	In Service	Date	Resin Replaced
C	#NAME?	PSIG	Isolated			MB A	2194	YES	7/17/2010	5/4/2010
D	#NAME?	PSIG	Standby			MB B	2265	NO	7/17/2010	3/29/2010
					E.a	CATION	1021	NO	9/17/2010	12/9/2009
Shut	down Requi	rement	Temp	Boron	1	DEB A	0	NO		
	1.77% =∆K	/K	547 F Hot	258		DEB B	0	NO	New	2/3/2010
	1.77% =∆K	/K	>350 F	611		SFP	1963	NO	3/28/2010	4/00/00000
	2.6% =∆K/	ĸ	100 F Cold	776		1011	1303		9/23/2008	4/22/2008
	6% =∆K/K		N/A	1950					0.000	
				1.000	Co	ondenser Air Inle	akago	Townshi	SGBD	
	POR	/ Settings		1	A	13	CFM		Value GPM	Status
Setti	ng Date	POT	GP-3 Psig		В	0	CFM	A	50	Flash Tan
A	7/18/2010	3.21	1000		Known	8	CFM	В	50	With Heat
В	7/18/2010	3.12	1040		Total	5		C	50	Recovery
С	7/18/2010	3.44	1000		IUlai	13	CFM	N2 Flow	8	SCFM
					Rad	Effluent Ra Current	diation Monit	or Setpoints		1
RCSL	.eakage	0.00	Unidentified		Monitor	Setpoint	Alert Va	iue 200X	NUE Value	
Total		0.03	GPM						2X	
PRT		0.02	GPM		R-14C	1.01E+04		/A	2.020E+04	
RCDT Leak					R-20	7.40E+03	N	/A	1.480E+04	
		0.01	GPM		R-18	1.00E+06	2.000	)E+08	2.000E+06	grad a server
Charging L		0	GPM		R-19A	1.05E+04	2.100	)E+06	2.100E+04	
Misc Identi		0	GPM	(5.5 Pt	R-19B	9.72E+03	1.944	E+06	1.944E+04	
Primary/Se	condary	0	GPD		R-19C	9.58E+03	1.916	E+06	1.916E+04	
Secondary	Loss	17.3	GPM		R-37	8.53E+03		E+06	1.706E+04	
	anan' Sari P						ally Entered D			hem data bas
		t Shutdowi	1			Boron PPM		PPM	Date	PPM
	Previous A	RI Counts	Setpoint			RCS		132		
	1.00		150			BAST-A	9/16/2010		#NAME?	#NAME?
	50					BAST-B		21,032	#NAME?	#NAME?
	50 60		180	1						#NAME?
			180			SFP			#NAME?	
	60	lormal Curr				SFP	9/15/2010	2246	#NAME? #NAME2	
	60 N	Iormal Curr		% BAND		SFP RWST	9/15/2010 9/16/2010	2246 2219	#NAME?	#NAME?
11-32	60 N		ents	% BAND 5 +/-		SFP RWST Accum-A	9/15/2010 9/16/2010 8/30/2010	2246 2219 2211	#NAME? #NAME?	#NAME? #NAME?
li-32 I-41 I-42	60 N UPPER 144	LOWER	ents TARGET			SFP RWST Accum-A Accum-B	9/15/2010 9/16/2010 8/30/2010 8/30/2010	2246 2219 2211 2206	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
li-32  -41  -42	60 N UPPER 144 126	LOWER 136	ents TARGET 0.0212	5 +/-		SFP RWST Accum-A Accum-B Accum-C	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	2246 2219 2211 2206 2230	#NAME? #NAME?	#NAME? #NAME?
I-32 -41 -42 -43 -44	60 UPPER 144 126 121 112	LOWER 136 125 113 108	ents TARGET 0.0212 0.0212 0.0212	5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	2246 2219 2211 2206	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
I-32 -41 -42 -43 -44	60 N UPPER 144 126 121	LOWER 136 125 113 108	ents TARGET 0.0212 0.0212 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	2246 2219 2211 2206 2230	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
I-32 -41 -42 -43 -44	60 UPPER 144 126 121 112	LOWER 136 125 113 108	ents TARGET 0.0212 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	2246 2219 2211 2206 2230	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
I-32 -41 -42 -43 -44	60 UPPER 144 126 121 112 X Rev# 2.1.0	LOWER 136 125 113 108	ents TARGET 0.0212 0.0212 0.0212 0.0212	5 +/- 5 +/- 5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010	2246 2219 2211 2206 2230	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
I-32 I-41 I-42 I-43 I-44 OWERTRA	60 UPPER 144 126 121 112 X Rev# 2.1.0 NS	LOWER 136 125 113 108 D RNP	ents TARGET 0.0212 0.0212 0.0212 0.0212 0.0212 % APL Date/Tst	5 +/- 5 +/- 5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010	2246 2219 2211 2206 2230 2221	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
OWERTRA	60 UPPER 144 126 121 112 XX Rev# 2.1.0 NS 1A/B	LOWER 136 125 113 108 0 RNP Test/Hrs 35640.6	ents TARGET 0.0212 0.0212 0.0212 0.0212 0.0212 % APL Date/Tst 3/8/10	5 +/- 5 +/- 5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010 Notes/Addi	2246 2219 2211 2206 2230 2221 2221	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
11-32 1-41 1-42 1-43 1-44 OWERTRA FAN HVE- HVE- HVE	60 UPPER 144 126 121 112 XX Rev# 2.1.0 NS 1A/B -15A	LOWER 136 125 113 108 0 RNP Test/Hrs 35640.6 18643.5	ents TARGET 0.0212 0.0212 0.0212 0.0212 0.0212 % APL Date/Tst 3/8/10 3/18/10	5 +/- 5 +/- 5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	9/15/2010 9/16/2010 8/30/2010 8/30/2010 7/6/2010 7/6/2010 Notes/Addi IC-17,	2246 2219 2211 2206 2230 2221 tional Data 20, 22	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?
II-32 I-41 I-42 I-43 I-44 OWERTRA OWERTRA FAN HVE- HVE- HVE-	60 UPPER 144 126 121 112 XX Rev# 2.1.0 NS 1A/B -15A	LOWER 136 125 113 108 0 RNP Test/Hrs 35640.6 18643.5 6928.3	ents TARGET 0.0212	5 +/- 5 +/- 5 +/- 5 +/-		SFP RWST Accum-A Accum-B Accum-C RHR Refuel Canal Refuel Cavity	9/15/2010 9/16/2010 8/30/2010 8/30/2010 8/30/2010 7/6/2010 Notes/Addi	2246 2219 2211 2206 2230 2221 tional Data 20, 22	#NAME? #NAME? #NAME?	#NAME? #NAME? #NAME?

### ILC-11-2 NRC SCENARIO 5 TURNOVER SHEET

POWER LEVEL:68% RTPCore Burnup:15697 MWD/MTUEFPD:448 EFPDBoron:132 PPMXenon:Approaching EQ - 37 pcm/hr and lowering.Tavg:565.8°FBank D Rods168 Steps

### EQUIPMENT UNDER CLEARANCE:

- "A" MDAFW pump inoperable with breaker racked out
- Switchyard access is RESTRICTED.

### **EQUIPMENT STATUS:**

- Automatic Rod Control is not operable.
- Currently thunderstorm watch is in effect for Darlington and Chesterfield counties.

INSTRUCTIONS FOR THE WATCH:

 "A" HDP recently started for PMT following maintenance. Maintain current power while RES is evaluating PMT results.

# **Unit 2 Status Board**

1 C	Date: EFPD	Today 448	Time:		0 AM Cycle:	27	MWD/N	AT: 15697	Design:	16500
Care a	CIPU	:448	Design	473.5				1. 10031	Design:	16590
HUT	Level %		04-4			Tank	Level %	6	Stat	
cvcs		Filling	Status			Monitor A			Stan	
CVCS.		Standb				Monitor B	38		Stan	
cvcs.		Standb				WCTA	37		Stan	
WHUT	#NAME	? Filling	<u>y</u>		12-177	WCT B	7		Stan	
1.1		<u>n ning</u>	the other			WCT C	9		Stand	
	Data Linke	to Pl	<u> </u>			WCT D	10		Stand	
WGDT						WCTE	9		Stand	
A	#NAME		and the second se	Status					Otant	10 y
	- HIVANIC I	PSIG	On cover		1 2 4 4			DEMINERAL	IZEDS	
в	#NAME?	PSIG	In Service							10
С	#NAME?	PSIG					PPM	In Servic	e Date	Resin
D	#NAME?		isolated			MB A	2194	YES	7/17/2010	Replaced
	articular t	1-316	Standby			MB B	2265	NO	7/17/2010	
SI	utdown Req	dan d			191 1916 24	CATION	1021	NO	9/17/2010	
			Temp	Boron		DEB A	0	NO		
	1.77% =∆		547 F Hot	258		DEB B	0	NO	New	2/3/2010
	1.77% =△		<u>≥</u> 350 F	611	NOS INS	SFP	1963	NO	3/28/2010	
	2.6% =∆⊭		100 F Cold	776	13 20 20		1903	NU	9/23/2008	4/22/2008
	6% =∆K/	K	N/A	1950	1320 68			_		
See Children					C	ondenser Air In	lastan		SGBL	)
	POF	<b>RV Settings</b>				13			Value GPM	Status
	ting Date	POT	GP-3 Psig		B	0	CFM	A	50	Flash Tank
A	7/18/2010	3.21	1000		Known	8	CFM	В	50	With Heat
3	7/18/2010	3.12	1040	-	Total		CFM	С	50	Recovery
2	7/18/2010	3.44	1000		Total	5	CFM	N2 Flow	8	SCFM
<u> 16 %</u> .		15 - Salaria							the state wanted	
PCS	Lash			<b>-</b>		Effluent R	adiation Mon	itor Setpoint	s	
RUS	Leakage	0.00	Unidentifie	d	Rad	Current			NUE Value	
otal		0.03		- ()	Monitor	Setpoint	Alert	aiue 200X	2X	a state of the second state of the
RT		0.02	GPM	_	R-14C	1.01E+04		N/A	2.020E+04	
CDT Lea	kon		GPM		R-20	7.40E+03		N/A		
		0.01	GPM	1	R-18	1.00E+06		0E+08	1.480E+04	(See)
harging		0	GPM		R-19A	1.05E+04			2.000E+06	1230
isc Ident		0	GPM		R-19B			0E+06	2.100E+04	
rimary/Se	econdary	0	GPD			9.72E+03	1.94	4E+06	1.944E+04	
econdary	Loss	17.3	GPM	-11	R-19C	9.58E+03	1.91	6E+06	1.916E+04	
LESIUS I S	A 9.63 EM	0.000.50		1	R-37	8.53E+03	1.70	6E+06	1.706E+04	-
	Hi Flux A	t Shutdown					ally Entered	Data		hem data base
	Previous Al	RI Counts	Setpoint	1. 1. 1. 1.		Boron PPM		PPM	Date	PPM
-31	50		150			RCS	Today	132		
-32	60		180	C Part an		BAST-A		21,535	#NAME?	#NAME?
	12	A CONTRACT				BAST-B		21,032	#NAME?	#NAME?
	N	ormal Curre	ante			SFP		2246	#NAME?	#NAME?
				les		RWST			#NAME?	
			TARGET	% BAND		Accum-A		2211	#NAME?	#NAME?
1			0.0212	5 +/-		Accum-B				#NAME?
11	144			5 +/-		Accum-C			#NAME?	#NAME?
2	144 126	25	0.0212						#NAME?	#NAME?
2 3	144 126 121	125 113	0.0212	5 +/-		KHR				
2 3 4	144 126 121 112	125 13 08	0.0212 0.0212			RHR Refuel Canal	7/6/2010	2221		1533 - 143 A. M
2 3 4	144 126 121	125 13 08	0.0212 0.0212	5 +/-		Refuel Canal	//6/2010	2221		
2 3 4 WERTRA	144 126 121 112 X Rev# 2.1.0	25 13 08 RNP	0.0212 0.0212	5 +/- 5 +/-		Refuel Canal Refuel Cavity	//6/2010			
2 3 4 WERTRA FAN	144 126 121 112 X Rev# 2.1.0	125 13 08 RNP	0.0212 0.0212	5 +/- 5 +/-		Refuel Canal				
2 3 4 WERTRA FAN HVE-	144 126 121 112 X Rev# 2.1.0 IS 1 1A/B 3	25 113 08 RNP ést/Hrs	0.0212 0.0212 % APL	5 +/- 5 +/-		Refuel Canal Refuel Cavity				
2 3 4 WERTRA FAN HVE- HVE-	144           126           121           112           X Rev# 2.1.0           IS           1A/B           15A	25 113 08 RNP est/Hrs [1 5640.6 3	0.0212 0.0212 % APL Date/Tst	5 +/- 5 +/-		Refuel Canal Refuel Cavity	Notes/Addit	ional Data		
2 3 4 WERTRA FAN HVE-	144 126 121 112 X Rev# 2.1.0 IS 1 1A/B 3 15A 1	125 113 08 RNP est/Hrs [] 5640.6 8643.5 3	0.0212 0.0212 % APL Date/Tst	5 +/- 5 +/-		Refuel Canal Refuel Cavity		ional Data		