

FACILITY NAME: McGuire Nuclear Plant

Section 4


REPORT NUMBER: 05000369/370/2009-301

DRAFT SIMULATOR SCENARIOS

CONTENTS:

- ☒ Draft Simulator Scenarios
 - ☒ Each containing ES-D-1 "Scenario Outline"
 - ☒ Each containing ES-D-2 "Required Operator Actions"

Location of Electronic Files:

Submitted By: 

Verified By: Mark J. Riches

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	N-BOP R-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 IRE010	C-RO C-BOP C(TS)-SRO	Zone 1B Lockout causing Runback/Stuck Rod		
5	SG001B	M-RO M-BOP M-SRO	SGTR (B)		
6	^{XMT} CA012	NA	Aux Feed Flow Transmitter to B SG fails high		
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>					

DRAFT

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 Malfunction," 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 course of plant stabilization the operator will notice that one control rod has not moved. The operator will respond in accordance with ARP1AD-2/D10, "RPI Urgent Failure," and after the runback clears, the operator will implement AP/1/A/5500/14, "Rod Control Malfunction,"

and respond in accordance with Enclosure 2, "Response to Rod Misalignment." During implementation of Enclosure 2, the operator will discover that QPTR is not within Technical Specification limits, and reduce load to less than 50% power using AP/1/A/5500/04, Rapid Downpower.

Shortly afterwards, a 260 gpm SGTR 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." Ultimately, 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 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.

N09-1-1

The following procedures are needed:

Event 1

- OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATIONS
ENCLOSURE 4.1, POWER INCREASE (Step 3.21.10)
- OP/1/A/6150/009, BORON CONCENTRATION CONTROL
ENCLOSURE 4.4, ALTERNATE DILUTE
- OP/1/A/6300/001A, TURBINE-GENERATOR STARTUP/SHUTDOWN
ENCLOSURE 4.1, TURBINE-GENERATOR LOAD CHANGE

Event 2

- AP/1/A/5500/06, S/G FEEDWATER MALFUNCTION

Event 3

- AP/1/A/5500/11, PRESSURIZER PRESSURE ANOMALIES
- TECHNICAL SPECIFICATION 3.4.1, RCS PRESSURE, TEMPERATURE, AND FLOW DEPARTURE FROM NUCLEATE BOILING (DNB) LIMITS
- TECHNICAL SPECIFICATION 3.4.11, PRESSURIZER POWER OPERATED RELIEF VALVES (PORVS)

Consider CT, may not need it, but used it last year, and could get rid of one of the SGTR CTs. **Critical Task:(SS-4600/113/E13.19) Close the Spray Valve within 1 minute to avoid reactor trip.**

Event 4

- AP/1/A/5500/03, LOAD REJECTION
- AP/1/A/5500/14, ROD CONTROL MALFUNCTION
- AP/1/A/5500/14, ROD CONTROL MALFUNCTION,
ENCLOSURE 1, RESPONSE TO DROPPED OR MISALIGNED ROD
- AP/1/A/5500/04, RAPID DOWNPOWER

Events 5/6

- AP/1/A/5500/10, NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV
- PUMPS CASE I, STEAM GENERATOR TUBE LEAKAGE
- EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION
- EP/1/A/5000/E-3, STEAM GENERATOR TUBE RUPTURE

PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 25
TOPIC: NRC Simulator Exam
Scenario N09-1-1

REFERENCES:

1. OP/1/A/6100/003, "Controlling Procedure for Unit Operation."
2. OP/1/A/6300/001A, "Turbine-Generator Load Change."
3. OP/1/A/6150/009, "Boron Concentration Control."
4. AP/1/A/5500/06, "S/G Feedwater Malfunction."
5. AP/1/A/5500/11, "Pressurizer Pressure Anomalies."
6. McGuire Technical Specifications
7. AP/1/A/5500/03, "Load Rejection."
8. AP/1/A/5500/14, "Rod Control Malfunction."
9. AP/1/A/5500/04, "Rapid Downpower."
10. AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps."
11. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
12. EP/1/A/5000/E-3, "Steam Generator Tube Rupture."
13. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review: 

Rev. 020509

Scenario Event Description

NRC Scenario 1

Facility:	McGuire	Scenario No.:	1	Op Test No.:	N09-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	

Initial Conditions:	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.
Turnover:	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).

Event No.	Malf. No.	Event Type*	Event Description
1	NA	N-BOP R-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 IRE010	C-RO C-BOP C(TS)-SRO	Zone 1B Lockout causing Runback/Stuck Rod
5	SG001B	M-RO M-BOP M-SRO	SGTR (B)
6	^{XMT} CA012	NA	Aux Feed Flow Transmitter to B SG fails high

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

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 Malfunction," 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 course of plant stabilization the operator will notice that one control rod has not moved. The operator will respond in accordance with ARP1AD-2/D10, "RPI Urgent Failure," and after the runback clears, the operator will implement AP/1/A/5500/14, "Rod Control Malfunction," and respond in accordance with Enclosure 2, "Response to Rod Misalignment." During implementation of Enclosure 2, the operator will discover that QPTR is not within Technical Specification limits, and reduce load to less than 50% power using AP/1/A/5500/04, Rapid Downpower.

Scenario Event Description

NRC Scenario 1

Shortly afterwards, a 260 gpm SGTR 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." Ultimately, 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 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 and 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 = 800 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"/>	<p style="text-align: center;">Crew Briefing</p> <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. 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, 60 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 Trigger #5	Zone 1B Lockout causing Runback/Stuck Rod LOA IPP003 = Override, Trigger #7; IPB Fan
<input type="checkbox"/>	At direction of examiner	(MALF) SG001B Set = 260 Trigger #9	SGTR (B) LOA-SA003 = 0, Trigger #11; TDCA Pump
<input type="checkbox"/>	Continued from Event 6	(XMT) CA012 Set = 600 Ramp = 600 seconds Trigger #13	Aux Feed Flow Transmitter to B SG fails high Set up to Trigger on Reactor Trip (Trigger #13)
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>57</u>
Event Description:		Power Increase							
Time	Position	Applicant's Actions or Behavior							

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."

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.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>1</u>	Page	<u>9</u>	of	<u>57</u>
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	57
Event Description:		Power Increase							
Time	Position	Applicant's Actions or Behavior							

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 57Event 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 Otit 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 57Event 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, OR at the discretion of the Lead Examiner move to Event #2.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>2</u>	Page	<u>13</u>	of	<u>57</u>
Event Description: Feed Flow Channel fails low									
Time	Position	Applicant's Actions or Behavior							

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.

Booth Operator Instructions: **Operate Trigger #1 (XMT-CF018 (0% - 60 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:	
		<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...	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 	
	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.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>2</u>	Page	<u>14</u>	of	<u>57</u>
Event Description: Feed Flow Channel fails low									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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.
	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.

Op Test No.: N09-1 Scenario # 1 Event # 2 Page 15 of 57Event Description: **Feed Flow Channel fails low**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		(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.
			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.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>2</u>	Page	<u>16</u>	of	<u>57</u>
Event Description:		Feed Flow Channel fails low							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
			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.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>17</u>	of	<u>57</u>
Event Description:		NC Master Pressure Controller fails high/PORV Leakage							
Time	Position	Applicant's Actions or Behavior							

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.	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.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>18</u>	of	<u>57</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.	NOTE: Pzr PORV 1NC-34A has opened and NOT fully closed.
	BOP	(Step 3 RNO) Perform the following:	
		<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.	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:	
		<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) 	
	BOP	(Step 6) Check Pzr spray valves – CLOSED.	

Op Test No.: N09-1 Scenario # 1 Event # 3 Page 19 of 57Event 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
	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 57Event 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 57Event Description: **NC Master Pressure Controller fails high/PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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			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.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>3</u>	Page	<u>22</u>	of	<u>57</u>
Event Description: NC Master Pressure Controller fails high/PORV Leakage									
Time	Position	Applicant's Actions or Behavior							

			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	COMPLETION TIME	
		A. Pressurizer pressure or RCS average temperature DNB parameters not within limits.	A.1 Restore DNB parameter(s) to within limit.	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 57Event Description: **NC Master Pressure Controller fails high/PORV Leakage**

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

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 24 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

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 course of plant stabilization the operator will notice that one control rod has not moved. The operator will respond in accordance with ARP1AD-2/D10, "RPI Urgent Failure," and after the runback clears, the operator will implement AP/1/A/5500/14, "Rod Control Malfunction," and respond in accordance with Enclosure 2, "Response to Rod Misalignment." During implementation of Enclosure 2, the operator will discover that QPTR is not within Technical Specification limits, and reduce load to less than 50% power using AP/1/A/5500/04, Rapid Downpower.

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

Indications Available:

- MWe decreases.
- Control Rods move inward in automatic.
- 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.	
	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. 	
	RO	(Step 3) Check control rod response as follows:	
		<ul style="list-style-type: none"> • Check control banks – MOVING IN AS REQUIRED. 	
	RO	<ul style="list-style-type: none"> • Check all rods – ALIGNED WITH ASSOCIATED BANK. 	NOTE: At this point Control Rod M12 is misaligned.

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 25 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The operator may recognize the Stuck Rod, but WILL continue with the rod insertion.
		(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:	
		<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. 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 26 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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:	
		<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". 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 27 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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. 	
	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.	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 28 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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:	
		<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:	NOTE: The SRO may decide to implement AP-14 at any time when the plant is stable. When AP-14 is implemented, skip to page 32 of the script.
		<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%. 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 29 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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"). 	
	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.	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 30 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 24) Shutdown unnecessary running plant equipment as follows:	NOTE: The SRO may decide to implement AP-14 at this time when the plant is stable. When AP-14 is implemented, skip to page 32 of the script.
		<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.
	RO	(Step 26) WHEN condenser dump valves closed AND no longer required for temperature control, THEN reset C-7A using "STEAM DUMP SELECT" switch.	
	BOP	(Step 27) Check the following PCBs – CLOSED:	Booth Instructor: as Dispatch call and indicate that PCBs will NOT be closed within the hour.
		<ul style="list-style-type: none"> PCB-8 	
		<ul style="list-style-type: none"> PCB-9 	
		<ul style="list-style-type: none"> PCB-11 	
		<ul style="list-style-type: none"> PCB-12 	
	BOP	(Step 27 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF AT ANY TIME the switchyard PCBs are open for greater than one hour AND the 230 KV switchyard is energized, THEN evaluate opening the following MODs to prevent damaging switchyard PCBs: 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 31 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF PCB-11 is open, THEN open MOD-11R and MOD-11Y. 	
		<ul style="list-style-type: none"> IF PCB-12 is open, THEN open MOD-12R and MOD-12Y. 	
		<ul style="list-style-type: none"> IF AT ANY TIME busline PCBs OR MODs will not operate from the Control Room, THEN perform the following: 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Dispatch switchyard coordinator to operate affected PCBs and MODs (875-5680 or beeper 778-6633 or Toddville TCC can contact). 	
		<ul style="list-style-type: none"> IF Switchyard personnel unavailable, THEN dispatch operator to operate affected busline PCBs and MODs from Switchyard Relay House PER OP/1/A/6300/001 	
		<ul style="list-style-type: none"> IF AT ANY TIME MODs are reclosed, THEN ensure associated PCB is reclosed within one hour or reopen associated MODs. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	RO / BOP	(Step 28) Check Generator Breakers – EITHER GENERATOR BREAKER CLOSED.	
	RO / BOP	(Step 29) Check Generator – TIED TO GRID.	
	RO / BOP	(Step 30) Check both bus lines – TIED TO GRID.	
	RO / BOP	(Step 30 RNO) Perform the following:	
		<ul style="list-style-type: none"> REFER TO Tech Spec 3.8.1 (AC Sources – Operating). 	
		<ul style="list-style-type: none"> Notify Toddville Transmission Control Center (TCC) to use single busline values to calculate RTCA (Real Time Contingency Analysis) for McGuire Unit 1, using one of the following: 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 32 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Ring down phone on Unit 2 condensate board. 	
		<ul style="list-style-type: none"> IF AT ANY TIME busline PCBs are open AND their associated MODs will be closed for greater than one hour, THEN ensure continuous actions of Step 27 are met. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> WHEN busline available, THEN tie to grid. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	RO	(Step 31) Check both Generator Breakers – CLOSED.	
	RO	(Step 31 RNO) When Busline energized.....	NOTE: Busline is NOT energized
	SRO	(Step 32) GO TO Step 34.	
	RO / BOP	(Step 34) Perform any required actions of OP/1/A/6100/003 (Controlling Procedure For Unit Operation), Enclosure 4.2 (Power Reduction).	
	RO / BOP	(Step 35) WHEN reason for runback has been determined, THEN unit may be loaded or shutdown PER OP/1/A/6100/003 (Controlling Procedure For Unit Operation).	NOTE: It is expected that once the SRO completes AP03, AP14 will be entered based on the entry conditions of a misaligned rod existing.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
	RO	(Step 1) IF more than one rod dropped, THEN perform the following:	NOTE: There are NO dropped rods.
		<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). 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 33 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 2) Place control rods in manual.	
	RO	(Step 3) Check rod movement – STOPPED.	
	RO	(Step 4) Check all rods – ALIGNED WITH ASSOCIATED BANK.	
	RO	(Step 4 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF two or more rods are misaligned greater than 24 steps, THEN perform the following: 	NOTE: There are NOT two or more misaligned rods.
		<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). 	
		<ul style="list-style-type: none"> IF T-Avg has gone down, THEN lower Turbine load as necessary to restore T-Avg to T-Ref. 	
	SRO	<ul style="list-style-type: none"> GO TO Enclosure 1 (Response To Dropped or Misaligned Rod). 	NOTE: The SRO will transition to Enclosure 1.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
ENCLOSURE 1, RESPONSE TO DROPPED OR MISALIGNED ROD			
	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) Dispatch rod control system qualified IAE to perform the following:	NOTE: SRO may call WCC/IAE to address the stuck rod. If so, Booth Instructor acknowledge as WCC.
		<ul style="list-style-type: none"> Correct cause of misaligned rod. 	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 34 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Notify Control Room operators when auto or manual rod motion is available for reactivity control. 	
	RO	(Step 3) Check "ROD CONTROL URGENT FAILURE" alarm (1AD-2, A-10) – DARK.	
	RO	(Step 4) Use OAC point M1P1385 (Reactor Thermal Power, Best Estimate) to determine reactor power in subsequent steps.	NOTE: A previous failure has rendered the Thermal Power Best Estimate inaccurate. The crew will need to use NIS and/or NC System ΔT to determine Reactor Power.
	RO	(Step 5) Check AFD (Tech Spec 3.2.3) – WITHIN TECH SPEC LIMITS.	Booth Instructor: as IAE, report that Rods may be moved in MANUAL, but NOT in AUTO.
	RO / SRO	Check QPTR (Tech Spec 3.2.4) – WITHIN TECH SPEC LIMITS.	NOTE: QPTR will NOT be within the TS Limit.
	SRO	(Step 6 RNO) Reduce reactor power as required by Tech Specs as follows:	
	RO	<ul style="list-style-type: none"> Do not move rods until IAE determines rod movement is available. 	
		<ul style="list-style-type: none"> Borate as required during power reduction to maintain T-avg at T-Ref. 	
		<ul style="list-style-type: none"> Monitor AFD during load reduction. 	
		<ul style="list-style-type: none"> IF AT ANY TIME AFD reaches Tech Spec limit AND reactor power is greater than 50% 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). 	
		<ul style="list-style-type: none"> Reduce load as required by tech Specs PER one of the following procedures: 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>35</u>	of	<u>57</u>
Event Description: Zone 1B Lockout causing Runback/Stuck Rod									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> AP/1/A/5500/04 (Rapid Downpower). 	NOTE: The SRO will determine that QPTR is NOT in spec, and that power must be reduced to < 50%.
TECHNICAL SPECIFICATION 3.2.4, QUADRANT POWER TILT RATIO (QPTR)			
	SRO	LCO 3.2.4 The QPTR shall be ≤ 1.02 .	
		APPLICABILITY: MODE1 with THERMAL POWER > 50% RTP.	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 36 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		CONDITION	REQUIRED ACTION	COMPLETION TIME	NOTE: The SRO will determine that QPTR is NOT in spec, and that power must be reduced to < 50%.
		A. QPTR not within limit.	A.1 Reduce THERMAL POWER \geq 3% from RTP for each 1% of QPTR > 1.02.	2 hours	
			AND		
			A.2 Perform SR 3.2.4.1 and reduce THERMAL POWER \geq 3% from RTP for each 1% of QPTR > 1.02.	Once per 12 hours	
			AND		
			A.3 Perform SR 3.2.1.1 and SR 3.2.2.1.	24 hours	
			AND	AND	
			AND	Once per 7 days	
			A.4 Reduce Power Range Neutron Flux – High Trip Setpoint \geq 3% for each 1% of QPTR > 1.02.	72 hours	
			AND		
			A.5 Reevaluate safety analyses and confirm results remain valid for duration of operation under this conditions.	Prior to increasing THERMAL POWER above the more restrictive limit of Required Action A.1 or A.2	
			AND		
			A.6 Calibrate excore detectors to show zero QPT.	Prior to increasing THERMAL POER above the more restrictive limit of Required Action A.1 or A.2	
			AND		
			A.7 Perform SR 3.2.1.1 and SR 3.2.2.1.	Within 24 hours after reaching RTP	
				OR	
				Within 48 hours after increasing THERMAL POWER above the more restrictive limit of Required Action A.1 or A.2	

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 37 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/04, RAPID DOWNPOWER			
	RO / BOP	(Step 1) Monitor Foldout page.	
	SRO	(Step 2) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 3) Check turbine control – IN AUTO.	
	RO	(Step 4) Check "MW LOOP" – INSERVICE.	
	RO	(Step 4 RNO) Depress "MW IN/MW OUT" pushbutton.	
	SRO	(Step 5) check shutdown to Mode 3 – DESIRED.	
	SRO	(Step 5 RNO) Observe Note prior to Step 8 and GO TO Step 8.	
	SRO	(Step 8) Determine the required power reduction rate (MW/min).	
	RO	(Step 9) Check control rods – IN AUTO.	NOTE: Due to the stuck rod the rods will NOT be in AUTO.
	RO	(Step 9 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF auto control available, 	NOTE: AUTO rod control is NOT available.

Op Test No.: N09-1 Scenario # 1 Event # 4 Page 38 of 57Event Description: **Zone 1B Lockout causing Runback/Stuck Rod**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF manual control available, THEN move rods as required to maintain T-Avg at T-Ref. 	
		<ul style="list-style-type: none"> IF rods cannot be moved in auto or manual, THEN perform the following: 	NOTE: Control rods can be moved manually.
	BOP	(Step 10) Notify SOC of load reduction (red dispatcher phone).	Booth Instructor: as SOC, acknowledge.
	RO	(Step 11) Initiate turbine load reduction to desired load at desired rate.	
	BOP	(Step 12) Borate NC System as follows:	
		<ul style="list-style-type: none"> Energize all backup Pzr heaters. 	
		<ul style="list-style-type: none"> Determine boration amount based on the following: 	
		<ul style="list-style-type: none"> Power Reduction Rate (MW/min) 	
		<ul style="list-style-type: none"> Present NC System Boron Concentration (ppm) 	
		<ul style="list-style-type: none"> Total Power Change (%). 	
		<ul style="list-style-type: none"> Record calculated boration amount: 	
		<ul style="list-style-type: none"> Check auto or manual rod control – AVAILABLE. 	
		<ul style="list-style-type: none"> (Step 12e) Perform boration 4 equal additions during load reduction PER OP/1/A/6150/009 (Boron Concentration Control), Enclosure 4.7 (Boration Using 1NV-265B (Boric Acid To NV Pumps)). 	NOTE: allow the BOP to complete the first of four borations.
At the discretion of the Lead Examiner move to Events #5-6.			

Op Test No.:	N09-1	Scenario #	1	Event #	5 & 6	Page	39	of	57
Event Description: SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high									
Time	Position	Applicant's Actions or Behavior							

Shortly afterwards, a 260 gpm SGTR 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." Ultimately, 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 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))
(XMT-CA012 (600 on 600 second ramp)) Trigger #13
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:	
		<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. 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 40 of 57Event Description: **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	<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. 	
		<ul style="list-style-type: none"> Start additional NV pump. 	
		<ul style="list-style-type: none"> IF CLAs are isolated, AND Pzr level is going down,..... 	NOTE: The CLAs are NOT isolated.
	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). 	NOTE: The SRO will dispatch an NLO. Booth Instructor: Operate Trigger #11 (LOA-SA003 (0)). Within 3 minutes , as NLO report that steam has been isolated to the TD CA Pump from the B SG.
	RO/ BOP	<ul style="list-style-type: none"> Trip reactor. 	
		<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.
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 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 41 of 57Event Description: **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"> 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.
	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.

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 42 of 57Event Description: **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 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. 	
	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. 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 43 of 57Event Description: **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"> 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). 	
	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:	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 44 of 57Event Description: **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	<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 PORV9s). 	
		<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. 	
		<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. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>5 & 6</u>	Page	<u>45</u>	of	<u>57</u>
Event Description: 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 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) 	
		<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	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 46 of 57Event Description: **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"> 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) 	
		<ul style="list-style-type: none"> 1EMF-27 (S/G D) 	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. If so, Booth Instructor acknowledge as Chemistry.
	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.

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 47 of 57Event Description: **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"> 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>
		<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). 	<p>NOTE: This is a Continuous Action. If NOT already done, the SRO will make both board operators aware.</p>
	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): 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 48 of 57Event Description: **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 	
		<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). 	
		<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.	

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Event Description: 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 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 	
		<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. 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 50 of 57Event Description: **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	<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. 	
		<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. 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 51 of 57Event Description: **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	<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. 	
		<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.

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 52 of 57Event Description: **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 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. 	
	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:	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>5 & 6</u>	Page	<u>53</u>	of	<u>57</u>
Event Description: SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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. 	
		(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). 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 54 of 57Event Description: **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	<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. 	
	RO / 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 	
		<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.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>1</u>	Event #	<u>5 & 6</u>	Page	<u>55</u>	of	<u>57</u>
Event Description:		SGTR (B)/ Aux Feed Flow Transmitter to B SG fails high							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
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). 	
	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) 	

Op Test No.: N09-1 Scenario # 1 Event # 5 & 6 Page 56 of 57Event Description: **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	<ul style="list-style-type: none">1NV-151A (NV Pumps Recirculation).	
		<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.			

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."
- 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).
- 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

Facility:	McGuire	Scenario No.:	2	Op Test No.:	N09-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	
Initial Conditions:	The Plant is at 95% power (MOL), following an unplanned load reduction due to the failure of the 1C1 Heater Drains Pump about 2 hours ago. The WCC has been informed, and it appears that corrective maintenance will be required. The crew will perform PT/1/A/4206/001B, "1B NI Pump Performance Test," upon completion of turnover. NLO (John) is standing by at the pump with a copy of the PT to support this activity.				
Turnover:	The following equipment is Out-Of-Service: PVI-5066, INST AIR SYS PRESS, has failed low (IAE is investigating). MCB Annunciator 1AD-6, D-4, "D NC PUMP LOWER MTR BRG LO KC FLO," is in constant alarm (IAE is investigating).				
Event No.	Malf. No.	Event Type*	Event Description		
1	XMT NI009	C-BOP C(TS)-SRO	Test the 1B NI Pump/Hot Pump Bearing		
2	MSR003E	R-RO C-BOP C-SRO	MSR Relief Valve fails open/Downpower		
3	IRE009	C-RO C-SRO	Rods fail to move in AUTO		
4	NC007D	C-BOP C(TS)-SRO	NC System Leak		
5	DEH008B	C-RO C-SRO	Turbine Control Unit failure		
6	NC007D	M-RO M-BOP M-SRO	Small Break LOCA (Loop D)		
7	NI001A	NA	1A NI Pump fails to Auto start		
8	NS001B	NA	1B NS Pump fails to start		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

DRAFT

McGuire 2009 NRC Scenario #2

The Plant is at 95% power (MOL), following an unplanned load reduction due to the failure of the 1C1 Heater Drains Pump about 2 hours ago. The WCC has been informed, and it appears that corrective maintenance will be required. The crew will perform PT/1/A/4206/001B, "1B NI Pump Performance Test," upon completion of turnover. NLO (John) is standing by at the pump with a copy of the PT to support this activity.

The following equipment is Out-Of-Service: PVI-5066, INST AIR SYS PRESS, has failed low (IAE is investigating). MCB Annunciator 1AD-6, D-4, "D NC PUMP LOWER MTR BRG LO KC FLO," is in constant alarm (IAE is investigating).

Shortly after taking the watch, the operator will be instructed to perform PT/1/A/4206/001B, "1B NI Pump Performance Test." During the performance of the test, the 1B NI Pump will develop a hot bearing. The operator will respond in accordance with OAC Alarm M1A0494, 1B NI PUMP MOTOR INBOARD BRG TEMP, and shutdown the pump. The operator will address Technical Specification 3.5.2, "ECCS-Operating."

After this, MSR Relief Valve 1HS179 will fail open causing a loss of turbine efficiency and an increase in reactor power. The operator will implement AP/1/A/5500/01, "Steam Leak." The operator will recognize the failure, and perform a rapid downpower in accordance with AP/1/A/5500/04, "Rapid Downpower," in an attempt to shut the valve. The valve will shut after power has been reduced to approximately 85-90%, and the operator will stabilize the plant.

During the downpower, the operator will observe that the Control Rods are not moving in Auto. The operator will place the rods in Manual in accordance with AP/1/A/5500/14, "Rod Control Malfunction," and control rods in manual as required to continue the downpower. After the Relief valve has closed, and the load decrease stabilized, the operator will implement AP/1/A/5500/14, "Rod Control Malfunction," Enclosure 2, "Failure of Rods to Move on Demand." The operator will direct IAE to investigate the problem, the problem will be corrected, and the Control Rods will be returned to Auto.

Subsequently, a 33 gpm NC System Cold Leg leak will develop on the Loop D connection to the Accumulator. The Operator will respond by implementing AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps," Case II, "NC System Leakage." The operator will address Technical Specification 3.4.13, "RCS Operational Leakage," and SLC 16.9.7, "Standby Shutdown System." The operator will reduce load to be in Mode 3 within an hour in accordance with AP/1/A/5500/04, "Rapid Downpower."

At the start of the downpower, a failure will occur in the Turbine Control Unit causing the unit to shift from Operator Auto to Manual control. The operator will address 1AD-1/F-4, TURBINE IN MANUAL, and control the Turbine manually during the downpower in accordance with OP/1/A/6300/001A, Enclosure 4.1, "Turbine Generator Load Change."

Shortly afterwards, the NC System Cold Leg leak will degrade into a Small Break LOCA. The operator will enter EP/1/A/5000/E-0, Reactor Trip or Safety Injection." Upon the

actuation of Safety Injection, the 1A NI Pump will fail to auto start, and must be manually started. Upon the actuation of Hi-Hi Containment pressure, the 1B NS Pump will trip on overload and be unavailable during the remainder of the event. During the performance of E-0, the Reactor Coolant Pumps (NCPs) will be required to be manually tripped upon reaching the established NCP trip criteria.

Upon completion of E-0, the operator will transition to EP/1/A/5000/E-1, "Loss of Reactor or Secondary Coolant." On the transition, an Orange Path will exist on the Containment Critical Safety Function, and the transition will be made to EP/1/A/5000/FR-Z.1, Response to High Containment Pressure," prior to E-1. Upon completion of FR-Z.1 the operator will transition to E-1.

The scenario will terminate at Step 14 of E-1, after the crew has determined to transition to EP/1/A/5000/ES-1.2, Post-LOCA Cooldown and Depressurization or upon a decision to transition to ES-1.3, "Transfer to Cold Leg Recirculation," based on E-1 Foldout Page criteria.

Critical Tasks:

SS (E1C)

Trip NC Pumps within 5 minutes of loss of SCM (4600/113/E13.1)

Safety Significance: Failure to trip all NCPs on a loss of subcooled margin can lead to core uncover and to fuel temperatures in excess of 2200°F. PT/0/A/4600/113, Enclosure 13.1 states that McGuire is committed to having NC Pumps tripped within 5 minutes of a loss of subcooling. The Safety Analysis recommends that the NC Pumps be tripped within 2 minutes to limit the depth and duration of core uncover. It is a management expectation that the NC Pumps be tripped as quickly as possible, but within 5 minutes of a loss of subcooling. Failure to take this action represents mis-operation by the operator which leads to degradation of the fuel cladding fission produce barrier, and a violation of a license condition.

E-0 J

Establish flow from at least one intermediate-head ECCS Pump before transitioning out of E-0.

Safety Significance: Failure to manually start at least one intermediate-head ECCS Pump under the postulated conditions constitutes "mis-operation or incorrect crew performance which leads to degraded ECCS capacity." The acceptable results obtained in the FSAR analysis of a small-break LOCA are based the assumption of the minimum ECCS injection flow, which assumes flow from one train of ECCS consisting of a high-head, intermediate head and low head pump, are met. If the crew fails to start the 1A NI Pump, the FSAR assumptions will not be met creating a condition where the plant is operated in an unanalyzed condition and in a manner which has violated the facility license.

N09-1-2

Event 1

- PT/1/A/4206/001B, 1B NI PUMP PERFORMANCE TEST
- TECHNICAL SPECIFICATION 3.5.2, ECCS - OPERATING

Events 2/3

- AP/1/A/5500/01, STEAM LEAK
- AP/1/A/5500/04, RAPID DOWNPOWER
- AP/1/A/5500/14, ROD CONTROL MALFUNCTION
- AP/1/A/5500/14, ROD CONTROL MALFUNCTION, ENCLOSURE 2, FAILURE OF RODS TO MOVE ON DEMAND
- TECHNICAL SPECIFICATION 3.4.1, "RCS PRESSURE, TEMPERATURE and FLOW DEPARTURE FROM NUCLEATE BOILING (DNB) LIMITS

Event 4

- AP/1/A/5500/10, NC SYSTEM LEAKAGE WITHIN the CAPACITY of BOTH NV PUMPS CASE II, NC SYSTEM LEAKAGE
- TECHNICAL SPECIFICATION 3.4.13, RCS OPERATIONAL LEAKAGE
- SELECTED LICENSEE COMMITMENT 16.9.7, STANDBY SHUTDOWN SYSTEM
- AP/1/A/5500/04, RAPID DOWNPOWER

Event 5

- OP/1/A/6100/001B, ANNUNCIATOR RESPONSE FOR PANEL 1AD-1 F-4, TURBINE IN MANUAL
- OP/1/A/6300/001A, TURBINE GENERATOR LOAD CHANGE

Events 6/7/8

- EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION
- E-0, REACTOR TRIP OR SAFETY INJECTION, ENCLOSURE 2, PHASE B HVAC EQUIPMENT
- EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION, ENCLOSURE 3, UNCONTROLLED NC SYSTEM COOLDOWN
- EP/1/A/5000/FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE
- EP/1/A/5000/E-1, LOSS OF REACTOR OR SECONDARY COOLANT

PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 25
TOPIC: NRC Simulator Exam
Scenario N09-1-2

REFERENCES:

1. PT/1/A/4206/001B, "1B NI Pump Performance Test."
2. OAC Alarm M1A0494, "1B NI PUMP MOTOR INBOARD BRG TEMP."
3. McGuire Technical Specifications.
4. AP/1/A/5500/01, "Steam Leak."
5. AP/1/A/5500/04, "Rapid Downpower."
6. AP/1/A/5500/14, "Rod Control Malfunction."
7. AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps."
8. McGuire Nuclear Station Selected Licensee Commitments Manual.
9. OP/1/A/6100/010B, "Annunciator Response For Panel 1AD-1."
10. OP/1/A/6300/001A, "Turbine Generator Load Change."
11. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
12. EP/1/A/5000/FR-Z-1, "Response to High Containment Pressure."
13. EP/1/A/5000/E-1, "Loss of Reactor or Secondary Coolant."
14. EP/1/A/5000/ES-1.2, "Post-LOCA Cooldown and Depressurization."
15. EP/1/A/5000/ES-1.3, "Transfer to Cold Leg Recirculation."
16. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review: 

Rev. 020509

Scenario Event Description

NRC Scenario 2

Facility:	McGuire	Scenario No.:	2	Op Test No.:	N09-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	
Initial Conditions:		The Plant is at 95% power (MOL), following an unplanned load reduction due to the failure of the 1C1 Heater Drains Pump about 2 hours ago. The WCC has been informed, and it appears that corrective maintenance will be required. The crew will perform PT/1/A/4206/001B, "1B NI Pump Performance Test," upon completion of turnover. NLO (John) is standing by at the pump with a copy of the PT to support this activity.			
Turnover:		The following equipment is Out-Of-Service: PVI-5066, INST AIR SYS PRESS, has failed low (IAE is investigating). MCB Annunciator 1AD-6, D-4, "D NC PUMP LOWER MTR BRG LO KC FLO," is in constant alarm (IAE is investigating).			
Event No.	Malf. No.	Event Type*	Event Description		
1	^{XMT} NI009	C-BOP C(TS)-SRO	Test the 1B NI Pump/Hot Pump Bearing		
2	MSR003E	R-RO C-BOP C-SRO	MSR Relief Valve fails open/Downpower		
3	IRE009	C-RO C-SRO	Rods fail to move in AUTO		
4	NC007D	C-BOP C(TS)-SRO	NC System Leak		
5	DEH008B	C-RO C-SRO	Turbine Control Unit failure		
6	NC007D	M-RO M-BOP M-SRO	Small Break LOCA (Loop D)		
7	NI001A	NA	1A NI Pump fails to Auto start		
8	NS001B	NA	1B NS Pump fails to start		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

McGuire 2009 NRC Scenario #2

The Plant is at 95% power (MOL), following an unplanned load reduction due to the failure of the 1C1 Heater Drains Pump about 2 hours ago. The WCC has been informed, and it appears that corrective maintenance will be required. The crew will perform PT/1/A/4206/001B, "1B NI Pump Performance Test," upon completion of turnover. NLO (John) is standing by at the pump with a copy of the PT to support this activity.

The following equipment is Out-Of-Service: PVI-5066, INST AIR SYS PRESS, has failed low (IAE is investigating). MCB Annunciator 1AD-6, D-4, "D NC PUMP LOWER MTR BRG LO KC FLO," is in constant alarm (IAE is investigating).

Shortly after taking the watch, the operator will be instructed to perform PT/1/A/4206/001B, "1B NI Pump Performance Test." During the performance of the test, the 1B NI Pump will develop a hot bearing. The operator will respond in accordance with OAC Alarm M1A0494, 1B NI PUMP MOTOR INBOARD BRG TEMP, and shutdown the pump. The operator will address Technical Specification 3.5.2, "ECCS-Operating."

After this, MSR Relief Valve 1HS179 will fail open causing a loss of turbine efficiency and an increase in reactor power. The operator will implement AP/1/A/5500/01, "Steam Leak." The operator will recognize the failure, and perform a rapid downpower in accordance with AP/1/A/5500/04, "Rapid Downpower," in an attempt to shut the valve. The valve will shut after power has been reduced to approximately 85-90%, and the operator will stabilize the plant.

During the downpower, the operator will observe that the Control Rods are not moving in Auto. The operator will place the rods in Manual in accordance with AP/1/A/5500/14, "Rod Control Malfunction," and control rods in manual as required to continue the downpower. After the Relief valve has closed, and the load decrease stabilized, the operator will implement AP/1/A/5500/14, "Rod Control Malfunction," Enclosure 2, "Failure of Rods to Move on Demand." The operator will direct IAE to investigate the problem, the problem will be corrected, and the Control Rods will be returned to Auto.

Subsequently, a 33 gpm NC System Cold Leg leak will develop on the Loop D connection to the Accumulator. The Operator will respond by implementing AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps," Case II, "NC System Leakage." The operator will address Technical Specification 3.4.13, "RCS Operational Leakage," and SLC 16.9.7, "Standby Shutdown System." The operator will reduce load to be in Mode 3 within an hour in accordance with AP/1/A/5500/04, "Rapid Downpower."

At the start of the downpower, a failure will occur in the Turbine Control Unit causing the unit to shift from Operator Auto to Manual control. The operator will address 1AD-1/F-4, TURBINE IN MANUAL, and control the Turbine manually during the downpower in accordance with OP/1/A/6300/001A, Enclosure 4.1, "Turbine Generator Load Change."

Shortly afterwards, the NC System Cold Leg leak will degrade into a Small Break LOCA. The operator will enter EP/1/A/5000/E-0, Reactor Trip or Safety Injection." Upon the actuation of Safety Injection, the 1A NI Pump will fail to auto start, and must be manually started. Upon the actuation of Hi-Hi Containment pressure, the 1B NS Pump will trip on overload and be unavailable during the remainder of the event. During the performance of E-0, the Reactor Coolant Pumps (NCPs) will be required to be manually tripped upon reaching the established NCP trip criteria.

Scenario Event Description

NRC Scenario 2

Upon completion of E-0, the operator will transition to EP/1/A/5000/E-1, "Loss of Reactor or Secondary Coolant." On the transition, an Orange Path will exist on the Containment Critical Safety Function, and the transition will be made to EP/1/A/5000/FR-Z.1, Response to High Containment Pressure," prior to E-1. Upon completion of FR-Z.1 the operator will transition to E-1.

The scenario will terminate at Step 14 of E-1, after the crew has determined to transition to EP/1/A/5000/ES-1.2, Post-LOCA Cooldown and Depressurization or upon a decision to transition to ES-1.3, "Transfer to Cold Leg Recirculation," based on E-1 Foldout Page criteria.

Critical Tasks:

SS (E1C)

Trip NC Pumps within 5 minutes of loss of SCM (4600/113/E13.1)

Safety Significance: Failure to trip all NCPs on a loss of subcooled margin can lead to core uncover and to fuel temperatures in excess of 2200°F. PT/0/A/4600/113, Enclosure 13.1 states that McGuire is committed to having NC Pumps tripped within 5 minutes of a loss of subcooling. The Safety Analysis recommends that the NC Pumps be tripped within 2 minutes to limit the depth and duration of core uncover. It is a management expectation that the NC Pumps be tripped as quickly as possible, but within 5 minutes of a loss of subcooling. Failure to take this action represents mis-operation by the operator which leads to degradation of the fuel cladding fission produce barrier, and a violation of a license condition.

E-0 J

Establish flow from at least one intermediate-head ECCS Pump before transitioning out of E-0.

Safety Significance: Failure to manually start at least one intermediate-head ECCS Pump under the postulated conditions constitutes "mis-operation or incorrect crew performance which leads to degraded ECCS capacity." The acceptable results obtained in the FSAR analysis of a small-break LOCA are based the assumption of the minimum ECCS injection flow, which assumes flow from one train of ECCS consisting of a high-head, intermediate head and low head pump, are met. If the crew fails to start the 1A NI Pump, the FSAR assumptions will not be met creating a condition where the plant is operated in an unanalyzed condition and in a manner which has violated the facility license.

Scenario Event Description

NRC Scenario 2

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		Reset to Temp I/C 151.	<p>MOC, 95% RTP, Train B in Operation. 1C1 HDTP Secured.</p> <ul style="list-style-type: none"> • MAL- NI001A, Value = 0 (Auto), Insert; Failure of 1A NI Pump to start in Auto. • XMT-VI003, Value= 0, Insert; Fails Instrument Air System Pressure Low (PVI_5066). • ANN-AD006-D04, Value= 0 (On); 1AD-6 D-4 (D NC Pump Lower Mtr Brg Low KC Flow). • MAL- NS001B, Value= 2 (Both), Insert; Failure of 1B NS Pump to start in Manual or Auto.
<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. Spec. Log.	
<input type="checkbox"/>		Fill out the NLO's Available section of Shift Turnover Info.	

Scenario Event Description
NRC Scenario 2

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Prior to Crew Briefing	RUN	
<input type="checkbox"/>	<p style="text-align: center;">Crew Briefing</p> <ol style="list-style-type: none"> 1. Assign Crew Positions based on evaluation requirements. 2. Provide CRSRO with a copy of PT/1/A/4206/001B, with Steps 12.1 and 12.2 signed off, and indicate that when the crew takes the watch, this surveillance will need to be performed. 3. Provide CRSRO with Manual TSAIL Form for 1B NI Pump. 4. Review the Shift Turnover Information with the crew. 5. 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	XMT-NI009 Set = 300 Ramp = 360 seconds Trigger #1	Test the 1B NI Pump/Hot Pump Bearing LOA-NI015, Rack Out 1B NI Pump Breaker, Trigger #13
<input type="checkbox"/>	At direction of examiner	MALF-MSR003E Set = 25 Ramp = 0 Trigger #3	MSR Relief Valve fails open/Downpower 1HS-179 (1C2 MSR Relief) Fails to 25% Open
<input type="checkbox"/>	As indicated in event 2	MALF-IRE009 Set = 0 Trigger #5	Rods fail to move in AUTO
<input type="checkbox"/>	At direction of examiner	MALF-NC007D Severity= 0.2 Ramp = 30 Trigger #7	NC System leak loop #4 0.2 = 33GPM

Scenario Event Description
NRC Scenario 2

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	When the RO presses GO on the Turbine Controls	MALF-DEH008B Trigger #9	Turbine Control Unit Failure
<input type="checkbox"/>	At direction of examiner	MALF-NC007D Set = 3 Ramp = 45 seconds	<p>Small Break LOCA (Loop D)</p> <p>(Small Break LOCA – NC System Pressure stabilizes @ 1150)</p> <p>Step 14 RNO g of E-0: Use the following LOAs:</p> <p>Step 5 of FR-Z.1: Use the following LOAs:</p> <p>NI024 = Racked In</p> <p>NI025 = Racked In</p> <p>Step 15.b of FR-Z.1: Use the following LOAs:</p> <p>VX009 = In Service/Enabled</p> <p>VX010 = In Service/Enabled</p> <p>Step 11.f of E-1: Use the following LOAs:</p> <p>DG003 = Stop D/G</p> <p>DG004 = Stop D/G</p>
<input type="checkbox"/>	At direction of examiner	MALF-NI001A Set = 1 Insert at T=0	<p>1A NI Pump fails to Auto Start</p> <p>MAL- NI001A, Value = 0 (Auto), Insert; Failure of 1A NI Pump to start in Auto.</p>
<input type="checkbox"/>	At direction of examiner	MALF-NS001B Set = 2 Insert at T=0	<p>1B NS Pump fails to start</p> <p>MAL- NS001B, Value= 2 (Both), Insert; Failure of 1B NS Pump to start in Manual or Auto.</p>
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>63</u>
Event Description: Test the 1B NI Pump/Hot Pump Bearing									
Time	Position	Applicant's Actions or Behavior							

Shortly after taking the watch, the operator will be instructed to perform PT/1/A/4206/001B, "1B NI Pump Performance Test." During the performance of the test, the 1B NI Pump will develop a hot bearing. The operator will respond in accordance with OAC Alarm M1A0494, 1B NI PUMP MOTOR INBOARD BRG TEMP, and shutdown the pump. The operator will address Technical Specification 3.5.2, "ECCS-Operating."

Booth Operator Instructions: Operate Trigger #1 (XMT-NI009 (300 over 360 seconds))

Indications Available: (After NI Pump is started)

- OAC Alarm M1A0494, 1B NI Pump Motor Inboard Brg Temp, increasing

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: During the performance of this test, the BOP may contact the NLO (John) locally at the pump for information regarding the pump operations. If so, Booth Instructor, respond as appropriate, without diagnosing the malfunction for the BOP.
PT/1/A/4206/001B, 1B NI PUMP PERFORMANCE TEST			
	BOP	(Step 12.3) Record initial position of the following:	
		<ul style="list-style-type: none"> • 1NI0118A (1A NI Pump Disch To NC Cold Legs Isol) 	
		<ul style="list-style-type: none"> • 1NI-121A (1A NI Pump Disch To B & C HL Cont Outside) 	
		<ul style="list-style-type: none"> • 1NI-150B (1B NI Pump To NC Cold Legs Isol) 	
		<ul style="list-style-type: none"> • 1NI-152B (1B NI Pump Disch To A & D HL Cont Outside) 	
		<ul style="list-style-type: none"> • 1NI-162A (Unit 1 NI To Cold Legs Cont Outside Isol) 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>9</u>	of	<u>63</u>
Event Description: Test the 1B NI Pump/Hot Pump Bearing									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12.4) IF NC System Pressure is less than 1B NI Pump discharge pressure....	NOTE: NC System pressure is > 1B NI Pump discharge pressure.
	BOP	(Step 12.5) Ensure open 1NI-118A (Train A NI to Cold Leg Isol).	
	SRO	(Step 12.6) Ensure PRA Risk interactions evaluated PRIOR to performing Step 12.7 (due to inoperable and unavailable). {PIP M-06-01610}	
	SRO	(Step 12.7) Declare 1B NI Pump inoperable and unavailable.	NOTE: The SRO will address LCO 3.5.2, and determine that one train is inoperable, requiring Condition A.
	BOP	(Step 12.8) Ensure closed 1NI-150B (Train B NI to Cold Leg Isol).	
	BOP	(Step 12.9) Check open 1NI-100B (FWST to NI Pumps).	
	BOP	(Step 12.10) IF 1NIPG5240 (1B NI Pump Suction Press) defective or out-of calibration....	NOTE: 1NIPG5240 is NOT defective or out-of calibration.
	BOP	(Step 12.11) Start 1B 1NI Pump.	NOTE: The RO will likely make a plant announcement regarding the NI pump start.
	BOP	(Step 12.12) Check open 1RN-215B (B NI Pump Cooler Sup Isol).	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>10</u>	of	<u>63</u>
Event Description: Test the 1B NI Pump/Hot Pump Bearing									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The BOP may call NLO (John) to address the pump operation. If so, Booth Instructor acknowledge as NLO, and report that the pump is running normally .
	BOP	(Step 12.13) Check 1NI-101 (Unit 1 FWST To NI Pump Chk) partial stroked by observing normal pump operation.	
	BOP	(Step 12.14) Check 1B NI Pump flow rate is greater than 25 gpm per 1FWP5250 or 1FWPG5250 (Unit 1 Safety Injection Miniflow) to check 1NI-143 (1B NI Pump Miniflow Chk) full stroked.	
	BOP	(Step 12.15) Check 1B NI Pump minimum flow rate is greater than 35 gpm per 1FWP5250 or 1FWPG5250 (Unit 1 Safety Injection Miniflow) to check 1NI-114 (1A NI Pump Miniflow Chk) backseated AND prevent gross diversion of flow.	
	BOP	(Step 12.16) IF 1NIPG5320 (1B NI Pump Disch Press) defective or out-of-calibration	NOTE: 1NIPG5320 is NOT defective or out-of calibration.
	BOP	(Step 12.17) WHEN pump conditions stabilize, allow 1B NI Pump to operate for at least 2 minutes.	
	BOP	(Step 12.18) Record Inservice data for 1B NI Pump as required by Enclosure.	NOTE: The BOP/RO responds to the OAC Alarm on the 1B NI Pump.
			NOTE: The BOP may NOT address the ARP before deciding to stop the 1B NI Pump.

Op Test No.: N09-1 Scenario # 2 Event # 1 Page 11 of 63Event Description: **Test the 1B NI Pump/Hot Pump Bearing**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
M1A0494, OAC ALARM 1B NI PUMP MOTOR INBOARD BRG TEMP - HI			
	BOP / NLO	(HI Step 1) Check oil level on affected motor.	NOTE: The BOP will need to contact NLO (John). Booth Instructor: as NLO, acknowledge.
	BOP / NLO	(HI Step 2) If oil level is low (below red tape), add oil or shutdown affected NI pump.	Booth Instructor: as NLO, report oil level normal.
	BOP / NLO	(HI Step 3) If oil ring is not rotating, shutdown affected NI pump.	Booth Instructor: as NLO, report oil ring is rotating.
	BOP	(HI Step 4) If motor bearing temperature is increasing greater than 2°F per minute, shutdown affected NI pump.	NOTE: The BOP will stop the 1B NI Pump.
	BOP	(HI Step 5) Monitor affected NI motor bearing temperature on point trend.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>12</u> of <u>63</u>
Event Description: Test the 1B NI Pump/Hot Pump Bearing							
Time	Position	Applicant's Actions or Behavior					

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(HI Step 6) Notify Engineering of the High NI motor bearing temperature.	<p>NOTE: SRO may call WCC/SE to address the pump bearing temperature.</p> <p>If so, Booth Instructor acknowledge as WCC.</p> <p>Within 5 minutes, Booth Instructor:</p> <p>Call, as NLO, and report that the 1B NI Pump breaker will be opened.</p> <p>Use LOA-NI015 (Racked Out) to remove pump from service.</p> <p>Within 2 minutes, report that the 1B NI Pump breaker has been racked out.</p>
	SRO	(HI-HI Step 1) Evaluate shifting malfunctioning NI pump.	
	SRO	(HI-HI Step 2) If in Mode 1, 2, or 3, refer to TS 3.5.2.	<p>NOTE: The SRO will address LCO 3.5.2.</p>
PT/1/A/4206/001B, 1B NI PUMP PERFORMANCE TEST			
	BOP	(Step 12.21) Stop 1B NI Pump.	<p>NOTE: The 1B NI Pump should be already stopped by this time.</p>
	BOP	(Step 12.22) Vent the NI System pressure.	<p>NOTE: The BOP should direct NLO (John) to vent the NI System Pressure by performing all of Step 12.22.</p>

Op Test No.: N09-1 Scenario # 2 Event # 1 Page 13 of 63Event Description: **Test the 1B NI Pump/Hot Pump Bearing**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
TECHNICAL SPECIFICATION 3.5.2, ECCS - OPERATING					
	SRO	3.5.2 ECCS – Operating			NOTE: The SRO will address LCO 3.5.2, and determine that one train is inoperable, requiring Condition A, and that the TS Action will be applicable for a longer period of time than anticipated.
	SRO	LCO 3.5.2 Two ECCS trains shall be OPERABLE.			
	SRO	APPLICABILITY:			
		MODES 1, 2, and 3.			
	SRO	ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. One or more trains inoperable. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	A.1 Restore train(s) to OPERABLE status.	72 hours	
					NOTE: SRO will likely conduct a Focus Brief.
At the discretion of the Lead Examiner, move to Events #2-3.					

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>14</u>	of	<u>63</u>
Event Description: MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO									
Time	Position	Applicant's Actions or Behavior							

After this, MSR Relief Valve 1HS179 will fail open causing a loss of turbine efficiency and an increase in reactor power. The operator will implement AP/1/A/5500/01, "Steam Leak." The operator will recognize the failure, and perform a rapid downpower in accordance with AP/1/A/5500/04, "Rapid Downpower," in an attempt to shut the valve. The valve will shut after power has been reduced to approximately 85-90%, and the operator will stabilize the plant. During the downpower, the operator will observe that the Control Rods are not moving in Auto. The operator will place the rods in Manual in accordance with AP/1/A/5500/14, "Rod Control Malfunction," and control rods in manual as required to continue the downpower. After the Relief valve has closed, and the load decrease stabilized, the operator will implement AP/1/A/5500/14, "Rod Control Malfunction," Enclosure 2, "Failure of Rods to Move on Demand." The operator will direct IAE to investigate the problem, the problem will be corrected, and the Control Rods will be returned to Auto.

Booth Operator Instructions: Operate Trigger #3 (MALF-MSR003E (25))

Indications Available:

- MWe decreases.
- Main Turbine Governor Valves open.
- Tavg decreases.
- Excore Nuclear Instruments indicate ≈100%.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/01, STEAM LEAK			
			NOTE: The SRO may dispatch NLOs to look for steam leaks. If so, Booth Instructor as NLO, respond back in 3-5 minutes per script (See Page 16).
	SRO	(Step 1) Monitor Foldout page.	
	RO	(Step 2) Reduce turbine load to maintain the following:	NOTE: The RO may take the Turbine Control to MANUAL.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>15</u>	of	<u>63</u>
Event Description:		MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Excore NI's – LESS THAN OR EQUAL TO 100% 	NOTE: The power level was originally at 95% and increased to 100%. The SRO will direct that power be maintained at initial power level.
		<ul style="list-style-type: none"> NC Loop D/T's – LESS THAN 60°F D/T 	
		<ul style="list-style-type: none"> T-Ave – AT T-REF. 	
	SRO	(Step 3) Check containment entry – IN PROGRESS.	NOTE: There is no Containment Entry in progress.
	SRO	(Step 3 RNO) GO TO Step 5.	
	BOP	(Step 5) Check Pzr pressure prior to event – GREATER THAN P-11 (1955 PSIG)	
	BOP	(Step 6) Check Pzr level – STABLE OR GOING UP	
	SRO	(Step 7) IF AT ANY TIME while in this procedure Pzr level cannot be maintained stable, THEN RETURN TO Step 6.	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	(Step 8) GO TO Step 12.	
	SRO	(Step 12) Announce occurrence on paging system.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 13) Identify and isolate leak on Unit 1:	
		<ul style="list-style-type: none"> Check SM PORVs – CLOSED. 	

Op Test No.: N09-1 Scenario # 2 Event # 2 & 3 Page 16 of 63Event Description: **MSR Relief Valve fails open/Downpower/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 condenser dump valves – CLOSED. 	
	RO / BOP	<ul style="list-style-type: none"> Check containment conditions – NORMAL: 	
		<ul style="list-style-type: none"> Containment temperature 	
		<ul style="list-style-type: none"> Containment pressure 	
		<ul style="list-style-type: none"> Containment humidity 	
		<ul style="list-style-type: none"> Containment floor and equipment sump level. 	
		<ul style="list-style-type: none"> Check TD CA pump – OFF. 	
		<ul style="list-style-type: none"> Check valves “STEAM LINE DRAIN VALVES” board (1MC-9) - CLOSED 	
	SRO	<ul style="list-style-type: none"> Check opposite Unit (Unit 2) “STEAM HEADER PRESSURE” – GREATER THAN 200 PSIG. 	NOTE: SRO will ask U2 RO. If so, Floor Instructor acknowledge as U2 RO, and report U2 Steam Header Pressure is > 200 psig.
		<ul style="list-style-type: none"> Dispatch operator to check for leaks. 	NOTE: If not already done, the SRO will dispatch NLOs to look for steam leaks. After 2-3 minutes , Booth Instructor , as NLO , report that an MSR Shell Side Relief Valve is lifting .
	RO / BOP	(Step 14) Check UST level – STABLE OR GOING U P.	
	BOP	(Step 14 RNO) Makeup to UST as required to maintain level.	
	SRO	(Step 15) Evaluate unit shutdown as follows:	
		<ul style="list-style-type: none"> Check unit status – IN MODE 1 OR 2. 	
		<ul style="list-style-type: none"> Determine if unit shutdown or load reduction is warranted based on the following criteria: 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>17</u>	of	<u>63</u>
Event Description: MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Size of leak 	
		<ul style="list-style-type: none"> Location of leak 	
		<ul style="list-style-type: none"> Rate of depletion of secondary inventory 	
		<ul style="list-style-type: none"> IF steam is leaking from a secondary heater relief OR MSR relief valve, THEN reducing turbine load may reduce pressure enough to close relief valve. 	
		<ul style="list-style-type: none"> IF turbine trip will isolate steam leak (such as feedwater heater leak or MSR leak), THEN it may be desirable to perform an orderly shutdown of the turbine and maintain reactor power in Mode 1. 	
		<ul style="list-style-type: none"> Check unit shutdown or load reduction – REQUIRED. 	NOTE: It is necessary to reduce load in an attempt to close the lifting relief valve.
		<ul style="list-style-type: none"> Check reactor trip – REQUIRED. 	NOTE: A reactor trip is NOT required.
	SRO	(Step 15.d RNO) GO TO Step 15.h.	
	SRO	<ul style="list-style-type: none"> (Step 15.h) Determine if turbine trip is desired to isolate steam leak: 	
		<ul style="list-style-type: none"> Check steam leak location – KNOWN TO BE ISOLABLE BY TURBINE TRIP 	
		<ul style="list-style-type: none"> Turbine trip – DESIRED. 	NOTE: A turbine trip is NOT desired.
	SRO	(Step 15.h RNO) Perform the following:	
		<ul style="list-style-type: none"> Reduce load as necessary PER one of the following: 	
		<ul style="list-style-type: none"> OP/1/A/6100/003 (Controlling Procedure For Unit Operation), Enclosure 4.2 (Power Reduction) 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>18</u>	of	<u>63</u>
Event Description:		MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		OR	
		<ul style="list-style-type: none"> AP/1/A/5500/04 (Rapid Downpower). 	NOTE: The SRO will transition to AP-4.
AP/1/A/5500/04, RAPID DOWNPOWER			
	SRO	(Step 1) Monitor Foldout page.	
	SRO	(Step 2) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 3) Check turbine control – IN AUTO.	
	RO	(Step 3 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF auto turbine control not available,..... 	NOTE: Auto turbine control is available.
		<ul style="list-style-type: none"> Place turbine control in auto. 	
	RO	(Step 4) Check "MW LOOP" – IN SERVICE.	
	RO	(Step 4 RNO) Depress "MW IN/MW OUT" pushbutton.	
	RO	(Step 5) Check shutdown to Mode 3 – DESIRED.	
	SRO	(Step 5 RNO) Observe Note prior to Step 8 and GO TO Step 8.	
	SRO	(Step 8) Determine the required power reduction rate (MW/min).	NOTE: The CRSRO will reduce load at ≈20MWe/minute.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>19</u>	of	<u>63</u>
Event Description: MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 9) Check control rods – IN AUTO.	
	BOP	(Step 10) Notify SOC of load reduction (red dispatcher phone).	Booth Instructor: as SOC, acknowledge.
	RO	(Step 11) Initiate turbine load reduction to desired load at desired rate.	
Booth Instructor: Operate Trigger #5 (MALF-IRE009 (0)). During the downpower, the operator will observe that the Control Rods are not moving in Auto. The operator will place the rods in Manual in accordance with AP/1/A/5500/14, "Rod Control Malfunction," and control rods in manual as required to continue the downpower. After the Relief valve has closed, and the load decrease stabilized, the operator will implement AP/1/A/5500/14, "Rod Control Malfunction," Enclosure 2, "Failure of Rods to Move on Demand." The operator will direct IAE to investigate the problem, the problem will be corrected, and the Control Rods will be returned to Auto.			
	BOP	(Step 12) Borate NC System as follows:	
		<ul style="list-style-type: none"> Energize all backup Pzr heaters. 	
		<ul style="list-style-type: none"> Determine boration amount based on the following: 	
		<ul style="list-style-type: none"> Power Reduction Rate (MW/min) 	
		<ul style="list-style-type: none"> Present NC System Boron Concentration (ppm) 	
		<ul style="list-style-type: none"> Total Power change (%). 	
		<ul style="list-style-type: none"> Record calculated boration amount: 	
	RO	<ul style="list-style-type: none"> Check auto or manual rod control – AVAILABLE. 	
	BOP	<ul style="list-style-type: none"> Perform boration in 4 equal additions during load reduction PER OP/1/A/6150/009 (Boron Concentration Control), Enclosure 4.7 (Boration Using 1NV-265B (Boric Acid to NV Pumps)). 	

Op Test No.: N09-1 Scenario # 2 Event # 2 & 3 Page 20 of 63Event Description: **MSR Relief Valve fails open/Downpower/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 13) Check control rods – MOVING IN AS REQUIRED TO MAINTAIN T-AVG AT T-REF.	NOTE: The rods are NOT moving inward in AUTO, and the operator will be inserting rods manually.
	RO	(Step 13 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF manual control available, THEN move control rods in manual as necessary to maintain T-Avg at T-Ref. 	
		<ul style="list-style-type: none"> IF rods cannot be moved in auto or manual,..... 	NOTE: Rods can be inserted manually.
	RO	(Step 14) Display Rod Insertion Limits on OAC by entering turn on code "RIL".	
	SRO	(Step 15) IF AT ANY TIME "CONTROL ROD BANK LO LO LIMIT" alarm (1AD-2, B-9) is lit, THEN perform one of the following to comply with Tech Spec 3.1.6 (Control Bank Insertion Limits):	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Ensure alarm clears within one hour as Xenon builds in. 	
		OR	
		<ul style="list-style-type: none"> Initiate boration as necessary within one hour to restore control rods above insertion limits. 	
	SRO	(Step 16) IF AT ANY TIME during this procedure C-7A is received, THEN ensure Transient Monitor freeze is triggered.	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	RO	(Step 17) Check turbine impulse pressure – GREATER THAN 260 PSIG.	
	SRO	(Step 18) REFER TO the following:	
		<ul style="list-style-type: none"> RP/0/A/5700/000 (Classification of Emergency) 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>21</u>	of	<u>63</u>
Event Description: MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> RP/0/A5700/010 (NRC Immediate Notification Requirements). 	NOTE: SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
	SRO	(Step 19) Notify Reactor Group Duty Engineer of load reduction.	NOTE: SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM. The SRO may call WCC/RE to address the switch position. If so, Booth Instructor acknowledge as WCC.
	SRO	(Step 20) Check target load – LESS THAN 1000 MW.	
	SRO	(Step 21) Check Unit 2 – AVAILABLE TO SUPPLY AUX STEAM (AS) HEADER.	
	SRO	(Step 22) Dispatch operator to ensure the following valves are open:	
		<ul style="list-style-type: none"> 1AS-74 (Unit 1 Unit 2 Aux Steam Hdr Cross-Tie Isol) (service bldg, 739+12, room 202, R-27, over B RL Pump) 	
		<ul style="list-style-type: none"> Unit 2 valve 2AS-74 (Unit 1 & Unit 2 Aux Steam Hdr Cross-Tie Isol) (service bldg, 739+14, room 202, S-27, above RL strainer. 	
		<ul style="list-style-type: none"> 1AS-253 (Unit 1 Aux Steam Hdr Isol) (service bldg, 739+15 P-28 above overhead door to Unit 1 turbine bldg). 	NOTE: The SRO will dispatch an NLO. If so, Floor Instructor acknowledge as NLO , and after 5 minutes , report back that the valves are OPEN .

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>22</u>	of	<u>63</u>
Event Description:		MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
Booth Instructor: At 85-90% power, or at the discretion of the Lead Examiner: Delete MALF-MSR003E Call as the NLO and report that the MSR Shell Side Relief Valve has CLOSED.			
			NOTE: The SRO will stabilize the Unit and transition to AP-1, Step 16.
AP/1/A/5500/01, STEAM LEAK			
	RO	(Step 16) Check MSIVs – CLOSED.	
	SRO	(Step 16 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF AT ANY TIME MSIVs are closed, THEN perform Step 17. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> GO TO Step 18. 	
	SRO	(Step 18) IF AT ANY TIME the steam release path is isolated, THEN exit this procedure.	NOTE: The SRO will transition to AP-14, due to the failure of rods to move in automatic.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
	RO	(Step 1) IF more than one rod dropped,.....	NOTE: No control rods dropped during this event.
	RO	(Step 2) Place control rods in manual.	NOTE: The RO placed the rods in manual during the downpower when the malfunction occurred.

Op Test No.: N09-1 Scenario # 2 Event # 2 & 3 Page 23 of 63Event Description: **MSR Relief Valve fails open/Downpower/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 rod movement – STOPPED.	NOTE: There was no rod motion when the Rods were taken to Manual during the downpower.
	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:	
		• “1A NC LOOP T-AVG”	
		• “1B NC LOOP T-AVG”	
		• “1C NC LOOP T-AVG”	
		• 1D NC LOOP T-AVG”	
		• “TURB IMP PRESS CH 1”	
		• T-Ref indication.	
	RO	(Step 7) Check Nuclear Power P/R Channels – NORMAL.	
	SRO	(Step 8) IF this AP entered due to unwarranted rod insertion or withdrawal....	NOTE: This AP was NOT entered due to unwarranted rod insertion or withdrawal.
	SRO	(Step 9) IF this AP entered due to a failure of rods to withdraw or insert when required, THEN GO TO Enclosure 2 (Failure Of Rods To Move On Demand).	NOTE: The SRO will transition to AP-14, Enclosure 2.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION ENCLOSURE 2, FAILURE OF RODS TO MOVE ON DEMAND			

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>2 & 3</u>	Page	<u>24</u>	of	<u>63</u>
Event Description: MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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.
	RO	(Step 2) Maintain T-Avg within 1°F of programmed T-Ref as follows:	
		• Adjust Turbine load	
		OR	
		• Borate/dilute NC System.	
	RO	(Step 3) Check for control system failure as follows:	
		• "ROD CONTROL URGENT FAILURE" alarm (1AD-2-, A-10) – LIT.	
	RO	(Step 3 RNO) Perform the following:	
		• IF manual rod control available, THEN rods can be used to maintain T-Avg within 1°F of programmed T-Ref.	NOTE: Rods were used in manual during the downpower to control T-Avg within 1°F of programmed T-Ref.
	SRO	• GO TO Step 5.	
	SRO	(Step 5) Notify rod control system qualified IAE personnel to investigate problem.	NOTE: SRO may call WCC/IAE to address the switch position. If so, Booth Instructor acknowledge as WCC.
	SRO	(Step 6) IF AT ANY TIME a runback occurs while in this procedure, THEN observe the following guidance:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		• IF IAE has determined that it is permissible to move rods, THEN respond to the runback PER AP/1/A/5500/03 (Load Rejection).	

Op Test No.: N09-1 Scenario # 2 Event # 2 & 3 Page 25 of 63Event Description: **MSR Relief Valve fails open/Downpower/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"> For all other circumstances, assume rod control is not available and respond to the runback as follows: 	
		<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 7) IF AT ANY TIME while in this procedure unit shutdown is required AND rod cannot be moved, THEN perform the following:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	BOP	<ul style="list-style-type: none"> Borate as required during shutdown to maintain T-Avg at T-Ref. 	
	RO	<ul style="list-style-type: none"> Monitor AFD during load reduction. 	
	RO / BOP	<ul style="list-style-type: none"> IF AT ANY TIME AFD reaches Tech Spec limit AND reactor power is greater than 50%, 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	<ul style="list-style-type: none"> IF entry into Mode 3 is desired,..... 	NOTE: Entry into Mode 3 is NOT desired.
	SRO	(Step 8) WHEN rod control problem is repaired, OR Engineering determines that rod control malfunction will not affect auto rod motion, THEN perform the following:	Booth Instructor: Delete MALF-IRE009 as IAE, and indicate that a loose card was found in the 7300 processing system, that it has been repaired, and that returning the control rods to Auto is recommended.
	RO	<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 control rods in auto. 	NOTE: The RO places the control rods back in AUTO.
	SRO	(Step 9) Exit this procedure.	

Op Test No.: N09-1 Scenario # 2 Event # 2 & 3 Page 26 of 63Event Description: **MSR Relief Valve fails open/Downpower/Rods fail to move in AUTO**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
At the discretion of the Lead Examiner move to Event #4.			

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>27</u>	of	<u>63</u>
Event Description:		NC System Leak							
Time	Position	Applicant's Actions or Behavior							

Subsequently, a 33 gpm NC System Cold Leg leak will develop on the Loop D connection to the Accumulator. The Operator will respond by implementing AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps," Case II, "NC System Leakage." The operator will address Technical Specification 3.4.13, "RCS Operational Leakage," and SLC 16.9.7, "Standby Shutdown System." The operator will reduce load to be in Mode 3 within an hour in accordance with AP/1/A/5500/04, "Rapid Downpower."

Booth Operator Instructions: Operate Trigger #7 (MALF-NC007D (.2 for 30 seconds))

Indications Available:

- 1AD-13/B-3, CONT PRESS ALERT HI.
- 1AD-13/E-5, CONTAINMENT FLOOR & EQUIP SUMP A HI LVL.
- Pzr Level decreases.
- Containment Pressure increases.
- 1RAD-1/E-2, 1EMF CONTAINMENT PARTS.

Time	Pos.	Expected Actions/Behavior	Comments
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:	
		<ul style="list-style-type: none"> • IF containment entry is in progress, 	NOTE: A Containment Entry is NOT in progress.
		<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 2 RNO) Perform the following as required to maintain level:	

Op Test No.: N09-1 Scenario # 2 Event # 4 Page 28 of 63Event Description: **NC System Leak**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<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. 	
		<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. 	NOTE: The BOP may reduce letdown flow to 45 gpm, or isolate it altogether.
		<ul style="list-style-type: none"> Start additional NV pump. 	NOTE: The BOP will NOT need to start an additional NV Pump.
	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.... 	NOTE: The Pzr level is NOT < 4%, or decreasing with maximum Charging flow.
	SRO	(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 	
		<ul style="list-style-type: none"> 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 NV graphic 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>29</u>	of	<u>63</u>
Event Description:		NC System Leak							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		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). 	NOTE: The leak should be estimated to be 30-40 gpm.
	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 if SSF is inoperable. 	NOTE: SRO may ask OSM to address, OR call Security on their own If OSM is asked, Floor Instructor acknowledge as OSM. If the SRO calls Security, Booth Instructor acknowledge as Security.
	SRO	(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.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>30</u>	of	<u>63</u>
Event Description:		NC System Leak							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 11) IF AT ANY TIME Containment pressure exceeds 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:	
		<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: The NCS leak is NOT known to be on the Normal Letdown Line.

Op Test No.: N09-1 Scenario # 2 Event # 4 Page 31 of 63Event Description: **NC System Leak**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 18 RNO) GO TO Step 20.	
	BOP	(Step 20) Check leak – KNOWN TO BE ON VCT.	NOTE: The NCS leak is NOT known to be on the VCT.
	SRO	(Step 20 RNO) GO TO Step 22.	
	BOP	(Step 22) Check leak – KNOWN TO BE ON NORMAL CHARGING LINE DOWNSTREAM OF 1NV-244A (Charging Line Cont Outside Isol).	NOTE: The NCS leak is NOT known to be on the Normal Charging Line downstream of 1NV-244A.
	SRO	(Step 22 RNO) GO TO Step 24.	
	BOP	(Step 24) Check the following indications – NORMAL:	
		• Pzr safeties:	
		• "PZR RELIEF VALVE TEMP"	
		• PZR RELIEF LINE" "NO FLOW" acoustic indication light.	
		• Pzr PORVs:	
		• "PZR RELIEF VALVE TEMP".	
		• PRT conditions:	
		• Pressure	
		• Level	
		• Temperature	
	BOP	(Step 25) check all CLA levels – NORMAL.	
	BOP	(Step 26) Check the following NCDT parameters:	
		• Level – NORMAL	

Op Test No.: N09-1 Scenario # 2 Event # 4 Page 32 of 63Event Description: **NC System Leak**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Temperature – NORMAL 	
		<ul style="list-style-type: none"> "PUMP FLOW" – AT "RECIRC FLOW". 	
	BOP	(Step 27) Check Containment floor and equipment sumps – NORMAL.	
	BOP	(Step 27 RNO) IF level going up AND Containment is accessible, THEN check inputs to CFAE sumps per PT/1/A/4150/001D (identifying sump leakage).	
	SRO	(Step 28) Check leak location – HAS BEEN IDENTIFIED.	NOTE: The NCS leak location has NOT been identified.
	SRO	(Step 28 RNO) Perform the following steps as necessary to identify location of leak:	
		<ul style="list-style-type: none"> IF leak is inside containment, THEN evaluate isolating letdown and charging PER Steps 19 and 23 to see if leak exists on these headers. 	
		<ul style="list-style-type: none"> Notify WCC SRO to review recent changes in plant status: 	NOTE: SRO may call WCC to address the leak. If so, Booth Instructor acknowledge as WCC, and respond as appropriate.
		<ul style="list-style-type: none"> Any equipment removed from service 	
		<ul style="list-style-type: none"> Any equipment returned to service 	
		<ul style="list-style-type: none"> Any venting or draining in progress. 	
	BOP	<ul style="list-style-type: none"> Notify Radwaste Chemistry to check the following tanks and sumps for excessive input: 	NOTE: SRO may call RW to address the leak. If so, Booth Instructor acknowledge as RW, and respond as appropriate.
		<ul style="list-style-type: none"> ND/NS sump 	
		<ul style="list-style-type: none"> RHT 	

Op Test No.: N09-1 Scenario # 2 Event # 4 Page 33 of 63Event Description: **NC System Leak**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Waste Drain Tank 	
		<ul style="list-style-type: none"> WEFT 	
		<ul style="list-style-type: none"> FDT 	
		<ul style="list-style-type: none"> Spent Resin Storage Tank. 	
		<ul style="list-style-type: none"> IF affected tank or sump readily identified,..... 	NOTE: The NCS leak location has NOT been identified.
	BOP	<ul style="list-style-type: none"> IF affected tank or sump not identified, THEN check all tanks and sumps in next steps. 	
		<ul style="list-style-type: none"> Check inputs to desired tanks and sumps PER PT/1/A/4150/001D (Identifying NC System Leakage). 	NOTE: SRO may ask U2 BOP to perform. If so, Floor Instructor acknowledge as U2 BOP.
	BOP	<ul style="list-style-type: none"> IF necessary to check inputs to FDT or WEFT, THEN 	NOTE: The NCS leak location is known to be in the Containment.
		<ul style="list-style-type: none"> IF leakage suspected through 1NV-137A (NC Filters Otl 3-Way Cntrl) to RHT, THEN 	NOTE: The NCS leak location is known to be in the Containment.
	SRO	<ul style="list-style-type: none"> IF leak possibly going to Unit 1 BAT, THEN 	NOTE: The NCS leak location is known to be in the Containment.
	SRO	(Step 29) Ensure RP is notified of location and size of leak.	NOTE: SRO may call WCC/RP to address the NCS leak. If so, Booth Instructor acknowledge as WCC/RP.
	SRO	(Step 30) Contact station management to evaluate need to shutdown.	NOTE: SRO may call WCC to contact management. If so, Booth Instructor acknowledge as WCC, and as Station Management direct that the plant be taken off-line within 1 hour.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>34</u>	of	<u>63</u>
Event Description:		NC System Leak							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 31) Check unit shutdown – REQUIRED.	
	SRO	(Step 32) Shutdown PER one of the following:	
		<ul style="list-style-type: none"> OP/1/A/6100/003 (Controlling Procedure For Unit Operation), Enclosure 4.2 (Power Reduction) 	
		OR	
		<ul style="list-style-type: none"> AP/1/A/5500/04 (Rapid Downpower). 	NOTE: The SRO will transition to AP-4.
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 	
		<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	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>35</u>	of	<u>63</u>
Event Description: NC System Leak									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior			Comments
					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	
SELECTED LICENSEE COMMITMENT 16.9.7					
STANDBY SHUTDOWN SYSTEM					
	SRO	16.9.7 Standby Shutdown System			
	SRO	COMMITMENT: The Standby Shutdown System (SSS) shall be operable.			
	SRO	APPLICABILITY: MODES 1, 2, and 3.			
	SRO	REMEDIAL ACTIONS:			
		<ul style="list-style-type: none">The SRO should ensure that security is notified 10 minutes prior to declaring the SSS inoperable. Immediately upon discovery of the SSS inoperability, Security must be notified to implement compensatory measures within 10 minutes of the discovery.			NOTE: The SRO may have already handed this off the OSM, however, the remedial action of notifying Security within 10 minutes must be identified by the CRSRO.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>36</u>	of	<u>63</u>
Event Description:		NC System Leak							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior			Comments
		<ul style="list-style-type: none">If inoperable SSS component is located inside containment, repairs shall be made at the first outage which permits containment access.			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		C. Total Unidentified LEAKAGE, Identified LEAKAGE, and reactor coolant pump seal leakoff > 20 gpm. OR Total reactor coolant pump seal leakoff > 16.3 gpm.	C.1 Declare the Standby Makeup Pump inoperable. AND C.2 Enter Condition A.	Immediately	
AP/1/A/5500/04, RAPID DOWNPOWER					
	SRO	(Step 1) Monitor Foldout page.			
	SRO	(Step 2) Announce occurrence on page.			NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 3) Check turbine control – IN AUTO.			
	RO	(Step 4) Check “MW LOOP” – IN SERVICE.			

Op Test No.: N09-1 Scenario # 2 Event # 4 Page 37 of 63Event Description: **NC System Leak**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 5) Check shutdown to Mode 3 – DESIRED.	NOTE: Mode 3 is desired.
	SRO	(Step 6) Check if "Shutdown Via Reactor Trip from 15% Power" appropriate:	NOTE: Shutdown Via Reactor Trip from 15% Power is appropriate.
		<ul style="list-style-type: none"> Shutdown Via Reactor Trip from 15% Power – DESIRED 	
		<ul style="list-style-type: none"> At least two CA pumps – OPERABLE. 	
	RO	(Step 7) Enter target load of 180 MWE in turbine control panel.	
	SRO	(Step 8) Determine the required power reduction rate (MW/min).	NOTE: The SRO will determine to reduce load at ≈14-15 MWe/minute.
	RO	(Step 9) Check control rods – IN AUTO.	
	BOP	(Step 10) Notify SOC of load reduction (red dispatcher phone).	Booth Instructor: as SOC, acknowledge.
	RO	(Step 11) Initiate turbine load reduction to desired load at desired rate.	Booth Instructor: When the RO presses "GO" on the Turbine Operate Trigger #9 (MALF-DEH008B)
When the RO presses GO on the Turbine move to Event #5.			

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>5</u>	Page	<u>38</u>	of	<u>63</u>
Event Description: Turbine Control Unit failure									
Time	Position	Applicant's Actions or Behavior							

At the start of the downpower, a failure will occur in the Turbine Control Unit causing the unit to shift from Operator Auto to Manual control. The operator will address 1AD-1/F-4, TURBINE IN MANUAL, and control the Turbine manually during the downpower in accordance with OP/1/A/6300/001A, Enclosure 4.1, "Turbine Generator Load Change."

Booth Operator Instructions: When the RO presses "GO" on the Turbine Operate Trigger #9 (MALF-DEH008B)

Indications Available:

- 1AD-1/F-4, TURBINE IN MANUAL.
- MW IN light on Turbine Control Panel goes dark.
- The Green MW OUT light on Turbine Control Panel is LIT.
- Turbine load does NOT change when it should be changing.

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/001B, ANNUNCIATOR RESPONSE FOR PANEL 1AD-1 F-4, TURBINE IN MANUAL			
	RO	(Immediate Action) Ensure Turbine/Generator operation stabilizes in either Load or Speed Modes of operation.	
	SRO	(Supplementary Action 1) Determine cause and effect, then notify IAE of any malfunction.	
	RO	(Supplementary Action 2) Refer to OP/1/A/6300/001 A (Turbine-Generator Load Change) for manual operation of Turbine Generator.	
	RO	(Supplementary Action 3) WHEN available and desired, return DEH to "OPER AUTO".	
OP/1/A/6300/001A, TURBINE GENERATOR LOAD CHANGE			

Op Test No.: N09-1 Scenario # 2 Event # 5 Page 39 of 63Event Description: **Turbine Control Unit failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3.5.2) IF Turbine in "MANUAL", 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">• IF raising load, depress "GV RAISE".	
		<ul style="list-style-type: none">• IF decreasing load, depress "GV LOWER".	
After 15-25 MWe or at the discretion of the Lead Examiner move to Events #6-8.			

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>6, 7 & 8</u>	Page	<u>40</u>	of	<u>63</u>
Event Description:		Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start							
Time	Position	Applicant's Actions or Behavior							

Shortly afterwards, the NC System Cold Leg leak will degrade into a Small Break LOCA. The operator will enter EP/1/A/5000/E-0, Reactor Trip or Safety Injection." Upon the actuation of Safety Injection, the 1A NI Pump will fail to auto start, and must be manually started. Upon the actuation of Hi-Hi Containment pressure, the 1B NS Pump will trip on overload and be unavailable during the remainder of the event. During the performance of E-0, the Reactor Coolant Pumps (NCPs) will be required to be manually tripped upon reaching the established NCP trip criteria. Upon completion of E-0, the operator will transition to EP/1/A/5000/E-1, "Loss of Reactor or Secondary Coolant." On the transition, an Orange Path will exist on the Containment Critical Safety Function, and the transition will be made to EP/1/A/5000/FR-Z.1, Response to High Containment Pressure," prior to E-1. Upon completion of FR-Z.1 the operator will transition to E-1. The scenario will terminate at Step 14 of E-1, after the crew has determined to transition to EP/1/A/5000/ES-1.2, Post-LOCA Cooldown and Depressurization or upon a decision to transition to ES-1.3, "Transfer to Cold Leg Recirculation," based on E-1 Foldout Page criteria.

Booth Operator Instructions: Set MALF NC007D = 3, at 45 second ramp.

Indications Available:

- Pzr pressure rapidly drops.
- Containment pressure rapidly rises.
- Reactor automatically trips.
- SI automatically actuates.

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			

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 41 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 1) Monitor Foldout page.	Examiner NOTE: NC Subcooling is lost immediately on the LOCA, and although neither NI Pump is running, Both NV Pumps are operating. The five minute Clock to stop the NC Pumps should start here. Record Time: _____
	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 3) Check Turbine Trip:	
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	
	RO	(Step 5) IF either CF pump is in Manual Direct Valve Position (MDVP) mode, THEN trip affected pump(s).	
	RO / SRO	(Step 6) Check if S/I is actuated:	
		<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. 	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 42 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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):	
		• Groups 1, 2, 5 – DARK.	
		• Group 3 – LIT.	
		• OAC – IN SERVICE.	
	BOP	• Group 4, Rows A through F – LIT AS REQUIRED.	NOTE: The 1B NI Pump is OOS, and the 1A NI Pump does NOT Auto start. The BOP may recognize this and manually start the 1A NI Pump.

CRITICAL TASK:**(E-0 J) Establish flow from at least one intermediate-head ECCS Pump before transitioning out of E-0.**

Safety Significance: Failure to manually start at least one intermediate-head ECCS Pump under the postulated conditions constitutes "mis-operation or incorrect crew performance which leads to degraded ECCS capacity." The acceptable results obtained in the FSAR analysis of a small-break LOCA are based the assumption of the minimum ECCS injection flow, which assumes flow from one train of ECCS consisting of a high-head, intermediate head and low head pump, are met. If the crew fails to start the 1A NI Pump, the FSAR assumptions will not be met creating a condition where the plant is operated in an unanalyzed condition and in a manner which has violated the facility license.

	BOP	(Step 8.d RNO) Perform the following:	
		• Ensure both trains Phase A Isolation are initiated.	
		• Align or start S/I and Phase A components with individual windows in Group 4 as required.	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 43 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> GO TO Step 8.f. 	
	BOP	(Step 8.f) Check LOCA Sequencer Actuated status light (1SI-14) on energized train(s) - LIT.	
	BOP	<ul style="list-style-type: none"> (Step 8.g) 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 INEJECTION TRAIN A COMPONENTS ALIGNED" 	
		<ul style="list-style-type: none"> F-5 "SAFETY INEJECTION TRAIN B COMPONENTS ALIGNED". 	
	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.	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 44 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 14) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment pressure is ≈5 psig due to the LOCA.
	BOP	(Step 14 RNO) Perform the following:	
		<ul style="list-style-type: none"> Record approximate time of reactor trip. 	NOTE: RO will report time of Rx Trip.
		<ul style="list-style-type: none"> Check Monitor Light Group 4, Row G, lit. 	
		<ul style="list-style-type: none"> IF any Row G window is dark on energized train(s), 	NOTE: 1B NS Pump is NOT running.
			NOTE: BOP may attempt to start 1B NS Pump, however, this Pump will NOT start.
	BOP	<ul style="list-style-type: none"> Stop all NC pumps while maintaining seal injection flow. 	
			<p>NOTE: SRO may call WCC or direct NLO to investigate the failed NS Pump breaker.</p> <p>If WCC, Booth Instructor acknowledge as WCC, wait 3-5 minutes and report 51V on 1B NS Pump Breaker.</p> <p>If NLO, Floor Instructor acknowledge, wait 3-5 minutes and report 51V on 1B NS Pump Breaker.</p>

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 45 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
CRITICAL TASK:			
(SS (E1C)) Trip NC Pumps within 5 minutes of loss of SCM (4600/113/E13.1)			
<p>Safety Significance: Failure to trip all NCPs on a loss of subcooled margin can lead to core uncover and to fuel temperatures in excess of 2200°F. PT/0/A/4600/113, Enclosure 13.1 states that McGuire is committed to having NC Pumps tripped within 5 minutes of a loss of subcooling. The Safety Analysis recommends that the NC Pumps be tripped within 2 minutes to limit the depth and duration of core uncover. It is a management expectation that the NC Pumps be tripped as quickly as possible, but within 5 minutes of a loss of subcooling. Failure to take this action represents mis-operation by the operator which leads to degradation of the fuel cladding fission produce barrier, and a violation of a license condition.</p> <p>Record Pump Stop Time: _____</p> <p>subtract time recorded at time of the loss SCM on page 40 _____ = _____ minutes.</p>			
		<ul style="list-style-type: none"> Ensure all RV pumps are in manual and off. 	
		<ul style="list-style-type: none"> Energize H₂ Igniters by depressing "ON" and "OVERRIDE". 	
	SRO	<ul style="list-style-type: none"> Dispatch operator to stop all Unit 1 NF AHUs (Control panels located in 750 and 733 electrical penetration rooms). 	<p>NOTE: SRO will dispatch NLO.</p> <p>Booth Instructor: As NLO, report in 5 minutes that all Unit 1 NF AHUs are stopped.</p>
		<ul style="list-style-type: none"> WHEN time allows, THEN check Phase B HVAC equipment PER Enclosure 2 (Phase B HVAC Equipment). 	<p>NOTE: The SRO may assign the BOP to perform this action.</p> <p>If so, BOP Examiner follow actions of Enclosure 2.</p> <p>Other Examiners follow E-0 Actions, Step 15, on Page 46.</p> <p>The SRO may ask U2 BOP to perform this action.</p> <p>If so, Floor Instructor: Acknowledge as U2 BOP.</p>
<p align="center">E-0, REACTOR TRIP OR SAFETY INJECTION</p> <p align="center">ENCLOSURE 2, PHASE B HVAC EQUIPMENT</p>			

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>6, 7 & 8</u>	Page	<u>46</u>	of	<u>63</u>
Event Description:		Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 1) Check VE System in Operation as Follows:	Examiner NOTE: Follow the actions associated with Enclosure 2 if BOP is assigned by SRO to perform.
		<ul style="list-style-type: none"> • VE Fans – On. 	
		<ul style="list-style-type: none"> • Ensure all damper mode select switches in AUTO. 	
		<ul style="list-style-type: none"> • 1AVS-D-7 Mode Select. 	
		<ul style="list-style-type: none"> • 1AVS-D-8 Mode Select. 	
		<ul style="list-style-type: none"> • 1AVS-D-2 Mode Select. 	
		<ul style="list-style-type: none"> • 1AVS-D-3 Mode Select. 	
		<ul style="list-style-type: none"> • Annulus pressure being maintained - NEGATIVE 	
	BOP	(Step 2) Check VX System in Operation as Follows:	
		<ul style="list-style-type: none"> • Time since Phase B actuation – GREATER THAN 10 MINUTES. 	
		<ul style="list-style-type: none"> • Check the following – OPEN. 	
		<ul style="list-style-type: none"> • 1RAF-D-4 (1B Cont Air Ret Fan To Lwr Cont Test A). 	
		<ul style="list-style-type: none"> • 1VX-2B (1B H2 Skimmer Fan Isol Test A). 	
		<ul style="list-style-type: none"> • 1RAF-D-2 (1A Cont Air Ret Fan To Lwr Cont Test A). 	
		<ul style="list-style-type: none"> • 1VX-1A (1A H2 Skimmer Fan Isol Test A) 	
		<ul style="list-style-type: none"> • Check Containment Air Return Fans – ON. 	
		<ul style="list-style-type: none"> • Check H2 Skimmer Fans – ON. 	
E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 15) Check S/I flow:	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 47 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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 "NV PMPS TO COLD LEG FLOW" gauge – INDICATING FLOW. 	NOTE: If the 1A NI Pump has NOT been previously manually started, it will be started here.
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 1600 PSIG. 	
		<ul style="list-style-type: none"> Check NI pumps – INDICATING FLOW. 	
	BOP	(Step 15.c RNO) Start NI pumps and align valves.	
	BOP	<ul style="list-style-type: none"> (Step 15.d) Check NC pressure – Less than 286 PSIG. 	
	BOP	(Step 15.d 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). 	
	SRO	<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 16. 	
	SRO	(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.
	BOP	(Step 17) Check CA flow:	
		<ul style="list-style-type: none"> Total CA flow – GREATER THAN 450 GPM. 	
		<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 49 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 4 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF any NC T-Cold is still going down, THENGO TO Step 6. 	
	RO	(Step 6) Control feed flow as follows:	
		<ul style="list-style-type: none"> IF S/G N/R level is less than 11% (32% ACC) in all S/Gs, THEN throttle feed flow to achieve the following: 	
		<ul style="list-style-type: none"> Minimize cooldown 	
		<ul style="list-style-type: none"> Maintain total feed flow greater than 450 GPM. 	
		<ul style="list-style-type: none"> WHEN N/R level is greater than 11% (32% ACC) in at least one S/G, THEN throttle feed flow further to: 	
		<ul style="list-style-type: none"> Minimize cooldown 	
		<ul style="list-style-type: none"> Maintain at least one S/G N/R level greater than 11% (32% ACC). 	
	RO	(Step 7) Check MSIVs – ANY OPEN.	
		(Step 7 RNO) Perform the following:	
	RO	<ul style="list-style-type: none"> Close MSIV bypass valves. 	
	SRO	<ul style="list-style-type: none"> Exit this enclosure. 	
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 19) Check Pzr PORV and spray valves:	
		<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. 	
		<ul style="list-style-type: none"> Normal Pzr spray valves - CLOSED 	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 50 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO / BOP	(Step 20) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	
	RO / BOP	(Step 20 RNO) IF at least one NV OR NI pump on, THEN stop all NC pumps while maintaining seal injection flow.	Examiner NOTE: Stopping the NC Pumps on low NC Subcooling is a Critical Task, and is most likely completed. If NOT, the NC Pumps will be stopped here.
	RO	(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:	
		<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) 	
		<ul style="list-style-type: none"> 1EMF-27 (S/G D) 	
	RO	<ul style="list-style-type: none"> S/G levels – STABLE OR GOING UP IN A CONTROLLED MANNER. 	
	BOP	(Step 23) Check if NC System intact:	
		<ul style="list-style-type: none"> Check containment EMFs – NORMAL: 	NOTE: 1EMF-38L is in TRIP 2.

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 51 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> 1EMF-38(L) (Containment Particulate (LR)) 	
		<ul style="list-style-type: none"> 1EMF-39(L) (Containment Gas (Lo Range)) 	
		<ul style="list-style-type: none"> 1EMF-40 (Containment Iodine) 	
		<ul style="list-style-type: none"> 1EMF-9 (Reactor Bldg Incore Inst Rm) 	
		<ul style="list-style-type: none"> 1EMF-16 (Containment Refueling Brdg). 	
	BOP	(Step 23 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF H₂ Igniters are off, 	NOTE: The H2 Igniters are ON.
		<ul style="list-style-type: none"> IF AT ANY TIME both of the following conditions exist, THEN start one train of VX PER ENCLOSURE 4 (VX Manual Start). 	NOTE: Neither condition exists.
		<ul style="list-style-type: none"> Containment pressure is between 1 PSIG and 3 PSIG. 	
		<ul style="list-style-type: none"> Containment pressure has remained less than 3 PSIG. 	
	SRO	<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-1 (Loss of Reactor Or Secondary Coolant). 	NOTE: Upon transition to E-1, an ORANGE Path will exist on Containment. The SRO will transition to FR-Z.1, rather than E-1.
EP/1/A/5000/FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE			
	SRO	(Step 1) IF loss of emergency coolant recirc has occurred, THEN this procedure may be completed as time allows.	NOTE: Loss of Emergency Coolant Recirc has NOT occurred.

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 52 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 2) Monitor Foldout Page.	
	BOP	(Step 3) Stop all NC pumps.	NOTE: All NC Pumps are stopped.
	BOP	(Step 4) Ensure all RV pumps are in manual and off.	
	SRO	(Step 5) Dispatch operator to remove white tags and close the following breakers:	NOTE: SRO will dispatch NLO. Floor/Booth Instructor: Acknowledge as appropriate.
		<ul style="list-style-type: none"> 1EMXA-R2A (1A ND To A&B Cold Legs Cont Outside Isol Motor (1NI-173A)) (aux bldg, 750, FF-54, FF-55) 	
		<ul style="list-style-type: none"> 1EMXB1-6B (1B ND To C&D Cold Legs Cont Outside Isol Motor (1NI-178B)) (aux bldg, 733, GG-55, GG-56) 	Booth Instructor: Wait 5 minutes, Insert LOA: NI024 = Racked In NI025 = Racked In And then, report as NLO that breakers are closed.
	BOP	(Step 6) Check containment pressure – LESS THAN 15 PSIG.	NOTE: Containment pressure is ≈5 psig due to the LOCA.
	BOP	(Step 7) Check any NS pump - ON.	NOTE: The 1A NS Pump is ON.
	SRO	(Step 8) Perform the remainder of this EP as time allows.	NOTE: SRO may continue with FR-Z.1 or Transition to E-1. If Transition is made here, moved forward to Page 56.

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 53 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NS Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 9) Check containment isolation:	
		<ul style="list-style-type: none"> Check OAC – IN SERVICE. 	
		<ul style="list-style-type: none"> Check the following windows on Group 4 of ESF Monitor light Panel – 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"> G-4 "CONT ISOL PHASE B TRN A VLVS ALIGNED" 	
		<ul style="list-style-type: none"> G-5 "CONT ISOL PHASE B TRN B VLVS ALIGNED". 	
	BOP	(Step 10) Check NS System in operation as follows:	
		<ul style="list-style-type: none"> Check EP/1/A/5000/ECA-1.1 (Loss of Emergency Coolant Recirc) – IN EFFECT. 	NOTE: Loss of Emergency Coolant Recirc is NOT in effect.
	SRO	(Step 10.a RNO) GO TO Step 10.d.	
	BOP	<ul style="list-style-type: none"> (Step 10.d) Check NS suction – ALIGNED TO FWST AS FOLLOWS: 	
		<ul style="list-style-type: none"> Check 1NS-18A (1A NS Pump Suct From Cont Sump Isol) – CLOSED 	
		<ul style="list-style-type: none"> Check 1NS-20A (1A NS Pump Suct From FWST Isol) – OPEN 	
		<ul style="list-style-type: none"> Check 1NS-1B (1B NS Pump Suct From Cont Sump Isol) – CLOSED 	
		<ul style="list-style-type: none"> Check 1NS-3B (1B NS Pump Suct From FWST Isol) - OPEN 	
		<ul style="list-style-type: none"> Check containment pressure – GREATER THAN 3 PSIG. 	NOTE: Containment pressure is ≈5 psig due to the LOCA.
		<ul style="list-style-type: none"> Check the following NS pump discharge valves – OPEN: 	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 54 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> 1NS-32A (1A NS Hx Outlet Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-29A (1A NS Hx Outlet Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-12B (1B NS Hx Outlet Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-15B (1B NS Hx Outlet Cont Outside Isol) 	
		<ul style="list-style-type: none"> Check NS pumps – ON. 	NOTE: BOP may attempt to start 1B NS Pump, however, this Pump will NOT start.
	BOP	(Step 10.g RNO) Perform the following:	
		<ul style="list-style-type: none"> Start pump(s) with available suctions and discharge flowpaths. 	
		<ul style="list-style-type: none"> IF both pumps are OFF,..... 	NOTE: The 1A NS Pump is ON.
	SRO	(Step 11) Check Phase B HVAC equipment PER Enclosure 3 (Phase B HVAC Equipment).	<p>NOTE: The SRO may assign the BOP to perform this action.</p> <p>If so, BOP Examiner follow actions of BOP previously performed as Enclosure 2 of E-0.</p> <p>The SRO may ask U2 BOP to perform this action.</p> <p>If so, Floor Instructor: Acknowledge as U2 BOP.</p>
	RO	(Step 12) Check the following – CLOSED:	
		<ul style="list-style-type: none"> All MSIVs 	
		<ul style="list-style-type: none"> All MSIV bypass valves. 	
	RO	(Step 13) Check steamlines intact:	
		<ul style="list-style-type: none"> All S/G pressures – STABLE OR GOING UP 	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 55 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> All S/Gs – PRESSURIZED. 	
	BOP	(Step 14) Check if one or two trains of ND aux containment spray should be aligned as follows:	
		<ul style="list-style-type: none"> Any ND Train – OPERATING IN COLD LEG RECIRC MODE. 	
	SRO	(Step 14.a RNO) Perform the following:	
		<ul style="list-style-type: none"> WHEN EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc), is completed, THEN perform Step 14 to determine if one or two trains of ND aux spray should be aligned. 	
		GO TO Step 15.	
	BOP	(Step 15) Check containment H ₂ concentration:	NOTE: The H ₂ Analyzers are NOT in service.
		<ul style="list-style-type: none"> Ensure operator dispatched to stop Unit 1 NF AHUs. 	
		<ul style="list-style-type: none"> Check H₂ analyzers – IN SERVICE. 	
	SRO	(Step 15 RNO) Perform the following:	NOTE: SRO will dispatch NLO. Floor/Booth Instructor: Acknowledge as appropriate.
		<ul style="list-style-type: none"> Dispatch operator to place H₂ analyzers in service PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 5 (Placing H₂ Analyzers In Service). 	
		<ul style="list-style-type: none"> WHEN H₂ analyzers in service, THEN complete Steps 15.c through 15.f. 	Booth Instructor: Wait 15 minutes, Insert LOA: VX009 = In Service/Enabled VX010 = In Service/Enabled And then, report as NLO that H₂ Analyzers are in service.

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 56 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> GO TO Step 16. 	
	SRO	(Step 16) RETURN TO procedure and step in effect.	NOTE: SRO will transition to E-1.
			NOTE: SRO will likely conduct a Focus Brief.
EP/1/A/5000/E-1, LOSS OF REACTOR OR SECONDARY COOLANT			
	SRO	(Step 1) Monitor Foldout page.	Examiner NOTE: After Transition to E-1, terminate scenario at Lead Examiner discretion.
	RO	(Step 2) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	NOTE: There should be no NC Subcooling due to the LOCA.
		(Step 2 RNO) IF any NV OR NI pump on, THEN perform the following:	NOTE: The NC Pumps should be stopped by this time.
	BOP	<ul style="list-style-type: none"> Ensure all NC pumps are off. Maintain seal injection flow. 	
	RO	(Step 3) Check if main steamlines intact:	
		<ul style="list-style-type: none"> All S/G pressures – STABLE OR GOING UP All S/Gs – PRESSURIZED. 	
	RO	(Step 4) 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). 	NOTE: Adverse Containment Numbers will be used.
	BOP	<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 57 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO / BOP	<ul style="list-style-type: none"> Throttle feed flow to maintain all intact S/G N/R levels between 11% (32% ACC) and 50%. 	NOTE: Adverse Containment Numbers will be used.
	BOP	(Step 5) Check secondary radiation normal as follows:	
		<ul style="list-style-type: none"> Check all S/Gs – INTACT. 	
	SRO	<ul style="list-style-type: none"> Notify RP to perform the following: 	NOTE: SRO may call WCC/RP to address the switch position. If so, Booth Instructor acknowledge as WCC/RP.
		<ul style="list-style-type: none"> Frisk all Unit 1 S/G cation columns to determine if activity level is significantly higher for any S/G. 	
		<ul style="list-style-type: none"> Notify Control Room of survey results. 	
	BOP	<ul style="list-style-type: none"> WHEN survey results reported, THEN perform the following: 	
		<ul style="list-style-type: none"> Check all S/G(s) activity levels – NORMAL. 	
	BOP	<ul style="list-style-type: none"> Check 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) 	
		<ul style="list-style-type: none"> 1EMF-27 (S/G D). 	
	BOP	(Step 6) Check Pzr PORVs and isolation valves:	
		<ul style="list-style-type: none"> Power to all Pzr PORV isolation valves – AVAILABLE. 	

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 58 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> All Pzr PORVs – CLOSED. 	
		<ul style="list-style-type: none"> At least one Pzr PORV isolation valve – OPEN. 	
		<ul style="list-style-type: none"> IF AT ANY TIME any Pzr PORV opens due to high pressure, THEN after pressure goes below 2315 PSIG, ensure PORV closes or is isolated. 	
	RO	(Step 7) Check S/I termination criteria:	
		<ul style="list-style-type: none"> NC subcooling based on core exit T/Cs – GREATER THAN 0°F. 	
	SRO	(Step 7.a RNO) GO TO Step 7.f	
	RO / BOP	<ul style="list-style-type: none"> (Step 7.f) Monitor S/I termination criteria PER Enclosure 2 (S/I Termination Criteria) while in this procedure. 	
	RO / SRO	<ul style="list-style-type: none"> IF AT ANY TIME while in this procedure S/I termination criteria is met, THEN RETURN TO Step 7. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	BOP	(Step 8) Check if NS pump should be stopped:	
		<ul style="list-style-type: none"> Any NS pump – ON. 	NOTE: The 1A NS Pump is ON.
		<ul style="list-style-type: none"> Containment pressure – LESS THAN 2 PSIG. 	
		(Step 8.b RNO) Perform the following:	
	BOP	<ul style="list-style-type: none"> IF NS pump suction has been aligned for Cold Leg Recirc, THEN GO TO Step 9. 	NOTE: Neither NS Pump has been aligned for Cold Leg Recirc.
		<ul style="list-style-type: none"> IF AT ANY TIME containment pressure is less than 2 PSIG, AND NS pump suction is still aligned to FWST, THEN perform Step 8. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 59 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> GO TO Step 9. 	
	BOP	(Step 9) Check if ND pumps should be stopped:	
		<ul style="list-style-type: none"> NC pressure – GREATER THAN 286 PSIG. 	
		<ul style="list-style-type: none"> NC pressure – STABLE OR GOING UP. 	
		<ul style="list-style-type: none"> Any ND Pump – ON. 	
		<ul style="list-style-type: none"> Running ND Pumps Suction – ALIGNED TO FWST. 	
		<ul style="list-style-type: none"> Check both NS Pumps – OFF. 	
	SRO	(Step 9.e RNO) Go To Step 10.	
	RO	(Step 10) Check NC and S/G pressures:	
		<ul style="list-style-type: none"> All S/G pressures – STABLE OR GOING UP. 	
		<ul style="list-style-type: none"> NC pressure – STABLE OR GOING DOWN. 	
	BOP	(Step 11) Check if D/Gs should be stopped:	
		<ul style="list-style-type: none"> Check any D/G – ON. 	NOTE: Both D/Gs are ON, and should be stopped.
		<ul style="list-style-type: none"> Check 1ETA and 1ETB – ENERGIZED BY OFFSITE POWER. 	
		<ul style="list-style-type: none"> 1ETA Emergency Breaker – OPEN 	
		<ul style="list-style-type: none"> 1ETA – ENERGIZED. 	
		<ul style="list-style-type: none"> Check 1ETB energized by offsite power as follows: 	
		<ul style="list-style-type: none"> 1ETB Emergency Breaker – OPEN 	
		<ul style="list-style-type: none"> 1ETB – ENERGIZED. 	
		<ul style="list-style-type: none"> Reset the following: 	

Op Test No.:	N09-1	Scenario #	2	Event #	6, 7 & 8	Page	60	of	63
Event Description:		Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> S/I. 	
		<ul style="list-style-type: none"> Sequencers. 	
		<ul style="list-style-type: none"> IF AT ANY TIME a B/O signal occurs, THEN restart S/I equipment previously on. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	<ul style="list-style-type: none"> Dispatch operator to stop any unloaded D/G(s) and place ins standby readiness PER OP/1/A/6350/002 (Diesel Generator): 	NOTE: SRO will dispatch NLO. Floor/Booth Instructor: Acknowledge as appropriate.
		<ul style="list-style-type: none"> Enclosure 4.3 (1A D/G Shutdown) 	
		<ul style="list-style-type: none"> Enclosure 4.4 (1B D/G Shutdown). 	Booth Instructor: Wait 5 minutes, Insert LOA: DG003 = Stop D/G DG004 = Stop D/G And then, report as NLO that Both D/Gs are stopped.
	BOP	(Step 12) Check containment H ₂ concentration:	
		<ul style="list-style-type: none"> Ensure Operator dispatched to stop Unit 1 NF AHUs PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 28 (De-energizing Ice Condenser AHUs). 	
		<ul style="list-style-type: none"> Check H₂ analyzers – IN SERVICE. 	NOTE: The H ₂ Analyzers are NOT in service.
	SRO	(Step 12.b RNO) Perform the following:	
		<ul style="list-style-type: none"> Dispatch operator to place H₂ analyzers in service PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 5 (Placing H₂ Analyzers In Service). 	NOTE: The SRO has most likely previously dispatched NLO. If contacted, Booth Instructor: Report action still in progress.
		<ul style="list-style-type: none"> WHEN H₂ analyzers in service, THEN complete Steps 12.c through 12.e. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.

Op Test No.: N09-1 Scenario # 2 Event # 6, 7 & 8 Page 61 of 63Event Description: **Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS 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"> GO TO Step 13. 	
	BOP	(Step 13) Initiate evaluation of plant status as follows:	
		<ul style="list-style-type: none"> Check Cold Leg Recirc capability from at least one train as follows: 	
		<ul style="list-style-type: none"> Train A: 	
		<ul style="list-style-type: none"> 1A ND pump – AVAILABLE. 	
		<ul style="list-style-type: none"> 1NI-185A (1A ND Pump Suction From Cont Sump Isol) – POWER AVAILABLE 	
	BOP	<ul style="list-style-type: none"> Check for potential leak in aux bldg as follows: 	
		<ul style="list-style-type: none"> Check aux bldg radiation: 	
		<ul style="list-style-type: none"> All area monitor EMFs – NORMAL 	
		<ul style="list-style-type: none"> EMF-41 (Aux Bldg Ventilation) – NORMAL. 	
	BOP	<ul style="list-style-type: none"> Check NC to ND pressure boundary intact as follows: 	
		<ul style="list-style-type: none"> ND Temperature – NORMAL 	
		<ul style="list-style-type: none"> ND Flow – NORMAL 	
		<ul style="list-style-type: none"> ND Pressure - NORMAL 	
	SRO	<ul style="list-style-type: none"> WHEN the TSC is staffed, THEN have TSC perform EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 30 (Evaluation of Plant Status During LOCAs by the TSC). 	NOTE: Any attempts to reach the TSC fail (The TSC is NOT yet staffed).
			Floor/Booth Instructor (As Appropriate): report as Station Management that the TSC is about to be manned and they will call when it is up and ready.
	BOP	(Step 14) Check if NC System cooldown and depressurization is required:	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>2</u>	Event #	<u>6, 7 & 8</u>	Page	<u>62</u>	of	<u>63</u>
Event Description:		Small Break LOCA (Loop D)/ 1A NI Pump fails to Auto start/1B NS Pump fails to start							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none">NC pressure – GREATER THAN 286 PSIG.	
	SRO	<ul style="list-style-type: none">GO TO EP/1/A/5000/ES-1.2 (Post LOCA Cooldown And Depressurization).	NOTE: The SRO will transition to ES-1.2.
At the discretion of the Lead Examiner terminate the exam.			

UNIT 1 STATUS:

Power Level: 95% NCS [B] 1039 ppm Pzr [B]: 1047 ppm Xe: Per OAC

Power History: Downpower from 100% 2 hours ago Core Burnup: 250 EFPDs

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

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

- The Plant is at 95% power (MOL), following an unplanned load reduction due to the failure of the 1C1 Heater Drains Pump about 2 hours ago.
- The WCC has been informed, and it appears that corrective maintenance will be required.
- The crew will perform PT/1/A/4206/001B, "1B NI Pump Performance Test," upon completion of turnover.
- NLO (John) is standing by at the pump with a copy of the PT to support this activity.

The following equipment is Out-Of-Service:

- PVI-5066, INST AIR SYS PRESS, has failed low (IAE is investigating).
- MCB Annunciator 1AD-6, D-4, "D NC PUMP LOWER MTR BRG LO KC FLO," is in constant alarm (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

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	ENB011D	I-BOP I(TS)-SRO	Power Range Channel failure		
3	NV028A NV023A	C-BOP C-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 DEH003A	NA	Failure of Automatic Rx Trip/Turbine Trip		
9	CA005	NA	TD CA Pump trip		
10	CA004A	NA	1A CA Pump fails to start		
11	^{OVR} IWE012D IWE014D	NA	CF Pumps fail to reset after FWIS		
* (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 control power fuses for Nuclear Excore Power Range Channel N44 will fail. The operator will respond in accordance with 1AD-2, F-3, "P/R/HI VOLTAGE FAILURE," then implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case III, "Power Range Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation."

Following this, the retention element on the in-service NV System Demineralizer will fail causing an immediate 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.

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."

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 AND the turbine will fail to trip automatically. The operator

will be expected to manually trip the reactor and enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and manually trip the turbine.

On the trip, the TD CA will overspeed. Additionally the 1A CA Pump will trip on overcurrent causing a Red Path to exist on Heat Sink. The operator will implement EP/1/A/5000/FR-H.1, "Response to Loss of Secondary Heat Sink." When the operator attempts to restore feedwater flow from the CF pumps, the operator will discover that neither CF can be reset. As the operator attempts to restore a heat sink with the CM system, the Steam Generator levels will approach the point at which NCS Feed and Bleed must be established.

The scenario is expected to terminate, unless the crew successfully establishes feed flow to one Steam Generator with the Condensate System, at Step 29 of FR-H.1, after the crew has established NCS Feed and Bleed cooling.

Critical Tasks:

E-0 A

Manually trip the reactor before SG Wide Range Levels decrease to < 24%.

Safety Significance: failure to manually trip the reactor causes a challenge to the Subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an "incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy and demonstrates the inability by the crew to recognize a failure of the automatic actuation of the RPS." A failure to trip the reactor when required will cause fission heat production to exceed the ability of the safeguards systems to remove heat from the system, and result in an NCS pressure increase. Under normal conditions, the Pzr PORV will open and degrade the NCS Barrier. Under worst case conditions the RCS Pressure Safety Limit could be exceeded within 2 minutes, potentially rupturing the RCS Fission Product Barrier.

FR-H.1 A/B

Either establish feedwater flow into at least one SG before Bleed and Feed criteria is met, or establish RCS Bleed and Feed before PORVs go open automatically due to plant heat-up.

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.

N09-1-3

Event 1

- OP/1/A/6250/001, CONDENSATE AND FEEDWATER SYSTEM ENCLOSURE 4.22, SWAPPING CF CONTROL VALVE CONTROL CIRCUIT

Event 2

- OP/1/A/6100/010C, ANNUNCIATOR RESPONSE FOR PANEL 1AD-2 F-3, P/R HI VOLTAGE FAILURE
- AP/1/A/5500/16, MALFUNCTION OF NUCLEAR INSTRUMENTATION CASE III, POWER RANGE MALFUNCTION
- TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION

Events 3/4

- OP/1/A/6100/010H, ANNUNCIATOR RESPONSE FOR PANEL 1AD-7 I-4, LETDN RELIEF HI TEMP
- AP/1/A/5500/10, NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV PUMPS, CASE II, NC SYSTEM LEAKAGE
- EP/1/A/5000/G-1, GENERIC ENCLOSURES, ENCLOSURE 2, ESTABLISHING EXCESS LETDOWN
- AP/1/A/5500/12, LOSS OF LETDOWN, CHARGING OR SEAL INJECTION
- TECHNICAL SPECIFICATION 3.4.13, RCS OPERATIONAL LEAKAGE
- SELECTED LICENSEE COMMITMENT 16.9.7, STANDBY SHUTDOWN SYSTEM

Event 5

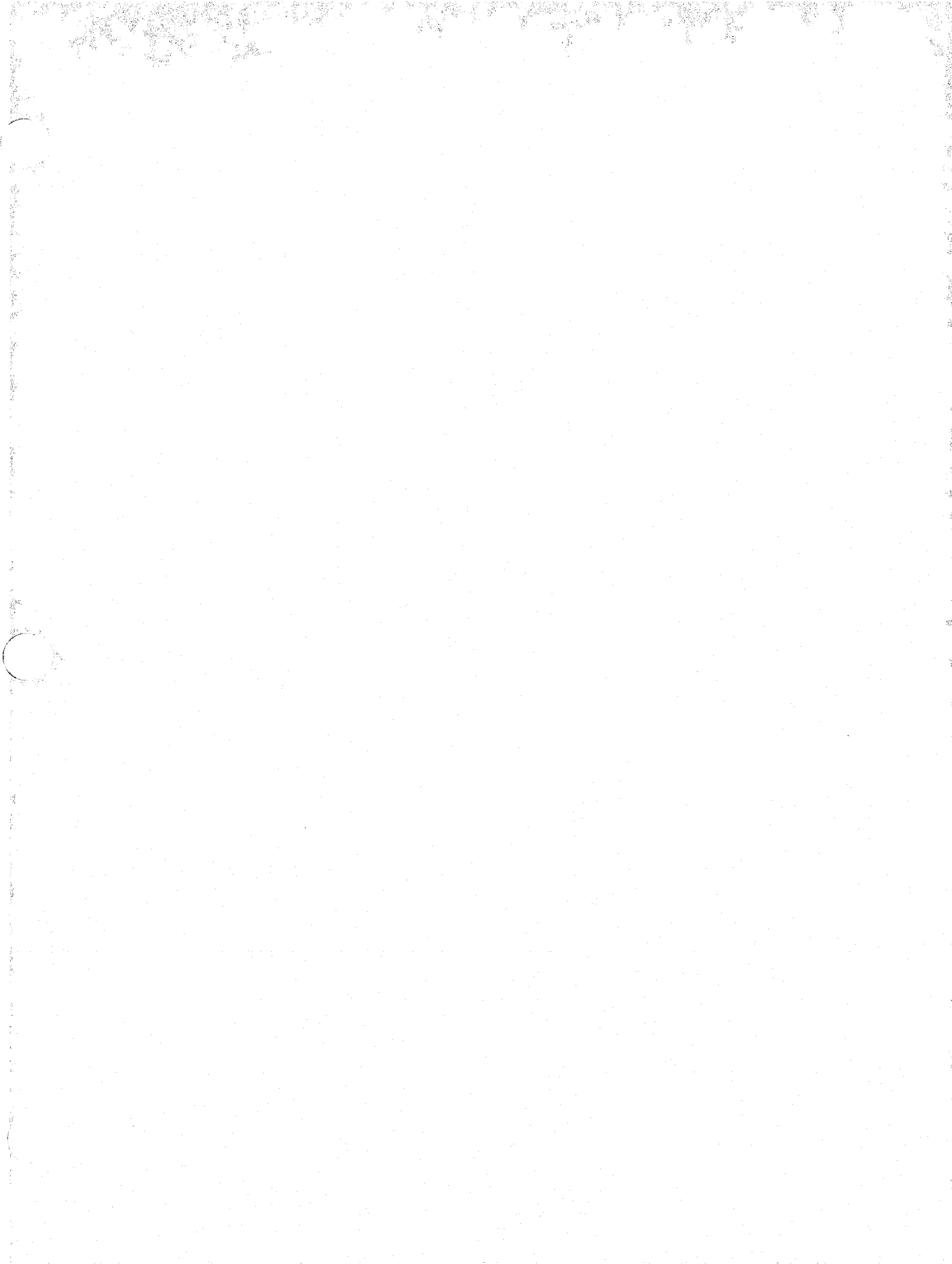
- AP/1/A/5500/14, ROD CONTROL MALFUNCTION
- AP/1/A/5500/14, ROD CONTROL MALFUNCTION, ENCLOSURE 3, RESPONSE TO CONTINUOUS ROD MOVEMENT
- TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION

Event 6

- AP/1/A/5500/06, S/G FEEDWATER MALFUNCTION

Event 7-10

- EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION
- EP/1/A/5000/ES-0.1, REACTOR TRIP RESPONSE
- EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK
- EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK ENCLOSURE 3, S/G BB AND SAMPLING VALVE CHECKLIST
- EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK ENCLOSURE 4, CA VALVE ALIGNMENT
- EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK ENCLOSURE 8, MAINTAINING PZR PRESSURE BELOW P-11



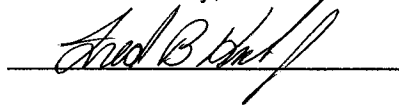
PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 25
TOPIC: NRC Simulator Exam
Scenario N09-1-3

REFERENCES:

1. OP/1/A/6250/001, "Condensate and Feedwater System."
2. OP/1/A/6100/010C, "Annunciator Response for Panel 1AD-2."
3. AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation."
4. McGuire Technical Specifications
5. OP/1/A/6100/010H, "Annunciator Response for Panel 1AD-7."
6. AP/1/A/5500/10, "NC System Leakage Within the Capacity of Both NV Pumps."
7. EP/1/A/5000/G-1, "Generic Enclosures."
8. AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection."
9. McGuire Nuclear Station Selected Licensee Commitments Manual.
10. AP/1/A/5500/14, "Rod Control Malfunction."
11. AP/1/A/5500/06, "S/G Feedwater Malfunctions."
12. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
13. EP/1/A/5000/ES-0.1, "Reactor Trip response."
14. EP/1/A/5000/FR-H.1, "Response to Loss of Secondary Heat Sink."
15. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review:



Rev. 020609

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	ENB011D	I-BOP I(TS)-SRO	Power Range Channel failure
3	NV028A NV023A	C-BOP C-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 DEH003A	NA	Failure of Automatic Rx Trip/Turbine Trip
9	CA005	NA	TD CA Pump trip
10	CA004A	NA	1A CA Pump fails to start
11	^{XOVR} IWE012D IWE014D	NA	CF Pumps fail to reset after FWIS

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

Scenario Event Description

NRC Scenario 3

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 swapper 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 control power fuses for Nuclear Excure Power Range Channel N44 will fail. The operator will respond in accordance with 1AD-2, F-3, "P/R/HI VOLTAGE FAILURE," then implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case III, "Power Range Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation."

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.

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."

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 AND the turbine will fail to trip automatically. The operator will be expected to manually trip the reactor and enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and manually trip the turbine.

Scenario Event Description

NRC Scenario 3

On the trip, the TD CA will overspeed. Additionally the 1A CA Pump will trip on overcurrent causing a Red Path to exist on Heat Sink. The operator will implement EP/1/A/5000/FR-H.1, "Response to Loss of Secondary Heat Sink." When the operator attempts to restore feedwater flow from the CF pumps, the operator will discover that neither CF can be reset. As the operator attempts to restore a heat sink with the CM system, the Steam Generator levels will approach the point at which NCS Feed and Bleed must be established.

The scenario is expected to terminate, unless the crew successfully establishes feed flow to one Steam Generator with the Condensate System, at Step 29 of FR-H.1, after the crew has established NCS Feed and Bleed cooling.

Critical Tasks:

E-0 A

Manually trip the reactor before SG Wide Range Levels decrease to < 24%.

Safety Significance: failure to manually trip the reactor causes a challenge to the Subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an "incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy and demonstrates the inability by the crew to recognize a failure of the automatic actuation of the RPS." A failure to trip the reactor when required will cause fission heat production to exceed the ability of the safeguards systems to remove heat from the system, and result in an NCS pressure increase. Under normal conditions, the Pzr PORV will open and degrade the NCS Barrier. Under worst case conditions the RCS Pressure Safety Limit could be exceeded within 2 minutes, potentially rupturing the RCS Fission Product Barrier.

FR-H.1 A/B

Either establish feedwater flow into at least one SG before Bleed and Feed criteria is met, or establish RCS Bleed and Feed before PORVs go open automatically due to plant heat-up.

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 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"/>		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.	
<input type="checkbox"/>		Freeze.	
<input type="checkbox"/>		Update Fresh Tech. Spec. Log.	1B CA Pump OOS LCF-5580, SG D #4 NR Level OOS

Scenario Event Description

NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
<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 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	(MALF) ENB011D Set = 1 Trigger #1	Power Range Channel failure (N44 Control Power Fuse failure)
<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
<input type="checkbox"/>	At direction of examiner	(XMT) SM003 Set = 0 Ramp = 30 seconds Trigger #7	Turbine Impulse Pressure Transmitter Failure

Scenario Event Description

NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
<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 (T=0) (MALF) DEH003A (T=0)	Failure of Automatic Rx Trip/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 (T=0)	1A CA Pump fails to start (Pump will fail to start in Auto or Manual) In FR-H.1, Step 10.f Use MAL-ISE007A/B = 5 (Block Both); for Enclosure 6.
<input type="checkbox"/>	Continued from Event 7	(OVR) IWE012D/IWE014D Trigger #15	CF Pumps fail to reset after FWIS See actuation point on Page 55 of Script.
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>65</u>
Event Description:		Swap CF Control Valve Circuit							
Time	Position	Applicant's Actions or Behavior							

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). 	<p>NOTE: The RO will contact NLO.</p> <p>Booth Instructor: Report that Alternate Control power is available for 1CVSV0234 on TB691.</p>
	RO	<ul style="list-style-type: none"> (Step 3.5.2) Place 1CF-32A (1A S/G CF Control) in "MAN." (R.M.) 	
			<p>NOTE: The RO may direct the NLO to perform Steps 3.5.3 through 3.5.5.</p> <p>If so, Booth Instructor: make the following reports all at once.</p>

Op Test No.: N09-1 Scenario # 3 Event # 1 Page 9 of 65Event 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: 	<p>NOTE: The RO will contact NLO.</p> <p>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.</p>
		<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: 	<p>NOTE: The RO will contact NLO.</p> <p>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.</p>
		<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%. 	<p>NOTE: The RO will contact NLO.</p> <p>Booth Instructor: Report that the digital readout on 1CFEM00008 and 1CMEM00004 are within 10%.</p>
	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.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>1</u>	Page	<u>10</u>	of	<u>65</u>
Event Description:		Swap CF Control Valve Circuit							
Time	Position	Applicant's Actions or Behavior							

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.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>11</u>	of	<u>65</u>
Event Description:		Power Range Channel failure							
Time	Position	Applicant's Actions or Behavior							

Immediately afterwards, the control power fuses for Nuclear Excore Power Range Channel N44 will fail. The operator will respond in accordance with 1AD-2, F-3, "P/R/HI VOLTAGE FAILURE," then implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case III, "Power Range Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation."

Booth Operator Instructions: Operate Trigger #1 (MALF- ENB011D (1))

Indications Available:

- 1AD-2/A-1, P/R HI FLUX RATE RATE ALERT.
- 1AD-2/A-3, P/R HI FLUX HI STPT ALERT.
- 1AD-2/A-8, OTDT RUNBACK/ROD STOP ALERT.
- 1AD-2/F-3, P/R HI VOLTAGE FAILURE.
- All Excore NI Channels steady at 100% on MCB Panel 2.

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010C, ANNUNCIATOR RESPONSE FOR PANEL 1AD-2 F-3, P/R HI VOLTAGE FAILURE			
	SRO	(Immediate Action) Go to AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation).	
	SRO	(Supplementary Action) Refer to Tech Specs for instrumentation requirement.	NOTE: The SRO may directly enter AP-16, and NOT address the ARP.
AP/1/A/5500/16, MALFUNCTION OF NUCLEAR INSTRUMENTATION CASE III, POWER RANGE MALFUNCTION			
	RO	(Step 1) Place control rods in manual.	
	RO	(Step 2) Check S/G levels – AT PROGRAMMED LEVEL.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>12</u>	of	<u>65</u>
Event Description: Power Range Channel failure									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 3) Announce occurrence on paging system.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 4) check P/R channels – ONLY ONE CHANNEL FAILED.	NOTE: This BOP will need to check locally at the Excore Cabinets to determine that N44 has failed.
	RO	(Step 5) Position "PR TO S/G PROGRAM LEVEL CHNNEL DEFEAT" switch to defeat inoperable channel.	
	RO	(Step 6) Secure any power increase in progress.	
	RO	(Step 7) Check the following interlocks – IN REQUIRED STATE FOR EXISTING PLANT CONDITIONS:	
		<ul style="list-style-type: none"> P-7 Lo Power Rx Trips Blocked 	
		<ul style="list-style-type: none"> P-8 Hi Pwr Lo Flo Rx Trip Blocked 	
		<ul style="list-style-type: none"> P-10 Nuclear at Power. 	
	BOP	(Step 8) Perform the following actions at the "MISCELLANEOUS CONTROL AND INDICATION PANEL" drawer:	
		<ul style="list-style-type: none"> Place the appropriate "ROD STOP BYPASS" switch to the failed channel position. 	
		<ul style="list-style-type: none"> Place the "POWER MISMATCH BYPASS" switch to the failed channel position. 	
	BOP	(Step 9) Perform the following actions at the "DETECTOR CURRENT COMPARATOR" drawer:	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>13</u>	of	<u>65</u>
Event Description: Power Range Channel failure									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Place the "UPPER SECTION" switch to the failed channel position. 	
		<ul style="list-style-type: none"> Check the "CHANNEL DEFEAT" light for the upper section – LIT. 	
		<ul style="list-style-type: none"> Place the "LOWER SECTION" switch to the failed channel position. 	
		<ul style="list-style-type: none"> Check the "CHANNEL DEFEAT" light for the lower section – LIT. 	
	BOP	(Step 10) Perform the following actions at the "COMPARATOR AND RATE" drawer:	
		<ul style="list-style-type: none"> Place the "COMPARATOR CHANNEL DEFEAT" switch to the failed channel position. 	
		<ul style="list-style-type: none"> Check the "COMPARATOR DEFEAT" light – LIT. 	
	BOP	(Step 11) Trip bistables of failed channel as follows:	
		<ul style="list-style-type: none"> Remove Control Power fuses from "POWER RANGE A" drawer for failed channel. 	
		<ul style="list-style-type: none"> IF Power Range Cabinet shows evidence of damage (i.e. visual smoke or abnormal smell)..... 	NOTE: The Power Range Cabinet does NOT show any evidence of damage.
	RO	(Step 12) Check the following status lights for the failed channel – LIT:	
		<ul style="list-style-type: none"> "NUC OVERPOWER ROD STOP CH I(II,III,IV) BYP" (1SI-19) 	
		<ul style="list-style-type: none"> "P/R HI FLUX LO STPT" (1SI-2) 	
		<ul style="list-style-type: none"> "P/R HI FLUX HI STPT" (1SI-2) 	
		<ul style="list-style-type: none"> "P/R HI FLUX RATE" (1SI-3) 	
	RO	(Step 13) Check the following annunciator lights – LIT:	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>14</u>	of	<u>65</u>
Event Description: Power Range Channel failure									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> "P/R HI VOLTAGE FAILURE" (1AD-2, F-3) 	
		<ul style="list-style-type: none"> "P/R HI FLUX HI STPT ALERT" (1AD-2, A-3) 	
		<ul style="list-style-type: none"> "P/R HI FLUX RATE ALERT" (1AD-2, A-1) 	
	RO	(Step 14) Check the following status lights on 1SI-18 – LIT:	
		<ul style="list-style-type: none"> "P/R LO SETPOINT TRAIN A TRIP BLOCKED" 	
		<ul style="list-style-type: none"> "P/R LO SETPOINT TRAIN B TRIP BLOCKED". 	
	RO	(Step 15) IF desired to control S/G levels in auto, THEN return affected S/G CF control valves to auto.	
	RO	(Step 16) Ensure operable P/R channel selected to record on NIS Recorder.	
	RO	(Step 17) Adjust control rods to maintain T-Avg at T-Ref.	
	RO	(Step 18) WHEN T-Avg within 1°F of T-Ref, AND auto rod control desired, THEN return control rods to auto.	NOTE: The RO will place the Control Rods back in AUTO.
	SRO	(Step 19) Instruct IAE to trip the following bistables associated with failed P/R channel within 6 hours of failure PER IP/1/A/3090/014 (Tripping Inoperable Protection Channels):	NOTE: SRO may call WCC/IAE to address the switch position. If so, Booth Instructor acknowledge as WCC.
		<ul style="list-style-type: none"> OPDT 	
		<ul style="list-style-type: none"> OTDT. 	

Op Test No.: N09-1 Scenario # 3 Event # 2 Page 15 of 65Event Description: **Power Range Channel failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 20) IF AT ANY TIME failed P/R channel is repaired prior to IAE tripping bistables, THEN perform the following:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	<ul style="list-style-type: none"> Inform IAE that bistables are no longer required to be tripped. 	
		<ul style="list-style-type: none"> GO TO Step 22. 	
	SRO	(Step 22) WHEN malfunctioning P/R channel repaired.....	NOTE: Power Range Channel has NOT been repaired.
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION			
	SRO	3.3.1 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.	
	SRO	APPLICABILITY: According to Table 3.3.1-1.	
	SRO	ACTIONS	

Op Test No.: N09-1 Scenario # 3 Event # 2 Page 16 of 65Event Description: **Power Range Channel 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 Functions 2a, 3, 6 and 7 of Table 3.3-1 are applicable and that Conditions A, D and E are required.	
		A. One or more Functions with one or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately		
		D. One channel inoperable.	D.1.1 Place channel in trip.	6 hours		
			AND			
			D.1.2 Reduce THERMAL POWER ≤ 75% RTP.	12 hours		
			OR			
			D.2.1 Place channel in trip.	6 hours		
D.2.2 Perform SR 3.2.4.2.	Once per 12 hours					
	OR					
	D.3 Be in MODE 3.	12 hours				
E. One channel inoperable.	E.1 Place channel in trip.	6 hours				
	OR					
	E.2 Be in MODE 3.	12 hours				
At the discretion of the Lead Examiner move to Events #3-4.						

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>17</u>	of	<u>65</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							

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 23.</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.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>18</u>	of	<u>65</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 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.
		<ul style="list-style-type: none"> 1NV-1A (NC L/D Isol To Regen Hx) 	NOTE: These valves are most likely already closed.
		<ul style="list-style-type: none"> 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:	
		<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). 	
	BOP	(Step 37) Ensure "NC SYS M/U CONTROLLER" in "AUTO".	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>19</u>	of	<u>65</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
	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.:	N09-1	Scenario #	3	Event #	3 & 4	Page	20	of	65
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-26 (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 21 of 65Event 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-26 (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-26 while maintaining excess letdown HX temperature less than 200°F. 	NOTE: BOP will fully open 1NV-26 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.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>22</u>	of	<u>65</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
		<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 Otlt 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-26 (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-26 (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). 	
	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.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>23</u>	of	<u>65</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
			Examiner NOTE: Move forward to event termination on Page 32 .
			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: 	
		<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. 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 24 of 65Event 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 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 	
		<ul style="list-style-type: none"> IF in Modes 1-4, OR no-mode, THEN GO TO Step 2. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>25</u>	of	<u>65</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
	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:	
		• 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:	
		• Monitor OAC NC graphic	
		OR	
		• Compare charging flow to letdown flow plus seal return flow	
		OR	
		• Monitor VCT level trend (OAC point M1P1271).	
	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.

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 26 of 65Event 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 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 if 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:	
		<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 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>27</u>	of	<u>65</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
		<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. 	
	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. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>28</u>	of	<u>65</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
	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 Otlt 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			
	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. 	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 29 of 65Event 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.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. 	
	BOP	(Step 2) Place 1NV-27B (Excess L/D Hx Otlt 3-Way Cntrl) to "VCT" position.	
	BOP	(Step 3) Open 1NV-26B (U1 Excess L/D Hx Outlet Cntrl).	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 30 of 65Event 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 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.	
	BOP	(Step 11) Notify Chemistry that excess letdown is in service.	NOTE: The BOP will call Chemistry. Booth Instructor acknowledge as Chemistry.

Op Test No.:	<u>N09-1</u>	Scenario #	<u>3</u>	Event #	<u>3 & 4</u>	Page	<u>31</u>	of	<u>65</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
	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.
	SRO	(Step 31) Check unit shutdown – REQUIRED.	
	SRO	(Step 31 RNO) GO TO Step 34.	

Op Test No.: N09-1 Scenario # 3 Event # 3 & 4 Page 32 of 65Event 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 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/Mnagement 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.
At the discretion of the Lead Examiner move to Event #5.			

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 33 of 65Event 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."

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:	NOTE: No Rods have dropped.
		<ul style="list-style-type: none"> • Trip reactor. • GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
	RO	(Step 2) Place control rods in manual.	
	RO	(Step 3) Check rod movement – STOPPED.	
	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.
		<ul style="list-style-type: none"> • "1A NC LOOP T-AVG" • "1B NC LOOP T-AVG" 	

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 34 of 65Event 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"> • "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:	
		<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). 	

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 35 of 65Event Description: **Turbine Impulse Pressure Transmitter failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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	
	SRO	LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.	

Op Test No.: N09-1 Scenario # 3 Event # 5 Page 36 of 65Event Description: **Turbine Impulse Pressure Transmitter failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	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	
At the discretion of the Lead Examiner move to Event #6.					

Op Test No.: N09-1 Scenario # 3 Event # 6 Page 37 of 65Event 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. 	
		<ul style="list-style-type: none"> • 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 	
		<ul style="list-style-type: none"> • Steam flow 	
		<ul style="list-style-type: none"> • S/G 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). 	

Op Test No.: N09-1 Scenario # 3 Event # 6 Page 38 of 65Event 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	65
Event Description:		FCV Controller failure							
Time	Position	Applicant's Actions or Behavior							

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.
	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 #7-11.			

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	40	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Shortly afterwards, the D SG NR Level Channel 2 will fail high causing an FWIS. Simultaneously, the reactor AND the turbine will fail to trip automatically. The operator will be expected to manually trip the reactor and enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and manually trip the turbine. On the trip, the TD CA will overspeed. Additionally the 1A CA Pump will trip on overcurrent causing a Red Path to exist on Heat Sink. The operator will implement EP/1/A/5000/FR-H.1, "Response to Loss of Secondary Heat Sink." When the operator attempts to restore feedwater flow from the CF pumps, the operator will discover that neither CF can be reset. As the operator attempts to restore a heat sink with the CM system, the Steam Generator levels will approach the point at which NCS Feed and Bleed must be established. The scenario is expected to terminate, unless the crew successfully establishes feed flow to one Steam Generator with the Condensate System, at Step 29 of FR-H.1, after the crew has established NCS Feed and Bleed 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.	
	RO	(Step 2) Check Reactor Trip:	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	41	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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 automatic reactor trip will fail, and the RO will have to trip the reactor manually.
		<ul style="list-style-type: none"> Trip reactor. 	

CRITICAL TASK:**(E-0 A) Manually trip the reactor before SG Wide Range Levels decrease to < 24%.**

Safety Significance: failure to manually trip the reactor causes a challenge to the Subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an "incorrect performance that necessitates the crew taking compensating action which complicates the event mitigation strategy and demonstrates the inability by the crew to recognize a failure of the automatic actuation of the RPS." A failure to trip the reactor when required will cause fission heat production to exceed the ability of the safeguards systems to remove heat from the system, and result in an NCS pressure increase. Under normal conditions, the Pzr PORV will open and degrade the NCS Barrier. Under worst case conditions the RCS Pressure Safety Limit could be exceeded within 2 minutes, potentially rupturing the RCS Fission Product Barrier.

	RO	(Step 3) Check turbine Trip:	
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	RO	(Step 3 RNO) Perform the following:	NOTE: The automatic turbine trip will fail, and the RO will have to trip the turbine manually.
		<ul style="list-style-type: none"> Trip turbine. 	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9, 10 & 11 Page 42 of 65

Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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:	
		<ul style="list-style-type: none"> “SAFETY INJECTION ACTUATED” status light (1SI-18) – LIT. 	
	BOP / RO	(Step 6.a RNO) Perform the following:	
		<ul style="list-style-type: none"> Check if S/I is required: 	
		<ul style="list-style-type: none"> Pzr pressure less than 1845 PSIG 	
		OR	
		<ul style="list-style-type: none"> Containment pressure greater than 1 PSIG. 	
		<ul style="list-style-type: none"> IF S/I is required, THEN initiate S/I. 	
		<ul style="list-style-type: none"> IF S/I is not required, THEN perform the following: 	
		<ul style="list-style-type: none"> Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees). 	NOTE: A Red Path will exist on Heat Sink, however, due to the initiating failures, the OAC will NOT show this.
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/ES-0.1 (Reactor Trip Response). 	NOTE: The SRO will transition to ES-0.1.

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	43	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/ES-0.1, REACTOR TRIP RESPONSE			
			NOTE: A Red Path will exist on Heat Sink , at any time during this procedure the SRO may suspend ES-0.1 and transition to FR-H.1. If so, Examiner move forward to FR-H.1 actions on Page 45 .
	SRO	(Step 1) Monitor Foldout page.	
	BOP	(Step 2) Check the following:	
		<ul style="list-style-type: none"> VI pressure – GREATER THAN 70 PSIG. 	
		<ul style="list-style-type: none"> Unit 1 6900V busses – ENERGIZED. 	
	SRO	(Step 3) Announce: "Unit 1 Reactor trip, 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.
	SRO	(Step 4) 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 / BOP	(Step 5) Check NC temperatures:	
		<ul style="list-style-type: none"> IF any NC pump on, THEN check NC T-Avg – STABLE OR TRENDING TO 557°F. 	
	RO / BOP	(Step 6) Continue to monitor NC temperature as follows:	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	44	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check any NC pump – ON. 	
		<ul style="list-style-type: none"> IF AT ANY TIME while in this procedure the following occurs, THEN perform Step 5. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> NC T-Avg is less than 557°F and going down 	
		OR	
		<ul style="list-style-type: none"> NC T-Avg is greater than 557°F and going up. 	
	RO	(Step 7) Check both generator breakers – OPEN.	
	RO	(Step 8) Check MSR “RESET” light – LIT.	
	SRO	(Step 9) Dispatch operator to perform Enclosure 5 (MSR Second Stage Drain Tank Isolation).	NOTE: The SRO will dispatch an NLO.
	RO	(Step 10) Check NC T-Avg – GREATER THAN 553°F.	
	RO / BOP	(Step 11) Check feedwater status:	
		<ul style="list-style-type: none"> Check any CA pump – ON. 	
		<ul style="list-style-type: none"> Check total feed flow to S/Gs – GREATER THAN 450 GPM. 	NOTE: A Red Path will exist on Heat Sink, however, due to the initiating failures, the OAC will NOT show this. However, at this step the crew will have recognized a Red path condition if NOT previously recognized.

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	45	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 11 RNO) Establish total feed flow to S/Gs greater than 450 GPM or maintain at least one S/G N/R level greater than 11% using one of the following:	
		<ul style="list-style-type: none"> Start CA pumps. 	
		OR	
		<ul style="list-style-type: none"> Use main feedwater PER Enclosure 4 (Reestablishing CF Flow). 	NOTE: The SRO will transition to FR-H.1.
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.	
	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:	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	46	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check W/R level in at least 3 S/Gs – LESS THAN 25% (36% ACC). 	
	RO / BOP	(Step 5 RNO) Perform the following:	
		<ul style="list-style-type: none"> Monitor feed and bleed initiation criteria. 	
		<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 62 .
	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 48.</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 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	47	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		• 1BB-3B (1C S/G Blowdown Cont Outside Isol Control) - CLOSED	
		• 1BB-4B (1D S/G Blowdown Cont Outside Isol Control) - CLOSED	
		• 1BB-5A (A S/G BB Cont Inside Isol) - CLOSED	
		• 1BB-6A (B S/G BB Cont Inside Isol) - CLOSED	
		• 1BB-7A (C S/G BB Cont Inside Isol) - CLOSED	
		• 1BB-8A (D S/G BB Cont Inside Isol) - CLOSED	
		• 1NM-187A (1A S/G Upper Shell Sample Cont Inside Isol) - CLOSED	
		• 1NM-190A (1A S/G Upper Shell Sample Cont Inside Isol) - CLOSED	
		• 1NM-201A (1B S/G Upper Shell Sample Cont Inside Isol) - CLOSED	
		• 1NM-207A (1C S/G Upper Shell Sample Cont Inside Isol) - CLOSED	
		• 1NM-210A (1C S/G Blowdown Sample Cont Inside Isol) - CLOSED	
		• 1NM-221A (1D S/G Blowdown Sample Cont Inside Isol) - CLOSED	
		• 1NM-191B (1A S/G Blowdown Sample Cont Inside Isol) - CLOSED	
		• 1NM-197B (1B S/G Upper Shell Sample Cont Inside Isol) - CLOSED	
		• 1NM-200B (1B S/G Blowdown Sample Cont Inside Isol) - CLOSED	
		• 1NM-211B (1C S/G Blowdown Sample Hdr Cont Outside Isol) - CLOSED	
		• 1NM-217B (1D S/G Upper Shell Sample Cont Inside Isol) - CLOSED	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	48	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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. 	
		(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 51.

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	49	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
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:	
		• 1CA-66AC (U1 TD CA Pump Disch To 1A S/G Isol) – OPEN	
		• 1CA-62A (1A CA Pump Disch To 1A S/G Isol) – OPEN	
		• 1CA-54AC (U1 TD CA Pump Disch To 1B S/G Isol) – OPEN	
		• 1CA-58A (1A CA Pump Disch To 1B S/G Isol) - OPEN	
		• 1CA-50B (U1 TD CA Pump Disch To 1C S/G Isol) – OPEN	
		• 1CA-46B (1B CA Pump Disch To 1C S/G Isol) - OPEN	
		• 1CA-38B (U1 TD CA Pump Disch To 1D S/G Isol) – OPEN	
		• 1CA-42B (1B CA Pump Disch To 1D S/G Isol) – OPEN.	
	BOP / RO	(Step 2) Check the following valves – OPEN:	
		• 1CA-64AB (U1 TD CA Pump Disch To 1A S/G Control) – OPEN	
		• 1CA-60A (1A CA Pump Disch To 1A S/G Control) – OPEN	
		• 1CA-52AB (U1 TD CA Pump Disch To 1B S/G Control) – OPEN	
		• 1CA-56A (1A CA Pump Disch To 1B S/G Control) - OPEN	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	50	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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:	
		<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 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	51	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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 	
		<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.

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	52	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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). 	<p>NOTE: The SRO will dispatch an NLO.</p> <p>Booth Instructor: Within 3 minutes, as NLO report that the TD CA Pump linkage appears to be broken.</p>
		<ul style="list-style-type: none"> IF reason for loss of steam supply to TD CA pump not determined,..... 	<p>NOTE: The reason for the loss of steam supply to the TD CA Pump turbine is known.</p>
	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,..... 	<p>NOTE: All CA pumps are OFF.</p>
		<ul style="list-style-type: none"> IF any feed flow to at least one S/G is indicated,..... 	<p>NOTE: There is no feed flow to any SG.</p>
	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:	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	53	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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. 	
		<ul style="list-style-type: none"> Place "STM PRESS CONTROLLER" in auto. 	
	BOP	(Step 9) Stop all NC pumps.	
	BOP	(Step 10) Reset Feedwater Isolation as follows:	
		<ul style="list-style-type: none"> Check the following alarms – DARK: 	
		<ul style="list-style-type: none"> 1AD-5, G-6 (Inner Doghouse Level Hi) 	
		<ul style="list-style-type: none"> 1AD-5, H-6 (Outer Doghouse Level Hi). 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	54	of	65
Event Description: SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	<ul style="list-style-type: none"> Dispatch operator to block Feedwater Isolation signal PER Enclosure 6 (Feedwater Isolation Override). 	NOTE: The SRO will dispatch an NLO. Floor Instructor: acknowledge as NLO.
	BOP / RO	<ul style="list-style-type: none"> Check S/I – HAS BEEN ACTUATED. 	
	SRO	(Step 10.c RNO) Perform the following:	
		<ul style="list-style-type: none"> IF any S/G N/R level has exceeded 83% (P-14) during this event, THEN GO TO Step 10.f. 	NOTE: The SRO will need to see that the 1D NR levels have failed causing P-14 to activate.
	SRO	<ul style="list-style-type: none"> (Step 10.f) Do not continue until Enclosure 6 (Feedwater Isolation Override) is completed. 	NOTE: The SRO will dispatch an NLO. Booth Instructor: Use MAL-ISE007A/B = 5 (Block Both) Within 2 minutes , as NLO report that Enclosure 6 has been completed.
	BOP	(Step 11) Check CM System in service:	
		<ul style="list-style-type: none"> Hotwell pump(s) – ON 	
		<ul style="list-style-type: none"> Condensate Booster pump(s) – ON. 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	55	of	65
Event Description: SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12) Check CF pumps – AT LEAST ONE AVAILABLE TO START.	Examiner NOTE: The SRO may decide, based on the FWIS, that the CF Pumps are NOT available to start and go to the RNO. If so, Follow Script starting with FR-H.1, Step 15 on Page 57. If NOT, continue with Script.
	SRO	(Step 13) Establish CF Flow PER Enclosure 7 (Reestablishing CF Flow).	NOTE: The SRO will most likely transition to Enclosure 7.
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK ENCLOSURE 7, REESTABLISHING CF FLOW			
	RO	(Step 1) Place the following in manual and close loaders for all:	Booth Instructor: Operate Trigger #15 (OVR-IWE012D and IWE014D).
		<ul style="list-style-type: none"> S/G CF control valves. S/G CF control valve bypass valves. 	
	RO	(Step 2) Depress and release the Feedwater Isolation reset pushbuttons.	
	RO	(Step 3) Check any CF pump – RESET.	
	SRO	(Step 3 RNO) GO TO Step 12.	
	RO	(Step 12) Depress "RESET" on "1A OR 1B CF PUMP RECIRC VALVE CLOSURE CIRCUIT" and check "RESET" light lit.	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	56	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 13) Reset CF pump turbine that will be placed in service as follows:	
		<ul style="list-style-type: none"> Depress "RESET" and hold "RESET" 2-3 seconds after the "RST" light is lit on pump to be started. 	
		<ul style="list-style-type: none"> Check CF pump turbine to be started – RESET. 	
	RO	(Step 13.b RNO) Perform the following:	
		<ul style="list-style-type: none"> IF other CF pump turbine is available to be reset, THEN depress "RESET" and hold "RESET" 2-3 seconds after "RST" light is lit on other CF pump. 	
		<ul style="list-style-type: none"> IF CF pump turbine reset,..... 	
		<ul style="list-style-type: none"> IF "RST" light dark, THEN dispatch operator to perform the following at the CF pump turbine to be reset: 	<p>NOTE: The SRO will dispatch an NLO.</p> <p>Floor Instructor: acknowledge as NLO.</p> <p>Booth Instructor: as NLO, 1 minute after dispatch, report that the plunger has been depressed, as need for each pump when requested to do so.</p>
		<ul style="list-style-type: none"> Establish communication with the Control Room. 	
		<ul style="list-style-type: none"> Depress and hold "RESET" plunger on Mechanical Overspeed Trip Block for 3-5 seconds. 	
		<ul style="list-style-type: none"> Hold plunger depressed an additional 2-3 seconds after "RST" lit in Control Room. 	<p>NOTE: Neither local reset attempt will work.</p>
		<ul style="list-style-type: none"> Do not continue until operator has attempted to locally reset CF pump turbine. 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	57	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF both CF pumps still tripped, THEN GO TO Step 15 in body of this procedure. 	NOTE: The SRO will go back to FR-H.1, Step 15.
			Examiner NOTE: If at any time during the event the Bleed and Feed Criteria of this step is met, move to Page 61 .
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK			
	BOP	(Step 15) Depressurize Pzr to less than 1905 PSIG as follows:	
		<ul style="list-style-type: none"> Check Pzr pressure – GREATER THAN 1905 PSIG. 	
		<ul style="list-style-type: none"> Ensure Pzr pressure is maintained above 1845 PSIG until Pzr S/I signal is blocked in Step 16. 	
		<ul style="list-style-type: none"> Check normal letdown – IN SERVICE. 	NOTE: Normal Letdown is NOT in service.
	BOP	(Step 15.c RNO) Perform the following:	
		<ul style="list-style-type: none"> Depressurize using one Pzr PORV to less than 1905 PSIG. 	
		<ul style="list-style-type: none"> IF Pzr PORV will not operate,..... 	NOTE: The Pzr PORVs will operate.
		<ul style="list-style-type: none"> IF Pzr PORV available, THEN perform the following: 	
		<ul style="list-style-type: none"> Maintain Pzr pressure less than 1905 PSIG. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 16. 	
	BOP	(Step 16) Block Pzr S/I actuation circuit and Low Pressure Steamline Isolation as follows:	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	58	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check "P-11 PZR S/I BLOCK PERMISSIVE" status light (1SI-18) – LIT. 	
		<ul style="list-style-type: none"> Depress "BLOCK" on Pzr S/I block switches. 	
		<ul style="list-style-type: none"> Depress "BLOCK" on Low Pressure Steamline Isolation block switches. 	
		<ul style="list-style-type: none"> IF AT ANY TIME conditions degrade, THEN manual S/I actuation may be required. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	<ul style="list-style-type: none"> Designate operator to continuously monitor and control Pzr pressure PER Enclosure 8 (Maintaining Pzr pressure below P-11). 	NOTE: The SRO will assign the BOP to maintain pressure in accordance with Enclosure 8.
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK ENCLOSURE 8, MAINTAINING PZR PRESSURE BELOW P-11			
	BOP	(Step 1) Check 1NV-21A (NV Spray To PZR Isol) – CLOSED.	Examiner NOTE: This will be a Continuous responsibility of the BOP.
	BOP	(Step 2) IF AT ANY TIME Pzr pressure approaches 1905 PSIG< THEN maintain pressure between 1905 PSIG and 1800 PSIG as follows:	NOTE: This is a Continuous Action.
		<ul style="list-style-type: none"> IF normal letdown isolated, OR NV aux spray not effective in maintaining pressure below 1905 PSIG, THEN cycle Pzr PORV. 	
	BOP	(Step 3) IF AT ANY TIME Pzr pressure inadvertently goes above 1955 PSIG, THEN ensure Step 16 in body of this procedure is performed again (to reinstate blocks), prior to depressurizing below 1845 PSIG.	NOTE: This is a Continuous Action.

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	59	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK			
	BOP	(Step 17) Attempt to establish feed flow from CM System as follows:	
	BOP	<ul style="list-style-type: none"> Check hotwell pumps – AT LEAST 2 PUMPS ON. 	
		<ul style="list-style-type: none"> Check condensate booster pumps – AT LEAST 2 PUMPS ON. 	
		<ul style="list-style-type: none"> Check "CF HEADER PRESSURE " – GREATER THAN 500 PSIG. 	
		<ul style="list-style-type: none"> Depressurize at least one S/G to less than 500 PSIG in following steps. 	
	RO	<ul style="list-style-type: none"> Close MSIV on S/Gs not to be depressurized. 	
		<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 S/G(s) to be depressurized – OPEN. 	
		<ul style="list-style-type: none"> Place "STM PRESS CONTROLLER" in manual. 	
		<ul style="list-style-type: none"> Check "STEAM DUMP SELECT" – IN STEAM PRESURE MODE. 	
		<ul style="list-style-type: none"> WHEN "P-12 LO-LO TAVG" status light (1SI-18) lit, THEN place steam dumps in bypass interlock. 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	60	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Dump steam from S/G(s) to be depressurized to condenser at maximum rate while attempting to avoid a Main Steam Isolation. 	Examiner NOTE: during this depressurization, feed and bleed criteria will most likely be met, and the crew will move forward to Step 20. If so, move forward to Page 62 . If NOT, continue with the script.
	RO	<ul style="list-style-type: none"> WHEN S/G(s) pressure is less than 500 PSIG, THEN stabilize pressure less than 500 PSIG, to avoid excessive cooldown. 	
	RO	<ul style="list-style-type: none"> Close the following valves: 	
		<ul style="list-style-type: none"> 1CF-35AB (1A S/G CF Cont Outside Isol). 	
		<ul style="list-style-type: none"> 1CF-30AB (1B S/G CF Cont Outside Isol). 	
		<ul style="list-style-type: none"> 1CF-28AB (1C S/G CF Cont Outside Isol). 	
		<ul style="list-style-type: none"> 1CF-26AB (1D S/G CF Cont Outside Isol). 	
		<ul style="list-style-type: none"> Place the following in manual and close manual loaders for all: 	
		<ul style="list-style-type: none"> S/G CF control valves. 	
		<ul style="list-style-type: none"> S/G CF control valve bypass valves. 	
		<ul style="list-style-type: none"> Depress and release the Feedwater Isolation reset pushbuttons. 	
		<ul style="list-style-type: none"> Check feed and bleed - ESTABLISHED PER STEPS 21 through 25. 	
	SRO	(Step 17.o RNO) GO TO Step 17.s.	
	RO	(Step 17.s) Align feed flow as follows:	

Op Test No.: N09-1 Scenario # 3 Event # 7, 8, 9, 10 & 11 Page 61 of 65

Event Description: **SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> OPEN the following valve(s) for the S/G(s) to be fed: 	
		<ul style="list-style-type: none"> 1CF-126B (1A S/G CF to CA Nozzle Isol). 	
		<ul style="list-style-type: none"> 1CF-127B (1B S/G CF CA Nozzle Isol). 	
		<ul style="list-style-type: none"> 1CF-128B (1C S/G CF CA Nozzle Isol). 	
		<ul style="list-style-type: none"> 1CF-129B (1D S/G CF CA Nozzle Isol). 	
		<ul style="list-style-type: none"> Throttle open S/G CF control bypass valve for the S/G(s) to be fed. 	
	SRO	(Step 17.t) Check if Step 17.q or 17.r – IMPLEMENTED.	NOTE: Steps 17.q and r are associated with Bleed and Feed, and if the SRO has arrived at this step in this event these steps will NOT have been performed.
	SRO	(Step 17.t RNO) Go To Step 17.w.	
	RO	(Step 17.w) Check feedwater flow to depressurized S/G – FLOW INDICATED.	
	SRO	(Step 17.w RNO) Perform the following:	
		<ul style="list-style-type: none"> IF depressurized S/G pressure is less than 500 PSIG, THEN GO TO Step 19. 	
		<ul style="list-style-type: none"> RETURN TO Step 17.a. 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	62	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
CRITICAL TASK:			
(FR-H.1 A/B) Either establish feedwater flow into at least one SG before Bleed and Feed criteria is met, or establish RCS Bleed and Feed before PORVs go open automatically due to plant heat-up.			
<p>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.</p>			
			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. 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	63	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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. 	
	BOP	(Step 25) Check two Pzr PORVs and associated isolation valves – OPEN.	
	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. 	

Op Test No.:	N09-1	Scenario #	3	Event #	7, 8, 9, 10 & 11	Page	64	of	65
Event Description:		SG NR Level Channel 2 fails high/FWIS/ Failure of Automatic Rx Trip/Turbine Trip/ TD CA Pump trip/1A CA Pump fails to start/CF fail to Reset after FWIS							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
CRITICAL TASK:			
(FR-H.1 A/B) Either establish feedwater flow into at least one SG before Bleed and Feed criteria is met, or establish RCS Bleed and Feed before PORVs go open automatically due to plant heat-up.			
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 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". 	
	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:	
		<ul style="list-style-type: none"> Maintain S/I flow 	
		<ul style="list-style-type: none"> 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 swapper 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).

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

Facility: McGuire		Scenario No.: 4		Op Test No.: N09-1	
Examiners: _____		Operators: _____		(SRO)	
_____		_____		(RO)	
_____		_____		(BOP)	
Initial Conditions:		<p>A plant startup is being conducted following an unplanned reactor trip due to a failure of the 1B CF Pump. The repairs on the pump are still in progress, and it is expected to be back in service within the next four hours. A reactor startup has been completed, and reactor power is stabilized at 10^{-8} amps. OP/1/A/6100/003 Enc 4.1, "Power Increase," has been completed through Step 3.16. It is planned that this shift will raise reactor power to 8-9% and stabilize for a Chemistry Hold per Step 3.17.9.1 of OP/1/A/6100/003 Enc 4.1. A dedicated operator has been stationed at the MCB to control the reactor during the startup. Pzr level control is selected to "3-2" due to previous testing on Channel 1.</p>			
Turnover:		<p>The following equipment is Out-Of-Service: 1B CF Pump is OOS (Expected back in 4 hours). LCA-5320, CA Condensate Storage Tank Level Indicator, failed last shift (IAE is investigating). MCB Annunciator 1AD-10, C-1, "KC SURGE TANK ABNORMAL LEVEL," has been in constant alarm over the last hour (IAE is investigating).</p>			
Event No.	Malf. No.	Event Type*	Event Description		
1	ILE003	I-BOP I(TS)-SRO	Pressurizer Level Transmitter fails high		
2	SM001A	C-RO C-SRO	SG PORV fails open		
3	IFE008A	I-RO I-SRO	Increase to POAH/Feedwater Bypass Valve Controller failure		
4	ENB009A	I-BOP I(TS)-SRO	Intermediate Range Channel failure		
5	EP009A DG004A	C-BOP C-RO C-SRO	LOP to 1ETA/DG Trip		
6	NA	N-BOP N-SRO	Restore Normal Letdown		
7	SM008A	M-RO M-BOP M-SRO	Unisolable Steam Line Break (Outside Containment)		
8	ISE002A ISE002B	NA	Failure of Automatic SIS Actuation		
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>					

McGuire 2009 NRC Scenario #4

A plant startup is being conducted following an unplanned reactor trip due to a failure of the 1B CF Pump. The repairs on the pump are still in progress, and it is expected to be back in service within the next four hours. A reactor startup has been completed, and reactor power is stabilized at 10^{-8} amps. OP/1/A/6100/003 Enc 4.1, "Power Increase," has been completed through Step 3.16. It is planned that this shift will raise reactor power to 8-9% and stabilize for a Chemistry Hold per Step 3.17.9.1 of OP/1/A/6100/003 Enc 4.1. A dedicated operator has been stationed at the MCB to control the reactor during the startup. Pzr level control is selected to "3-2" due to previous testing on Channel 1.

The following equipment is Out-Of-Service: 1B CF Pump is OOS (Expected back in 4 hours). LCA-5320, CA Condensate Storage Tank Level Indicator, failed last shift (IAE is investigating). MCB Annunciator 1AD-10, C-1, "KC SURGE TANK ABNORMAL LEVEL," has been in constant alarm over the last hour (IAE is investigating).

Shortly after taking the watch, the controlling Pzr Level Transmitter (LNC-5170) 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," and determine that the LCO is not applicable until the power level is above P-7.

After the plant stabilizes, the A Steam Generator PORV will slowly fail fully open. The operator will respond in accordance with AP/1/A/5500/01, "Steam Leak," and isolate the PORV.

Next, the dedicated operator will withdrawal control rods to raise power to the POAH. When the POAH is reached, the A Feedwater FCV Bypass Valve controller will fail causing the Feedwater FCV Bypass Valve to fail fully open. The operator will respond in accordance with AP/1/A/5500/06, "S/G Feedwater Malfunction," and take manual control of the failed controller. The controller will remain in manual control throughout the remainder of the scenario.

After this, Intermediate Range N35 High Voltage Power Supply will fail. The operator will implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case II, "Intermediate Range Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation." After consulting with plant management, a decision will be made to shutdown to reactor.

Shortly afterwards, the Normal Supply Breaker to 4160 VAC Essential Bus 1ETA will fail open. The 1A DG will start but trip on overspeed, causing a sustained Blackout on the bus. The operator will implement AP/1/A/5500/07, "Loss of Electrical Power," Case II, "Loss of Normal Power to either 1ETA or 1ETB." The RO will be required to control feed flow complicated by the auto start of the TD CA Pump, and the BOP will isolate Letdown and manually start the opposite train NV, KC and RN pumps. During the recovery, the BOP will be directed to restore normal Letdown in accordance with AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection."

During the response, a major steam line break will occur upstream of the MSIV on the A Steam Line outside the Containment. Additionally, the SIS actuation will fail automatically. The operator will be expected to manually actuate SIS as directed by EP/1/A/5000/E-0. Upon completion of E-0, the operator will transition to EP/1/A/5000/E-2, "Faulted Steam Generator Isolation," and isolate the A Steam Generator. After isolating the Steam Generator, the operator will transition to EP/1/A/5000/ES-1.1, "SI Termination," at step 13.

Upon entry into ES-1.1, the operator will stop the NI and ND pumps, stop all but one NV Pump and stop injection flow from the NV Pumps.

The scenario will terminate at Step 7.c when 1NI-9A and 1NI-10B are closed.

Critical Tasks:

E-0 D

Manually actuate at least one train of SIS-Actuated safeguards before transition out of E-0.

Safety Significance: Failure to manually actuate SI under the postulated conditions constitutes "mis-operation or incorrect crew performance that leads to degraded ECCS capacity." Since SI can be initiated manually from the Control Room, failure to do so demonstrates an inability by the crew to recognize a failed auto actuation of an ESF and take appropriate action, and to take action that would unnecessarily challenge a CSF. In the specified scenario, if ECCS system are not actuated, all assumption made in the FSAR analysis for the Steam Line break analysis are invalid.

E-2 A

Isolate the Faulted Steam Generator before transitioning out of E-2.

Safety Significance: Failure to isolate a Faulted SG that can be isolated causes challenges to the Critical Safety Functions that would not otherwise occur. Failure to isolate flow could result in an unwarranted Orange or Red Path condition on NC Integrity and/or Subcriticality (if cooldown is allowed to continue uncontrollably).

N09-1-4

Event 1

- OP/1/A/6100/010G, ANNUNCIATOR RESPONSE FOR PANEL 1AD-6, C-7, PZR HI LEVEL DEV CONTROL
- TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION
- TECHNICAL SPECIFICATION 3.3.3, PAM INSTRUMENTATION

Event 2

- AP/1/A/5500/01, STEAM LEAK

Event 3

- AP/1/A/5500/06, S/G FEEDWATER MALFUNCTIONS

Event 4

- OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATION ENCLOSURE 4.1, POWER INCREASE
- AP/1/A/5500/16, MALFUNCTION OF NUCLEAR INSTRUMENTATION CASE II, INTERMEDIATE RANGE MALFUNCTION
- TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION

Event 5

- AP/1/A/5500/07, LOSS OF ELECTRICAL POWER, CASE II, LOSS OF NORMAL POWER TO EITHER 1ETA OR 1ETB

Events 6 & 7

- E-0, REACTOR TRIP OR SAFETY INJECTION
- E-0, REACTOR TRIP OR SAFETY INJECTION, ENCLOSURE 3, UNCONTROLLED NC SYSTEM COOLDOWN
- E-2, FAULTED STEAM GENERATOR ISOLATION
- ES-1.1, SAFETY INJECTION TERMINATION

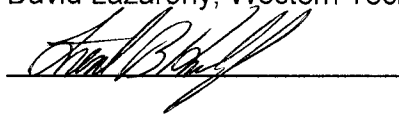
PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 25
TOPIC: NRC Simulator Exam
Scenario N09-1-4

REFERENCES:

1. OP/1/A/6100/003, "Controlling Procedure for Unit Operation."
2. OP/1/A/6100/010G, "Annunciator Response For Panel 1AD-6."
3. McGuire Technical Specifications.
4. AP/1/A/5500/01, "Steam Leak."
5. AP/1/A/5500/06, "S/G Feedwater Malfunctions."
6. AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation."
7. AP/1/A/5500/07, "Loss of Electrical Power."
8. AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection."
9. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
10. EP/1/A/5000/E-2, "Faulted Steam Generator Isolation."
11. EP/1/A/5000/ES-1.1, "SI Termination."
12. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review:



Rev. 021209

Scenario Event Description

NRC Scenario 4

Facility:	McGuire	Scenario No.:	4	Op Test No.:	N09-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	

Initial Conditions: A plant startup is being conducted following an unplanned reactor trip due to a failure of the 1B CF Pump. The repairs on the pump are still in progress, and it is expected to be back in service within the next four hours. A reactor startup has been completed, and reactor power is stabilized at 10^{-8} amps. OP/1/A/6100/003 Enc 4.1, "Power Increase," has been completed through Step 3.16. It is planned that this shift will raise reactor power to 8-9% and stabilize for a Chemistry Hold per Step 3.17.9.1 of OP/1/A/6100/003 Enc 4.1. A dedicated operator has been stationed at the MCB to control the reactor during the startup. Pzr level control is selected to "3-2" due to previous testing on Channel 1.

Turnover: The following equipment is Out-Of-Service: 1B CF Pump is OOS (Expected back in 4 hours). LCA-5320, CA Condensate Storage Tank Level Indicator, failed last shift (IAE is investigating). MCB Annunciator 1AD-10, C-1, "KC SURGE TANK ABNORMAL LEVEL," has been in constant alarm over the last hour (IAE is investigating).

Event No.	Malf. No.	Event Type*	Event Description
1	ILE003	I-BOP I(TS)-SRO	Pressurizer Level Transmitter fails high
2	SM001A	C-RO C-SRO	SG PORV fails open
3	IFE008A	I-RO I-SRO	Increase to POAH/Feedwater Bypass Valve Controller failure
4	ENB009A	I-BOP I(TS)-SRO	Intermediate Range Channel failure
5	EP009A DG004A	C-BOP C-RO C-SRO	LOP to 1ETA/DG Trip
6	NA	N-BOP N-SRO	Restore Normal Letdown
7	SM008A	M-RO M-BOP M-SRO	Unisolable Steam Line Break (Outside Containment)
8	ISE002A ISE002B	NA	Failure of Automatic SIS Actuation
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

McGuire 2009 NRC Scenario #4

A plant startup is being conducted following an unplanned reactor trip due to a failure of the 1B CF Pump. The repairs on the pump are still in progress, and it is expected to be back in service within the next four hours. A reactor startup has been completed, and reactor power is stabilized at 10^{-8} amps. OP/1/A/6100/003 Enc 4.1, "Power Increase," has been completed through Step 3.16. It is planned that this shift will raise reactor power to 8-9% and stabilize for a Chemistry Hold per Step 3.17.9.1 of OP/1/A/6100/003 Enc 4.1. A dedicated operator has been stationed at the MCB to control the reactor during the startup. Pzr level control is selected to "3-2" due to previous testing on Channel 1.

The following equipment is Out-Of-Service: 1B CF Pump is OOS (Expected back in 4 hours). LCA-5320, CA Condensate Storage Tank Level Indicator, failed last shift (IAE is investigating). MCB Annunciator 1AD-10, C-1, "KC SURGE TANK ABNORMAL LEVEL," has been in constant alarm over the last hour (IAE is investigating).

Shortly after taking the watch, the controlling Pzr Level Transmitter (LNC-5170) 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," and determine that the LCO is not applicable until the power level is above P-7.

After the plant stabilizes, the A Steam Generator PORV will slowly fail fully open. The operator will respond in accordance with OP/1/A/5500/AP1, "Steam Leak," and isolate the PORV.

Next, the dedicated operator will withdrawal control rods to raise power to the POAH. When the POAH is reached, the A Feedwater FCV Bypass Valve controller will fail causing the Feedwater FCV Bypass Valve to fail fully open. The operator will respond in accordance with OP/1/A/5500/AP6, "S/G Feedwater Malfunction," and take manual control of the failed controller. The controller will remain in manual control throughout the remainder of the scenario.

After this, Intermediate Range N35 High Voltage Power Supply will fail. The operator will implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case II, "Intermediate Range Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation." After consulting with plant management, a decision will be made to shutdown to reactor.

Shortly afterwards, the Normal Supply Breaker to 4160 VAC Essential Bus 1ETA will fail open. The 1A DG will start but trip on overspeed, causing a sustained Blackout on the bus. The operator will implement AP/1/A/5500/07, "Loss of Electrical Power," Case II, "Loss of Normal Power to either 1ETA or 1ETB." The RO will be required to control feed flow complicated by the auto start of the TD CA Pump, and the BOP will isolate Letdown and manually start the opposite train NV, KC and RN pumps. During the recovery, the BOP will be directed to restore normal Letdown in accordance with AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection."

During the response, a major steam line break will occur upstream of the MSIV on the A Steam Line outside the Containment. Additionally, the SIS actuation will fail automatically. The operator will be expected to manually actuate SIS as directed by EP/1/A/5000/E-0. Upon completion of E-0, the operator will transition to EP/1/A/5000/E-2, "Faulted Steam Generator

Scenario Event Description

NRC Scenario 4

Isolation,” and isolate the A Steam Generator. After isolating the Steam Generator, the operator will transition to EP/1/A/5000/ES-1.1, “SI Termination,” at step 13.

Upon entry into ES-1.1, the operator will stop the NI and ND pumps, stop all but one NV Pump and stop injection flow from the NV Pumps.

The scenario will terminate at Step 7.c when 1NI-9A and 1NI-10B are closed.

Critical Tasks:

E-0 D

Manually actuate at least one train of SIS-Actuated safeguards before transition out of E-0.

Safety Significance: Failure to manually actuate SI under the postulated conditions constitutes “mis-operation or incorrect crew performance that leads to degraded ECCS capacity.” Since SI can be initiated manually from the Control Room, failure to do so demonstrates an inability by the crew to recognize a failed auto actuation of an ESF and take appropriate action, and to take action that would unnecessarily challenge a CSF. In the specified scenario, if ECCS system are not actuated, all assumption made in the FSAR analysis for the Steam Line break analysis are invalid.

E-2 A

Isolate the Faulted Steam Generator before transitioning out of E-2.

Safety Significance: Failure to isolate a Faulted SG that can be isolated causes challenges to the Critical Safety Functions that would not otherwise occur. Failure to isolate flow could result in an unwarranted Orange or Red Path condition on NC Integrity and/or Subcriticality (if cooldown is allowed to continue uncontrollably).

Scenario Event Description

NRC Scenario 4

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		Reset to Temporary IC-143.	<ul style="list-style-type: none"> • Mode 2, Reactor Power stable at 10^{-8} amps. • XMT-CA010= 0, LCA-5320OOS • ANN-AD10-C01 = ON, AD-10/C1 Failed ON • MALF-ISE002A, ISE002B, Failure of SI (Auto Only) • ANN-AD11-C05 = ON, XFMR A URGENT ALARM • ANN-AD11-F05 = ON, XFMR B URGENT ALARM
<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.	
<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 4

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Prior to Crew Briefing	RUN	
<input type="checkbox"/>	Crew Briefing <ol style="list-style-type: none"> 1. Copy of OP/1/A/6100/003 Enc 4.1 (Power Increase) Complete through Step 3.16. 2. OP/1/A/6100/003 Enc 4.8 (Guidelines for Power Increase) Step 3.1.1 will be assigned the surrogate. 3. OP/1/A/6100/003 Enc 4.12 (CF Hdr Press/SM Hdr Press DP With CF Pumps in Manual During Low Power Operation). 4. Level 1 PJB for power increase. 5. Reactivity Plan from Rx Eng for power increase. 		
<input type="checkbox"/>	T-0	Begin Familiarization Period	
<input type="checkbox"/>	At direction of examiner	(XMT) ILE003 Set = 100 Ramp = 30 seconds Trigger #1	Pzr Level Transmitter fails high
<input type="checkbox"/>	At direction of examiner	(MALF) SM001A Set = 100 Ramp = 360 seconds Trigger #3	SG PORV fails open
<input type="checkbox"/>	At direction of examiner	(MALF) IFE008A Set = 100 Ramp = 60 seconds Trigger #5	Increase to POAH/Feedwater Bypass Valve Controller failure
<input type="checkbox"/>	At direction of examiner	(MALF) ENB009A Trigger #7	Intermediate Range Channel failure (N35 High voltage failure)

Scenario Event Description

NRC Scenario 4

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	(MALF) EP009A (MALF) DG004A Trigger #9	LOP to 1ETA/DG Trip AP7 Step 13, Booth Instructor use MALF RN005A to close valve 1RN-40A. AP7 Step 15.a-b, Booth Instructor use: MAL-KC-008D = 0; Ramp 30 seconds MAL-KC-007C = 0; Ramp 30 seconds to close valve 1KC-230A and 1KC-3A. AP7 Step 40, Booth Instructor use LOA-EKL-012 = CLOSED ALT to complete Enclosure 7 (DC Bus Alignment) within 30 minutes of B/O.
<input type="checkbox"/>	At direction of examiner	(MALF) SM008A Set = 4.125×10^6 Trigger #11	Unisolable Steam Line Break (Outside Containment)
<input type="checkbox"/>	Continued from Event 6	(MALF) ISE002A, ISE002B Set = 0 T=0	Failure of Automatic SIS Actuation
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>8</u>
Event Description: Pressurizer Level Transmitter fails high									
Time	Position	Applicant's Actions or Behavior							

Shortly after taking the watch, the controlling Pzr Level Transmitter (LNC-5170) 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," and determine that the LCO is not applicable until the power level is above P-7.

Booth Operator Instructions: Operate Trigger#1 (XMT-ILE003 (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 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>1</u>	Page	<u>9</u>	of	<u>9</u>
Event Description:		Pressurizer Level Transmitter fails high							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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.
		<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 1-2 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	NOTE: The SRO will recognize that Table 3.3-1 shows that function 9 is applicable in Mode 1 above P-7, and is NOT applicable at this power level.
	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.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>1</u>	Page	<u>10</u>	of	<u>10</u>
Event Description:		Pressurizer Level Transmitter fails high							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
At the discretion of the Lead Examiner move to Event #2.			

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>2</u>	Page	<u>11</u>	of	<u>11</u>
Event Description:		SG PORV fails open							
Time	Position	Applicant's Actions or Behavior							

After the plant stabilizes, the A Steam Generator PORV will slowly fail fully open. The operator will respond in accordance with OP/1/A/5500/AP1, "Steam Leak," and isolate the PORV.

Booth Operator Instructions: **Operate Trigger #3 (MALF-SM001A (100 over 360 seconds))**

Indications Available:

- 1A SG PORV Red Status Light is LIT.
- Various OAC Alarms.

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: If malfunction is NOT diagnosed within 2 Minutes of insertion, Booth Instructor: call Control Room as NLO and report that Steam is coming out of exterior Doghouse.
AP/1/A/5500/01, STEAM LEAK			
	SRO	(Step 1) Monitor Foldout page.	
	RO	(Step 2) Reduce turbine load to maintain the following:	NOTE: No action will be needed with the turbine off-line.
		• Excore NI's – LESS THAN OR EQUAL TO 100%.	
		• NC Loop D/T's – LESS THAN 60°F D/T	
		• T-Ave – AT T-REF.	
	SRO	(Step 3) Check containment entry – IN PROGRESS.	NOTE: A Containment Entry is NOT in progress.
	SRO	(Step 3 RNO) GO TO Step 5.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>2</u>	Page	<u>12</u>	of	<u>12</u>
Event Description:		SG PORV fails open							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 5) Check Pzr pressure prior to event – GREATER THAN P-11 (1955 PSIG).	
	BOP	(Step 6) Check Pzr level – STABLE OR GOING UP.	
	BOP	(Step 7) IF AT ANY TIME while in this procedure Pzr level cannot be maintained stable, THEN RETURN TO Step 6.	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	(Step 8) GO TO Step 12.	
	SRO	(Step 12) Announce occurrence on paging system.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 13) Identify and isolate leak on Unit 1:	
		<ul style="list-style-type: none"> Check SM PORVs – CLOSED. 	NOTE: The 1A SG PORV is Open.
	RO	(Step 13 RNO) IF S/G pressure is less than 1092 PSIG, THEN perform the following:	
		<ul style="list-style-type: none"> Close affected S/G SM PORV manual loader. 	NOTE: Closing the Manual Loader will have no effect.
		<ul style="list-style-type: none"> IF SM PORV is still open, THEN: Close SM PORV isolation valve. 	NOTE: The 1A SG PORV Isolation Valve will need to be closed.
		<ul style="list-style-type: none"> Close SM PORV isolation valve. 	
		<ul style="list-style-type: none"> IF SM PORV isolation valve still open..... 	NOTE: The PORV Isolation valve is closed.
	RO	<ul style="list-style-type: none"> (Step 13.b) Check condenser dump valves – CLOSED. 	

Op Test No.: N09-1 Scenario # 4 Event # 2 Page 13 of 13Event Description: **SG PORV fails open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Check containment conditions – NORMAL: 	
		<ul style="list-style-type: none"> Containment temperature 	
		<ul style="list-style-type: none"> Containment pressure 	
		<ul style="list-style-type: none"> Containment humidity 	
		<ul style="list-style-type: none"> Containment floor and equipment sump level. 	
	RO / BOP	<ul style="list-style-type: none"> Check TD CA pump – OFF. 	
		<ul style="list-style-type: none"> Check valves on “STEAM LINE DRAIN VALVES” board (1MC-9) – CLOSED. 	
	SRO	<ul style="list-style-type: none"> Check opposite Unit (Unit 2) “STEAM HEADER PRESSURE” – GREATER THAN 200 PSIG. 	
		<ul style="list-style-type: none"> Dispatch operator to check for leaks. 	NOTE: The SRO will NOT dispatch NLOs to look for leaks because it is understood that the SM PORV opening was the reason that AP-1 was entered.
	BOP	(Step 14) Check UST level – STABLE OR GOING UP.	
	SRO	(Step 15) Evaluate unit shutdown as follows:	
		<ul style="list-style-type: none"> Check unit status – IN MODE 1 OR 2. 	
		<ul style="list-style-type: none"> Determine if unit shutdown or load reduction is warranted based on the following criteria: 	NOTE: SRO may call WCC/Management to address the startup. If so, Booth Instructor acknowledge as WCC. If needed, as Station management direct that the startup be continued.
		<ul style="list-style-type: none"> Size of leak 	
		<ul style="list-style-type: none"> Location of leak 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>2</u>	Page	<u>14</u>	of	<u>14</u>
Event Description:		SG PORV fails open							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Rate of depletion of secondary inventory 	
		<ul style="list-style-type: none"> IF steam is leaking from a secondary heater relief OR MSR relief valve, THEN reducing turbine load may reduce pressure enough to close relief valve. 	NOTE: No action will be needed with the turbine off-line.
		<ul style="list-style-type: none"> IF turbine trip will isolate steam leak (such as feedwater heater leak or MSR leak), THEN it may be desirable to perform an orderly shutdown of the turbine and maintain reactor power in Mode 1. 	NOTE: No action will be needed with the turbine off-line.
		<ul style="list-style-type: none"> Check unit shutdown or load reduction – REQUIRED. 	NOTE: SRO may call WCC/Management to address the startup. If so, Booth Instructor acknowledge as WCC. If needed, as Station management direct that the startup be continued.
	SRO	(Step 15.c RNO) Perform the following:	
		<ul style="list-style-type: none"> Maintain present plant conditions until leak can be isolated or repaired. 	
		<ul style="list-style-type: none"> Exit this procedure. 	NOTE: SRO will likely conduct a Focus Brief.
At the discretion of the Lead Examiner move to Event #3.			

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>15</u>	of	<u>15</u>
Event Description:		Increase to POAH/Feedwater Bypass Valve Controller failure							
Time	Position	Applicant's Actions or Behavior							

Next, the dedicated operator will withdrawal control rods to raise power to the POAH. When the POAH is reached, the A Feedwater FCV Bypass Valve controller will fail causing the Feedwater FCV Bypass Valve to fail fully open. The operator will respond in accordance with OP/1/A/5500/AP6, "S/G Feedwater Malfunction," and take manual control of the failed controller. The controller will remain in manual control throughout the remainder of the scenario.

Booth Operator Instructions: When the POAH has been reached Operate Trigger #5 (MALF-IFE008A (100 over 60 seconds))

Indications Available:

- 1AD-4/A-1, S/G A FLOW MISMATCH LO STM FLOW.
- 1CF-104AB Controller output rises to 100%.

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATION ENCLOSURE 4.1, POWER INCREASE			
	SRO	(Step 3.17) Increase Reactor Power to 8 – 9% RTP as follows:	Examiner NOTE: The dedicated operator (Surrogate) will withdrawal control rods as needed to raise power to the POAH.
	DO	<ul style="list-style-type: none"> • Begin power increase to 8 – 9% RTP. 	
	RO	<ul style="list-style-type: none"> • Perform the following to determine existing S/G WR level cycles: 	
		<ul style="list-style-type: none"> • Ensure the following OAC points are trending: 	
		<ul style="list-style-type: none"> • M1A1004 (1A S/G Wide Range Level) 	
		<ul style="list-style-type: none"> • M1A1005 (1B S/G Wide Range Level) 	
		<ul style="list-style-type: none"> • M1A0970 (1C S/G Wide Range Level) 	
		<ul style="list-style-type: none"> • M1A0988 (1D S/G Wide Range Level) 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>16</u>	of	<u>16</u>
Event Description: Increase to POAH/Feedwater Bypass Valve Controller failure									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Monitor WR S/G level trends to determine the beginning of the cycle upswings and the "desired area for power increase". (Refer to Enclosure 4.8, Table 4.8-1 (S/G WR Level Cycles)) 	
AP/1/A/5500/06, S/G FEEDWATER MALFUNCTIONS			
	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. 	
		<ul style="list-style-type: none"> Restore S/G level to program. 	
	RO	(Step 2) IF CF pump speed control has failed,.....	NOTE: The CF pump 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 	
		<ul style="list-style-type: none"> Steam flow 	
		<ul style="list-style-type: none"> S/G 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 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). 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>17</u>	of	<u>17</u>
Event Description:		Increase to POAH/Feedwater Bypass Valve Controller failure							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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 7 RNO) IF S/G level(s) going down, OR any CA pump is on,.....	NOTE: The 1A SG Level is NOT decreasing, and there are no CA Pumps on.
	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:	
	RO	<ul style="list-style-type: none"> Automatic control – DESIRED 	NOTE: automatic control of the CF Control Valves is NOT desired at this power level.

Op Test No.: N09-1 Scenario # 4 Event # 3 Page 18 of 18Event Description: **Increase to POAH/Feedwater Bypass Valve Controller failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 12) Check all S/G CF control bypass valves – IN MANUAL AND FULL OPEN.	
	RO	(Step 12 RNO) WHEN the following conditions met, THEN place affected CF control bypass valve in automatic:	
		<ul style="list-style-type: none"> Automatic control – DESIRED 	NOTE: automatic control of the 1A CF Control Valve Bypass Valve is NOT desired.
	RO	(Step 13) Check both CF pumps – IN AUTO.	
	RO	(Step 13 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF both CF pumps in manual AND it is desired to place CF pump in auto,..... 	NOTE: It is NOT desired to place the CF Pumps in AUTO.
		<ul style="list-style-type: none"> IF one CF pump in auto AND it is desired to place second CF pump in auto, 	NOTE: It is NOT desired to place the second CF Pump in AUTO.
			NOTE: SRO may call WCC/IAE to address the controller. If so, Booth Instructor acknowledge as WCC.
	RO / BOP	(Step 14) Check all CA pumps – OFF.	NOTE: SRO will likely conduct a Focus Brief.
At the discretion of the Lead Examiner move to Event #4.			

Op Test No.:	N09-1	Scenario #	4	Event #	4	Page	19	of	19
Event Description: Intermediate Range Channel failure									
Time	Position	Applicant's Actions or Behavior							

After this, Intermediate Range N35 High Voltage Power Supply will fail. The operator will implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation," Case II, "Intermediate Range Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation." After consulting with plant management, a decision will be made to shutdown to reactor.

Booth Operator Instructions: Operate Trigger #7 (MALF-ENB009A)

Indications Available:

- 1AD-2/C-1, I/R HI VOLTAGE FAILURE.
- N35 MCB Indication indicates low.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/16, MALFUNCTION OF NUCLEAR INSTRUMENTATION CASE II, INTERMEDIATE RANGE MALFUNCTION			
	RO	(Step 1) Check one I/R channel – OPERABLE.	
	SRO	(Step 2) Announce occurrence on paging system.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 3) Place failed channel "LEVEL TRIP" switch on I/R Drawer to "BYPASS".	
	BOP	(Step 4) Check the following – LIT:	
		<ul style="list-style-type: none"> • "LEVEL TRIP BYPASS" indicating light on failed I/R drawer. 	
		<ul style="list-style-type: none"> • "S/R OR I/R TRIP BYPASS" alarm (1AD-2, E-2) 	
		<ul style="list-style-type: none"> • The failed channel's status light on 1SI-19: 	
		<ul style="list-style-type: none"> • "1/N-35A I/R CHANNEL I TRIP BYPASS" 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>4</u>	Page	<u>20</u>	of	<u>20</u>
Event Description:		Intermediate Range Channel failure							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 5) Place operable I/R channel to record on NIS Recorder.	
	BOP	(Step 6) IF AT ANY TIME I/R fuses are pulled above P-10, THEN they should be inserted prior to lowering power below P-10 (to prevent a reactor trip).	
	BOP	(Step 7) Check I/R channel – FAILED LOW.	NOTE: SRO may call WCC/IAE to address the failed channel. If so, Booth Instructor acknowledge as WCC/IAE. If asked, there will be a 3-4 time delay before repairs can be made.
	BOP	(Step 8) WHEN malfunctioning I/R channel repaired, THEN...	NOTE: IR Channel N35 has NOT been repaired.
			NOTE: SRO will likely conduct a Focus Brief.
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION			
	SRO	3.3.1 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.	
	SRO	APPLICABILITY: According to Table 3.3.1-1.	
	SRO	ACTIONS	

Op Test No.: N09-1 Scenario # 4 Event # 4 Page 21 of 21Event Description: **Intermediate Range Channel failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		CONDITION	REQUIRED ACTION	COMPLETION TIME	NOTE: The SRO will recognize that Table 3.3-1 shows that function 4 is applicable, and that Conditions A and F are required. The SRO will determine that a reactor shutdown is necessary.
		A. One or more Functions with one or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately	
		F. THERMAL POWER > P-6 and < P-10, one Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6. OR F.2 Increase THERMAL POWER P-10.	2 hours 2 hours	
At the discretion of the Lead Examiner move to Events #5-6.					

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>22</u>	of	<u>22</u>
Event Description: LOP to 1ETA/DG Trip/ Restore Normal Letdown									
Time	Position	Applicant's Actions or Behavior							

Shortly afterwards, the Normal Supply Breaker to 4160 VAC Essential Bus 1ETA will fail open. The 1A DG will start but trip on overspeed, causing a sustained Blackout on the bus. The operator will implement AP/1/A/5500/07, "Loss of Electrical Power," Case II, "Loss of Normal Power to either 1ETA or 1ETB." The RO will be required to control feed flow complicated by the auto start of the TD CA Pump, and the BOP will isolate Letdown and manually start the opposite train NV, KC and RN pumps.

Booth Operator Instructions: Operate Trigger #9 (MALF-EP009A, MALF-DG004A)

Indications Available:

- Many MCB Annunciators.
- Noticeable change in Control Room Lighting.
- 1ETA Blackout Status Light LIT.
- 1A DG starts, and then over-speeds.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/07, LOSS OF ELECTRICAL POWER CASE II, LOSS OF NORMAL POWER TO EITHER 1ETA OR 1ETB			
			NOTE: The RO may throttle CA flow to all SGs immediately after the LOP.
	BOP	(Step 1) Check bus energized and sequencer applying loads.	
	BOP	(Step 1 RNO) Perform the following:	
		<ul style="list-style-type: none"> • IF both NV pumps off, THEN isolate normal letdown. 	NOTE: Letdown will need to be isolated because there is no NV Pump operating.
		<ul style="list-style-type: none"> • Start opposite train: 	
		<ul style="list-style-type: none"> • NV pump 	NOTE: The BOP will start the 1B NV Pump.
		<ul style="list-style-type: none"> • KC pumps 	NOTE: The BOP will start the 1B1 and 1B2 KC Pumps
		<ul style="list-style-type: none"> • RN pump. 	NOTE: The BOP will start the 1B RN Pump.
	SRO	<ul style="list-style-type: none"> • GO TO Step 3. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>23</u>	of	<u>23</u>
Event Description: LOP to 1ETA/DG Trip/ Restore Normal Letdown									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP / RO	(Step 3) Check – S/I HAS OCCURRED DURING THIS EVENT.	NOTE: SI has NOT occurred.
	BOP	(Step 3 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF both NV pumps off,..... 	NOTE: The 1B NV is running.
	SRO	<ul style="list-style-type: none"> IF any pump was manually started per Step 1, THEN GO TO Step 5. 	NOTE: The 1B NV Pump was manually started.
	BOP	(Step 5) Check D/Gs – OFF.	NOTE: The SRO may implement the RNO because the 1A DG started but oversped.
	BOP	(Step 5 RNO) IF bus deenergized, THEN immediately dispatch operator to stop affected Unit 1 D/G using emergency stop pushbutton.	NOTE: The 1A D/G has tripped on overspeed. The SRO will dispatch an NLO.
	BOP	(Step 6) Check ND System status:	
		<ul style="list-style-type: none"> ND System – IN RHR MODE AT TIME OF B/O. 	NOTE: ND is NOT in RHR Mode.
	SRO	(Step 6a RNO) GO TO Step 7.	
	BOP	(Step 7) Check any RN pump – RUNNING.	NOTE: The 1B RN Pump is running.
	BOP	(Step 8) Align KC as follows:	
		<ul style="list-style-type: none"> Place recirc valve on operating train in "AUTO". 	
		<ul style="list-style-type: none"> 1KC-54B (Train B Recirc Isol). 	
		<ul style="list-style-type: none"> Ensure KC flow remains less than 4000 GPM per operating KC pump while performing next step. 	

Op Test No.: N09-1 Scenario # 4 Event # 5 & 6 Page 24 of 24Event Description: **LOP to 1ETA/DG Trip/ Restore Normal 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 the following valves on energized train are open: 	
		<ul style="list-style-type: none"> B 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"> 1KC-364B (B NC Pump Therm Bar Otlit) 	
		<ul style="list-style-type: none"> 1KC-413B (D NC Pump Therm Bar Otlit). 	
	BOP	(Step 9) Check any charging pump – RUNNING.	NOTE: The 1B NV is running.
	BOP	(Step 10) Align RN as follows:	
		<ul style="list-style-type: none"> Check 1A RN pump – RUNNING. 	NOTE: The 1A RN is OFF.
	BOP	(Step 10a RNO) Align 1B RN as follows:	
		<ul style="list-style-type: none"> Ensure 1RN-187B (B KC Hx Inlet Isol) is open. 	
		<ul style="list-style-type: none"> Throttle 1RN-190B (RN To B KC Hx Control) for desired KC cooling, while ensuring 1B RN pump flow remains less than the following: 	
		<ul style="list-style-type: none"> IF 1B RN pump suction is aligned to Low Level Intake, THEN limit flow to 16,000 GPM. 	
		<ul style="list-style-type: none"> Start all available RV pumps. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 11. 	
	SRO	(Step 11) Notify Unit 2 RO to start 2A RN pump.	Floor Instructor: As U2 RO report "2A RN Pump is running."

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>25</u>	of	<u>25</u>
Event Description: LOP to 1ETA/DG Trip/ Restore Normal Letdown									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12) Check – B/O ON 1ETA.	
	BOP	(Step 13) Perform one of the following to isolate RN train crosstie:	
		<ul style="list-style-type: none"> Dispatch operator to close 1RN-40A (Train A To Non Ess Hdr Isol) (aux bldg, 716+7, GG-55 beside Unit 1 side stairway to 695 elevation). 	<p>NOTE: SRO will dispatch NLO to close 1RN-40A.</p> <p>Booth Instructor acknowledge as appropriate, wait 10 minutes, then use MALF RN005A to close valve.</p> <p>After closing valve, Booth Instructor report action taken to Control Room.</p>
		OR	
		<ul style="list-style-type: none"> Evaluate closing 1RN-41B (Train B To Non Ess Hdr Isol). 	
	SRO	(Step 14) When RN train crosstie is isolated, THEN 1RN-190B (RN To B KC Hx Control) may be throttled further open, while maintaining 1B RN pump flow less than the following:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> IF 1B RN pump suction is aligned to Low Level Intake, THEN limit flow to 16,000 GPM. 	
	SRO	(Step 15) Dispatch operator to close the following:	<p>NOTE: SRO will dispatch NLO to close 1KC-230A and 1KC-3A.</p> <p>Booth Instructor acknowledge as appropriate, wait 10 minutes, then use MAL-KC-008D = 0; Ramp 30 seconds and MAL-KC-007C = 0; Ramp 30 seconds to close valves.</p> <p>After closing valve, Booth Instructor report action taken to Control Room.</p>

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>26</u>	of	<u>26</u>
Event Description: LOP to 1ETA/DG Trip/ Restore Normal Letdown									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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 Ess Ret Isol) (aux bldg, 733+8, HH-55, north of column HH-55). 	
	BOP	(Step 16) Check 1A ND Train – WAS IN RHR MODE.	NOTE: 1A ND was NOT in the RHR Mode
	SRO	(Step 16 RNO) GO TO Step 30.	
	BOP	(Step 30) Check normal letdown – IN SERVICE.	NOTE: Letdown was previously isolated.
	BOP	(Step 30 RNO) IF desired to establish normal or excess letdown, THEN have any available operator establish letdown PER AP/1/A/5500/12 (Loss of Letdown, Charging Or seal Injection) while continuing with this procedure.	NOTE: The SRO will hand off AP12, and the restoration of normal Letdown to the BOP. SRO and RO will continue on with AP7.
			Examiner NOTE: If BOP is assigned to restore letdown per AP12, BOP Examiner follow actions of AP12 starting on Page 29 . Other Examiners continue with script.
	RO	(Step 31) Check VCT makeup control system:	NOTE: While the BOP restores Letdown using AP12, the SRO and RO will continue with AP7.
		<ul style="list-style-type: none"> Ensure Boric Acid Transfer pump on energized train running. 	
		<ul style="list-style-type: none"> Ensure NC System makeup controller in "AUTO". 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>27</u>	of	<u>27</u>
Event Description: LOP to 1ETA/DG Trip/ Restore Normal Letdown									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Place NC System makeup switch to "START". 	
	RO	(Step 32) Perform the following:	
		<ul style="list-style-type: none"> Check any Unit 1 6900V bus – ENERGIZED. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 38. 	
	SRO	(Step 38) Announce occurrence on paging system.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 39) Check – S/I HAS OCCURRED DURING THIS EVENT.	NOTE: SI has NOT occurred.
	SRO	(Step 39 RNO) Perform the following:	
		<ul style="list-style-type: none"> Initiate EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 13 (VC And VA System Operation) within 30 minutes of B/O. 	
	SRO	(Step 40) Have available licensed operator initiate Enclosure 7 (DC Bus Alignment) within 30 minutes of B/O.	NOTE: SRO may assign U2 operator to perform. If so, Floor Instructor acknowledge as U2 Operator. Booth Instructor: wait 10 minutes, then use LOA-EKL-012 = CLOSED ALT.
	RO	(Step 41) Check D/G on bus that was blacked out – ON.	NOTE: The 1A DG is OFF.
	RO	(Step 41 RNO) Perform the following affected D/G:	

Op Test No.: N09-1 Scenario # 4 Event # 5 & 6 Page 28 of 28Event Description: **LOP to 1ETA/DG Trip/ Restore Normal 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 D/G was stopped using emergency stop pushbutton, 	NOTE: The 1A DG was NOT stopped using the Emergency PB, it tripped automatically on overspeed.
		<ul style="list-style-type: none"> IF bus known to be locked out,..... 	NOTE: The SRO may dispatch an NLO or call WCC to determine the status of 1ETA. If NLO dispatched, Floor Instructor Acknowledge. If WCC contacted, Booth Instructor acknowledge. Wait 2 minutes and report that 1ETA is NOT Locked out .
		<ul style="list-style-type: none"> Place affected D/G Mode Select to "C/R". 	
		<ul style="list-style-type: none"> Depress, then release, the "RESET" pushbutton for affected train's sequencer. 	
		<ul style="list-style-type: none"> Start D/G. 	
		<ul style="list-style-type: none"> IF D/G is attempting to start but will not start, THEN dispatch operator to stop the affected D/G by depressing "EMERG STOP" pushbutton to prevent relay damage. 	
		<ul style="list-style-type: none"> IF D/G will not start, THEN GO TO Step 43. 	
	SRO	(Step 43) Check – S/I HAS OCCURRED DURING THIS EVENT.	NOTE: SI has NOT occurred.
	SRO	(Step 43 RNO) GO TO Step 45.	
	RO	(Step 45) Control CA flow:	NOTE: The RO most likely took action early in the event to control CA flow to each SG.
		<ul style="list-style-type: none"> Check TD CA pump – ON. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>29</u>	of	<u>29</u>
Event Description:		LOP to 1ETA/DG Trip/ Restore Normal Letdown							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	
		<ul style="list-style-type: none"> Control CA flow to maintain S/G N/R levels at program level. 	
		<ul style="list-style-type: none"> Check reactor power – GREATER THAN 10%. 	
	SRO	(Step 45.d RNO) GO TO Step 46.	
AP/1/A/5500/12, LOSS OF LETDOWN, CHARGING OR SEAL INJECTION			
			Examiner NOTE: BOP Examiner follow these actions if the BOP is directed to restore Letdown in accordance with AP12 while implementing AP7.
	BOP	(Step 48) Establish normal letdown:	
		<ul style="list-style-type: none"> Ensure 1NV-459 (Variable L/D Orifice Outlet Flow Cntrl) is closed. 	
		<ul style="list-style-type: none"> Place 1NV-124 (Letdown Pressure Control) in manual between 10-20% open. 	
		<ul style="list-style-type: none"> Check the following – OPEN: 	
		<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). 	
	BOP	(Step 48c RNO) Ensure all personnel are out of lower containment prior to continuing.	
	BOP	<ul style="list-style-type: none"> (Step 48d) Establish cooling to Regenerative HX by performing the following concurrently: 	
		<ul style="list-style-type: none"> Establish at least 65 GPM charging flow by throttling open 1NV-238 (Charging Line Flow control) or raising PD pump speed. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>30</u>	of	<u>30</u>
Event Description: LOP to 1ETA/DG Trip/ Restore Normal Letdown									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Throttle 1NV-241 (Seal Inj Flow Control) to establish approximately 8 GPM seal injection flow to each NC pump. 	
	BOP	<ul style="list-style-type: none"> Open letdown line isolation valves: 	
		<ul style="list-style-type: none"> 1NV-7B (Letdown Cont Outside Isol). 	
		<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). 	
		<ul style="list-style-type: none"> 1NV-35A (Variable L/D Orifice Outlet Cont Isol). 	
	BOP	<ul style="list-style-type: none"> Establish desired letdown flow (normally 75 GPM) by completing the following concurrently: 	
		<ul style="list-style-type: none"> Slowly throttle open 1NV-459 (Variable L/D Orifice Outlet Flow Cntrl) to achieve desired letdown flow. 	
		<ul style="list-style-type: none"> As letdown pressure rises, adjust 1NV-124 (Letdown Pressure Control) to maintain letdown pressure between 250 PSIG and 350 PSIG. 	
	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"> Regenerative HX letdown temperature less than 380°F. 	
		<ul style="list-style-type: none"> Pzr level at program level. 	
	BOP	<ul style="list-style-type: none"> IF more letdown flow required OR a different letdown orifice is desired, THEN.... 	NOTE: More letdown flow is NOT needed.
	BOP	<ul style="list-style-type: none"> Check 1NV-124 (Letdown Pressure Control) – IN MANUAL. 	
	BOP	<ul style="list-style-type: none"> Check potentiometer setting for 1NV-124 (Letdown Pressure Control) set at – APPROXIMATELY 5.8. 	
	BOP	<ul style="list-style-type: none"> Manually adjust 1NV-124 to obtain letdown pressure of 350 PSIG. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>31</u>	of	<u>31</u>
Event Description: LOP to 1ETA/DG Trip/ Restore Normal Letdown									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Place 1NV-124 in "AUTO". 	
	BOP	<ul style="list-style-type: none"> Ensure letdown pressure controlled at 350 PSIG. 	
	BOP	<ul style="list-style-type: none"> Check 1A or 1B NV pump – SUPPLYING NORMAL CHARGING. 	
	BOP	<ul style="list-style-type: none"> WHEN Pzr level matches program level, THEN perform the following: 	NOTE: This is a Continuous Action.
		<ul style="list-style-type: none"> Place "PZR LEVEL MASTER" in "MAN". 	
		<ul style="list-style-type: none"> Place "PZR LEVEL MASTER" demand to approximately 50%. 	
		<ul style="list-style-type: none"> Place "PZR LEVEL MASTER" in AUTO. 	
		<ul style="list-style-type: none"> Place 1NV-238 (Charging Line Flow Control) in "AUTO". 	
		<ul style="list-style-type: none"> Adjust 1NV-241 (Seal Inj Flow control) as necessary to maintain approximately 8 GPM seal injection flow to each NC pump. 	
	BOP	<ul style="list-style-type: none"> Notify Chemistry that normal letdown is in service. 	NOTE: The BOP will contact Chemistry. Booth Instructor: Acknowledge as appropriate.
	BOP	<ul style="list-style-type: none"> Check position of 1NV-127A (L/D Hx Outlet 3-Way Temp Cntrl) – ALIGNED TO "DEMIN". 	
	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: The BOP may call WCC/SE to address. If so, Booth Instructor acknowledge as WCC/SE.
		<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: Aux Spray nozzle was NOT in service.
	BOP	<ul style="list-style-type: none"> Check excess letdown – ISOLATED. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>5 & 6</u>	Page	<u>32</u>	of	<u>32</u>
Event Description:		LOP to 1ETA/DG Trip/ Restore Normal Letdown							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	<ul style="list-style-type: none">RETURN TO procedure and step in effect.	NOTE: The BOP will report to the SRO that Normal Letdown has been restored.

At the discretion of the Lead Examiner move to Events #7-8.

Op Test No.:	N09-1	Scenario #	4	Event #	7 & 8	Page	33	of	33
Event Description:		Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation							
Time	Position	Applicant's Actions or Behavior							

During the response, a major steam line break will occur upstream of the MSIV on the A Steam Line outside the Containment. Additionally, the SIS actuation will fail automatically. The operator will be expected to manually actuate SIS as directed by EP/1/A/5000/E-0. Upon completion of E-0, the operator will transition to EP/1/A/5000/E-2, "Faulted Steam Generator Isolation," and isolate the A Steam Generator. After isolating the Steam Generator, the operator will transition to EP/1/A/5000/ES-1.1, "SI Termination," at step 13. Upon entry into ES-1.1, the operator will stop the NI and ND pumps, stop all but one NV Pump and stop injection flow from the NV Pumps. The scenario will terminate at Step 7.c when 1NI-9A and 1NI-10B are closed.

Booth Operator Instructions: Operate Trigger #11 (MALF-SM008A (4.125 x 10⁶))

Indications Available:

- 1AD-4/C1-4, S/G A-D FLOW MISMATCH LO CF FLOW.
- 1AD-3/C1-4, STM LINE A-D HI DEPRESS RATE ALERT.
- 1A SG pressure drops rapidly.
- Containment Pressure does NOT increase.
- NCS Tavg drops rapidly.
- Pzr level and pressure drops.
- SI should occur on low Pressurizer pressure, but does NOT automatically actuate.

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: Crew will carry out Immediate Actions of E-0, prior to the SRO addressing the EP.
E-0, REACTOR TRIP OR SAFETY INJECTION			
			NOTE: The SRO may dispatch or direct NLOs to look for steam leaks. If so, Booth Instructor as NLO , wait 3 minutes and report back that there is steam blowing from the exterior doghouse area, but NOT from the interior doghouse.

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 34 of 34Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 1) Monitor Foldout page.	
	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 . 	NOTE: Only N36 is going down, N35 has failed.
	RO	(Step 3) Check Turbine Trip:	
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	NOTE: 1ETA is de-energized.
	BOP	(Step 4 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF both busses de-energized,..... 	NOTE: 1ETB is energized.
		<ul style="list-style-type: none"> WHEN time allows, THEN try to restore power to de-energized bus PER AP/1/A/5500/07 (Loss of Electrical Power) while continuing with this procedure. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	RO	(Step 5) IF either CF pump is in Manual Direct Valve Position (MDVP) mode, THEN trip affected pump(s).	
	BOP	(Step 6) Check if S/I is actuated:	NOTE: Auto SI has failed and SI will need to be actuated manually.
		<ul style="list-style-type: none"> "A SAFETY INJECTION ACTUATED" status light (1SI-18) – LIT. 	
		<ul style="list-style-type: none"> Both LOCA Sequencer Actuated status lights (1SI-14) – LIT. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>7 & 8</u>	Page	<u>35</u>	of	<u>35</u>
Event Description:		Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
CRITICAL TASK:			
(E-0 D) Manually actuate at least one train of SIS-Actuated safeguards before transition out of E-0.			
Safety Significance: Failure to manually actuate SI under the postulated conditions constitutes "mis-operation or incorrect crew performance that leads to degraded ECCS capacity." Since SI can be initiated manually from the Control Room, failure to do so demonstrates an inability by the crew to recognize a failed auto actuation of an ESF and take appropriate action, and to take action that would unnecessarily challenge a CSF. In the specified scenario, if ECCS system are not actuated, all assumption made in the FSAR analysis for the Steam Line break analysis are invalid.			
	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):	
		• Groups 1, 2, 5 – DARK.	
		• Group 3 – LIT.	
		• OAC – IN SERVICE.	
		• Group 4, Rows A through F – LIT AS REQUIRED.	
	SRO	• GO TO Step 9.	
	RO	(Step 9) Check proper CA pump status:	
		• MD CA pumps – ON.	NOTE: The 1A CA Pump is NOT on.
		• N/R level in at least 3 S/Gs – GREATER THAN 17%.	
	RO	(Step 9.a RNO) Start pumps.	NOTE: The 1A CA Pump cannot be started.

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 36 of 36Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 10) Check all KC pumps – ON.	NOTE: The 1A1 and 1A2 KC Pumps are NOT on.
	BOP	(Step 10 RNO) Start pumps.	NOTE: The 1A1 and 1A2 KC Pumps cannot be started.
	BOP	(Step 11) Check both RN pumps – ON.	NOTE: The 1A RN Pump is NOT on.
	BOP	(Step 11 RNO) Perform the following:	
		<ul style="list-style-type: none"> Start pump(s). 	NOTE: The 1A RN Pump cannot be started.
		<ul style="list-style-type: none"> IF any RN pump off, THEN perform the following: 	
		<ul style="list-style-type: none"> IF 1A RN pump is off, THEN stop NC pumps. 	
		<ul style="list-style-type: none"> IF affected train is deenergized, AND its D/G is off, THEN GO TO Step 12. 	
	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.	NOTE: 1A SG Pressure is decreasing uncontrollably.
	RO	(Step 13 RNO) Perform the following:	
		<ul style="list-style-type: none"> Check the following closed: 	
		<ul style="list-style-type: none"> All MSIVs 	
		<ul style="list-style-type: none"> All MSIV bypass valves 	
		<ul style="list-style-type: none"> All SM PORVs. 	
	RO	<ul style="list-style-type: none"> IF any valve open, THEN perform the following: 	NOTE: All 1A SG Valves are Closed.
		<ul style="list-style-type: none"> Initiate Main Steam Isolation signal. 	

Op Test No.:	N09-1	Scenario #	4	Event #	7 & 8	Page	37	of	37
Event Description:		Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF any valve still open, THEN close valve. 	
	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. 	NOTE: NC Pressure is ≈1850 psig.
		<ul style="list-style-type: none"> Check NI pumps – INDICATING FLOW. 	NOTE: The 1A NI Pump is NOT on.
	BOP	(Step 15.c RNO) Start NI pumps and align valves.	NOTE: The 1A NI Pump cannot be started.
	BOP	<ul style="list-style-type: none"> (Step 15.d) Check NC pressure – LESS THAN 286 PSIG. 	
	BOP	(Step 15.d 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-67B (1B ND Pump & Hx Mini Flow Isol). 	
	SRO	<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 16. 	
	SRO	(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:	

Op Test No.:	N09-1	Scenario #	4	Event #	7 & 8	Page	38	of	38
Event Description:		Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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. 	NOTE: All NC Pumps will be OFF.
	RO / BOP	(Step 18 RNO) Perform the following based on plant conditions:	NOTE: The SRO may assign the RO to perform this action. If so, RO Examiner follow actions of Enclosure 3 . Others should move ahead to Page 40 to continue in E-0.
		<ul style="list-style-type: none"> IF temperature less than 557°F AND going down, THEN attempt to stop cooldown PER Enclosure 3 (Uncontrolled NC System Cooldown). 	
		<ul style="list-style-type: none"> IF temperature greater than 557°F AND going up, 	
E-0, REACTOR TRIP OR SAFETY INJECTION ENCLOSURE 3, UNCONTROLLED NC SYSTEM COOLDOWN			
	RO	(Step 1) Check steam dump valves – CLOSED.	Examiner NOTE: Follow the actions associated with Enclosure 3 if RO is assigned by SRO to perform.
	RO	(Step 2) Check all SM PORVs – CLOSED.	NOTE: The 1A SM PORV is opened, but isolated.

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 39 of 39Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 2 RNO) Perform the following:	
		<ul style="list-style-type: none"> Close affected SM PORV manual loader. 	
		<ul style="list-style-type: none"> IF SM PORV cannot be closed, THEN perform the following: 	
		<ul style="list-style-type: none"> Close SM PORV isolation valve. 	
		<ul style="list-style-type: none"> IF SM PORV isolation valve cannot be closed,..... 	NOTE: The 1A SM PORV isolation valve is closed.
	RO	(Step 3) Check MSR "RESET" light – LIT.	
	RO	(Step 4) Check any NC pump – ON.	
	RO	(Step 4 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF any NC T-Cold is still going down, THEN GO TO Step 6. 	
	RO	(Step 6) Control feed flow as follows:	
		<ul style="list-style-type: none"> IF S/G N/R level is less than 11% (32% ACC) in all S/Gs, 	
		<ul style="list-style-type: none"> WHEN N/R level is greater than 11% (32% ACC) in at least one S/G, THEN throttle feed flow further to: 	
		<ul style="list-style-type: none"> Minimize cooldown 	
		<ul style="list-style-type: none"> Maintain at least one S/G N/R level greater than 11% (32% ACC). 	
	RO	(Step 7) Check MSIVs – ANY OPEN.	
	RO	(Step 7 RNO) Perform the following:	
		<ul style="list-style-type: none"> Close MSIV bypass valves. 	
		<ul style="list-style-type: none"> Exit this enclosure. 	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>7 & 8</u>	Page	<u>40</u>	of	<u>40</u>
Event Description:		Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 19) Check Pzr PORV and spray valves:	
		<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. Normal Pzr spray valves – CLOSED. 	
	BOP / RO	(Step 20) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	
	BOP / RO	(Step 21) Check if main steamlines intact:	
		<ul style="list-style-type: none"> All S/G pressures – STABLE OR GOING UP All S/Gs – PRESSURIZED. 	NOTE: The 1A SG is Faulted.
	RO	(Step 21 RNO) IF any S/G is faulted, THEN perform the following:	
		<ul style="list-style-type: none"> IF fault is outside containment, THEN perform the following: Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees). GO TO EP/1/A/5000/E-2 (Faulted Steam Generator Isolation). 	NOTE: The SRO will transition to E-2.
E-2, FAULTED STEAM GENERATOR ISOLATION			
	SRO	(Step 1) Monitor Foldout page.	
	RO / BOP	(Step 2) Maintain at least one S/G available for NC System cooldown in subsequent steps.	

Op Test No.:	<u>N09-1</u>	Scenario #	<u>4</u>	Event #	<u>7 & 8</u>	Page	<u>41</u>	of	<u>41</u>
Event Description:		Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO / BOP	(Step 3) Maintain any faulted S/G or secondary break isolated during subsequent recovery actions unless needed for NC System cooldown.	
	RO	(Step 4) Check the following – CLOSED:	
		• All MSIVs	
		• All MSIV bypass valves.	
	RO	(Step 5) Check at least one S/G pressure – STABLE OR GOING UP.	NOTE: Although all SG pressures may be decreasing slowly, the operator will report stable based on plant conditions (i.e. faulted SG). Otherwise a transition to ECA-2.1 will be made.
	RO	(Step 6) Identify faulted S/G(s):	NOTE: The 1A SG is Faulted.
		• Any S/G pressure – GOING DOWN IN AN UNCONTROLLED MANNER	
		OR	
		• Any S/G – DEPRESSURIZED.	
	RO	(Step 7) Check faulted S/G(s) SM PORV – CLOSED.	NOTE: The 1A SM PORV has previously failed open, but is isolated.
	RO	(Step 7 RNO) Perform the following:	
		• Close faulted S/G(s) SM PORV.	
		• IF SM PORV can not be closed, THEN close SM PORV isolation valve.	
		• IF SM PORV isolation valve can not be closed,.....	NOTE: The 1A SM PORV isolation valve is closed.

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 42 of 42Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 8) Reset CA modulating valves.	
	RO	(Step 9) IF TD CA pump is the only source of feedwater,.....	NOTE: The 1B CA Pump is running.
	RO	(Step 10) Isolate faulted S/G(s) as follows:	
		<ul style="list-style-type: none"> For 1A S/G: 	
		<ul style="list-style-type: none"> Check "S/G A FDW ISOLATED" status light (1SI-4) – LIT. 	
	SRO	<ul style="list-style-type: none"> Close 1CA-66A (U1 TD CA Pump Disch To 1A S/G Isol). 	NOTE: 1CA-66A has no power.
		(Step 10.a.2 RNO) Perform the following:	
	RO	<ul style="list-style-type: none"> Close 1CA-64AB (U1 TD CA Pump Disch To 1A S/G Control). 	NOTE: 1CA-64AB has no power.
	SRO	<ul style="list-style-type: none"> Dispatch operator to close 1CA-66 (Unit 1 exterior doghouse, 750+8, FF-44, 4 ft from inner wall, 8 ft from column DD-44). 	NOTE: The SRO will dispatch an NLO. Booth Instructor: NO LOA Within 3 minutes , as NLO report that 1CA-66 is closed .
		<ul style="list-style-type: none"> IF exterior doghouse not accessible, OR CA cannot be isolated, THEN dispatch operator to unlock and close 1CA-63 (Unit 1 TD CA Pump Disch to 1A/SG Control Inlet Isol) Unit 1 CA pump room, 716+9, BB-51, above doorway to TD CA Pump, 4 ft south of 1A CA Pump). 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	RO	<ul style="list-style-type: none"> (Step 10.a.3) Close 1CA-62A (1A CA Pump Disch To 1A S/G Isol). 	NOTE: 1CA-62A has no power.
	RO	(Step 10.a.3 RNO) Perform the following:	
		Close 1CA-60A (1A CA Pump Disch To 1A S/G Control).	NOTE: 1CA-60A has no power.

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 43 of 43Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	Dispatch operator to close 1CA-62A (Unit 1 exterior doghouse, 750+12, DD-44, southeast corner).	NOTE: The SRO will dispatch an NLO. Booth Instructor: NO LOA Within 3 minutes , as NLO report that 1CA-62A is closed .
		IF exterior doghouse not accessible, OR CA cannot be isolated, THEN dispatch operator to unlock and close 1CA-59 (1A CA Pump Disch To 1A S/G Control Inlet Isol) (Unit 1 CA pump room, 716+10, CC-50, above 1B CA Pump).	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	RO	<ul style="list-style-type: none"> (Step 10.a.4) Check BB valves – CLOSED: 	
		<ul style="list-style-type: none"> 1BB-1B (1A S/G Blowdown Cont Outside Isol Control) 	
		<ul style="list-style-type: none"> 1BB-5A (B S/G BB Cont Inside Isol). 	
	BOP	<ul style="list-style-type: none"> Close 1SM-83 (A SM Line Drain Isol). 	

CRITICAL TASK:**(E-2 A) Isolate the Faulted Steam Generator before transitioning out of E-2.**

Safety Significance: Failure to isolate a Faulted SG that can be isolated causes challenges to the Critical Safety Functions that would not otherwise occur. Failure to isolate flow could result in an unwarranted Orange or Red Path condition on NC Integrity and/or Subcriticality (if cooldown is allowed to continue uncontrollably).

	RO	(Step 11) Close 1AS-12 (Main Steam To Aux Steam).	
	BOP	(Step 12) Check if S/G tubes intact:	
		<ul style="list-style-type: none"> Check steamline EMF's – NORMAL: 	

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 44 of 44Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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) 	
		<ul style="list-style-type: none"> 1EMF-27 (S/G D). 	
	SRO	<ul style="list-style-type: none"> IF any S/G has previously been identified as ruptured..... 	NOTE: There have been no SGTRs identified.
	RO	(Step 13) 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 to intact S/Gs – GREATER THAN 450 GPM. 	
	BOP	<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). 	
	SRO	<ul style="list-style-type: none"> GO TO EP/1/A/5000/ES-1.1 (Safety Injection Termination). 	NOTE: The SRO will transition to ES-1.1
ES-1.1, SAFETY INJECTION TERMINATION			
	SRO	(Step 1) Monitor Foldout page.	
	BOP	(Step 2) 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. 	

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 45 of 45Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO / BOP	<ul style="list-style-type: none"> IF AT ANY TIME a B/O signal occurs, THEN restart S/I equipment previously on. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	BOP	(Step 3) Establish VI to containment as follows:	
		<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 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. 	
	BOP	(Step 4) Check if NS pumps should be stopped:	
		<ul style="list-style-type: none"> Any NS pump – ON. 	
	BOP	(Step 4.a RNO) Perform the following:	
		<ul style="list-style-type: none"> IF AT ANY TIME while in this procedure an NS pump starts, THEN perform Step 4. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> GO TO Step 5. 	
	BOP	(Step 5) Stop all but one NV pump.	NOTE: only the 1B NV Pump is running.
	BOP	(Step 6) Check NC pressure – STABLE OR GOING UP.	
	BOP	(Step 7) Isolate NV S/I flowpath:	

Op Test No.: N09-1 Scenario # 4 Event # 7 & 8 Page 46 of 46Event Description: **Unisolable Steam Line Break (Outside Containment)/ Failure of Automatic SIS Actuation**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check NV pump – SUCTION ALIGNED TO FWST. 	
		<ul style="list-style-type: none"> Check NV pumps miniflow valves – OPEN: 	
	BOP	<ul style="list-style-type: none"> 1NV-150B (NV Pumps Recirculation) 	
		<ul style="list-style-type: none"> 1NV-151A (NV Pumps Recirculation). 	
	BOP	(Step 7.b RNO) Perform the following:	
		<ul style="list-style-type: none"> Open valves. 	
		<ul style="list-style-type: none"> IF both valves open, THEN GO TO Step 7.c. 	
	BOP	<ul style="list-style-type: none"> (Step 7.c) 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.			

UNIT 1 STATUS:

Power Level: 0% NCS [B] 1841 ppm Pzr [B]: 1849 ppm Xe: Per OAC

Power History: Shutdown for 4 days Core Burnup: 12.1 EFPDs

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

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

- A plant startup is being conducted following an unplanned reactor trip due to a failure of the 1B CF Pump.
- The repairs on the pump are still in progress, and it is expected to be back in service within the next four hours.
- A reactor startup has been completed, and reactor power is stabilized at 10^{-8} amps. OP/1/A/6100/003 Enc 4.1, "Power Increase," has been completed through Step 3.16.
- It is planned that this shift will raise reactor power to 8-9% and stabilize for a Chemistry Hold per Step 3.17.9.1 of OP/1/A/6100/003 Enc 4.1.
- A dedicated operator has been stationed at the MCB to control the reactor during the startup.
- Pzr level control is selected to "3-2" due to previous testing on Channel 1.

The following equipment is Out-Of-Service:

- 1B CF Pump is OOS (Expected back in 4 hours).
- LCA-5320, CA Condensate Storage Tank Level Indicator, failed last shift (IAE is investigating).
- MCB Annunciator 1AD-10, C-1, "KC SURGE TANK ABNORMAL LEVEL," has been in constant alarm 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