

FACILITY NAME: McGuire Nuclear Plant

Section 10

REPORT NUMBER: 05000369/370/2009-301

FINAL SIMULATOR SCENARIOS

CONTENTS:

- ☒ Final Simulator Scenarios
 - 'As given' with changes made during administration annotated
 - Each containing ES-D-1 "Scenario Outline"
 - Each containing ES-D-2 "Required Operator Actions"

Location of Electronic Files:

Submitted By: 

Verified By: 

Scenario Event Description

NRC Scenario 1

Facility:	McGuire	Scenario No.:	1	Op Test No.:	N09-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	
Initial Conditions:	<p>The Plant is at 75% power (MOL), following an unplanned load reduction four days ago to complete corrective maintenance on the 1A CF Pump. The maintenance was completed and the pump restarted, and power level raised to the present power level two days ago. The present plan is to observe operation of the 1A CF Pump at this power level, and then raise power to 100% within the next 24 hours. Dispatch has indicated that there have been intermittent voltage swings, and other instabilities, on the electrical grid, and that this is being investigated. It is expected to commence a power increase to 100% power starting at Step 3.21.10 of Enclosure 1 of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." It is expected to raise power on the upcoming shift at 2 MWe/Minute. Use of Alternate Dilute during power ascension in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control," has been approved. The RMWST Dissolved Oxygen Concentration is 800 ppb.</p>				
Turnover:	<p>The following equipment is Out-Of-Service: 1EMF27, SM Line D/Inner Doghouse Radiation Monitor, failed last shift (IAE is investigating) and MCB Annunciator 1AD-8, E-2, "GROUNDWATER HI LEVEL," has alarmed spuriously several times over the last hour (IAE is investigating).</p>				
Event No.	Malf. No.	Event Type*	Event Description		
1	NA	R-BOP N-RO N-SRO	Power Increase		
2	XMT CF018	I-RO I-SRO	Feed Flow Channel fails low		
3	ILE001 NC012B	I-BOP I(TS)-SRO	NC Master Pressure Controller fails high/PORV Leakage		
4	EP003C IRE009 IRE010	C-RO C(TS)-SRO	Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO		
5	SG001B	C-BOP C(TS)-SRO	Steam Generator Tube Leak (B)		
6	SG001B	M-RO M-BOP M-SRO	SGTR (B)		
7	XMT CA012	NA	Aux Feed Flow Transmitter to B SG fails high		
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>					

McGuire 2009 NRC Scenario #1

The Plant is at 75% power (MOL), following an unplanned load reduction four days ago to complete corrective maintenance on the 1A CF Pump. The maintenance was completed and the pump restarted, and power level raised to the present power level two days ago. The present plan is to observe operation of the 1A CF Pump at this power level, and then raise power to 100% within the next 24 hours. Dispatch has indicated that there have been intermittent voltage swings, and other instabilities, on the electrical grid, and that this is being investigated. It is expected to commence a power increase to 100% power starting at Step 3.21.10 of Enclosure 1 of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." It is expected to raise power on the upcoming shift at 2 MWe/Minute. Use of Alternate Dilute during power ascension in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control," has been approved. The RMWST Dissolved Oxygen Concentration is 800 ppb.

The following equipment is Out-Of-Service: 1EMF27, SM Line D/Inner Doghouse Radiation Monitor, failed last shift (IAE is investigating) and MCB Annunciator 1AD-8, E-2, "GROUNDWATER HI LEVEL," has alarmed spuriously several times over the last hour (IAE is investigating).

Shortly after taking the watch, the operator will raise power in accordance with Step 3.21.10 of Enclosure 4.1, "Power Increase," of OP/1/A/6100/003, "Controlling Procedure for Unit Operations." The RO will control the Turbine Generator in accordance with Enclosure 4.1, "Turbine-Generator Load Change," of OP/1/A/6300/001A, "Turbine-Generator Load Change," and the BOP will conduct an NC System Boron dilution in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control."

During the power increase, the controlling Feed Flow Transmitter (FCF-5060) on the D Steam Generator will fail low, causing a Steam Generator D Feed Flow Mismatch alarm. The operator will respond by implementing AP/1/A/5500/06, "S/G Feedwater Malfuction," recognize the failure and select an operating Feed Flow channel.

After this, the Pressurizer Pressure Master Controller output will fail high. This will cause the PORV 1NC34A and both spray valves to open, and NC Pressure will start to drop. The operator will respond in accordance with AP/1/A/5500/11, "Pressurizer Pressure Anomalies." The operator will ultimately close the Block Valve for Pressurizer PORV 1NC34A when it is determined that the valve now leaks by its closed seat. The operator will address Technical Specification 3.4.1, "RCS Pressure, Temperature and Flow Departure From Nucleate Boiling (DNB) Limits," and 3.4.11, "Pressurizer Power Operated Relief Valves (PORVS)." Ultimately, IAE will correct the problem with the Pressurizer Pressure Master Controller, and it will be placed back in automatic control.

Subsequently, a Zone 1B Lockout causes PCB 11 and 12 to open, as well as the 1B Main Generator Breaker to open and the turbine to automatically runback to 56%. The operator will implement AP/1/A/5500/03, "Load Rejection." During the runback the operator will notice that the rods do not move in manual, and the operator will need to drive rods in manually. Additionally, the operator will notice that Control Rod M12 will remain stuck in its original position.

During the plant stabilization, a slow developing Steam Generator Tube Leak will occur on the 1B Steam Generator. The operator will enter AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps," and sequentially reduce and isolate Letdown and start a second

Scenario Event Description

NRC Scenario 1

NV Pump. Ultimately, the leak will degrade to a 260 gpm SGTR. the operator will trip the reactor and actuate Safety Injection, and then enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection." The operator will address Technical Specification 3.4.13, "RCS Operational Leakage."

The operator will transition to EP/1/A/5000/E-3, "Steam Generator Tube Rupture," and isolate the flow into and out of the 1B Steam Generator and then conduct a cooldown of the NC System. The attempt to isolate Auxiliary Feedwater flow into the B Steam generator will be complicated by the failure of the Auxiliary Feed Flow transmitter (FCA-5100) to the B Steam Generator.

The scenario will terminate at Step 23.c of E-3, after the crew has closed 1NI-9A and 1NI-10B.

Critical Tasks:

E-3A

Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.

Safety Significance: Failure to isolate the ruptured SG causes a loss of ΔP between the ruptured SG and the intact SGs. Upon a loss of ΔP , the crew must transition to a contingency procedure that constitutes an incorrect performance that "necessitates the crew taking compensating action which complicates the event mitigation strategy." If the crew fails to isolate steam from the SG, or feed flow into the SG the ruptured SG pressure will tend to decrease to the same pressures as the intact SGs, requiring a transition to a contingency procedure, and delaying the stopping of RCS leakage into the SG.

E-3B

Establish/maintain an RCS temperature so that transition from E-3 does not occur because RCS temperature is either too high to maintain minimum required subcooling, or too low causing an Orange path on Subcriticality or Integrity.

Safety Significance: Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency procedure which constitutes an incorrect performance that "necessitates the crew taking compensating action which complicates the event mitigation strategy." If the RCS temperature is too high when RCS depressurization is started, a loss of subcooling will occur when the RCS depressurization is started. On the other hand, if RCS temperature is allowed to continue to decrease after the initial cooldown, the operator may be required to transition to the Subcriticality or Integrity response FRP, and delay the RCS depressurization.

E-3C

Depressurize the RCS to meet SI termination criteria before ruptured SG level reaches 100% Wide Range Level.

Safety Significance: Failure to stop the reactor coolant leakage into a ruptured SG by depressurizing the RCS (when it is possible to do so) needlessly complicates the mitigation of the event. It also constitutes a "significant reduction of Safety Margin beyond that irreparably introduced by the scenario. If RCS depressurization does NOT occur, the inventory in the secondary side of the ruptured SG will occur leading to water release through the SG PORV or Safety Valve, which could cause an unisolable fault in the ruptured SG.

Scenario Event Description

NRC Scenario 1

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		Reset to Temp I/C 152.	Insert MALF-EMF227 = 6; EMF-27 Failure Event 6, Insert XMT-CA012, Set = 600, Ramp = 600 seconds (Connected to P4)
<input type="checkbox"/>		RUN	
<input type="checkbox"/>		Update Status Board, Setup OAC Setup ICCM, Turbine Displays, & Trend Recorders. Check Rod Step Counters agree with rod positions Check Make-up Control Switch in "ARMED." Ensure DRPI Screen is Re-zeroed. Ensure CF Pump LoveJoy reset. Place orange Work Request Sticker on 1AD-6/E-11 Panel board.	NOTE: RMWST DO = <1000 ppb.
<input type="checkbox"/>		Freeze.	
<input type="checkbox"/>		Update Fresh Tech. Spec. Log.	
<input type="checkbox"/>		Fill out the NLO's Available section of Shift Turnover Info.	

Scenario Event Description

NRC Scenario 1

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Prior to Crew Briefing	RUN	
<input type="checkbox"/>	Crew Briefing <ol style="list-style-type: none"> 1. Assign Crew Positions based on evaluation requirements 2. Review the Shift Turnover Information with the crew. 3. Provide Enclosure 4.1 of OP/1/A/6100/003 marked up from 3.21.1 – 3.21.9. Marked up as follows: Check Box on step 3.21.1 checked. Check Box on step 3.21.2 checked. Step 3.21.3 initialed and Todd St.Claire entered as Person Notified. Step 3.21.4 initialed. Check Box on step 3.21.5 checked. Step 3.21.6.1 initialed and Don Gabriel entered as Person Notified. Step 3.21.6.2 NA and initialed. Step 3.21.6.3 NA and initialed. Check Box on step 3.21.7 checked. Step 3.21.8 NA and initialed. Step 3.21.9 NA and initialed. 4. Provide OP/1/A6300/001, "Turbine-Generator Startup/Shutdown," and OP/1/A/6150/009, "Boron Concentration Control," with Enclosure 4.4 marked up through Step 3.5. 5. Provide a Reactivity Plan W/Pwr ascension Guidelines of 2 MWe/minute. 6. Direct the crew to Review the Control Boards taking note of present conditions, alarms. 		
<input type="checkbox"/>	T-0	Begin Familiarization Period	
<input type="checkbox"/>	At direction of examiner		Power Increase
<input type="checkbox"/>	At direction of examiner	(XMT) CF018 Set = 0, 30 Second Ramp Trigger #1	Feed Flow Channel fails low.
<input type="checkbox"/>	At direction of examiner	(MALF) ILE001 Set = 1700, 30 second Ramp (MALF) NC012B Set = 1 (OVR) NC088B = ON Trigger #3	NC Master Pressure Controller fails high/PORV Leakage ILE001 will be deleted during the course of the recovery. LOA-NC33A=Racked Out, 600 second Delay; on Trigger #15 (PORV Isolation Valve Breaker)

Scenario Event Description

NRC Scenario 1

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	(MALF) EP003C (MALF) IRE010M12 (MALF) IRE009 = 0 Trigger #5	Zone 1B Lockout causing Runback/Stuck Rod/Rods fail to move in AUTO LOA IPP003 = Override, Trigger #7; IPB Fan
<input type="checkbox"/>	At direction of examiner	(MALF) SG001B Set = 260 Ramp = 360 seconds Trigger #9	Steam Generator Tube Leak (B)/SGTR (B) LOA-SA003 = 0, Trigger #13; TDCA Pump
<input type="checkbox"/>	Continued from Event 6	(XMT) CA012 Set = 600 Ramp = 600 seconds Trigger #11	Aux Feed Flow Transmitter to B SG fails high Set up to Trigger on Reactor Trip (Trigger #11)
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.: N09-1 Scenario # 1 Event # 1 Page 8 of 52Event Description: **Power Increase**

Time	Position	Applicant's Actions or Behavior
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Shortly after taking the watch, the operator will raise power in accordance with Step 3.21.10 of Enclosure 4.1, "Power Increase," of OP/1/A/6100/003, "Controlling Procedure for Unit Operations." The RO will control the Turbine Generator in accordance with Enclosure 4.1, "Turbine-Generator Load Change," of OP/1/A6300/001A, "Turbine-Generator Load Change," and the BOP will conduct an NC System Boron dilution in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control."

Booth Operator Instructions: NA**Indications Available: NA**

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATIONS ENCLOSURE 4.1, POWER INCREASE			
	SRO	(Step 3.21.10) Continue power increase to 95% RTP."	NOTE: The power increase will be at 2 MWe/minute.
OP/1/A/6150/009, BORON CONCENTRATION CONTROL ENCLOSURE 4.4, ALTERNATE DILUTE			
	BOP	(Step 3.6) Ensure Boric Acid Flow Counter reset to zero.	
	BOP	(Step 3.7) Set Total Make Up Flow Counter to value determined in Step 3.5. (R.M.)	
	BOP	(Step 3.8) WHEN Total Make Up Flow Counter cover closed, check counter at desired value. (R.M.)	
	BOP	(Step 3.9) Select "ALTERNATE DILUTE" on "NC Sys M/U Controller".	

Op Test No.:	N09-1	Scenario #	1	Event #	1	Page	9	of	52
Event Description: Power Increase									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.10) If desired to makeup only through 1NV-175A (BA Blender to VCT Outlet), select CLOSED on 1NV-171A (BA Blender to VCT Inlet).	
	BOP	(Step 3.11) IF desired to adjust reactor makeup water flow using the "BA Blend Discharge Cntrl" potentiometer, adjust "BA Blend Discharge Cntrl" potentiometer setpoint to achieve desired flowrate.	
	BOP	(Step 3.12) If desired to manually adjust reactor makeup water flow, perform the following:	
		<ul style="list-style-type: none"> Place "BA Blend Disch Cntrl" in manual. 	
		<ul style="list-style-type: none"> Adjust "BA Blend Disch Cntrl" output to control reactor makeup water flowrate. 	
	BOP	(Step 3.13) IF required to lower VCT level....	NOTE: It is NOT required to lower VCT level.
	BOP	(Step 3.14) IF plant parameters require termination of dilution, place "NC System Makeup" to "STOP". (R.M.)	
	BOP	(Step 3.15) Momentarily select "START" on "NC System Make Up". (R.M.)	
	BOP	(Step 3.16) Check "NC System Make Up" red light lit.	
	BOP	(Step 3.17) Check 1NV-175A (BA Blender To VCT Outlet) open.	
	BOP	(Step 3.18) Check 1NV-252A (Rx M/U Water To Blender control) open or throttled as required.	

Op Test No.: N09-1 Scenario # 1 Event # 1 Page 10 of 52Event Description: **Power Increase**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.19) IF 1NV-171A (BA Blender To VCT Inlet) in "AUTO", check 1NV-171A (BA Blender To VCT Inlet) open.	
	BOP	(Step 3.20) Check Rx M/U Water Pump starts.	
	BOP	(Step 3.21) Monitor Total Make Up Flow Counter. (R.M.)	
	BOP	(Step 3.22) Do NOT continue until one of the following occurs:	
		<ul style="list-style-type: none"> Amount of reactor makeup water recorded per Step 3.5 added 	
		OR	
		<ul style="list-style-type: none"> Reactor makeup water addition manually terminated 	
	BOP	(Step 3.23) Ensure dilution terminated as follows: (R.M.)	
		<ul style="list-style-type: none"> IF in "AUTO", ensure the following off: 	
		<ul style="list-style-type: none"> 1A Rx M/U Water Pump 	
		<ul style="list-style-type: none"> 1B Rx M/U Water Pump 	
		<ul style="list-style-type: none"> Ensure the following closed: 	
		<ul style="list-style-type: none"> 1NV-175A (BA Blender To VCT Outlet) 	
		<ul style="list-style-type: none"> 1NV-252A (RX M/U Water To Blender Control) 	
		<ul style="list-style-type: none"> 1NV-171A (BA Blender To VCT Inlet) 	
	BOP	(Step 3.24) Ensure 1NV-171A (BA Blender to VCT Inlet) in "AUTO".	

Op Test No.: N09-1 Scenario # 1 Event # 1 Page 11 of 52Event Description: **Power Increase**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.25) Ensure "BA Blend Disch Ctrl" in "AUTO". (R.M.)	
	BOP	(Step 3.26) Ensure "BA Blend Disch Cntrl" potentiometer set at 5.6 (90 gpm). (R.M.)	
	BOP	(Step 3.27) Ensure 1NV-137A (NC Filters Otlit 3-Way Control) in "AUTO".	
	BOP	(Step 3.28) IF desired to flush blender,,	NOTE: It is NOT desired to flush the blender.
	BOP	(Step 3.29) Select "AUTO" for "NC Sys M/U Controller".	
	BOP	(Step 3.30) Momentarily select "START" on "NC System Make Up".	
	BOP	(Step 3.31) Check "NC System Make Up" red light lit.	
	BOP	(Step 3.32) Ensure the following reset to zero:	
		• Total Make Up Flow Counter	
		• Boric Acid Flow Counter	
	BOP	(Step 3.33) Record in Auto Log that final blender content is Rx Makeup Water.	
OP/1/A/6300/001A, TURBINE-GENERATOR STARTUP/SHUTDOWN ENCLOSURE 4.1, TURBINE-GENERATOR LOAD CHANGE			
	RO	(Step 3.5) Changing Turbine Load	

Op Test No.: N09-1 Scenario # 1 Event # 1 Page 12 of 52Event Description: **Power Increase**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF Turbine in "OPERATOR AUTO", perform the following: 	
		<ul style="list-style-type: none"> Ensure desired change within "Calculated Capability Curve". 	
		<ul style="list-style-type: none"> IF turbine load will increase or decrease more than 10 MWs, notify Dispatcher of expected load change. 	
		<ul style="list-style-type: none"> Depress "LOAD RATE". 	
		<ul style="list-style-type: none"> Enter desired load rate in "VARIABLE DISPLAY". 	NOTE: the RO will select 2 MWe/Min loading rate.
		<ul style="list-style-type: none"> Depress "ENTER". 	
		<ul style="list-style-type: none"> Depress "REFERENCE". 	
		<ul style="list-style-type: none"> Enter desired load in "VARIABLE DISPLAY". 	
		<ul style="list-style-type: none"> Depress "ENTER". 	
		<ul style="list-style-type: none"> Depress "GO" Check load changes at selected rate. 	
After 15-25 Mwe increase, <u>OR</u> at the discretion of the Lead Examiner move to Event #2.			

Op Test No.: N09-1 Scenario # 1 Event # 2 Page 13 of 52Event Description: **Feed Flow Channel fails low**

Time	Position	Applicant's Actions or Behavior
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During the power increase, the controlling Feed Flow Transmitter (FCF-5060) on the D Steam Generator will fail low, causing a Steam Generator D Feed Flow Mismatch alarm. The operator will respond by implementing AP/1/A/5500/06, "S/G Feedwater Malfunction," recognize the failure and select an operating Feed Flow channel.

Booth Operator Instructions: **Operate Trigger #1 (XMT-CF018 (0% - 30 second ramp))**

Indications Available:

- Annunciator 1AD-4/A4, "S/G D Flow Mismatch Lo Stm Flow."
- Annunciator 1AD-4/B4, "S/G D Level Deviation."
- Annunciator 1AD-4/C4, "S/G D Flow Mismatch Lo CF Flow."
- D CF flow decreases.
- D NR Level decreases.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/06, S/G FEEDWATER MALFUNCTION			
			NOTE: Crew will carry out Immediate Actions of AP6, prior to the SRO addressing the AP.
	RO	(Step 1) IF CF control valve OR bypass valve has failed, THEN perform the following:	Immediate Action
		<ul style="list-style-type: none"> • Place affected valve in manual. 	
		<ul style="list-style-type: none"> • Restore S/G level to program. 	
	RO	(Step 2) IF CF pump speed control has failed...	Immediate Action
			NOTE: The CF pump speed control has NOT failed.
	RO	(Step 3) On each S/G, check the following channels – INDICATING the SAME:	NOTE: Channel I Feed Flow has failed low on D SG.
		<ul style="list-style-type: none"> • Feed flow 	

Op Test No.:	N09-1	Scenario #	1	Event #	2	Page	14	of	52
Event Description: Feed Flow Channel fails low									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3 RNO) Select an operable channel on the affected S/G(s).	NOTE: operator will select Channel II on Steam Flow, Feed Flow and NR level.
	RO	(Step 4) Check unit status as follows:	
		<ul style="list-style-type: none"> Reactor trip breakers – CLOSED 	
		<ul style="list-style-type: none"> Pzr pressure – GREATER THAN P-11 (1955 PSIG). 	
	RO	(Step 5) IF AT ANY TIME S/G NR level approaches 17% OR 83%, THEN perform the following:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Trip reactor. 	
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
	SRO	(Step 6) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 7) Check reactor power – GREATER THAN 3%.	
	RO	(Step 8) Check CM/CF – PRESENTLY FEEDING S/Gs.	
	RO	(Step 9) Check S/G levels – STABLE OR TRENDING TO PROGRAM LEVEL.	NOTE: By this time NR level should be at or trending to programmed level.

Op Test No.: N09-1 Scenario # 1 Event # 2 Page 15 of 52Event Description: **Feed Flow Channel fails low**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 10) Check NC temperatures as follows:	
		<ul style="list-style-type: none"> IF any NC pump on, THEN check NC T-Avg – STABLE OR TRENDING TO DESIRED TEMPERATURE. 	NOTE: NC Tavg should be stable.
	RO	(Step 11) Check all S/G CF control valves – IN AUTO.	NOTE: 1D CF Control Valve will be in MANUAL.
		(Step 11 RNO) WHEN the following conditions met, THEN place affected CF control valve in automatic:	
		<ul style="list-style-type: none"> Automatic control – DESIRED 	
		<ul style="list-style-type: none"> Affected S/G level(s) – AT PROGRAM LEVEL 	NOTE: operator will place 1D CF Control Valve back in AUTO.
		<ul style="list-style-type: none"> Selected control channels – INDICATE CORRECTLY ON CHART RECORDER: 	
		<ul style="list-style-type: none"> Feed flow 	
		<ul style="list-style-type: none"> Steam flow 	
		<ul style="list-style-type: none"> S/G level 	
	RO	(Step 12) Check all S/G CF control bypass valves – IN MANUAL AND FULL OPEN.	
	RO	(Step 13) Check both CF pumps – IN AUTO.	
	RO	(Step 14) Check all CA pumps – OFF.	
			NOTE: The SRO may check TS, however, there are NO associated TS with this failure.

Op Test No.: N09-1 Scenario # 1 Event # 2 Page 16 of 52Event Description: **Feed Flow Channel fails low**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: SRO may call WCC/IAE to address the failure. If so, Booth Instructor acknowledge as WCC.
			NOTE: SRO will likely conduct a Focus Brief.
			NOTE: This failure renders the Thermal Power Best Estimate inaccurate. The crew will need to use NIS and/or NC System ΔT to determine Reactor Power.
			NOTE: after the Focus Brief, it is likely that the crew will resume the power increase.
At the discretion of the Lead Examiner move to Event #3.			

Op Test No.: N09-1 Scenario # 1 Event # 3 Page 17 of 52Event Description: **NC Master Pressure Controller fails high/PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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After this, the Pressurizer Pressure Master Controller output will fail high. This will cause the PORV 1NC34A and both spray valves to open, and NC Pressure will start to drop. The operator will respond in accordance with AP/1/A/5500/11, "Pressurizer Pressure Anomalies." The operator will ultimately close the Block Valve for Pressurizer PORV 1NC34A when it is determined that the valve now leaks by its closed seat. The operator will address Technical Specification 3.4.1, "RCS Pressure, Temperature and Flow Departure From Nucleate Boiling (DNB) Limits," and 3.4.11, "Pressurizer Power Operated Relief Valves (PORVS)." Ultimately, IAE will correct the problem with the Pressurizer Pressure Master Controller, and it will be placed back in automatic control.

Booth Operator Instructions: Operate Trigger #3 (MALF-ILE001 (1700, 30 second ramp); MALF-NC012B (1%), OVR-NC088B (ON))

Indications Available:

- 1AD-6/A-5, "Pzr Hi Press Dev Control."
- 1AD-6/A-6, "Pzr Lo Press PORV NC34 Blocked."
- 1AD-6/B-6, "Pzr Lo Press PORV NC32 & 36 Blocked."
- 1AD-6/A-9, "Pzr Safety Discharge Hi Temp."
- 1AD-6/B-9, "Pzr PORV Discharge Hi Temp."
- 1AD-6/C-12, "PORV NC-34 Actuated."
- 1AD-6/F-5, "1NC1, 2 or 3 Flo Detected."
- NC Pressure drops to 2216 psig (TS value).
- Dual position indication on 1NC-34A.

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: If the power increase has been restarted, the CRSRO will go to HOLD on the Turbine.
AP/1/A/5500/11, PRESSURIZER PRESSURE ANOMALIES			
	BOP	(Step 1) Check actual Pzr pressure – HAS GONE DOWN.	Immediate Action NOTE: Crew will carry out Immediate Actions of AP11, prior to the SRO addressing the AP.
	BOP	(Step 2) Check all Pzr pressure channels – INDICATING THE SAME.	Immediate Action

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>18</u>	of	<u>52</u>
Event Description: NC Master Pressure Controller fails high/PORV Leakage									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3) Check Pzr PORVs – CLOSED.	Immediate Action NOTE: Pzr PORV 1NC-34A has opened and NOT fully closed.
	BOP	(Step 3 RNO) Perform the following:	Immediate Action
		<ul style="list-style-type: none"> Close PORVs. 	NOTE: 1NC-34A will continue to display dual position indication.
		<ul style="list-style-type: none"> IF PORV will not close, THEN close PORV isolation valve. 	NOTE: The operator will close the 1NC-34A PORV isolation valve (1NC-33A).
	BOP	(Step 4) Check Pzr spray valves – CLOSED.	Immediate Action NOTE: depending on event timing, the Pzr Spray may or may NOT be closed. If they are move to Step 5.
	BOP	(Step 4 RNO) Perform the following:	Immediate Action
		<ul style="list-style-type: none"> Close Pzr spray valve(s). 	
		<ul style="list-style-type: none"> IF AT ANY TIME a reactor trip occurs AND spray valve still open, THEN stop 1A and 1B NC pumps. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	BOP	(Step 5) Check Pzr PORVs – CLOSED.	
		(Step 5 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF associated PORV isolation valve will not close AND pressure going down rapidly, THEN..... 	NOTE: The PORV Isolation valve will close.
		<ul style="list-style-type: none"> Close associated PORV inlet drain valve as follows: 	
		<ul style="list-style-type: none"> IF 1NC-34A (Pzr PORV) failed, THEN close 1NC-270 (Pzr PORV Drn Isol For 1NC-34A) 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>19</u>	of	<u>52</u>
Event Description: NC Master Pressure Controller fails high/PORV Leakage									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 6) Check Pzr spray valves – CLOSED.	
	SRO	(Step 7) GO TO Step 9.	
	SRO	(Step 9) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 10) Check 1NV-21A (NV Spray To PZR Isol) – CLOSED.	
	BOP	(Step 11) Check the following Pzr heaters – ON:	
		• 1A	
		• 1B	
		• 1D	
	BOP	(Step 11 RNO) IF NC pressure below desired pressure, THEN:	
		• Place Pzr heater mode select switches in manual.	
		• Turn on heaters as necessary to control pressure.	
	BOP	(Step 12) Check 1C Pzr heaters – ON.	
	BOP	(Step 12 RNO) IF NC pressure below desired pressure, THEN:	
		• Place “PZR PRESS MASTER” in manual.	
		• Control pressure.	

Op Test No.: N09-1 Scenario # 1 Event # 3 Page 20 of 52Event Description: **NC Master Pressure Controller fails high/PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> WHEN Pzr pressure returns to normal AND automatic Pzr pressure control desired, THEN place "PZR PRESS MASTER" in auto. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware; and will be used when the failure is corrected by IAE.
	BOP	(Step 13) Check Pzr pressure – GOING UP TO DESIRED PRESSURE.	
	BOP	(Step 14) Check "1NC-27 PRESSURIZER SPRAY EMERGENCY CLOSE" switch – SELECTED TO "NORMAL".	
	SRO	(Step 14 RNO) Notify station management to ensure switch restored to "NORMAL" once spray valve is repaired.	NOTE: SRO may call WCC/IAE to address the switch position. If so, Booth Instructor acknowledge as WCC.
	BOP	(Step 15) Check "1NC-29 PRESSURIZER SPRAY EMERGENCY CLOSE" switch - SELECTED TO "NORMAL".	
	SRO	(Step 15 RNO) Notify station management to ensure switch restored to "NORMAL" once spray valve is repaired.	NOTE: SRO may call WCC/IAE to address the switch position. If so, Booth Instructor acknowledge as WCC.
	SRO	(Step 16) GO TO Step 24.	
	BOP	(Step 24) Ensure Pzr Press Rec Select is on operable channel.	NOTE: SRO will likely conduct a Focus Brief.

Op Test No.: N09-1 Scenario # 1 Event # 3 Page 21 of 52Event Description: **NC Master Pressure Controller fails high/PORV Leakage**

Time	Position	Applicant's Actions or Behavior	
			Booth Instructor: Delete ILE001 Within 5 minutes , as WCC report that IAE discovers a blown fuse in the Pzr Master Controller circuitry, which has been replaced, and that IAE recommends that the Pzr Master Pressure Controller be placed back in AUTO. As Station Management , report that Pzr Spray Valve Switches can be returned to NORMAL when system response is satisfactory.
	SRO	Return to Continuous Action of Step 12 RNO.	
	BOP	(Step 12 RNO) IF NC pressure below desired pressure, THEN:	
		<ul style="list-style-type: none"> Place "PZR PRESS MASTER" in manual. 	
		<ul style="list-style-type: none"> Control pressure. 	
		<ul style="list-style-type: none"> WHEN Pzr pressure returns to normal AND automatic Pzr pressure control desired, THEN place "PZR PRESS MASTER" in auto. 	NOTE: The BOP will: Manually adjust Spray Valve Controllers to 0 demand Place the Spray Valve Controllers to AUTO Place the Master Pressure Controller to about 50% output. Place the Master Pressure Controller to AUTO. Place the Emergency Close Switch for the Spray Valves to NORMAL. Control Pzr Heaters as needed.

Op Test No.: N09-1 Scenario # 1 Event # 3 Page 22 of 52Event Description: **NC Master Pressure Controller fails high/PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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			NOTE: SRO will likely conduct a Focus Brief.
TECHNICAL SPECIFICATION 3.4.1, RCS PRESSURE, TEMPERATURE, AND FLOW DEPARTURE FROM NUCLEATE BOILING (DNB) LIMITS			
	SRO	3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits.	NOTE: NC System Pressure drops to ≈2150 psig on the failure, and TS 3.4.1 was entered and exited during the transient.
	SRO	LCO 3.4.1 RCS DNB parameters for pressurizer pressure, RCS average temperature, and RCS total flow rate shall be within the limits specified in Table 3.4.1-1.	
	SRO	APPLICABILITY: MODE 1.	
	SRO	ACTIONS	
	SRO	CONDITION	REQUIRED ACTION
		A. Pressurizer pressure or RCS average temperature DNB parameters not within limits.	A.1 Restore DNB parameter(s) to within limit.
			COMPLETION TIME
			2 hours
TECHNICAL SPECIFICATION 3.4.11, PRESSURIZER POWER OPERATED RELIEF VALVES (PORVS)			
	SRO	3.4.11 Pressurizer Power Operated Relief Valves (PORVs)	

Op Test No.: N09-1 Scenario # 1 Event # 3 Page 23 of 52Event Description: **NC Master Pressure Controller fails high/PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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	SRO	LCO 3.4.11 Each PORV and associated block valve shall be OPERABLE.			
	SRO	APPLICABILITY: MODE 1, 2, and 3.			
	SRO	ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	NOTE: The operator determines that LCO 3.4.11 is NOT met, and that condition B must be applied.
		B. One or two PORVs inoperable and not capable of being manually cycled.	B.1 Close associated block valves	1 hour	
			AND		
			B.2 Remove power from associated block valves	1 hour	
			AND		
			B.3 Restore one PORV to OPERABLE status if two PORVs are inoperable.	72 hours	
					NOTE: SRO may call WCC to address the Pzr PORV Isolation Valve Breaker position. If so, Booth Instructor acknowledge as WCC. Operate Trigger #15: LOA-NC33A = Racked Out, 600 second Delay. As NLO , report action when complete.
At the discretion of the Lead Examiner move to Event #4.					

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 24 of 52Event Description: **Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Subsequently, a Zone 1B Lockout causes PCB 11 and 12 to open, as well as the 1B Main Generator Breaker to open and the turbine to automatically runback to 56%. The operator will implement AP/1/A/5500/03, "Load Rejection." During the runback the operator will notice that the rods do not move in manual, and the operator will need to drive rods in manually. Additionally, the operator will notice that Control Rod M12 will remain stuck in its original position.

Booth Operator Instructions: Operate Trigger #5 (MALF-EP003C, MALF-IRE010M12 and IRE009 (0))

Indications Available:

- MWe decreases.
- Control Rods do NOT move inward in automatic as expected.
- DRPI for control rod M12 indicates that the rod is stuck.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/03, LOAD REJECTION			
	RO	(Step 1) Ensure control rods in auto.	Immediate Action NOTE: While the RO will see that the Control Rods are in AUTO, it will also be observed that Rods are NOT moving, and that they are required to move. The RO will inform the SRO of the situation, and the SRO will direct that the RO control the rods in MANUAL to maintain TavG-Tref.
	RO	(Step 2) Check Turbine Generator response as follows:	
		<ul style="list-style-type: none"> • Check Generator – TIED TO GRID. 	
		<ul style="list-style-type: none"> • Check Generator output – GOING DOWN AS REQUIRED. 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 25 of 52Event Description: **Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3) Check control rod response as follows:	
		<ul style="list-style-type: none"> Check control banks – MOVING IN AS REQUIRED. 	NOTE: The Control Rods will NOT be moving in as required.
	RO	(Step 3 RNO) IF no rods will move in auto; THEN perform the following:	
		<ul style="list-style-type: none"> Place Control Rods in manual. 	
		<ul style="list-style-type: none"> Insert rods to reduce T-avg equal to programmed T-Ref. 	
		<ul style="list-style-type: none"> If no rods will move, THEN..... 	NOTE: The Control Rods will move in MANUAL.
	RO	<ul style="list-style-type: none"> Check all rods – ALIGNED WITH ASSOCIATED BANK. 	NOTE: At this point Control Rod M12 is misaligned.
			<p>NOTE: The operator may recognize the Stuck Rod, but WILL continue with the rod insertion.</p> <p>EXAMINER NOTE: At this point TS 3.1.4 for Rod Misalignment has been entered, however, with the plant transient in progress, the SRO will not check TS. This TS is shown on Page 50, and should be checked after exam termination.</p>
		(Step 3b RNO) IF 2 or more control rods are misaligned greater than 24 steps, THEN perform the following:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Trip Reactor. 	
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
	BOP	(Step 4) Check CM system response as follows:	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 26 of 52Event Description: **Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Standby Hotwell and Condensate Booster pumps – RUNNING. 	
		<ul style="list-style-type: none"> 1CM-420 (Unit 1 Generator Load Rejection Bypass control) – OPEN. 	
	RO	(Step 5) IF 50% runback, THEN ensure turbine impulse pressure going down to less than 410 PSIG.	NOTE: The runback will terminate ≈56%.
	SRO	(Step 6) Announce: "UNIT 1 LOAD REJECTION, NON-ESSENTIAL PERSONNEL STAY OUT OF UNIT 1 TURBINE BLDG".	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 7) Check P/R meters – LESS THAN 20%.	
	SRO / RO	(Step 7 RNO) Perform the following:	
		<ul style="list-style-type: none"> Designate an operator to continuously monitor reactor power. 	
		<ul style="list-style-type: none"> IF AT ANY TIME reactor power is less than 20%, THEN perform Step 8 to stabilize reactor power. 	NOTE: This is a Continuous Action. The SRO will designate the RO to observe this action.
	SRO	<ul style="list-style-type: none"> GO TO Step 9. 	
	RO	(Step 9) Check condenser dump valves – MODULATING OPEN.	
	BOP	(Step 10) Check "IPB AIR FLOW TROUBLE" alarm (1AD-11, J-5) – DARK.	
	RO	(Step 10 RNO) within 15 minutes of lockout initiation, restore 1PB cooling as follows:	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 27 of 52Event Description: **Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF "MAIN GENERATOR" less than 10,000 amps, THEN 	NOTE: The Main Generator is NOT < 10,000 amps.
	SRO	<ul style="list-style-type: none"> Dispatch operator to check the following areas for signs of fire and notify Control Room of results within 5 minutes: 	NOTE: The SRO will dispatch an NLO.
		<ul style="list-style-type: none"> 1A Main Step Up Transformer 	
		<ul style="list-style-type: none"> 1B Main Step Up Transformer 	
		<ul style="list-style-type: none"> Unit 1 IPB Fan Enclosure area. 	
	SRO	<ul style="list-style-type: none"> Record approximate time lockout occurred. 	
	SRO	<ul style="list-style-type: none"> Do not continue until operator has been given sufficient time (approximately 5 minutes) to complete fire inspection. 	Booth Instructor: Within 3 minutes , as NLO report that there does NOT appear to be a fire around the transformers or IPB Fan area.
	SRO	<ul style="list-style-type: none"> IF operator confirms no fire has occurred, THEN dispatch operator to perform the following at the Unit 1 "IPB ALARM PANEL": 	NOTE: The SRO will dispatch an NLO.
		<ul style="list-style-type: none"> Depress "LOCKOUT OVERRIDE" on the fan in "MAN". 	
		<ul style="list-style-type: none"> IF IPB fan in "MAN" cannot be started, THEN depress "LOCKOUT OVERRIDE" on the fan in "AUTO". 	Booth Instructor: Operate Trigger #7 (LOA-IPP003 (Override). Within 3 minutes , as NLO report that the 1A IPB Fan is running in Manual.
		<ul style="list-style-type: none"> IF neither IPB fan can be started,..... 	NOTE: The 1A IPB Fan is running.
	BOP	(Step 11) Check Pzr pressure control response as follows:	
		<ul style="list-style-type: none"> Ensure Pzr heaters are in auto. 	
		<ul style="list-style-type: none"> Ensure Pzr spray control valves are in auto. 	
		<ul style="list-style-type: none"> Check Pzr PORVs – CLOSED. 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 28 of 52Event Description: **Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 11.c RNO) WHEN Pzr pressure is less than 2315 PSIG, THEN perform the following:	
		<ul style="list-style-type: none"> Ensure Pzr PORVs are closed. 	NOTE: 1NC-34A has previously failed to fully close.
		<ul style="list-style-type: none"> IF any PORV cannot be closed, THEN close its isolation and inlet drain valve as follows: 	
		IF 1NC-34A (PZR PORV failed, THEN close the following:	NOTE: These valves have been previously closed.
		<ul style="list-style-type: none"> 1NC-33A (PZR PORV Isol). 	
		<ul style="list-style-type: none"> 1NC-270 (PZR PORV Drn Isol For 1NC-34A). 	
	BOP	<ul style="list-style-type: none"> (Step 11d) Check Pzr spray control valves – CLOSED. 	
	RO	(Step 12) Check load rejection – DUE TO LOSS OF CF PUMP.	
	SRO	(Step 12 RNO) GO To Step 15.	
	RO	(Step 15) Check turbine impulse pressure – LESS THAN 260 PSIG.	
	RO	(Step 15 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF AT ANY TIME turbine impulse pressure drops to less than 260 PSIG, THEN GO TO Step 16. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	<ul style="list-style-type: none"> GO TO Step 19. 	
	RO / BOP	(Step 19) Check Main Generator as follows:	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 29 of 52Event Description: **Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check Generator Breakers – EITHER GENERATOR BREAKER CLOSED. 	
		<ul style="list-style-type: none"> Check Generator – TIED TO GRID. 	
		<ul style="list-style-type: none"> Check generator power factor – 0.9 TO 1.0 LAGGING. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 20. 	
	SRO	(Step 20) REFER TO RP/0/A/5700/000 (Classification of Emergency).	NOTE: SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
	RO	(Step 21) WHEN transient is over, THEN perform the following:	
		<ul style="list-style-type: none"> Check reactor power – GREATER THAN 40%. 	
		<ul style="list-style-type: none"> Check S/G "CF FLOW" – LESS THAN 15%. 	
	RO	(Step 21.b RNO) Perform the following:	
		<ul style="list-style-type: none"> IF AT ANY TIME CF flow will be maintained less than 15%, THEN RETURN TO Step 21.c to swap CF flow to S/G CF Bypass control valves. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	<ul style="list-style-type: none"> GO TO Step 21.g. 	
	RO	<ul style="list-style-type: none"> (Step 21.g) Check either CF pump – RUNNING IN AUTO. 	
	BOP	<ul style="list-style-type: none"> Slowly throttle closed 1CM-420 (Unit 1 Generator Load Rejection Bypass Control) while monitoring Condensate Booster pump suction pressure. 	
	BOP	<ul style="list-style-type: none"> WHEN 1CM-420 is closed, THEN check load rejection signal reset (OAC turn on code "CM"). 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 30 of 52Event Description: **Zone 1B Lockout causing Runback/Stuck Rod/Rods Fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Reposition manual loader for 1CM-420 to 100% open. 	
	SRO	<ul style="list-style-type: none"> IF thermal power is greater than 15% THEN within 4 hours of reaching stable conditions, ensure each power range channel is within 2% of heat balance. 	
	RO	<ul style="list-style-type: none"> Check T-avg – GREATER THAN 561°F. 	
	RO	<ul style="list-style-type: none"> Check "CONTROL ROD BANK LO LO LIMIT" alarm (1AD-2, B-9) – DARK. 	
	RO / BOP	<ul style="list-style-type: none"> (Step 21.n) Check "CONTROL ROD BANK LO LIMIT" alarm (1AD-2, A-9) – DARK. 	
	RO	(Step 22) Check load rejection – DUE TO LOSS OF CF PUMP.	
	SRO	(Step 22 RNO) Go To Step 24.	
	BOP	(Step 24) Shutdown unnecessary running plant equipment as follows:	
		<ul style="list-style-type: none"> Condensate Booster pumps and place in auto. 	
		<ul style="list-style-type: none"> Hotwell pumps and place in auto. 	
		<ul style="list-style-type: none"> IF desired to secure,.....HDPs. 	NOTE: It is NOT desired to secure the HDPs.
	SRO	(Step 25) IF power change greater than 15% in one hour, THEN notify Primary Chemistry to perform required Tech Spec sampling.	NOTE: SRO may contact Chemistry. If so, Booth Instructor: acknowledge as Chemistry.
At the discretion of the Lead Examiner move to Events #5-7.			

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 31 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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During the plant stabilization, a slow developing Steam Generator Tube Leak will occur on the 1B Steam Generator. The operator will enter AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps," and sequentially reduce and isolate Letdown and start a second NV Pump. Ultimately, the leak will degrade to a 260 gpm SGTR. the operator will trip the reactor and actuate Safety Injection, and then enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection." The operator will address Technical Specification 3.4.13, "RCS Operational Leakage." The operator will transition to EP/1/A/5000/E-3, "Steam Generator Tube Rupture," and isolate the flow into and out of the 1B Steam Generator and then conduct a cooldown of the NC System. The attempt to isolate Auxiliary Feedwater flow into the B Steam generator will be complicated by the failure of the Auxiliary Feed Flow transmitter (FCA-5100) to the B Steam Generator. The scenario will terminate at Step 23.c of E-3, after the crew has closed 1NI-9A and 1NI-10B.

Booth Operator Instructions: Operate Trigger #9 (MALF- SG001B (260 over 360 seconds))

**(XMT-CA012 (600 on 600 second ramp)) Trigger #11
Conditional on Rx Trip**

Indications Available:

- 1RAD1/C-1, "1EMF 71 S/G A Leakage Hi Rad."
- 1RAD1/D-1, "1EMF 72 S/G B Leakage Hi Rad."
- 1RAD1/D-2, "1EMF 73 S/G C Leakage Hi Rad."
- 1RAD1/D-3, "1EMF 74 S/G D Leakage Hi Rad."
- 1RAD1/B-1, "1EMF 33 Cond Air Eject Exh Hi Rad."
- 1RAD3/E-5, "1EMF 24, 25, 26, 27 S/G A, B, C, D Steamline Hi Rad."
- Pzr Level drops.
- Charging flow increases in automatic.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/10, NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV PUMPS CASE I, STEAM GENERATOR TUBE LEAKAGE			
	RO / BOP	(Step 1) Check Pzr level – STABLE OR GOING UP.	
	BOP	(Step 1 RNO) Perform the following as required to maintain level:	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 32 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Maintain charging flow less than 200 GPM at all times in subsequent steps. 	
		<ul style="list-style-type: none"> Ensure 1NV-238 (Charging Line Flow Control) opening. 	
	BOP	<ul style="list-style-type: none"> Open 1NV-241 (U1 Seal Water Inj Flow Control) while maintaining NC pump seal flow greater than 6 GPM. 	
		<ul style="list-style-type: none"> Reduce or isolate letdown. 	<p>NOTE: The SRO will likely direct that Letdown be reduced to 45 gpm.</p> <p>After Letdown has been reduced to 45 gpm, and Pzr Level is still lowering, the SRO will likely direct that Letdown be isolated.</p>
		<ul style="list-style-type: none"> Start additional NV pump. 	<p>NOTE: When it is determined that the Pzr level is still lowering with Letdown Isolated, the SRO will direct that a 2nd Charging Pump be started.</p>
		<ul style="list-style-type: none"> IF CLAs are isolated, AND Pzr level is going down,..... 	<p>NOTE: The CLAs are NOT isolated.</p>
	SRO	<ul style="list-style-type: none"> IF Pzr level cannot be maintained greater than 4%, OR Pzr level going down with maximum charging flow, THEN perform the following: 	
		<ul style="list-style-type: none"> 1F 1B OR 1C S/G identified as ruptured, THEN immediately have another operator initiate actions to isolate TD CA pump steam supply from ruptured S/G PER Enclosure 3 (TD CA Pump Steam Supply Isolation). 	<p>NOTE: The SRO will dispatch an NLO.</p> <p>Booth Instructor:</p> <p>Operate Trigger #13 (LOA-SA003 (0)).</p> <p>Within 3 minutes, as NLO report that steam has been isolated to the TD CA Pump from the B SG.</p>
	RO/ BOP	<ul style="list-style-type: none"> Trip reactor. 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 33 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> WHEN reactor tripped OR auto S/I setpoint reached, THEN ensure S/I initiated. 	
	SRO	<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	NOTE: The SRO will transition to E-0.
			EXAMINER NOTE: At this point TS 3.4.13 for RCS Leakage has been entered, however, with the plant transient in progress, the SRO will not check TS. This TS is shown on Page 49 , and should be checked after exam termination.
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	SRO	(Step 1) Monitor Foldout page.	NOTE: Crew will carry out Immediate Actions of E-0, prior to the SRO addressing the EP.
	RO	(Step 2) Check Reactor Trip:	
		<ul style="list-style-type: none"> All rod bottom lights – LIT 	
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R amps – GOING DOWN. 	
	RO	(Step 2 RNO) Perform the following:	NOTE: The RO will take the RNO action because Control Rod M12 is NOT on the bottom (i.e. Rod Bottom light is NOT LIT).
		<ul style="list-style-type: none"> Trip reactor. 	
		<ul style="list-style-type: none"> If reactor will not trip..... 	NOTE: The RO will report that the Reactor is tripped.

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 34 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3) Check Turbine Trip:	
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	
	BOP	(Step 5) IF either CF pump is in Manual Direct Valve Position (MDVP) mode, THEN trip affected pump(s).	
	RO/ BOP	(Step 6) Check if S/I is actuated:	NOTE: If SI has NOT automatically actuated, it should be manually actuated here.
		<ul style="list-style-type: none"> “SAFETY INJECTION ACTUATED” status light (1SI-18) – LIT. 	
		<ul style="list-style-type: none"> Both LOCA Sequencer Actuated status lights (1SI-14) – LIT. 	
	SRO	(Step 7) Announce “Unit 1 Safety Injection”.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 8) Check ESF Monitor Light Panel on energized train(s):	
		<ul style="list-style-type: none"> Groups 1, 2, 5 – DARK. 	
		<ul style="list-style-type: none"> Group 3 – LIT. 	
		<ul style="list-style-type: none"> OAC – IN SERVICE. 	
		<ul style="list-style-type: none"> Group 4, Rows A through F – LIT AS REQUIRED. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 9. 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 35 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO / BOP	(Step 9) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	
		<ul style="list-style-type: none"> N/R level in at least 3 S/Gs – GREATER THAN 17%. 	
	BOP	(Step 10) Check all KC pumps – ON.	
	BOP	(Step 11) Check both RN pumps – ON.	
	SRO	(Step 12) Notify Unit 2 to start 2A RN pump.	Floor Instructor: As U2 RO report "2A RN Pump is running."
	RO	(Step 13) Check all S/G pressures – GREATER THAN 775 PSIG.	
	BOP	(Step 14) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment Pressure is normal.
	BOP	(Step 15) Check S/I flow:	
		<ul style="list-style-type: none"> Check "NV PMPS TO COLD LEG FLOW" gauge – INDICATING FLOW. 	
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 1600 PSIG. 	
	BOP	(Step 15b RNO) Perform the following:	
		<ul style="list-style-type: none"> Ensure ND pump miniflow valve on running pump(s) open: 	
		<ul style="list-style-type: none"> 1ND-68A (1A ND Pump & Hx Mini Flow Isol) 	
		<ul style="list-style-type: none"> 1ND-67B (1B ND Pump & Hx Mini Flow Isol). 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 36 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 16. 	
		(Step 16) Notify OSM or other SRO to perform EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 22 (OSM Actions Following an S/I) within 10 minutes.	NOTE: SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
	RO	(Step 17) Check CA flow:	
		<ul style="list-style-type: none"> Total CA flow – GREATER THAN 450 GPM. 	
	BOP	<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	
	RO	<ul style="list-style-type: none"> WHEN N/R level in any S/G greater than 11% (32% ACC), THEN control CA flow to maintain N/R levels between 11% (32% ACC) and 50%. 	
	RO	(Step 18) Check NC temperatures:	
		<ul style="list-style-type: none"> IF all NC pumps off, THEN check NC T-Colds – STABLE OR TRENDING TO 557°F. 	
	BOP	(Step 19) Check Pzr PORV and spray valves:	
	BOP	<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. 	NOTE: 1NC-34A has previously failed to fully close.
	BOP	(Step 19a RNO) if Pzr pressure less than 2315 PSIG, THEN perform the following:	
		<ul style="list-style-type: none"> Close Pzr PORV(s). 	
		<ul style="list-style-type: none"> IF any Pzr PORV cannot be closed, THEN perform the following: 	
		<ul style="list-style-type: none"> Close its isolation valve. 	
		<ul style="list-style-type: none"> Close the following valve. 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 37 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF 1NC-34A (PZR PORV) failed, THEN close 1NC-270 (PZR PORV Drn Isol For 1NC-34A). 	NOTE: These valves have been previously closed.
		<ul style="list-style-type: none"> IF PORV isolation valve cannot be closed,..... 	NOTE: The PORV Isolation valve is closed.
		<ul style="list-style-type: none"> IF any PZR PORV cannot be closed or isolated, 	NOTE: The PORVs are either closed or isolated.
		<ul style="list-style-type: none"> (Step 19b) Normal PZR spray valves – CLOSED. 	
	BOP	(Step 19b RNO) IF PZR pressure is less than 2100 PSIG,.....	NOTE: PZR Pressure is > 2100 psig.
	RO	(Step 20) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	
	RO/ BOP	(Step 21) Check if main steamlines intact:	
		<ul style="list-style-type: none"> All S/G pressures – STABLE OR GOING UP 	
		<ul style="list-style-type: none"> All S/Gs – PRESSURIZED. 	
	BOP	(Step 22) Check if S/G tubes intact:	NOTE: All S/G EMFs are NOT Normal, and the 1B SG Level is increasing in an uncontrolled manner.
		<ul style="list-style-type: none"> The following secondary EMFs – NORMAL: 	
		<ul style="list-style-type: none"> 1EMF-33 (Condenser Air Ejector Exhaust) 	
		<ul style="list-style-type: none"> 1EMF-34(L) (S/G Sample (Lo Range)) 	
		<ul style="list-style-type: none"> 1EMF-24 (S/G A) 	
		<ul style="list-style-type: none"> 1EMF-25 (S/G B) 	
		<ul style="list-style-type: none"> 1EMF-26 (S/G C) 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 38 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1EMF-27 (S/G D). 	
		<ul style="list-style-type: none"> S/G levels – STABLE OR GOING UP IN A CONTROLLED MANNER. 	
	SRO	(Step 22 RNO) IF S/G levels going up in an uncontrolled manner OR any EMF abnormal, THEN perform the following:	
		<ul style="list-style-type: none"> Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees). 	
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-3 (Steam Generator Tube Rupture). 	NOTE: The SRO will transition to E-3.
EP/1/A/5000/E-3, STEAM GENERATOR TUBE RUPTURE			
	SRO	(Step 1) Monitor Foldout page.	
	BOP	(Step 2) Identify ruptured S/G(s):	
		<ul style="list-style-type: none"> Any S/G N/R level – GOING UP IN AN UNCONTROLLED MANNER 	NOTE: The 1B SG Level is increasing in an uncontrolled manner.
		OR	
		<ul style="list-style-type: none"> Chemistry or RP has determined ruptured S/G by sampling 	NOTE: The SRO may contact Chemistry for sampling. Booth Instructor: Acknowledge as appropriate.
		OR	
		<ul style="list-style-type: none"> Any of the following EMFs – ABOVE NORMAL: 	NOTE: The S/G related EMFs are NOT normal, with 1EMF-25 reading the highest.
		<ul style="list-style-type: none"> 1EMF-24 (S/G A) 	
		<ul style="list-style-type: none"> 1EMF-25 (S/G B) 	
		<ul style="list-style-type: none"> 1EMF-26 (S/G C) 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 39 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1EMF-27 (S/G D) 	<p>NOTE: 1EMF-27 is OOS. The CRSRO may call Chemistry and direct that the 1D SG be sampled to ensure that a SGTR/SGTL does NOT exist in the 1G SG.</p> <p>If so, Booth Instructor acknowledge as Chemistry.</p>
	RO	(Step 3) Check at least one S/G – AVAILABLE FOR NC SYSTEM COOLDOWN.	
	RO	(Step 4) Isolate steam flow from ruptured S/G(s) as follows:	
		<ul style="list-style-type: none"> Check ruptured S/G(s) SM PORV – CLOSED. 	
		<ul style="list-style-type: none"> IF TD CA pump is the only source of feedwater, 	NOTE: the TD CA Pump is NOT the only source of feedwater.
		<ul style="list-style-type: none"> Check S/Gs 1B and 1C – INTACT. 	NOTE: the 1B SG is NOT intact.
	BOP	(Step 4c RNO) Isolate TD CA pump steam supply from ruptured S/G as follows:	Examiner NOTE: This action may have already taken place. If so, continue with Step 4d.
		<ul style="list-style-type: none"> Ensure operators dispatched in next step immediately notify Control Room Supervisor when valves are closed. 	
		<ul style="list-style-type: none"> Immediately dispatch 2 operators to concurrently verify (CV), unlock and close valves on ruptured S/G(s): 	<p>NOTE: If NOT already done, the SRO will direct two NLOs to CLOSE 1SA-2 and 78.</p> <p>Booth Instructor: Set LOA-SA003 = 0, (1SA-2/78)</p> <p>Within 3 minutes, as NLO report that steam has been isolated to the TD CA Pump from the B SG.</p>

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 40 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> For 1B S/G: 	
		<ul style="list-style-type: none"> 1SA-2 (1B S/G SM Supply to Unit 1 TD CA Pump Turb Maint Isol) (Unit 1 interior doghouse, 767+12, FF-53) 	
		<ul style="list-style-type: none"> 1SA-78 (1B S/G SM Supply to Unit 1 TD CA Pump Turb Loop Seal Isol) (Unit 1 interior doghouse, 767+10, FF-53). 	
	SRO	<ul style="list-style-type: none"> IF AT ANY TIME local closure of SA valves takes over 8 minutes, THEN isolate TD CA pump steam supply PER Enclosure 2 (Tripping TD CA Pump Stop Valve or Alternate Steam Isolation). 	NOTE: This is a Continuous Action. If NOT already done, the SRO will make both board operators aware.
	RO	<ul style="list-style-type: none"> (Step 4d) Check blowdown isolation valves on ruptured S/G(s) – CLOSED: 	
		<ul style="list-style-type: none"> For 1B S/G: 	
		<ul style="list-style-type: none"> 1BB-2B (1B S/G Blowdown Cont Outside Isol Control) 	
		<ul style="list-style-type: none"> 1BB-6A (B S/G BB Cont Inside Isol). 	
		<ul style="list-style-type: none"> Close steam drain on ruptured S/G(s). 	
		<ul style="list-style-type: none"> 1SM-89 (B SM Line Drain Isol) 	
		<ul style="list-style-type: none"> Close the following on ruptured S/G(s): 	
		<ul style="list-style-type: none"> MSIV 	
		<ul style="list-style-type: none"> MSIV bypass valve. 	
	RO	(Step 5) Control ruptured S/G(s) level as follows:	
		<ul style="list-style-type: none"> Check ruptured S/G(s) N/R level – GREATER THAN 11% (32% ACC). 	
		<ul style="list-style-type: none"> Isolate feed flow to ruptured S/G(s): 	
		<ul style="list-style-type: none"> Close 1CA-54AC (U1 TD CA Pump Disch To 1B S/G Isol). 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 41 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Close 1CA-58A (1A CA Pump Disch To 1B S/G Isol). 	<p>NOTE: Because CA flow has failed on 1B SG, the CRSRO may direct an NLO to check the position of the valve locally.</p> <p>If so, Booth Instructor report back as NLO, that the valves are closed.</p>

CRITICAL TASK:

(E-3A) Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs.

Safety Significance: Failure to isolate the ruptured SG causes a loss of ΔP between the ruptured SG and the intact SGs. Upon a loss of ΔP , the crew must transition to a contingency procedure that constitutes an incorrect performance that "necessitates the crew taking compensating action which complicates the event mitigation strategy." If the crew fails to isolate steam from the SG, or feed flow into the SG the ruptured SG pressure will tend to decrease to the same pressures as the intact SGs, requiring a transition to a contingency procedure, and delaying the stopping of RCS leakage into the SG.

	RO	(Step 6) Check ruptured S/G(s) pressure – GREATER THAN 280 PSIG.	
	BOP	(Step 7) Check any NC pump – RUNNING.	
	BOP	(Step 8) Check Pzr pressure – GREATER THAN 1955 PSIG	
	SRO	(Step 9) Initiate NC System cooldown as follows:	
		<ul style="list-style-type: none"> Determine required core exit temperature based on lowest ruptured S/G pressure: 	NOTE: SRO determines to cooldown to 508-520°F.
	RO	<ul style="list-style-type: none"> Check the following on the ruptured S/G(s) – CLOSED. 	
		<ul style="list-style-type: none"> MSIV 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 42 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> MSIV bypass valve 	
		<ul style="list-style-type: none"> Check ruptured S/G(s) SM PORV – CLOSED. 	
		<ul style="list-style-type: none"> Check S/Gs 1B and 1C – INTACT. 	
	RO	(Step 9.d RNO) IF 1B OR 1C S/G is ruptured, THEN do not continue until steam is isolated to TDCA pump from ruptured S/G per one of the following:	<p>NOTE: If NOT already done, the SRO will direct two NLOs to CLOSE 1SA-2 and 78.</p> <p>Booth Instructor: Set LOA-SA003 = 0, (1SA-2/78)</p> <p>Within 3 minutes, as NLO report that steam has been isolated to the TD CA Pump from the B SG.</p>
		<ul style="list-style-type: none"> Local isolation of SA line (per Step 4.c) 	
		OR	
		<ul style="list-style-type: none"> Tripping TD CA pump stop valve (per Step 4.c) 	
	RO	<ul style="list-style-type: none"> Check condenser available: 	
		<ul style="list-style-type: none"> “C-9 COND AVAILABLE FOR STEAM DUMP” status light (1SI-18) – LIT 	
		<ul style="list-style-type: none"> MSIV on intact S/G(s) – OPEN 	
		<ul style="list-style-type: none"> Check S/Gs 1B and 1C – INTACT. 	
	RO	<ul style="list-style-type: none"> (Step 9.f) Perform the following to place steam dumps in steam pressure mode: 	
		<ul style="list-style-type: none"> Place “STM PRESS CONTROLLER” in manual. 	
		<ul style="list-style-type: none"> Adjust “STM PRESS CONTROLLER” output to equal “STEAM DUMP DEMAND” signal. 	
		<ul style="list-style-type: none"> Place “STEAM DUMP SELECT” in steam pressure mode. 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 43 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> WHEN "P-12 LO-LO TAVG" status light (1SI-18) lit, THEN place steam dumps in bypass interlock. 	
		<ul style="list-style-type: none"> Dump steam from intact S/G(s) to condenser at maximum rate while attempting to avoid a Main Steam Isolation. 	
		<ul style="list-style-type: none"> Check Low Pressure Steamline Isolation – BLOCKED. 	
		(Step 9.i RNO) Perform the following:	
	BOP	<ul style="list-style-type: none"> Depressurize Pzr to less than 1955 PSIG using one of the following: 	
		<ul style="list-style-type: none"> Maximum available Pzr spray. 	
		OR	
		<ul style="list-style-type: none"> IF normal Pzr spray is not available, THEN use Pzr PORV. 	
		<ul style="list-style-type: none"> Do not continue until Pzr pressure is less than 1955 PSIG. 	
		<ul style="list-style-type: none"> Depress "BLOCK" on Low Pressure Steamline Isolation block switches. 	
		<ul style="list-style-type: none"> Close Pzr spray valve(s) and Pzr PORVs. 	
		<ul style="list-style-type: none"> Maintain NC pressure less than 1955 PSIG. 	
	RO	<ul style="list-style-type: none"> (Step 9.j) Check Core exit T/Cs- LESS THAN REQUIRED TEMPERATURE. 	
	SRO	(Step 9.j RNO) Perform the following:	
		<ul style="list-style-type: none"> WHEN Core exit T/Cs are less than required temperature, THEN perform the following: 	
		<ul style="list-style-type: none"> Stop NC System cooldown. 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 44 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Maintain core exit T/Cs less than required temperature. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 10. 	
	RO	(Step 10) Control intact S/G levels:	
		<ul style="list-style-type: none"> Check N/R level in any intact S/G – GREATER THAN 11% (32% ACC). 	
		<ul style="list-style-type: none"> Throttle feed flow to maintain all intact S/G N/R levels between 22% (32% ACC) and 50%. 	
	BOP	(Step 11) Check Pzr PORVs and isolation valves:	
		<ul style="list-style-type: none"> Power to all Pzr PORV isolation valves – AVAILABLE. 	
		<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. 	NOTE: 1NC-34A has previously failed to fully close.
	BOP	(Step 11b RNO) IF Pzr pressure less than 2315 PSIG, THEN perform the following:	
		<ul style="list-style-type: none"> Close Pzr PORV(s). 	
		<ul style="list-style-type: none"> IF any Pzr PORV cannot be closed, THEN close its isolation valve. 	NOTE: This valve has been previously closed.
		<ul style="list-style-type: none"> IF PORV isolation valve cannot be closed..... 	NOTE: The PORV Isolation valve is closed.
		<ul style="list-style-type: none"> IF any Pzr PORV cannot be closed or isolated, 	NOTE: All PORVs are either closed or isolated.
		<ul style="list-style-type: none"> IF any Pzr PORV cannot be closed, THEN close the following valve: 	
		<ul style="list-style-type: none"> IF 1NC-34A (PZR PORV) failed, THEN close 1NC-270 (PZR 	NOTE: This valve has been previously closed.
	BOP	<ul style="list-style-type: none"> (Step 11c) At least one Pzr PORV isolation valve – OPEN. 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 45 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12) Reset the following:	
		<ul style="list-style-type: none"> S/I 	
		<ul style="list-style-type: none"> Sequencers 	
		<ul style="list-style-type: none"> Phase A Isolation 	
		<ul style="list-style-type: none"> Phase B Isolation 	
	BOP	(Step 13) Establish VI to containment:	
		<ul style="list-style-type: none"> Open the following: 	
		<ul style="list-style-type: none"> 1VI-129B (VI Supply to A Cont Ess VI Hdr Outside Isol)) 	
		<ul style="list-style-type: none"> 1VI-160B (VI Supply to B Cont Ess VI Hdr Outside Isol)) 	
		<ul style="list-style-type: none"> 1VI-150B (Lwr Cont Non Ess Cont Outside Isol). 	
		<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 85 PSIG. 	
	RO	(Step 14) Check if NC System cooldown should be stopped as follows:	
		<ul style="list-style-type: none"> Check Core exit T/Cs – LESS THAN REQUIRED TEMPERATURE. 	
	RO	(Step 14a RNO) Perform the following:	
		<ul style="list-style-type: none"> IF AT ANY TIME while in this step ruptured S/G pressure changes by over 100 PSIG, AND ruptured S/G pressure is greater than 400 PSIG, THEN select a new target temperature from table in Step 9.a. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Do not continue until core exit T/Cs are less than target temperature. 	
	RO	<ul style="list-style-type: none"> (Step 14b) Stop NC System cooldown. 	
		<ul style="list-style-type: none"> Maintain Core exit T/Cs – LESS THAN REQUIRED TEMPERATURE. 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 46 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		(Step 15) Check ruptured S/G(s) pressure – STABLE OR GOING UP.	
	RO	(Step 16) Check NC subcooling based on core exit T/Cs – GREATER THAN 20°F.	
CRITICAL TASK: (E-3B) Establish/maintain an RCS temperature so that transition from E-3 does not occur because RCS temperature is either too high to maintain minimum required subcooling, or too low causing an Orange path on Subcriticality or Integrity. Safety Significance: Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency procedure which constitutes an incorrect performance that “necessitates the crew taking compensating action which complicates the event mitigation strategy.” If the RCS temperature is too high when RCS depressurization is started, a loss of subcooling will occur when the RCS depressurization is started. On the other hand, if RCS temperature is allowed to continue to decrease after the initial cooldown, the operator may be required to transition to the Subcriticality or Integrity response FRP, and delay the RCS depressurization.			
	RO	(Step 17) Depressurize NC System as follows:	
		<ul style="list-style-type: none"> Check ruptured S/G(s) NR level – LESS THAN 73% (63% ACC). 	
	BOP	<ul style="list-style-type: none"> Check normal Pzr spray flow – AVAILABLE. 	
		<ul style="list-style-type: none"> Initiate NC depressurization using maximum available spray. 	
		<ul style="list-style-type: none"> IF AT ANY TIME during this step, spray valves are not effective at reducing NC pressure, OR ruptured S/G(s) NR level is approaching 83% (73% ACC), THEN GO TO Step 18. 	NOTE: The SRO may decide that Pzr Spray is ineffective at reducing pressure, and proceed to Step 18. If so, proceed forward to Step 18 on Page 47 .
	RO / BOP	<ul style="list-style-type: none"> Do not continue until any of the following conditions satisfied: 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 47 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> NC subcooling based on core exit T/Cs – LESS THAN 0°F 	
		<ul style="list-style-type: none"> Pzr level – GREATER THAN 76% (58% ACC) 	
		<ul style="list-style-type: none"> Both of the following: 	
	RO / BOP	<ul style="list-style-type: none"> NC pressure – LESS THAN RUPTURED S/G(s) PRESSURE. 	
		<ul style="list-style-type: none"> Pzr level – GREATER THAN 11% (29% ACC). 	
	BOP	<ul style="list-style-type: none"> Close Pzr spray valves. 	
	BOP	(Step 17.g) Check 1NV-21A (NV Spray to PZr Isol) – CLOSED.	
	BOP	(Step 17.h) Observe Caution prior to Step 20 and GO TO Step 20.	
	BOP	(Step 18) Depressurize NC System using Pzr PORV as follows:	NOTE: This step will only be performed if the SRO determines that the Pzr Spray is NOT effective at reducing NC System pressure.
	BOP	<ul style="list-style-type: none"> Check at least one Pzr PORV - AVAILABLE. 	
	BOP	<ul style="list-style-type: none"> Open one Pzr PORV. 	
	BOP	<ul style="list-style-type: none"> Do not continue until any of the following conditions satisfied: 	
		<ul style="list-style-type: none"> NC subcooling based on core exit T/Cs - LESS THAN 0°F 	
		OR	
		<ul style="list-style-type: none"> Pzr level - GREATER THAN 76% (58% ACC) 	
		OR	
		<ul style="list-style-type: none"> Both of the following: 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 48 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> NC pressure - LESS THAN RUPTURED S/G(s) PRESSURE. 	
		<ul style="list-style-type: none"> Pzr level - GREATER THAN 11% (29% ACC). 	
	BOP	<ul style="list-style-type: none"> Close Pzr PORV. 	
	BOP	<ul style="list-style-type: none"> Close Pzr spray valves. 	
	BOP	(Step 19) Check NC pressure - GOING UP.	

CRITICAL TASK

(E-3C) Depressurize the RCS to meet SI termination criteria before ruptured SG level reaches 100% Wide Range Level.

Safety Significance: Failure to stop the reactor coolant leakage into a ruptured SG by depressurizing the RCS (when it is possible to do so) needlessly complicates the mitigation of the event. It also constitutes a "significant reduction of Safety Margin beyond that irreparably introduced by the scenario. If RCS depressurization does NOT occur, the inventory in the secondary side of the ruptured SG will occur leading to water release through the SG PORV or Safety Valve, which could cause an unisolable fault in the ruptured SG.

	RO / BOP	(Step 20) Check S/I termination criteria:	
		<ul style="list-style-type: none"> NC subcooling based on core exit T/Cs – GREATER THAN 0°F. 	
		<ul style="list-style-type: none"> Secondary heat sink: 	
		<ul style="list-style-type: none"> N/R level in at least one intact S/G – GREATER THAN 11% (32% ACC) 	
		Or	
		<ul style="list-style-type: none"> Total feed flow available to S/G(s) – GREATER THAN 450 GPM. 	
		<ul style="list-style-type: none"> NC pressure – STABLE OR GOING UP. 	
		<ul style="list-style-type: none"> Pzr level – GREATER THAN 11% (29% ACC). 	

Op Test No.:	N09-1	Scenario #	1	Event #	5, 6 & 7	Page	49	of	52
Event Description:		Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 21) Stop S/I pumps as follows:	
		<ul style="list-style-type: none"> NI pumps. 	
		<ul style="list-style-type: none"> All but one NV pump. 	
	BOP	(Step 22) Isolate NV S/I flowpath:	
		<ul style="list-style-type: none"> Check NV pump – SUCTION ALIGNED TO FWST. 	
		<ul style="list-style-type: none"> Check NV pumps minimflow valves – OPEN: 	
		<ul style="list-style-type: none"> 1NV-150B (NV Pumps Recirculation) 	
	BOP	<ul style="list-style-type: none"> 1NV-151A (NV Pumps Recirculation). 	
		<ul style="list-style-type: none"> Close the following valves: 	
		<ul style="list-style-type: none"> 1NI-9A (NC Cold Leg Inj From NV) 	
		<ul style="list-style-type: none"> 1NI-10B (NC Cold Leg Inj From NV). 	
At the discretion of the Lead Examiner terminate the exam.			
			EXAMINER NOTE: Following Exam termination, Examiner should follow-up with TS Requirements during the Steam Generator Tube Leak.
TECHNICAL SPECIFICATION 3.4.13, RCS OPERATIONAL LEAKAGE			
	SRO	3.4.13 RCS Operational LEAKAGE	
	SRO	LCO 3.4.13 RCS operational LEAKAGE shall be limited to:	
		<ul style="list-style-type: none"> No pressure boundary LEAKAGE; 	
		<ul style="list-style-type: none"> 1 gpm unidentified LEAKAGE; 	

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 50 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		<ul style="list-style-type: none">10 gpm identified LEAKAGE;			
		<ul style="list-style-type: none">389 gallons per day total primary to secondary LEAKAGE through steam generators (SGs); and			
		<ul style="list-style-type: none">135 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).			
	SRO	APPLICABILITY: MODES 1, 2, 3, AND 4.			
	SRO	ACTIONS			
					NOTE: The SRO will determine that LCO 3.4.13 is NOT met, and that Condition A is applicable, during the course of the transient.
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. RCS Operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE within limits.	4 hours	
TECHNICAL SPECIFICATION 3.1.4, ROD GROUP ALIGNMENT LIMITS					
	SRO	3.1.4 Rod Group Alignment Limits			

Op Test No.: N09-1 Scenario # 1 Event # 5, 6 & 7 Page 51 of 52Event Description: **Steam Generator Tube Leak (B)/SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	LCO 3.1.4 - All shutdown and control rods shall be OPERABLE, with all individual indicated rod positions within 12 steps of their group step counter demand position.			
	SRO	APPLICABILITY: MODES 1 and 2.			
	SRO	ACTIONS			
					NOTE: The SRO will determine that LCO 3.1.4 is NOT met, and that Condition B is applicable, during the course of the transient.
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		B. One rod not within alignment limits.	B.1 Restore rod to within alignment limits.	1 hour	
			<u>OR</u> B.2.1.1 Verify SDM is within the limit specified in the COLR.	1 hour	
			<u>OR</u> B.2.1.2 Initiate boration to restore SDM to within limit.	1 hour	
			<u>AND</u> B.2.2 Reduce THERMAL POWER to $\leq 75\%$ RTP.	2 hours	
			<u>AND</u> B.2.3 Verify SDM is within the limit specified in the COLR.	Once per 12 hours	
			<u>AND</u> B.2.4 Perform SR 3.2.1.1.	72 hours	
			<u>AND</u> B.2.5 Perform SR 3.2.2.1.	72 hours	
			<u>AND</u> B.2.6 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions.	5 days	

UNIT 1 STATUS:

Power Level: 75% NCS [B] 1136 ppm Pzr [B]: 1149 ppm Xe: Per OAC

Power History: The Plant is at 75% power (MOL), Core Burnup: 250 EFPDs
for two days.

CONTROLLING PROCEDURE: OP/1/A/6100/03 Controlling Procedure for Unit Operation
(See Reactivity Plan and Power Ascension Guidelines)

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

- The Plant is at 75% power (MOL), following an unplanned load reduction four days ago to complete corrective maintenance on the 1A CF Pump.
- The maintenance was completed and the pump restarted, and power level raised to the present power level two days ago.
- The present plan is to observe operation of the 1A CF Pump at this power level, and then raise power to 100% within the next 24 hours.
- Dispatch has indicated that there have been intermittent voltage swings, and other instabilities, on the electrical grid, and that this is being investigated.
- It is expected to commence a power increase to 100% power starting at Step 3.21.10 of Enclosure 1 of OP/1/A/6100/003, "Controlling Procedure for Unit Operation."
- Use of Alternate Dilute during power ascension in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control," has been approved.
- The RMWST Dissolved Oxygen Concentration is 800 ppb.
- The crew has been directed to raise power at 2 MWe/Minute.

The following equipment is Out-Of-Service:

- 1EMF27, SM Line D/Inner Doghouse Radiation Monitor, failed last shift (IAE is investigating).
- MCB Annunciator 1AD-8, E-2, "GROUNDWATER HI LEVEL," has alarmed spuriously several times over the last hour (IAE is investigating).

Work Control SRO/Offsite Communicator **Jim**

Plant SRO **Joe**

NLO's AVAILABLE

Unit 1

Aux Bldg. John

Turb Bldg. Bob

5th Rounds. Carol

Extra(s) Bill Ed Wayne Tanya

Unit 2

Aux Bldg. Chris

Turb Bldg. Mike

Scenario Event Description

NRC Scenario 3

Facility:	McGuire	Scenario No.:	3	Op Test No.:	N09-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
				(BOP)	
Initial Conditions:	The Plant is at 100% power (EOL), steady-state operation. The Work Control Center has requested that the operator swap CF Control Valve Control Circuit for 1CF-32 (A S/G CF Control Valve) from Normal to Alternate for required corrective maintenance. An NLO (Bob) is standing by in the Turbine Building Basement to support this activity. System Engineering has indicated that Turbine Load does not need to be reduced to perform this. When the swapover is complete Maintenance personnel will perform corrective maintenance on the system.				
Turnover:	The following equipment is Out-Of-Service: 1B CA Pump is OOS (Expected back in 6 hours). SG NR Level Channel 4 failed last shift (IAE is investigating). MCB Annunciator 1AD-2, F-9, "ROD DRIVE M/G SETS TROUBLE," has alarmed spuriously several times over the last hour (IAE is investigating).				
Event No.	Malf. No.	Event Type*	Event Description		
1	NA	N-RO N-SRO	Swap CF Control Valve Circuit		
2	ILE001	I-BOP I(TS)-SRO	Pressurizer Level Transmitter fails high		
3	NV028A NV023A	C-BOP C(TS)-SRO	NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open		
4	NA	N-BOP N-SRO	Establish Excess Letdown		
5	^{XMT} SM003	I-RO I(TS)-SRO	Turbine Impulse Pressure Transmitter failure		
6	IFE006A	C-RO C-SRO	FCV Controller failure		
7	^{XMT} CF032	M-RO M-BOP M-SRO	SG NR Level Channel 2 fails high/FWIS		
8	IPE001A/B IPE002A/B DEH003A	NA	Failure of Automatic/Manual Rx Trip/ Automatic Turbine Trip		
9	CA005	NA	TD CA Pump trip		
10	CA004A	NA	1A CA Pump fails to start		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

McGuire 2009 NRC Scenario #3

The Plant is at 100% power (EOL), steady-state operation. The Work Control Center has requested that the operator swap CF Control Valve Control Circuit for 1CF-32 (A S/G CF Control Valve) from Normal to Alternate for required corrective maintenance. An NLO (Bob) is standing by in the Turbine Building Basement to support this activity. System Engineering has indicated that Turbine Load does not need to be reduced to perform this. When the swapover is complete Maintenance personnel will perform corrective maintenance on the system.

The following equipment is Out-Of-Service: 1B CA Pump is OOS (Expected back in 6 hours). SG NR Level Channel 4 failed last shift (IAE is investigating). MCB Annunciator 1AD-2, F-9, "ROD DRIVE M/G SETS TROUBLE," has alarmed spuriously several times over the last hour (IAE is investigating).

Shortly after taking the watch, the operator will shift from Normal to the Alternate CF Control Valve Control Circuit for 1CF-32, (A S/G CF Control Valve) in accordance with section 3.6 of Enclosure 4.22, "Swapping CF Control Valve Control Circuit," of OP/1/A/6250/001, "Condensate and Feedwater System." When the procedure is complete 1CF-32 will be in Automatic Control on the Alternate Control Circuit.

Immediately afterwards, the controlling Pzr Level Transmitter (LNC-5160) will rapidly fail high causing charging flow to lower. The operator will respond in accordance with 1AD-6/C-7, "Pzr Hi Level DEV Control," determine that a failed instrument has occurred and swap to an operable channel. The operator will address Technical Specification 3.3.1, "RTS Instrumentation," 3.3.3, "PAM Instrumentation," 3.3.4, "Remote Shutdown System."

Following this, the retention element on the in-service NV System Demineralizer will fail causing an immediately plugging of Letdown Filter A, and causing Letdown Line Relief Valve to lift, and then fail open. There are two possible success paths for the operating crew. The operator may elect to isolate Letdown, and then implement AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection," due to the loss of Letdown flow. On the other hand, the operator may respond in accordance with 1AD-7, I-4, "LETDN RELIEF HI TEMP," and then implement AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps," Case II, "NC System leakage." In either situation the operator will isolate normal letdown and establish excess letdown. The operator will address Technical Specification 3.4.13, "RCS Operational Leakage."

After excess Letdown is established, Turbine Impulse Pressure Channel 1 will fail low causing Tref to go low, and Control Rods to move inward in auto to maintain Tavg-Tref deviation. The operator will implement AP/1/A/5500/14, "Rod Control Malfunction." The control rods will be left in manual control for the remainder of the scenario. The operator will address Technical Specification 3.3.1, "RTS Instrumentation." The operator will also address SLC 16.7.1, "ATWS/AMSAC."

Subsequently, the controller for 1CF-32 (A S/G CF Control Valve) will fail in Automatic control causing the valve to go closed. The operator will implement AP/1/A/5500/06, "S/G Feedwater Malfunctions," and take manual control of the control valve. The controller will be left in manual control for the remainder of the scenario.

Shortly afterwards, the D SG NR Level Channel 2 will fail high causing an FWIS. Simultaneously, the Reactor will fail to trip automatically and manually; and the Turbine will fail to trip automatically. The operator will be expected to enter EP/1/A/5000/E-0, "Reactor Trip or

Scenario Event Description

NRC Scenario 3

Safety Injection,” and attempt to manually trip the Reactor. When the Reactor does not trip, the operator will be expected to transition to EP/1/A/5000/FR-S.1, “Response to Nuclear Power Generation/ATWS.” During the performance of FR-S.1, the operator will successfully trip the Reactor and the Turbine.

Upon event initiation, the TD CA Pump will overspeed. Additionally, the 1A CA Pump will trip on overcurrent causing a Red Path to exist on Heat Sink. Following completion of FR-S.1, the operator will transition to EP/1/A/5000/FR-H.1, “Response to Loss of Secondary Heat Sink.” Upon entry into FR-H.1, the Steam Generator levels will approach the point at which NCS Bleed and Feed must be established.

The scenario is expected to terminate at Step 29 of FR-H.1, after the crew has established NCS Bleed and Feed cooling.

Critical Tasks:

FR-S.1 C

Manually drive rods inward before completing the immediate actions of FR-S.1 (Step 2).

Safety Significance: failure to insert negative reactivity, under the postulated plant conditions, results in an unnecessary situation in which the reactor remains critical or returns to a critical condition. Performance of the critical task would move the reactor towards a subcritical condition to prevent a subsequent return to criticality. A failure to insert negative reactivity constitutes a mis-operation or incorrect crew performance which leads to incorrect reactivity control.

FR-S.1 A

Trip the Turbine prior to Wide Range Steam Generator levels dropping to < 24%

Safety Significance: Turbine trip is important in maintaining Steam generator inventory and primary-to-secondary heat transfer. If the Turbine is NOT tripped the Steam Generator U-Tubes uncover sooner and faster. Thus, primary-to-secondary heat transfer starts to deteriorate earlier in the transient and deteriorates more rapidly. The result is that once tube uncover begins, NC System temperature and pressure increase more rapidly and reach higher values.

FR-H.1 B

Establish RCS Bleed and Feed before all four Steam Generator Wide Range Levels reach 0%, and the NCS temperature and/or pressure increases.

Safety Significance: Failure to establish RCS Bleed and Feed before automatic opening of the PORVs (due to plant heatup) reduces the probability of success to establish a heat sink for the core. This constitutes a “Significant reduction of safety margin beyond that irreparably introduced by the scenario.” Establishing feedwater flow into the Steam Generators offers the most effective recovery action to restore the heat sink. If all attempts to initiate feedwater flow fail, the crew must establish bleed and feed to cool the core. This is accomplished by manually initiating SI, and then manually opening the PORVs. The lower NCS pressure allows a greater ECCS flow to recover NCS inventory and force flow through the core. If this action is to be successful, it must be started before SG dryout. SG dryout would cause NC temperature to increase, increasing NC Pressure and forcing open the PORVs automatically. If NCS pressure is at the PORV setpoint due to NCS heatup, the operator action of opening the PORVs manually may not be successful in lowering NCS pressure and increasing ECCS flow. Ultimately, the core could uncover.

Scenario Event Description

NRC Scenario 3

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		Reset to Temporary IC-153	<ul style="list-style-type: none"> • 100% Steady-State EOL • LOA CA-010=Racked Out, 1B CA Pump is OOS • XMT-CF031 = 100, LCF-5580, SG D #4 NR Level OOS • MALF IPE001A/B, Failure of Automatic Rx Trip • MALF IPE002A/B, Failure of Manual Rx Trip • MALF DEH003A, Failure of Automatic Turbine Trip • MALF CA004A=2, Failure of 1A CA Pump to start (Both Auto and Manual)
<input type="checkbox"/>		RUN	
<input type="checkbox"/>		<p>Update Status Board,</p> <p>Setup OAC</p> <p>Setup ICCM, Turbine Displays, & Trend Recorders.</p> <p>Check Rod Step Counters agree with rod positions</p> <p>Check Make-up Control Switch in "ARMED."</p> <p>Ensure DRPI Screen is Re-zeroed.</p> <p>Ensure CF Pump LoveJoy reset.</p>	
<input type="checkbox"/>		Freeze.	
<input type="checkbox"/>		Update Fresh Tech.	1B CA Pump OOS

Scenario Event Description

NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
		Spec. Log.	LCF-5580, SG D #4 NR Level OOS
<input type="checkbox"/>		Fill out the NLO's Available section of Shift Turnover Info.	
<input type="checkbox"/>	Prior to Crew Briefing	RUN	
<input type="checkbox"/>	Crew Briefing <ol style="list-style-type: none"> 1. Assign Crew Positions based on evaluation requirements. 2. Provide crew with OP/1/A/6250/001, Enclosure 4.22, completed through Steps 3.1 – 3.3. 3. Review the Shift Turnover Information with the crew. 4. Direct the crew to Review the Control Boards taking note of present conditions, alarms. 		
<input type="checkbox"/>	T-0	Begin Familiarization Period	
<input type="checkbox"/>	At direction of examiner	NA	Swap CF Control Valve Circuit
<input type="checkbox"/>	At direction of examiner	(XMT) ILE001 Set = 100 Ramp = 30 seconds Trigger #1	Pzr Level Transmitter fails high
<input type="checkbox"/>	At direction of examiner	(MALF) NV028A Set = 100 Trigger #3 (MALF) NV023A Set = OPEN Trigger #5	NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open When Letdown Hi Pressure Annunciator alarms, Operate Trigger #5.
<input type="checkbox"/>	Continued from Event 3	NA	Establish Excess Letdown

Scenario Event Description

NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	(XMT) SM003 Set = 0 Ramp = 30 seconds Trigger #7	Turbine Impulse Pressure Transmitter Failure
<input type="checkbox"/>	At direction of examiner	(MALF) IFE006A Set = 0 Ramp = 60 seconds Trigger #9	FCV Controller failure
<input type="checkbox"/>	At direction of examiner	(XMT) CF032 Set = 100 Trigger #11	SG NR Level Channel 2 fails high/FWIS (LCF-5600, SG D #2 NR Level)
<input type="checkbox"/>	Continued from Event 7	(MALF) IPE001A/B (MALF) IPE002A/B (T=0) (MALF) DEH003A (T=0)	Failure of Automatic/Manual Rx Trip/ Automatic Turbine Trip
<input type="checkbox"/>	Continued from Event 7	(MALF) CA005 Trigger #13 (w/P4)	TD CA Pump trip Trigger #13 = Conditional on reactor trip (P4).
<input type="checkbox"/>	Continued from Event 7	(MALF) CA004A Set = BOTH (T=0)	1A CA Pump fails to start (Pump will fail to start in Auto or Manual)
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.: N09-1 Scenario # 3 Event # 1 Page 8 of 59Event Description: **Swap CF Control Valve Circuit**

Time	Position	Applicant's Actions or Behavior
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Shortly after taking the watch, the operator will shift from Normal to the Alternate CF Control Valve Control Circuit for 1CF-32, (A S/G CF Control Valve) in accordance with section 3.6 of Enclosure 4.22, "Swapping CF Control Valve Control Circuit," of OP/1/A/6250/001, "Condensate and Feedwater System." When the procedure is complete 1CF-32 will be in Automatic Control on the Alternate Control Circuit.

Booth Operator Instructions: NA**Indications Available: NA**

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6250/001, CONDENSATE AND FEEDWATER SYSTEM ENCLOSURE 4.22, SWAPPING CF CONTROL VALVE CONTROL CIRCUIT			
	RO	(Step 3.4) Perform the following sections, as applicable:	
		<ul style="list-style-type: none"> Section 3.5, Swap CF Control /valve Control Circuit For 1CF-32AB (1A S/G CF Control) 	
	RO/ NLO	(Step 3.5) Swap CF Control Valve Control Circuit For 1CF-32AB (1A S/G CF Control)	
		<ul style="list-style-type: none"> (Step 3.5.1) IF swapping from Normal to Alternate Control Circuit, check Alternate Control Power available for 1CFSV0234 on TB 691 (Unit 1 Turbine Building Basement). 	NOTE: The RO will contact NLO. Booth Instructor: Report that Alternate Control power is available for 1CVSV0234 on TB691.
	RO	<ul style="list-style-type: none"> (Step 3.5.2) Place 1CF-32A (1A S/G CF Control) in "MAN." (R.M.) 	
			NOTE: The RO may direct the NLO to perform Steps 3.5.3 through 3.5.5. If so, Booth Instructor: make the following reports all at once.

Op Test No.: N09-1 Scenario # 3 Event # 1 Page 9 of 59Event Description: **Swap CF Control Valve Circuit**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO / NLO	<ul style="list-style-type: none"> (Step 3.5.3) Check the following green lights on the HART Interface Module (HIM) alternate controller (1CFEM0008) for 1CF-32AB (1A S/G CF Control) lit: 	NOTE: The RO will contact NLO. Booth Instructor: Report that the Input, Ready, Trip1, and Trip 2 green lights are lit on the HART Interface Module alternate controller for 1CF-32AB.
		<ul style="list-style-type: none"> Input 	
		<ul style="list-style-type: none"> Ready 	
		<ul style="list-style-type: none"> Trip 1 	
		<ul style="list-style-type: none"> Trip 2 	
	RO/ NLO	<ul style="list-style-type: none"> (Step 3.5.4) Check the following green lights on the HART Interface Module (HIM) normal controller (1CFEM0004) for 1CF-32AB (1A S/G CF Control) lit: 	NOTE: The RO will contact NLO. Booth Instructor: Report that the Input, Ready, Trip1, and Trip 2 green lights are lit on the HART Interface Module normal controller for 1CF-32AB.
		<ul style="list-style-type: none"> Input 	
		<ul style="list-style-type: none"> Ready 	
		<ul style="list-style-type: none"> Trip 1 	
		<ul style="list-style-type: none"> Trip 2 	
		<ul style="list-style-type: none"> (Step 3.5.5) Check digital readout on 1CFEM0008 and 1CFEM0004 indicate within 10%. 	NOTE: The RO will contact NLO. Booth Instructor: Report that the digital readout on 1CFEM00008 and 1CMEM0004 are within 10%.
	RO	<ul style="list-style-type: none"> (Step 3.5.6) Place 1CF-32AB "SELECTOR SWITCH" to desired control circuit: 	
		<ul style="list-style-type: none"> "ALT" 	
		OR	
		<ul style="list-style-type: none"> "NORM" 	

Op Test No.: N09-1 Scenario # 3 Event # 1 Page 10 of 59Event Description: **Swap CF Control Valve Circuit**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	<ul style="list-style-type: none"> (Step 3.5.7) Maintain 1A S/G level programmed level. 	
	RO	<ul style="list-style-type: none"> (Step 3.5.8) WHEN desired, place 1CF-32AB (1A S/G CF Control) in "AUTO" as follows: (R.M.) 	
		<ul style="list-style-type: none"> Ensure the following: 	
		<ul style="list-style-type: none"> Selected control channels for 1A S/G indicating correctly on chart recorder for the following: 	
		<ul style="list-style-type: none"> Feed Flow 	
		<ul style="list-style-type: none"> Stm Flow 	
		<ul style="list-style-type: none"> S/G Level 	
		<ul style="list-style-type: none"> 1A S/G level at programmed level. 	
		<ul style="list-style-type: none"> Place 1CF-32AB (1A S/G CF Control) in "AUTO". 	<p>NOTE: The RO may contact NLO to observe system operation as normal.</p> <p>If so, Booth Instructor: as NLO, report that System operation is Normal.</p>
At the discretion of the Lead Examiner move to Event #2.			

Op Test No.: N09-1 Scenario # 3 Event # 2 Page 11 of 59Event Description: **Pzr Level Transmitter fails high**

Time	Position	Applicant's Actions or Behavior
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Immediately afterwards, the controlling Pzr Level Transmitter (LNC-5160) will rapidly fail high causing charging flow to lower. The operator will respond in accordance with 1AD-6/C-7, "Pzr Hi Level DEV Control," determine that a failed instrument has occurred and swap to an operable channel. The operator will address Technical Specification 3.3.1, "RTS Instrumentation," 3.3.3, "PAM Instrumentation," 3.3.4, "Remote Shutdown System."

Booth Operator Instructions: Operate Trigger#1 (XMT-ILE001 (100 over 30 seconds))

Indications Available:

- Annunciator 1AD-6/C-7, "Pzr Hi Level Dev Control."
- Annunciator 1AD-7/A-7, "Pzr Hi level Alert."
- Charging flow decreases.
- Channel #3 Pzr level indicates 100%.
- Actual Pzr Level decreases.

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The SRO may address AP12, however, this AP will NOT mitigate the failure. The crew will eventually recognize that the ARP mitigates the failure and address it.
OP/1/A/6100/010G, ANNUNCIATOR RESPONSE FOR PANEL 1AD-6 C-7, PZR HI LEVEL DEV CONTROL			
	BOP	(IA Step 1) Check backup heaters are on and charging flow is decreasing.	
	BOP	(IA Step 2) IF instrument malfunction, manually control charging flow at the appropriate man/auto station:	
		<ul style="list-style-type: none"> • Pzr Level Master Cntrl 	
		<ul style="list-style-type: none"> • 1NV-238 (Charging Line Flow Control) 	NOTE: The BOP will place 1NV-238 in MANUAL to control Charging flow.

Op Test No.: N09-1 Scenario # 3 Event # 2 Page 12 of 59Event Description: **Pzr Level Transmitter fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> PD Pump Speed 	
	BOP	(IA Step 3) IF instrument malfunction, place "Pzr Level Cntrl Select" to unaffected channels.	NOTE: The BOP will select position 3-2 on Pzr Level Control.
	SRO	(SA Step 1) IF required to control Letdown/Charging, go to OP/1/A/6200/001 A (Chemical and Volume Control System Letdown) or OP/1/A/6200/001 B (Chemical and Volume Control System Charging).	NOTE: The SRO may isolate Letdown. If so, AP12 will be entered to re-establish Letdown.
	SRO	(SA Step 2) Refer to Tech Specs for minimum instrumentation requirements.	NOTE: The SRO will likely conduct a Focus Brief.
			NOTE: The SRO may call WCC/IAE to address failure. If so, Booth Instructor acknowledge as WCC.
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION			
	SRO	Reactor Trip System (RTS) Instrumentation	
	SRO	LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.	
		APPLICABILITY: According to Table 3.3.1-1.	
	SRO	ACTIONS	

Op Test No.: N09-1 Scenario # 3 Event # 2 Page 13 of 59Event Description: **Pzr Level Transmitter fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
					NOTE: The SRO will recognize that Table 3.3-1 shows that function 9 is applicable in Mode 1 above P-7, and determine that Action M is applicable.
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		M. One channel inoperable.	-----NOTE----- One channel may be bypassed for up to 4 hours for surveillance testing.		
			M.1 Place channel in trip.	6 hours	
			<u>OR</u> M.2 Reduce THERMAL POWER to < P-7.	12 hours	
TECHNICAL SPECIFICATION 3.3.3, PAM INSTRUMENTATION					
	SRO	Post Accident Monitoring (PAM) Instrumentation			
	SRO	LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.			
		APPLICABILITY: Modes 1, 2 and 3.			
	SRO	ACTIONS			

Op Test No.: N09-1 Scenario # 3 Event # 2 Page 14 of 59Event Description: **Pzr Level Transmitter fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
					NOTE: The SRO will recognize that Table 3.3.3-1 shows that function 11 is applicable and determine that Action B is applicable.
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		B. One or more Functions with one required channel inoperable.	B.1 Restore required channel to OPERABLE status.	30 days	
TECHNICAL SPECIFICATION 3.3.4, REMOTE SHUTDOWN SYSTEM					
	SRO	Remote Shutdown System			
	SRO	LCO 3.3.4 The Remote Shutdown System Functions in Table 3.3.4-1 shall be OPERABLE.			
		APPLICABILITY: Modes 1, 2 and 3.			
	SRO	ACTIONS			
					NOTE: The SRO will recognize that Table 3.3.4-1 shows that function 4 is applicable and determine that Action A is applicable.
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. One or more required Functions inoperable.	A.1 Restore required Function to OPERABLE status.	30 days	
At the discretion of the Lead Examiner move to Events #3-4.					

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 15 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Following this, the retention element on the in-service NV System Demineralizer will fail causing an immediately plugging of Letdown Filter A, and causing Letdown Line Relief Valve to lift, and then fail open. There are two possible success paths for the operating crew. The operator may elect to isolate Letdown, and then implement AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection," due to the loss of Letdown flow. On the other hand, the operator may respond in accordance with 1AD-7, I-4, "LETDN RELIEF HI TEMP," and then implement AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps," Case II, "NC System leakage." In either situation the operator will isolate normal letdown and establish excess letdown.

Booth Operator Instructions: Operate Trigger #3 (MALF-NV028A (100))

**When Letdown High Pressure Annunciator alarms,
Operate Trigger #5 (MALF-NV23A (Open))**

Indications Available:

- 1AD-7/H-1, LETDN HI OUTLET HI PRESS
- 1AD-7/I-4, LETDN RELIEF HI TEMP
- OAC Alarms.

Time	Pos.	Expected Actions/Behavior	Comments
			<p>NOTE: The crew actually has two success paths. They could isolate the leak by isolating Letdown, and go to AP12. This success path is scripted first.</p> <p>On the other hand, they could address the ARP and then go to AP10. If so, Examiner following script starting on Page 22.</p>
			<p>NOTE: The operator may recognize from the onset of the event that Letdown must be isolated to stop the leak, take action to do so, and enter AP12. If so, Examiner start here.</p>
AP/1/A/5500/12, LOSS OF LETDOWN, CHARGING OR SEAL INJECTION			

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 16 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 1) IF a loss of charging through the Regenerative HX has occurred, THEN....	NOTE: A loss of Charging has NOT occurred.
	BOP	(Step 2) Check Pzr level – LESS THAN 96%.	
	BOP	(Step 3) IF AT ANY TIME "REGEN HX LETDN HI TEMP" alarms (1AD-7, I-2), THEN close the following valves:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		• 1NV-1A (NC L/D Isol To Regen Hx)	NOTE: These valves are most likely already closed.
		• 1NV-2A (NC L/D Isol To Regen Hx).	
	RO	(Step 4) Stop any power or temperature changes in progress.	
	SRO	(Step 5) Announce occurrence on paging system.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	SRO	(Step 6) IF this AP entered due to loss of letdown only, THEN GO TO Step 36.	NOTE: The SRO will need to answer YES to this condition if this procedure is to be of any use to the crew.
	BOP	(Step 36) Ensure the following are closed:	
		• 1NV-458A (75 GPM L/D Orifice Outlet Cont Isol)	
		• 1NV-457A (45 GPM L/D Orifice Outlet Cont Isol)	
		• 1NV-35A (Variable L/D Orifice Outlet Cont Isol).	
	BOP	(Step 37) Ensure "NC SYS M/U CONTROLLER" in "AUTO".	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 17 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 38) Ensure charging flow going down to maintain Pzr at program level.	NOTE: The BOP may take manual control of Charging flow via 1NV-238.
	BOP	(Step 39) Check "LETDN RELIEF HI TEMP" alarm (1AD-7, I-4) – HAS REMAINED DARK.	
	BOP	(Step 39 RNO) Evaluate if low failure of letdown pressure instrument caused loss of letdown.	
	BOP	(Step 40) Check 1NV-21A (NV Spray To PZR Isol) – CLOSED.	
	BOP	(Step 41) Operate Pzr heaters as follows:	
		<ul style="list-style-type: none"> Check all Pzr heater group supply breakers – CLOSED. 	
		<ul style="list-style-type: none"> Check normal Pzr spray – AVAILABLE. 	
		<ul style="list-style-type: none"> Place the following Pzr heater groups in manual and "ON" to maximize spray flow: 	
		<ul style="list-style-type: none"> A 	
		<ul style="list-style-type: none"> B 	
		<ul style="list-style-type: none"> D 	
	BOP	(Step 42) Check the following valves – OPEN:	NOTE: These valves have been previously closed.
		<ul style="list-style-type: none"> 1NV-1A (NC L/D Isol To Regen Hx). 	
		<ul style="list-style-type: none"> 1NV-2A (NC L/D Isol To Regen Hx). 	
	SRO	(Step 43) GO TO Step 48.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>18</u>	of	<u>59</u>
Event Description:		NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 48) Establish normal letdown:	NOTE: The SRO will need to know that the procedure is directing an action that plant conditions will NOT allow, and go to the RNO.
	SRO	(Step 48 RNO) GO TO Step 49.	
	BOP	(Step 49) Establish excess letdown:	NOTE: The SRO may direct the BOP step by step, or handout this section of the procedure to the BOP.
	BOP	<ul style="list-style-type: none"> Adjust charging to minimum while maintaining the following: 	
		<ul style="list-style-type: none"> NC pump seal injection flow greater than 6 GPM 	
		<ul style="list-style-type: none"> Pzr level at program level. 	
	SRO/ BOP	<ul style="list-style-type: none"> IF AT ANY TIME excess letdown cannot be established, THEN observe Note prior to Step 50 and GO TO Step 50 to establish letdown using Rx Vessel Head Vents. 	NOTE: This is a Continuous Action.
	SRO/ BOP	<ul style="list-style-type: none"> IF AT ANY TIME excess letdown cannot be established, THEN observe Note prior to Step 50 and GO TO Step 50 to establish letdown using Rx Vessel Head Vents. 	NOTE: This is a Continuous Action.
	BOP	<ul style="list-style-type: none"> Open the following: 	
		<ul style="list-style-type: none"> 1KC-315B (Excess L/D Hx Ret Hdr Cont Otsd Isol). 	
		<ul style="list-style-type: none"> 1KC-305B (Excess L/D Hx Sup Hdr Cont Otsd Isol). 	
	BOP	<ul style="list-style-type: none"> Ensure 1NV-27B (Excess L/D Hx Otlt 3-Way Cntrl) selected to "VCT" position. 	
	BOP	<ul style="list-style-type: none"> Open 1NV-26B (Excess L/D Hx Outlet Cntrl). 	
	BOP	<ul style="list-style-type: none"> Wait 2 minutes. 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 19 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Close 1NV-26B (Excess L/D Hx Outlet Cntrl). 	
	BOP	<ul style="list-style-type: none"> Check the following valves – OPEN: 	
		<ul style="list-style-type: none"> 1NV-94AC (NC Pumps Seal Ret Cont Inside Isol) 	
		<ul style="list-style-type: none"> 1NV-95B (NC Pumps Seal Ret Cont Outside Isol). 	
	BOP	<ul style="list-style-type: none"> Open 1NV-24B (C NC Loop To Exs L/D Hx Isol). 	
	BOP	<ul style="list-style-type: none"> Open 1NV-25B (C NC Loop To Exs L/D Hx Isol). 	
	BOP	<ul style="list-style-type: none"> Check the following: 	
		<ul style="list-style-type: none"> Reactor – CRITICAL 	
		<ul style="list-style-type: none"> 1NV-27B – ALIGNED TO VCT 	
	BOP	<ul style="list-style-type: none"> Closely monitor reactor response once excess letdown is in service. 	
	BOP	<ul style="list-style-type: none"> Slowly open 1NV-26B while maintaining excess letdown HX temperature less than 200°F. 	NOTE: BOP will fully open 1NV-26B over time, in order to control inventory.
	SRO/BOP	<ul style="list-style-type: none"> GO TO Step 49.r. 	
	BOP	<ul style="list-style-type: none"> Notify Primary Chemistry that excess letdown is in service. 	NOTE: SRO/BOP may call Chemistry to address. If so, Booth Instructor acknowledge as Chemistry.
	BOP	<ul style="list-style-type: none"> Adjust charging flow as desired while maintaining: 	
		<ul style="list-style-type: none"> NC pump seal injection flow greater than 6 GPM. 	
		<ul style="list-style-type: none"> Pzr level at program level. 	
	BOP	<ul style="list-style-type: none"> Operate Pzr heaters as desired. 	
	BOP	<ul style="list-style-type: none"> WHEN time allows, THEN notify engineering to document the following transients: 	NOTE: SRO/BOP may call WCC to address. If so, Booth Instructor acknowledge as WCC.

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 20 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Letdown isolation. 	
		<ul style="list-style-type: none"> Potential charging nozzle transient. 	
		<ul style="list-style-type: none"> IF NV Aux Spray was in service, THEN 	NOTE: NV Aux Spray has NOT been used.
	BOP	<ul style="list-style-type: none"> Check 1NV-27B (Excess L/D Hx Ottl 3-Way Cntrl) – ALIGNED TO “VCT”. 	
	BOP	<ul style="list-style-type: none"> IF AT ANY TIME VCT level needs to be lowered AND NCDT is available to pump water outside containment, THEN perform the following: 	NOTE: This is a Continuous Action.
		<ul style="list-style-type: none"> Place 1NV-27B to “NCDT”. 	
		<ul style="list-style-type: none"> Adjust 1NV-26B (Excess L/D Hx Outlet Cntrl) as necessary to maintain NCDT pressure less than 8 PSIG. 	
		<ul style="list-style-type: none"> WHEN VCT at desired level, THEN return 1NV-27B to “VCT”. 	
	SRO/ BOP	<ul style="list-style-type: none"> WHEN normal letdown available, THEN establish normal letdown PER Steps 42 through 48. 	NOTE: This is a Continuous Action.
	BOP	<ul style="list-style-type: none"> WHEN desired to isolate excess letdown, THEN perform the following: 	NOTE: This is a Continuous Action.
		<ul style="list-style-type: none"> Close 1NV-26B (Excess L/D Hx Outlet Cntrl). 	
		<ul style="list-style-type: none"> Close 1NV-24B (C NC Loop To Exs L/D Hx Isol). 	
		<ul style="list-style-type: none"> Close 1NV-25B (C NC Loop To Exs L/D Hx Isol). 	
		<ul style="list-style-type: none"> Close 1KC-305B (Excess L/D Hx Sup Hdr Cont Otsd Isol). 	
	BOP	<ul style="list-style-type: none"> Close 1KC-315B (Excess L/D Hx Ret Hdr Cont Otsd Isol). 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 21 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO/ BOP	<ul style="list-style-type: none"> RETURN TO procedure and step in effect. 	NOTE: SRO/BOP may call WCC to address. If so, Booth Instructor acknowledge as WCC.
			Examiner NOTE: Move forward to event termination on Page 36 .
			Examiner NOTE: If the crew uses the ARP and then goes to AP10 to respond to the Letdown Relief Valve lifting, Start Here.
OP/1/A/6100/010H, ANNUNCIATOR RESPONSE FOR PANEL1AD-7 I-4, LETDN RELIEF HI TEMP			
	BOP	(Immediate Action) Monitor letdown pressure and correct if necessary.	
	BOP	(Supplementary Action Step 1) Monitor VCT and PRT.	
	BOP	(SA Step 2) IF in Mode 4 AND placing ND in service AND it is determined 1NV-6 is leaking,.....	NOTE: The plant is NOT in Mode 4.
	BOP	(SA Step 3) IF determined 1NV-6 leaking, perform the following:	
	BOP	<ul style="list-style-type: none"> Place 1NV-124 (Letdown Pressure Control) in "MAN". 	
		<ul style="list-style-type: none"> Adjust 1NV-124 (Letdown Pressure Control) as required to establish 250 psig letdown pressure. 	
	BOP	<ul style="list-style-type: none"> IF determined 1NV-6 (Letdown Header Relief) still leaking, perform the following: 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 22 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Ensure "Regen Hx L/D Temp" less than 340°F. 	
		<ul style="list-style-type: none"> Adjust 1NV-124 (Letdown Pressure Control) as required to establish 150 – 250 psig letdown pressure. 	
		<ul style="list-style-type: none"> Ensure 1NV-124 (Letdown Pressure Control) potentiometer set to control at desired pressure. 	NOTE: This action cannot be done. The SRO will decide to leave this controller in Manual.
		<ul style="list-style-type: none"> Place 1NV-124 (Letdown Pressure Control) in "AUTO". 	NOTE: The SRO will decide to leave this controller in Manual.
	SRO	(SA Step 4) Refer to AP/1/A/5500/010 (NC System Leakage Within Capacity of Both NV Pumps).	NOTE: The SRO will transition to AP-10.
	SRO	(SA Step 5) Refer to Tech Spec for leakage specifications.	NOTE: The SRO will note that LCO 3.4.13 and SLC 16.9.7 are applicable.
	SRO	(SA Step 6) IF instrument failure, notify WCC SRO.	NOTE: SRO may call WCC to address the relief valve leakage. If so, Booth Instructor acknowledge as WCC.
AP/1/A/5500/10, NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV PUMPS CASE II, NC SYSTEM LEAKAGE			
	BOP	(Step 1) Check leak – KNOWN TO BE IN THE AUX BUILDING.	NOTE: The NCS leak is NOT known to be in the Aux Building.
	SRO	(Step 1 RNO) Perform the following:	NOTE: A Containment Entry is NOT in progress.
		<ul style="list-style-type: none"> IF containment entry is in progress 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 23 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF in Modes 1-4, OR no-mode, THEN GO TO Step 2. 	
	BOP	(Step 2) Check Pzr level – STABLE OR GOING UP.	
	BOP	(Step 3) IF AT ANY TIME while in this procedure Pzr level cannot be maintained stable, THEN perform Step 2.	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	BOP	(Step 4) Check Pzr pressure – STABLE OR TRENDING TO 2235 PSIG.	
	RO	(Step 5) Check main steam line intact:	
		<ul style="list-style-type: none"> Reactor power – AT TURBINE POWER NC Loop T-Avg – STABLE. 	
	SRO	(Step 6) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO / BOP	(Step 7) Estimate leak rate using any of the following methods:	
		<ul style="list-style-type: none"> Monitor OAC NC graphic 	
		OR	
		<ul style="list-style-type: none"> Compare charging flow to letdown flow plus seal return flow 	
		OR	
		<ul style="list-style-type: none"> Monitor VCT level trend (OAC point M1P1271). 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 24 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 8) REFER TO RP/0/A/5700/000 (Classification of Emergency).	NOTE: SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
	SRO	(Step 9) IF AT ANY TIME NC leakage exceeds Tech Spec limits, THEN perform the following:	
		<ul style="list-style-type: none"> Ensure Outside Air Pressure Filter train in service PER OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System), Enclosure 4.4 (Control Room Atmosphere Pressurization During Abnormal Conditions). 	NOTE: SRO may ask U2 BOP to address. If so, Floor Instructor acknowledge as U2 BOP.
		<ul style="list-style-type: none"> Have another SRO evaluate if leakage exceeds SLC 16.9.7 condition C limits and immediately notify security is SSF is inoperable. 	NOTE: SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
	BOP	(Step 10) IF AT ANY TIME VCT level goes below 16% ("VCT ABNORMAL LEVEL" alarm (1AD-7, D-3) low setpoint), THEN align NV pump suction to FWST.	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	BOP	(Step 11) IF AT ANY TIME Containment pressure exceed Tech Spec limit (0.3 PSIG), THEN evaluate placing all 4 VL AHU mode select switches in "HGIH" to prevent them from cycling around 0.5 PSIG.	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	BOP	(Step 12) check seal leakoff on all NC pumps – LESS THAN 6 GPM.	
	BOP	(Step 13) Check NC pump thermal barriers intact as follows:	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 25 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> NC pump thermal barrier KC outlet flows and temperatures on OAC KC graphic – NORMAL (flow and temperature should be similar for all 4 NC pumps) 	
		<ul style="list-style-type: none"> KC surge tank level rates on OAC KC graphic – NORMAL. 	
		<ul style="list-style-type: none"> KC Surge Tank level – NORMAL 	
		<ul style="list-style-type: none"> 1EMF-46A (Train A Component Cooling) – NORMAL 	
		<ul style="list-style-type: none"> 1EMF-46B (Train B Component Cooling) – NORMAL 	
	SRO	(Step 14) GO TO Step 16.	
	BOP	(Step 16) Check leak – SUSPECTED ON LETDOWN LINE NEAR DEMINERALIZERS.	NOTE: The NCS leak is NOT suspected to be on the Letdown Line near the Demineralizers.
	SRO	(Step 16 RNO) GO TO Step 18.	
	BOP	(Step 18) Check leak – KNOWN TO BE ON NORMAL LETDOWN LINE.	NOTE: in order to use this flow path the BOP must recognize that the leak was on the letdown Line, and answer YES to this question.
	BOP	(Step 19) Isolate leak as follows:	
		<ul style="list-style-type: none"> Check leak – KNOWN TO BE DUE TO LETDOWN LINE RELIEF OPEN. 	
		<ul style="list-style-type: none"> Check letdown pressure – BETWEEN 150 TO 350 PSIG. 	
		<ul style="list-style-type: none"> Perform Supplementary actions PER Annunciator Response for “LETDN RELIEF HI TEMP” (1AD-7, I-4). 	
		<ul style="list-style-type: none"> Check leak – ISOLATED. 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 26 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 19.d RNO) Observe Note prior to Step 19.f and GO TO Step 19.f.	
	SRO	<ul style="list-style-type: none"> (Step 19.f) Check letdown isolation – DESIRED. 	
	BOP	<ul style="list-style-type: none"> Close the following letdown isolation valves: 	
		<ul style="list-style-type: none"> 1NV-458A (75 GPM L/D Orifice Outlet Cont Isol). 	
		<ul style="list-style-type: none"> 1NV-457A (45 GPM L/D Orifice Outlet Cont Isol). 	
		<ul style="list-style-type: none"> 1NV-35A (Variable L/D Orifice Outlet Cont Isol). 	
		<ul style="list-style-type: none"> Check leak – ISOLATED. 	NOTE: the only way to know if the leak is isolated is to check that the PRT Level has stabilized.
		<ul style="list-style-type: none"> Ensure charging flow going down to maintain Pzr at program level. 	
		<ul style="list-style-type: none"> IF tube leak is suspected on Letdown Hx,..... 	NOTE: A tube leak on the Letdown HX is NOT suspected.
		<ul style="list-style-type: none"> Check leak – ISOLATED. 	
		<ul style="list-style-type: none"> Place 1NV-137A (NC Filters Otlit 3-Way Cntrl) to "HUT" to ensure VCT is isolated from leak. 	
		<ul style="list-style-type: none"> Establish excess letdown PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 2 (Establishing Excess Letdown). 	NOTE: The SRO will direct the BOP to establish Excess Letdown using Generic Enclosure 2.
EP/1/A/5000/G-1, GENERIC ENCLOSURES ENCLOSURE 2, ESTABLISHING EXCESS LETDOWN			

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 27 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 1) Check KC System alignment as follows:	
		<ul style="list-style-type: none"> Containment pressure – HAS REMAINED BELOW 3 PSIG 	
		<ul style="list-style-type: none"> All KC pumps – ON. 	
	BOP	(Step 1.b RNO) IF either train KC pumps off, THEN perform the following:	
		<ul style="list-style-type: none"> Close from control room or dispatch operator to close the following valves on idle train: 	
		<ul style="list-style-type: none"> A train: 	
		<ul style="list-style-type: none"> 1KC-230A (Trn A Rx Bldg Non Ess Sup Isol) aux bldg, 750+12, JJ-55, above north end of KC HX 1A). 	
		<ul style="list-style-type: none"> 1KC-3A (Trn A Rx Bldg Non Non Ess Ret Isol) aux bldg, 733+8, HH-55, north of column HH-55). 	
	BOP	<ul style="list-style-type: none"> WHEN idle train isolated from Reactor Bldg header per step above, THEN open the following valves on operating train: 	
		<ul style="list-style-type: none"> 1KC-18B (Trn B Rx Bldg Non Ess Ret Isol). 	
		<ul style="list-style-type: none"> 1KC-228B (Trn B Rx Bldg Non Ess Sup Isol). 	
		<ul style="list-style-type: none"> Do not continue until KC aligned to Reactor Bldg header. 	
	BOP	<ul style="list-style-type: none"> (Step 1.c) Open the following: 	
		<ul style="list-style-type: none"> 1KC-305B (Excess L/D Hx Sup Hdr Cont Otsd Isol) 	
		<ul style="list-style-type: none"> 1KC-315B (Excess L/D Hx Ret Hdr Cont Otsd Isol). 	
		<ul style="list-style-type: none"> Check containment pressure – HAS REMAINED BELOW 3 PSIG. 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 28 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 2) Place 1NV-27B (Excess L/D Hx Otl 3-Way Cntrl) to "VCT" position.	
	BOP	(Step 3) Open 1NV-26B (U1 Excess L/D Hx Outlet Cntrl).	
	BOP	(Step 4) Wait 2 minutes.	
	BOP	(Step 5) Close 1NV-26B (U1 Excess L/D Hx Outlet Cntrl).	
	BOP	(Step 6) Check the following valves – OPEN:	
		<ul style="list-style-type: none"> 1NV-94AC (NC Pumps Seal Ret Cont Inside Isol) 	
		<ul style="list-style-type: none"> 1NV-95B (NC Pumps Seal Ret Cont Outside Isol). 	
	BOP	(Step 7) Check reactor – SUBCRITICAL.	
	BOP	(Step 7 RNO) IF reactor critical, THEN perform the following:	
		<ul style="list-style-type: none"> Closely monitor reactor response once excess letdown is in service. 	
	BOP	(Step 8) Open 1NV-24B (C NC Loop To Exs L/D Hx Isol).	
	BOP	(Step 9) Open 1NV-25B (C NC Loop To Exs L/D Hx Isol).	
	BOP	(Step 10) Open 1NV-25B (U1 Excess L/D Hx Outlet Cntrl) while maintaining Excess letdown Hx temperature less than 200°F.	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 29 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 11) Notify Chemistry that excess letdown is in service.	NOTE: The BOP will call Chemistry. Booth Instructor acknowledge as Chemistry.
	BOP	(Step 12) WHEN time allows, THEN notify engineering to document transients on letdown and charging.	NOTE: The BOP may call WCC to document transients. If so, Booth Instructor acknowledge as WCC.
	BOP	(Step 13) RETURN TO procedure and step in effect.	NOTE: The BOP reports that excess Letdown is established and SRO returns to AP10.
AP/1/A/5500/10, NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV PUMPS			
CASE II, NC SYSTEM LEAKAGE			
	SRO	<ul style="list-style-type: none"> Power operation may continue as long as NC System activity and chemistry requirements are met. 	
		<ul style="list-style-type: none"> GO TO Step 29. 	
	SRO	(Step 29) Ensure RP is notified of location and size of leak.	NOTE: SRO will call RP. If so, Booth Instructor acknowledge as RP.
	SRO	(Step 30) Contact station management to evaluate need to shutdown.	NOTE: SRO may call WCC/Management to address the need to shutdown. If so, Booth Instructor acknowledge as WCC.

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 30 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 31) Check unit shutdown – REQUIRED.	
	SRO	(Step 31 RNO) GO TO Step 34.	
	SRO	(Step 34) WHEN leak less than Tec Spec limits, THEN perform the following:	
	BOP	<ul style="list-style-type: none"> Check VCT – INTACT. 	
		<ul style="list-style-type: none"> Check NV pump suction – ALIGNED TO VCT. 	
	SRO	<ul style="list-style-type: none"> IF Outside Air Pressure Filter Train in service, THEN contact station management to evaluate securing filter train PER OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System), Enclosure 4.4 (Control Room Atmosphere Pressurization During Abnormal Conditions) 	NOTE: SRO may call WCC/Management to address the OAFPT alignment. If so, Booth Instructor acknowledge as WCC.
		<ul style="list-style-type: none"> IF VL AHU mode select switches were placed to “HIGH” in Step 11,..... 	NOTE: The VL AHU Mode Select Switches were NOT placed in HIGH.
TECHNICAL SPECIFICATION 3.4.13, RCS OPERATIONAL LEAKAGE			
	SRO	3.4.13 RCS Operational LEAKAGE	
	SRO	LCO 3.4.13 RCS operational LEAKAGE shall be limited to:	
		<ul style="list-style-type: none"> No pressure boundary LEAKAGE; 	
		<ul style="list-style-type: none"> 1 gpm unidentified LEAKAGE; 	
		<ul style="list-style-type: none"> 10 gpm identified LEAKAGE; 	
		<ul style="list-style-type: none"> 389 gallons per day total primary to secondary LEAKAGE through steam generators (SGs); and 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 31 of 59Event Description: **NV Demin Retention Element failure/Letdown Line Relief valve lifts and fails open/ Establish Excess Letdown**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		<ul style="list-style-type: none">135 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).			
	SRO	APPLICABILITY: MODES 1, 2, 3, AND 4.			
	SRO	ACTIONS			
					NOTE: The SRO will determine that LCO 3.4.13 is NOT met, and that Condition A is applicable, during the course of the transient.
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. RCS Operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE within limits.	4 hours	
At the discretion of the Lead Examiner move to Event #5.					

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 32 of 59Event Description: **Turbine Impulse Pressure Transmitter failure**

Time	Position	Applicant's Actions or Behavior
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After excess Letdown is established, Turbine Impulse Pressure Channel 1 will fail low causing Tref to go low, and Control Rods to move inward in auto to maintain Tavg-Tref deviation. The operator will implement AP/1/A/5500/14, "Rod Control Malfunction." The control rods will be left in manual control for the remainder of the scenario. The operator will address Technical Specification 3.3.1, "RTS Instrumentation." The operator will also address SLC 16.7.1, "ATWS/AMSAC."

Booth Operator Instructions: Operate Trigger #7 (XMT-SM003 (0 over 30 seconds))

Indications Available:

- Channel I Impulse Pressure indicates low.
- Control rods heard and observed to be moving in Auto.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
	RO	(Step 1) IF more than one rod dropped, THEN perform the following:	Immediate Action NOTE: No Rods have dropped.
		• Trip reactor.	
		• GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection).	
	RO	(Step 2) Place control rods in manual.	Immediate Action
	RO	(Step 3) Check rod movement – STOPPED.	Immediate Action
	RO	(Step 4) Check all rods – ALIGNED WITH ASSOCIATED BANK.	
	RO	(Step 5) Check "ROD CONTROL URGENT FAILURE" alarm (1AD-2, A-10) – DARK.	
	RO	(Step 6) Check the following reactor control instruments – NORMAL:	NOTE: The Channel 1 Turbine Impulse Pressure has failed.

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 33 of 59Event Description: **Turbine Impulse Pressure Transmitter failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> • "1A NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "1B NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "1C NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "1D NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "TURB IMP PRESS CH 1" 	
	SRO	(Step 6 RNO) Perform the following:	
		<ul style="list-style-type: none"> • IF "NC LOOP T-AVE" channel failed, 	NOTE: Loop Tavg has NOT failed.
		<ul style="list-style-type: none"> • GO TO Enclosure 3 (Response to Continuous Rod Movement). 	NOTE: The SRO will go to Enclosure 3.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION, ENCLOSURE 3, RESPONSE TO CONTINUOUS ROD MOVEMENT			
	SRO	(Step 1) Announce occurrence on paging system.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	SRO	(Step 2) Evaluate the following prior to any control rod withdrawal:	
		<ul style="list-style-type: none"> • Ensure no inadvertent mode change will occur. 	
		<ul style="list-style-type: none"> • Ensure control rods are withdrawn in a deliberate manner, while closely monitoring the reactor's response. 	
	RO	(Step 3) Check the following – NORMAL:	
		<ul style="list-style-type: none"> • "TURB IMP PRESS CH 1" 	
		<ul style="list-style-type: none"> • T-Ref indication. 	
	RO	(Step 3 RNO) Perform the following:	

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 34 of 59Event Description: **Turbine Impulse Pressure Transmitter failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF "TURB IMP PRESS CH 1" failed, THEN ensure P-7 and P-13 interlocks are in required state for existing unit conditions (Tech Spec 3.3.1.16). 	
	SRO	<ul style="list-style-type: none"> Notify IAE to repair failed channel. 	NOTE: SRO may call WCC/IAE to address. If so, Booth Instructor acknowledge as WCC/IAE.
		<ul style="list-style-type: none"> IF unit coastdown in progress,..... 	NOTE: Coastdown is NOT in progress.
	RO	<ul style="list-style-type: none"> Perform any of the following as necessary to maintain T-Colds 555°F to 557°F: 	
		<ul style="list-style-type: none"> Position control rods in manual. 	
		OR	
		<ul style="list-style-type: none"> Borate/dilute NC System 	
		OR	
		<ul style="list-style-type: none"> Adjust turbine load. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 6. 	
	RO	(Step 6) WHEN problem is repaired, THEN perform the following:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Ensure T-Avg at T-Ref $\pm 1^\circ\text{F}$. 	
		<ul style="list-style-type: none"> IF auto rod control desired, THEN place rods in auto. 	
	SRO	(Step 7) Exit this procedure.	NOTE: SRO will likely conduct a Focus Brief.
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION			
	SRO	3.3.1 Reactor Trip System (RTS) Instrumentation	

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 35 of 59Event Description: **Turbine Impulse Pressure Transmitter failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.			
	SRO	APPLCIABILITY: According to Table 3.3.1-1.			
	SRO	ACTIONS			
	SRO	CONDITION	REQUIRED ACTION	COMPLETION TIME	NOTE: The SRO will determine that Functional Units 16.b and 16.e on Table 3.3-1 are affected by this event, and that Conditions A and T are required.
A. One or more Functions with one or more required channels inoperable.		A.1 Enter the Condition referenced in Table 3.3.3-1 for the channel(s).	Immediately		
T. One or more channel(s) inoperable.		T.1 Verify interlock is in required state for existing unit conditions. OR T.2 Be in MODE 2.	1 hour 7 hours		
SELECTED LICENSEE COMMITMENT 16.7.1, AMSAC					
	SRO	16.7.1 ATWS/AMSAC			
	SRO	COMMITMENT: The ATWS/AMSAC system shall be OPERABLE.			
	SRO	APPLCIABILITY: MODE 1 above 40% RTP.			
	SRO	ACTIONS			

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 36 of 59Event Description: **Turbine Impulse Pressure Transmitter failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	CONDITION	REQUIRED ACTION	COMPLETION TIME	NOTE: The SRO will determine that Condition A is required.
		A. ATWS/AMSAC system inoperable.	A.1 Restore ATWS/AMSAC system to OPERABLE status. <u>OR</u> A.2 Prepare and submit a Special Report outlining the cause of the malfunction and plans for restoring the system to OPERABLE status.	7 days 37 days	
		T. One or more channel(s) inoperable.	T.1 Verify interlock is in required state for existing unit conditions. <u>OR</u> T.2 Be in MODE 2.	1 hour 7 hours	
At the discretion of the Lead Examiner move to Event #6.					

Op Test No.: N09-1 Scenario # 3 Event # 6 Page 37 of 59Event Description: **FCV Controller failure**

Time	Position	Applicant's Actions or Behavior
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Subsequently, the controller for 1CF-32 (A S/G CF Control Valve) will fail in Automatic control causing the valve to go closed. The operator will implement AP/1/A/5500/06, "S/G Feedwater Malfunctions," and take manual control of the control valve. The controller will be left in manual control for the remainder of the scenario.

Booth Operator Instructions: Operate Trigger #9 (MALF- IFE006A (0 over 60 seconds))

Indications Available:

- 1AD-4/B-1, S/G A LEVEL DEVIATION
- 1AD-4/C-1, S/G A FLOW MISMATCH LO CF FLOW

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/06, S/G FEEDWATER MALFUNCTION			
	RO	(Step 1) IF CF control valve OR bypass valve has failed, THEN perform the following:	
		<ul style="list-style-type: none"> • Place affected valve in manual. • Restore S/G level to program. 	
	RO	(Step 2) IF CF pump speed control has failed,...	NOTE: CF speed control has NOT failed.
	RO	(Step 3) On each S/G, check the following channels – INDICATING THE SAME:	
		<ul style="list-style-type: none"> • Feed flow • Steam flow • S/G level. 	
	RO	(Step 4) Check unit status as follows:	
		<ul style="list-style-type: none"> • Reactor trip breakers – CLOSED • Pzr pressure – GREATER THAN P-11 (1955 PSIG). 	

Op Test No.: N09-1 Scenario # 3 Event # 6 Page 38 of 59Event Description: **FCV Controller failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 5) IF AT ANY TIME S/G N/R level approaches 17% OR 83%, THEN perform the following:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> • Trip reactor. 	
		<ul style="list-style-type: none"> • GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
	SRO	(Step 6) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 7) Check reactor power – GREATER THAN 3%.	
	RO	(Step 8) Check CM/CF – PRESENTLY FEEDING S/Gs.	
	RO	(Step 9) Check S/G levels – STABLE OR TRENDING TO PROGRAM LEVEL.	
	RO	(Step 10) Check NC temperatures as follows:	
		<ul style="list-style-type: none"> • IF any NC pump on, THEN check NC T-Avg – STABLE OR TRENDING TO DESIRED TEMPERATURE. 	
	RO	(Step 11) Check all S/G CF control valves – IN AUTO.	
	RO	(Step 11 RNO) WHEN the following conditions met, THEN place affected CF control valve in automatic:	NOTE: Due to maintenance being performed, the 1A CF Control Valve will need to remain in MANUAL.
		<ul style="list-style-type: none"> • Automatic control – DESIRED 	NOTE: AUTO control is NOT desired.

Op Test No.: N09-1 Scenario # 3 Event # 6 Page 39 of 59Event Description: **FCV Controller failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Affected S/G level(s) – AT PROGRAM LEVEL 	
		<ul style="list-style-type: none"> Selected control channels – INDICATE CORRECTLY ON CHART RECORDER: 	
		<ul style="list-style-type: none"> Feed flow 	
		<ul style="list-style-type: none"> Steam flow 	
		<ul style="list-style-type: none"> S/G level. 	
			NOTE: SRO may dispatch an NLO to investigate valve. If so, Floor Instructor acknowledge as NLO.
			NOTE: SRO may call WCC/IAE to address failure. If so, Booth Instructor acknowledge as WCC.
	RO	(Step 12) Check all S/G CF control bypass valves – IN MANUAL AND FULL OPEN.	
	RO	(Step 13) Check both CF pumps – IN AUTO.	
	RO	(Step 14) Check all CA pumps – OFF.	
At the discretion of the Lead Examiner move to Events #7-10.			

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 40 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Shortly afterwards, the D SG NR Level Channel 2 will fail high causing an FWIS. Simultaneously, the Reactor will fail to trip automatically and manually; and the Turbine will fail to trip automatically. The operator will be expected to enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and attempt to manually trip the Reactor. When the Reactor does not trip, the operator will be expected to transition to EP/1/A/5000/FR-S.1, "Response to Nuclear Power Generation/ATWS." During the performance of FR-S.1, the operator will successfully trip the Reactor and the Turbine. Upon event initiation, the TD CA Pump will overspeed. Additionally, the 1A CA Pump will trip on overcurrent causing a Red Path to exist on Heat Sink. Following completion of FR-S.1, the operator will transition to EP/1/A/5000/FR-H.1, "Response to Loss of Secondary Heat Sink." Upon entry into FR-H.1, the Steam Generator levels will approach the point at which NCS Bleed and Feed must be established. The scenario is expected to terminate at Step 29 of FR-H.1, after the crew has established NCS Bleed and Feed cooling.

Booth Operator Instructions: Operate Trigger #11 (XMT-CF032 (100))**Trigger #13 (CA005) will operate on P4 (Reactor Trip)****Indications Available:**

- 1AD-1/A-4, S/G D HI-HI LVL TURB TRIP.
- 1FO-1/F-5, TURB TRIP CAUSES RX TRIP.
- Reactor Trip Breakers remain closed.
- Main Turbine does NOT trip.
- Normal feedwater to SG is isolated.
- OAC does NOT indicate Red Path on Heat Sink, although the Red Path exists.

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: Crew will carry out Immediate Actions of E-0, prior to the SRO addressing the EP.
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	SRO	(Step 1) Monitor Foldout page.	Immediate Action
	RO	(Step 2) Check Reactor Trip:	Immediate Action
		<ul style="list-style-type: none"> • All rod bottom lights – LIT 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 41 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R amps – GOING DOWN. 	
	RO	(Step 2 RNO) Perform the following:	NOTE: The reactor trip will fail, and the crew will need to transition to FR-S.1.
		<ul style="list-style-type: none"> Trip reactor. 	
FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS			
	RO	(Step 1) Check Reactor Trip:	Immediate Action
		<ul style="list-style-type: none"> All rod bottom lights – LIT 	
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R amps – GOING DOWN. 	
	RO	(Step 1 RNO) Perform the following:	Immediate Action
		<ul style="list-style-type: none"> Trip the reactor. 	
		<ul style="list-style-type: none"> IF reactor will not trip, THEN manually insert rods. 	NOTE: The RO will drive Rods in, in MANUAL until Reactor Trip Breakers have been opened.
Critical Task: (FR-S.1 C)			
Manually drive rods inward before completing the immediate actions of FR-S.1 (Step 2).			
<p>Safety Significance: failure to insert negative reactivity, under the postulated plant conditions, results in an unnecessary situation in which the reactor remains critical or returns to a critical condition. Performance of the critical task would move the reactor towards a subcritical condition to prevent a subsequent return to criticality. A failure to insert negative reactivity constitutes a mis-operation or incorrect crew performance which leads to incorrect reactivity control.</p>			

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 42 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 2) check Turbine Trip:	Immediate Action
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
Critical Task: (FR-S.1 A) Trip the Turbine prior to Wide Range Steam Generator levels dropping to < 24% Safety Significance: Turbine trip is important in maintaining Steam generator inventory and primary-to-secondary heat transfer. If the Turbine is NOT tripped the Steam Generator U-Tubes uncover sooner and faster. Thus, primary-to-secondary heat transfer starts to deteriorate earlier in the transient and deteriorates more rapidly. The result is that once tube uncover begins, NC System temperature and pressure increase more rapidly and reach higher values.			
Booth Instructor: Delete MALF-IPE001A/B 30 seconds after an operator is dispatched to locally trip the reactor.			
	SRO	(Step 3) Monitor Foldout page.	
	BOP	(Step 4) Check proper CA pump status:	NOTE: All CA Pumps will be OFF, and will NOT be able to be started.
		<ul style="list-style-type: none"> MD CA pumps – ON. 	
		<ul style="list-style-type: none"> Check N/R Level in at least 3 S/Gs – GREATER THAN 17%. 	NOTE: SRO may call WCC to address the CA Pump failures. If so, Booth Instructor acknowledge as WCC.
	BOP	(Step 5) Initiate emergency boration of NC System:	
		<ul style="list-style-type: none"> Ensure one NV pump – ON. 	
		<ul style="list-style-type: none"> Align boration flowpath as follows: 	
		<ul style="list-style-type: none"> Open 1NV-265B (Boric Acid To NV Pumps). 	
		<ul style="list-style-type: none"> Start both boric acid transfer pumps. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 43 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check emergency boration flow – GREATER THAN 30 GPM. 	
	BOP	(Step 5b3 RNO) IF NV pump suction is aligned to VCT, THEN	NOTE: This step will only be applicable if an SI has occurred.
	BOP	<ul style="list-style-type: none"> (Step 5c) Check if NV flowpath aligned to NC System: 	
		<ul style="list-style-type: none"> 1NV-244A (Charging Line Cont Outside Isol) – OPEN 	
		<ul style="list-style-type: none"> 1NV-245B (Charging Line Cont Outside Isol) – OPEN. 	
	BOP	(Step 5c RNO) Perform the following:	NOTE: This step will only be applicable if an SI has occurred.
		<ul style="list-style-type: none"> IF NV pump suction is aligned to VCT, THEN align to FWST as follows: 	
		<ul style="list-style-type: none"> Open 1NV-221A (NV Pumps Suct From FWST). 	
		<ul style="list-style-type: none"> Open 1NV-222B (NV Pumps Suct From FWST). 	
		<ul style="list-style-type: none"> Close 1NV-141A (VCT Outlet Isol). 	
		<ul style="list-style-type: none"> Close 1NV-142B (VCT Outlet Isol). 	
		<ul style="list-style-type: none"> Open the following: 	
		<ul style="list-style-type: none"> 1NI-9A (NC Cold Leg Inj From NV) 	
		<ul style="list-style-type: none"> 1NI-10B (NC Cold Leg Inj From NV). 	
	SRO	<ul style="list-style-type: none"> GO TO Step 5e. 	
	BOP	(Step 5d) Ensure charging flow is greater than emergency boration flow.	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 44 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> (Step 5e) Check Pzr pressure – LESS THAN 2335 PSIG. 	
	BOP	(Step 6) Close the following VQ valves:	
		<ul style="list-style-type: none"> 1VQ-1A (U1 Cont Air Release Inside Isol) 	
		<ul style="list-style-type: none"> 1VQ-6A (U1 Cont Air Addition Inside Isol) 	
		<ul style="list-style-type: none"> 1VQ-2B (U1 Cont Air Release Outside Isol) 	
		<ul style="list-style-type: none"> 1VQ-5B (U1 Cont Air Addition Outside Isol). 	
	SRO	(Step 7) IF AT ANY TIME while in this procedure an S/I signal exists or occurs, THEN perform the following:	
		<ul style="list-style-type: none"> Have another Licensed Operator check S/I equipment PER Enclosure 3 (Subsequent S/I Actions). 	NOTE: If an SI has occurred the SRO will hand this off to the BOP, and continue through FR-S.1 with the RO.
		<ul style="list-style-type: none"> Continue with this procedure. 	
			Examiner NOTE: Follow the actions associated with Enclosure 3 if BOP is assigned by SRO to perform. Others go to Page 46 to continue with FR-S.1.
FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS ENCLOSURE 3, SUBSEQUENT S/I ACTIONS			
	BOP	(Step 1) Check 1ETA and 1ETB – ENERGIZED.	
	BOP	(Step 2) Check both LCOA Sequencer Actuated status lights (1SI-14) – LIT.	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 45 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3) Check ESF Monitor Light Panel on energized train(s):	
		<ul style="list-style-type: none"> Groups 1, 2, 5, - DARK. 	
	BOP	<ul style="list-style-type: none"> Group 3 – LIT. 	
		<ul style="list-style-type: none"> OAC – IN SERVICE. 	
		<ul style="list-style-type: none"> Group 4, Rows A through F – LIT AS REQUIRED. 	
	BOP	(Step 3d RNO) Perform the following;	
		<ul style="list-style-type: none"> Ensure both trains Phase A Isolation are initiated. 	
		<ul style="list-style-type: none"> Align or start S/I and Phase A components with individual windows in Group 4 as required. 	
		<ul style="list-style-type: none"> GO TO Step 3.f. 	
	BOP	<ul style="list-style-type: none"> (Step 3 continued) Check LOCA Sequencer Actuated status light (1SI-14) on energized train(s) – LIT. 	
		<ul style="list-style-type: none"> Check the following windows on Monitor Light Panel Group 4 – LIT: 	
		<ul style="list-style-type: none"> C-3 “CONT ISOL PHASE A TRN A VLVS ALIGNED” 	
		<ul style="list-style-type: none"> C-6 “CONT ISOL PHASE A TRN B VLVS ALIGNED” 	
		<ul style="list-style-type: none"> F-4 “SAFETY INJECTION TRAIN A COMPONENTS ALIGNED” 	
		<ul style="list-style-type: none"> F-5 “SAFETY INJECTION TRAIN B COMPONENTS ALIGNED”. 	
	BOP	(Step 4) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	
		<ul style="list-style-type: none"> N/R level in at least 3 S/Gs – GREATER THAN 17%. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 46 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 4b RNO) Ensure TD CA pump on.	
	BOP	(Step 5) Check all KC pumps – ON.	
	BOP	(Step 6) Check both RN pumps – ON.	
	BOP	(Step 7) Notify Unit 2 to start 2A RN pump.	Floor Instructor: As U2 RO report “2A RN Pump is running.”
	BOP	(Step 8) Check all S/G pressures – GREATER THAN 775 PSIG.	
	BOP	(Step 9) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	
	BOP	(Step 10) IF AT ANY TIME while in this procedure containment pressure goes above 3 PSIG, THEN perform Step 9.	
	BOP	(Step 11) Notify OSM or other SRO to perform EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 22 (OSM Actions Following an S/I).	NOTE: The BOP may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS			
	RO	(Step 8) Check if the following trips have occurred:	
		<ul style="list-style-type: none"> Reactor trip. 	
		<ul style="list-style-type: none"> Turbine trip. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 47 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 9) Check reactor subcritical:	
		<ul style="list-style-type: none"> P/R channels – LESS THAN 5%. 	
		<ul style="list-style-type: none"> W/R Neutron Flux – LESS THAN 5% 	
		<ul style="list-style-type: none"> I/R SUR – NEGATIVE. 	
	SRO	(Step 10) GO TO Step 17.	
	BOP	(Step 17) Ensure adequate shutdown margin:	
		<ul style="list-style-type: none"> Obtain current NC boron concentration from Primary Chemistry. 	NOTE: The SRO will contact Chemistry. Booth Instructor: Acknowledge as Chemistry.
		<ul style="list-style-type: none"> WHEN current NC boron concentration is obtained, THEN perform shutdown margin calculation PER OP/0/A/6100/006 (Reactivity Balance Calculation). 	NOTE: The SRO will hand this off to another SRO. Floor Instructor: Acknowledge as another SRO.
		<ul style="list-style-type: none"> WHEN following conditions satisfied, THEN NC System boration may be stopped: 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Adequate shutdown margin is obtained. 	
		<ul style="list-style-type: none"> Uncontrolled cooldown has been stopped. 	
	SRO	(Step 18) REFER TO RP/0/A/5700/000 (Classification of Emergency).	NOTE: The SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
	SRO	(Step 19) RETURN TO procedure and step in effect.	NOTE: The SRO will transition back to E-0, however a Red Path will exist on Heat Sink , and the transition should be made to FR-H.1 .

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 48 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK			
	BOP	(Step 1) IF total feed flow is less than 450 GPM due to operator action,	NOTE: total feed flow is NOT < 450 gpm due to operator action.
	BOP / RO	(Step 2) Check if secondary heat sink is required:	
		<ul style="list-style-type: none"> NC pressure – GREATER THAN ANY NON-FAULTED S/G PRESSURE. 	
		<ul style="list-style-type: none"> Any NC T-Hot – GREATER THAN 350°F (347°F ACC). 	
	SRO	(Step 3) Monitor Foldout Page.	NOTE: Foldout Criteria for Bleed and Feed may be met at this point. If so, move forward to Step 20 on Page 56 .
	BOP	(Step 4) Check at least one of the following NV pumps – AVAILABLE:	
		<ul style="list-style-type: none"> 1A NV pump 	
		OR	
		<ul style="list-style-type: none"> 1B NV pump. 	
	RO	(Step 5) Check if NC System feed and bleed should be initiated:	
		<ul style="list-style-type: none"> Check W/R level in at least 3 S/Gs – LESS THAN 25% (36% ACC). 	NOTE: Foldout Criteria for Bleed and Feed may be met at this point. If so, move forward to Step 20 on Page 56 .
	RO / BOP	(Step 5 RNO) Perform the following:	
		<ul style="list-style-type: none"> Monitor feed and bleed initiation criteria. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 49 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> WHEN criteria satisfied, THEN GO TO Step 20. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	<ul style="list-style-type: none"> GO TO Step 6. 	Examiner NOTE: If at any time during the event the Bleed and Feed Criteria of this step is met, move to Page 56 .
	RO / BOP	(Step 6) Ensure S/G BB and NM valves closed PER Enclosure 3 (S/G BB and Sampling Valve Checklist).	<p>Examiner NOTE: The SRO may assign the RO or the BOP to perform this Enclosure.</p> <p>If so, RO/BOP Examiner follow actions of RO/BOP in Enclosure 3.</p> <p>Examiners not following operator assigned, moved forward to FR-H.1 actions on Page 50.</p>
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK ENCLOSURE 3, S/G BB AND SAMPLING VALVE CHECKLIST			
	RO / BOP	(Step 1) Check the following valves – CLOSED:	
		<ul style="list-style-type: none"> 1BB-1B (1A S/G Blowdown Cont Outside Isol Control) - CLOSED 	
		<ul style="list-style-type: none"> 1BB-2B (1B S/G Blowdown Cont Outside Isol Control) - CLOSED 	
		<ul style="list-style-type: none"> 1BB-3B (1C S/G Blowdown Cont Outside Isol Control) - CLOSED 	
		<ul style="list-style-type: none"> 1BB-4B (1D S/G Blowdown Cont Outside Isol Control) - CLOSED 	
		<ul style="list-style-type: none"> 1BB-5A (A S/G BB Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1BB-6A (B S/G BB Cont Inside Isol) - CLOSED 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 50 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1BB-7A (C S/G BB Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1BB-8A (D S/G BB Cont Inside Isol) – CLOSED 	
		<ul style="list-style-type: none"> 1NM-187A (1A S/G Upper Shell Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-190A (1A S/G Upper Shell Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-201A (1B S/G Upper Shell Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-207A (1C S/G Upper Shell Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-210A (1C S/G Blowdown Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-221A (1D S/G Blowdown Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-191B (1A S/G Blowdown Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-197B (1B S/G Upper Shell Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-200B (1B S/G Blowdown Sample Cont Inside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-211B (1C S/G Blowdown Sample Hdr Cont Outside Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1NM-217B (1D S/G Upper Shell Sample Cont Inside Isol) – CLOSED 	
		<ul style="list-style-type: none"> 1NM-220B (1D S/G Blowdown Sample Cont Inside Isol) – CLOSED. 	
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK			
	RO / BOP	(Step 7) Attempt to establish CA flow to at least one S/G as follows:	
		<ul style="list-style-type: none"> Check power to both MD CA pumps – AVAILABLE. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 51 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		(Step 7.a RNO) Perform the following:	
	RO / BOP	<ul style="list-style-type: none"> IF essential power is not available,..... 	NOTE: Essential power is available.
	SRO	<ul style="list-style-type: none"> IF the essential bus is energized, THEN dispatch operator to determine cause or breaker failure. 	NOTE: The SRO will dispatch an NLO. Booth Instructor: Within 3 minutes , as NLO report that the 1A CA Pump Breaker has a 51 relay tripped .
	RO / BOP	<ul style="list-style-type: none"> (Step 7.b) Ensure control room CA valves aligned PER Enclosure 4 (CA Valve Alignment). 	NOTE: The SRO may assign the RO or the BOP to perform this Enclosure. If so, RO/BOP Examiner follow actions of RO/BOP in Enclosure 4. Examiners not following operator assigned, moved forward to FR-H.1 actions on Page 54 .
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK ENCLOSURE 4, CA VALVE ALIGNMENT			
	BOP / RO	(Step 1) Check the following valves – OPEN:	
		<ul style="list-style-type: none"> 1CA-66AC (U1 TD CA Pump Disch To 1A S/G Isol) – OPEN 	
		<ul style="list-style-type: none"> 1CA-62A (1A CA Pump Disch To 1A S/G Isol) – OPEN 	
		<ul style="list-style-type: none"> 1CA-54AC (U1 TD CA Pump Disch To 1B S/G Isol) – OPEN 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 52 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1CA-58A (1A CA Pump Disch To 1B S/G Isol) - OPEN 	
		<ul style="list-style-type: none"> 1CA-50B (U1 TD CA Pump Disch To 1C S/G Isol) – OPEN 	
		<ul style="list-style-type: none"> 1CA-46B (1B CA Pump Disch To 1C S/G Isol) - OPEN 	
		<ul style="list-style-type: none"> 1CA-38B (U1 TD CA Pump Disch To 1D S/G Isol) – OPEN 	
		<ul style="list-style-type: none"> 1CA-42B (1B CA Pump Disch To 1D S/G Isol) – OPEN. 	
	BOP / RO	(Step 2) Check the following valves – OPEN:	
		<ul style="list-style-type: none"> 1CA-64AB (U1 TD CA Pump Disch To 1A S/G Control – OPEN 	
		<ul style="list-style-type: none"> 1CA-60A (1A CA Pump Disch To 1A S/G Control) – OPEN 	
		<ul style="list-style-type: none"> 1CA-52AB (U1 TD CA Pump Disch To 1B S/G Control) – OPEN 	
		<ul style="list-style-type: none"> 1CA-56A (1A CA Pump Disch To 1B S/G Control) - OPEN 	
		<ul style="list-style-type: none"> 1CA-48AB (U1 TD CA Pump Disch To 1C S/G Control) – OPEN 	
		<ul style="list-style-type: none"> 1CA-44B (1B CA Pump Disch To 1C S/G Control) - OPEN 	
		<ul style="list-style-type: none"> 1CA-36AB (U1 TD CA Pump Disch To 1D S/G Isol) – OPEN 	
		<ul style="list-style-type: none"> 1CA-40B (1B CA Pump Disch To 1D S/G Control) – OPEN. 	
	BOP / RO	(Step 3) Check CA Storage tank (water tower) level – GREATER THAN 1.5 FT.	
	BOP / RO	(Step 4) Check the following valves – CLOSED:	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 53 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1RN-69A (1A RN Assured Supply To U1 CA Isol) – CLOSED 	
		<ul style="list-style-type: none"> 1CA-86A (U1 TD CA Pump Suction From 1A RN Isol) – CLOSED 	
		<ul style="list-style-type: none"> 1CA-15A (1A CA Pump Suction From 1A RN Isol) - CLOSED 	
		<ul style="list-style-type: none"> 1RN-162B (1B RN Assured Supply To U1 CA Isol) – CLOSED 	
		<ul style="list-style-type: none"> 1CA-116B (U1 TD CA Pump Suction From 1B RN Isol) – CLOSED 	
		<ul style="list-style-type: none"> 1CA-18B (1B CA Pump Suction From 1B RN Isol) – CLOSED. 	
	BOP / RO	(Step 5) Check the following valves – OPEN:	
		<ul style="list-style-type: none"> 1CA-11A (1A CA Pump Suction Isol) – OPEN 	
		<ul style="list-style-type: none"> 1CA-7AC (U1 TD CA Pump Suction Isol) – OPEN 	
		<ul style="list-style-type: none"> 1CA-9B (1B CA Pump Suction Isol) – OPEN. 	
	BOP / RO	(Step 6) GO TO Step 8.	
	BOP / RO	(Step 8) Check 1CA-2 (U1 CA Pumps Suct From CA Storage Tank Isol) – OPEN.	
	BOP / RO	(Step 9) Check CA pump suction from UST and CA Condensate Storage Tank (service bldg roof tank) valves – CLOSED:	
		<ul style="list-style-type: none"> 1CS-18 (U1 UST To CA Pump Suct Hdr Isol) – CLOSED 	
		<ul style="list-style-type: none"> 1CA-4 (U1 CA Pumps Suct From UST Isol) – CLOSED 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 54 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1CA-6 (U1 CA Pumps Suct From CA CST Isol) – CLOSED. 	
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK			
	RO / BOP	<ul style="list-style-type: none"> (Step 7.c) Start all available CA pumps. 	
		<ul style="list-style-type: none"> Check TD CA pump – RUNNING. 	
		(Step 7.d RNO) Perform the following as necessary:	
		<ul style="list-style-type: none"> IF 1SA-48ABC (SM From S/G C To TD CA Pump Isol) is closed,..... 	NOTE: 1SA-48ABC is NOT closed.
		<ul style="list-style-type: none"> IF 1SA-49AB (SM From S/G B to TD CA Pump Isol) is closed, THEN... 	NOTE: 1SA-49AB is NOT closed.
		<ul style="list-style-type: none"> IF "TD CA PUMP STOP VLV NOT OPEN" alarm (1AD-5, F-3) is lit, THEN dispatch operator to reset 1SA-3 (Unit 1 TD CA Pump Turb Stop Valve) PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 24 (Resetting TD CA Stop Valve). 	NOTE: The SRO will dispatch an NLO. Booth Instructor: Within 3 minutes , as NLO report that the TD CA Pump linkage appears to be broken .
		<ul style="list-style-type: none"> IF reason for loss of steam supply to TD CA pump not determined,..... 	NOTE: The reason for the loss of steam supply to the TD CA Pump turbine is known.
	RO / BOP	<ul style="list-style-type: none"> (Step 7.e) Check total flow to S/G(s) – GREATER THAN 450 GPM. 	
	RO / BOP	(Step 7.e RNO) Perform the following:	
		<ul style="list-style-type: none"> IF any CA pump is started,..... 	NOTE: All CA pumps are OFF.
		<ul style="list-style-type: none"> IF any feed flow to at least one S/G is indicated,..... 	NOTE: There is no feed flow to any SG.

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 55 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	<ul style="list-style-type: none"> IF no feed flow indicated, THEN perform the following: 	
		<ul style="list-style-type: none"> IF no CA pump can be started, THEN dispatch operator and maintenance to CA pumps to try to restore one CA pump to service. 	<p>NOTE: The SRO will dispatch an NLO, and contact WCC/Maintenance.</p> <p>Floor Instructor: acknowledge as NLO.</p> <p>Booth Instructor: acknowledge as WCC.</p>
		<ul style="list-style-type: none"> Dispatch operator to ensure CA valves aligned PER Enclosure 5 (Local CA Valve Alignment). 	<p>NOTE: The SRO will dispatch an NLO.</p> <p>Floor Instructor: acknowledge as NLO.</p>
	SRO	<ul style="list-style-type: none"> GO TO Step 8. 	
	RO	(Step 8) Check steam dumps:	
		<ul style="list-style-type: none"> Check condenser available: 	
		<ul style="list-style-type: none"> "C-9 COND AVAILABLE FOR STEAM DUMP" status light (1SI-18) – LIT 	
		<ul style="list-style-type: none"> Any MSIV – OPEN 	
	RO	<ul style="list-style-type: none"> "STEAM DUMP SELECT" – IN T-AVG MODE. 	
	RO	<ul style="list-style-type: none"> Perform the following to place steam dumps in steam pressure mode: 	
		<ul style="list-style-type: none"> Ensure "STM PRESS CONTROLLER" setpoint at 1092 PSIG (pot setting of 8.4). 	
		<ul style="list-style-type: none"> Place "STM PRESS CONTROLLER" in manual. 	
		<ul style="list-style-type: none"> Adjust "STM PRESS CONTROLLER" output to equal "STEAM DUMP DEMAND" signal. 	
		<ul style="list-style-type: none"> Place "STEAM DUMP SELECT" in steam pressure mode. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 56 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Place "STM PRESS CONTROLLER" in auto. 	
	BOP	(Step 9) Stop all NC pumps.	
			Examiner NOTE: If at any time during the event the Bleed and Feed Criteria of this step is met, the crew will move forward to HERE.
	SRO	(Step 20) Perform Steps 21 through 25 quickly to establish NC heat removal by NC feed and bleed.	
	BOP	(Step 21) Ensure all NC pumps – OFF	
	BOP	(Step 22) Initiate S/I.	
	BOP	(Step 23) Check "NV PMPS TO COLD LEG FLOW" – INDICATING FLOW.	
	BOP	(Step 24) Establish NC System bleed path as follows:	
		<ul style="list-style-type: none"> Check all Pzr PORV isolation valves – OPEN. 	
		<ul style="list-style-type: none"> Select "OPEN" on two Pzr PORVs that have an open Pzr PORV isolation valve. 	
		<ul style="list-style-type: none"> Align N₂ to Pzr PORVs by opening: 	
		<ul style="list-style-type: none"> 1NI-430A (Emerg N2 From CLA To 1NC-34A) 	
		<ul style="list-style-type: none"> 1NI-431B (Emerg N2 From CLA To 1NC-32B & 36B). 	
		<ul style="list-style-type: none"> Check power to all Pzr PORV isolation valves – AVAILABLE. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 57 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 25) Check two Pzr PORVs and associated isolation valves – OPEN.	
Critical Task: (FR-H.1 A) Establish RCS Bleed and Feed before all four Steam Generator Wide Range Levels reach 0%, and the NCS temperature and/or pressure increases. Safety Significance: Failure to establish RCS Bleed and Feed before automatic opening of the PORVs (due to plant heatup) reduces the probability of success to establish a heat sink for the core. This constitutes a “Significant reduction of safety margin beyond that irreparably introduced by the scenario.” Establishing feedwater flow into the Steam Generators offers the most effective recovery action to restore the heat sink. If all attempts to initiate feedwater flow fail, the crew must establish bleed and feed to cool the core. This is accomplished by manually initiating SI, and then manually opening the PORVs. The lower NCS pressure allows a greater ECCS flow to recover NCS inventory and force flow through the core. If this action is to be successful, it must be started before SG dryout. SG dryout would cause NC temperature to increase, increasing NC Pressure and forcing open the PORVs automatically. If NCS pressure is at the PORV setpoint due to NCS heatup, the operator action of opening the PORVs manually may not be successful in lowering NCS pressure and increasing ECCS flow. Ultimately, the core could uncover.			
	BOP	(Step 26) Isolate NV Recirc flowpath as follows:	
		<ul style="list-style-type: none"> Close: 	
		<ul style="list-style-type: none"> 1NV-150B (NV Pumps Recirculation) 	
		<ul style="list-style-type: none"> 1NV-151A (NV Pumps Recirculation). 	
		<ul style="list-style-type: none"> Maintain NV recirc valves closed unless directed to open by subsequent steps. 	
	BOP	(Step 2&) Ensure Pzr heaters remain off as follows:	
		<ul style="list-style-type: none"> Place A,B, and D Pzr heaters in manual and off. 	
		<ul style="list-style-type: none"> Open “C PZR HTR GRP SUP BKR”. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9 & 10 Page 58 of 59Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic/Manual Rx Trip/Automatic Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 28) Have another licensed operator check S/I equipment PER Enclosure 9 (Subsequent S/I Actions) while continuing with this procedure.	NOTE: SRO may ask U2 BOP to address. If so, Floor Instructor acknowledge as U2 BOP.
	BOP	(Step 29) Maintain NC System heat removal by performing the following:	
		• Maintain S/I flow	
		• Maintain 2 Pzr PORV flowpaths – OPEN.	
At the discretion of the Lead Examiner terminate the exam.			

UNIT 1 STATUS:

Power Level: 100% NCS [B] 76 ppm Pzr [B]: 79 ppm Xe: Per OAC

Power History: At this power for 288 days Core Burnup: 485 EFPDs

CONTROLLING PROCEDURE: OP/1/A/6100/03 Controlling Procedure for Unit Operation

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

- The Plant is at 100% power (EOL), steady-state operation.
- The Work Control Center has requested that the operator swap CF Control Valve Control Circuit for 1CF-32 (A S/G CF Control Valve) from Normal to Alternate for required corrective maintenance.
- An NLO (Bob) is standing by in the Turbine Building Basement to support this activity. System Engineering has indicated that Turbine Load does not need to be reduced to perform this.
- When the swapover is complete Maintenance personnel will perform corrective maintenance on the system.

The following equipment is Out-Of-Service:

- 1B CA Pump is OOS (Expected back in 6 hours).
- 1D SG NR Level Channel 4 failed last shift (IAE is investigating).
- MCB Annunciator 1AD-2, F-9, "ROD DRIVE M/G SETS TROUBLE," has alarmed spuriously several times over the last hour (IAE is investigating).

Work Control SRO/Offsite Communicator **Jim**

Plant SRO **Joe**

NLO's AVAILABLE

Unit 1

Aux Bldg. John

Turb Bldg. Bob

5th Rounds. Carol

Extra(s) Bill Ed Wayne Tanya

Unit 2

Aux Bldg. Chris

Turb Bldg. Mike