

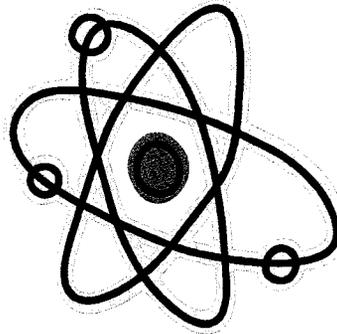
Draft Submittal
(Pink Paper)

SIMULATOR SCENARIOS

MCGUIRE MAY 2008 EXAM - 50-369, 370/2008-301
DRAFT SIMULATOR SCENARIOS

NRC Examination

Scenarios



McGuire Nuclear Station

45-day Submittal

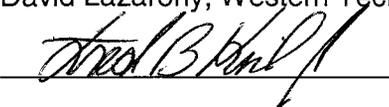
March 17, 2008

PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 24
TOPIC: NRC Simulator Exam
Scenario N08-1-1

REFERENCES:

1. OP/0/A/6450/011, "Control Area Ventilation/ Chilled Water System."
2. OP/1/A/6200/001B, "Chemical and Volume Control System Charging."
3. OP/1/A/6100/010E, "Annunciator Response For Panel 1AD-4."
4. AP/1/A/5500/006, "S/G Feedwater Malfunction."
5. OP/1/A/6100/010G, "Annunciator Response For Panel 1AD-6."
6. OP/1/A/6100/010H, "Annunciator Response For Panel 1AD-7."
7. McGuire Technical Specifications
8. AP/1/A/5500/010, "NV Leakage Within Capacity of Charging Pumps."
9. AP/1/A/5500/004, "Rapid Downpower."
10. AP/1/A/5500/14, "Rod Control Malfunction."
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-2, "Faulted Steam Generator Isolation."
14. EP/1/A/5000/E-3, "Steam Generator Tube Rupture."
15. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review: 

January 21, 2008
Rev. 0

Scenario Event Description

NRC Scenario 1

Facility:	McGuire	Scenario No.:	1	Op Test No.:	N08-1
Examiners:	_____	Operators:	(SRO)		
	_____		(OATC)		
	_____		(BOP)		

Initial Conditions:	The Plant is at 75% power (MOL), following an unplanned load reduction four days ago to complete corrective maintenance on the 1B 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 1B CF Pump at this power level, and then raise power to 100% within the next 24 hours. The 1A NV was started last shift to support maintenance observation.
Turnover:	The following equipment is Out-Of-Service: A CA Pump (Expected back in 6 hours), OEMF 43A, Control Room Air Intake Radiation Monitor, failed last shift (IAE is investigating) and Enclosure 4.14, "Response When EMF43A or 43B In Trip 2 or Inoperable," of OP/0/A/6450/011, "Control Area Ventilation/ Chilled Water System," has been completed. MCB Annunciator 1AD-8, B-6, "GLAND STM COND HI D/P," has alarmed spuriously several times over the last hour (IAE is investigating). It is expected to swap back to the 1B NV Pump on the upcoming shift. The previous shift has performed the flush and vent of the 1B NV Pump and the operator will commence the procedure starting at Step 3.3.4 of Enclosure 4.2 of OP/1/A/6200/001B, "Chemical and Volume Control System Charging." An NLO (John) is standing by locally to support the pump swap, and there are no R&Rs that will impact this activity.

Event No.	Malfunction No.	Event Type*	Event Description
1	NA	N-BOP N-SRO	Swap NV Pumps
2	^{XMT} SM007	I-RO I-SRO	Steam Flow Channel fails low
3	^{XMT} ILE001	I-BOP I(TS)-SRO	Pzr Level Channel fails high
4	SG001B	C-RO C-BOP C(TS)-SRO	Steam Generator Tube Leak/Downpower
5	IRE003A	C-RO C-SRO	Uncontrolled Inward Rod Motion
6	SM007C SM006C	M-RO M-BOP M-SRO	Inadvertent MSIV Closure/Faulted SG
7	ISE005A/ B	NA	Failure of Containment Spray to auto actuate
8	CA009B	NA	B CA Pump Trip
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description

NRC Scenario 1

McGuire 2008 NRC Scenario #1

The Plant is at 75% power (MOL), following an unplanned load reduction four days ago to complete corrective maintenance on the 1B 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 1B CF Pump at this power level, and then raise power to 100% within the next 24 hours. The 1A NV was started last shift to support maintenance observation.

The following equipment is Out-Of-Service: A CA Pump (Expected back in 6 hours), OEMF 43A, Control Room Air Intake Radiation Monitor, failed last shift (IAE is investigating) and Enclosure 4.14, "Response When EMF43A or 43B In Trip 2 or Inoperable," of OP/0/A/6450/011, "Control Area Ventilation/ Chilled Water System," has been completed. MCB Annunciator 1AD-8, B-6, "GLAND STM COND HI D/P," has alarmed spuriously several times over the last hour (IAE is investigating). It is expected to swap back to the 1B NV Pump for on the upcoming shift. The previous shift has performed the flush and vent of the 1B NV Pump and the operator will commence the procedure starting at Step 3.3.4 of Enclosure 4.2 of OP/1/A/6200/001B, "Chemical and Volume Control System Charging." An NLO (John) is standing by locally to support the pump swap, and there are no R&Rs that will impact this activity.

Shortly after taking the watch, the operator will shift from 1A NV Pump to 1B NV Pump in accordance with section 3.3 of Enclosure 4.2, "NV Pump Operation," of OP/1/A/6200/001B, "Chemical and Volume Control System Charging." When the procedure is complete the 1B NV Pump will be operating and the 1A NV Pump will be shutdown.

Following this, the controlling Steam Flow Transmitter (FSM-5030) on the B Steam Generator will slowly fail low causing the Feed Regulating Valve to move in the closed direction, and a Steam Generator B Steam Flow Mismatch alarm. The operator will respond by implementing AP-6, "S/G Feedwater Malfunction," recognize the failure and select an operating Steam Flow channel.

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

Subsequently, a 10 gpm Steam Generator Tube Leak will develop on the B Steam Generator. The Operator will respond by implementing AP-10, "NC System Leakage Within the Capacity of Both NV Pumps." The operator will address Technical Specification 3.4.13, "RCS Operational Leakage," and 3.7.16, "Secondary Specific Activity." The operator will reduce load to be in Mode 3 within 3 hours in accordance with AP4, "Rapid Downpower."

During the downpower, uncontrolled inward rod motion will occur with Rod Control in automatic. The operator will respond in accordance with AP14, "Rod Control Malfunction," and take manual control of the control rods. (The rods will remain in manual control throughout the remainder of the scenario).

Shortly afterwards, the C MSIV inadvertently closes causing a major Steam Line Rupture to occur on the C Steam Generator inside the Containment. A Reactor Trip/Safety Injection will occur and the operator will enter E-0, "Reactor Trip or Safety Injection." The Containment Spray (NS) bistable will fail to energize, and require manual operator action. The SGTL in the B SG

Scenario Event Description

NRC Scenario 1

will degrade to about 75 gpm over the next 15 minutes due to the plant transient. Additionally, the B CA Pump will auto start but trip on overcurrent. This will leave the CATD Pump as the only source of CA to the intact Steam Generators.

Upon completion of E-0, an Orange Path on Containment will require a transition to FR-Z.1, "Response to High Containment Pressure." Upon completion of FR-Z.1, the operator will transition to E-2, "Faulted Steam Generator Isolation," and isolate the C Steam Generator. Upon Steam Generator isolation the steam supply for the CATD Pump will be provided from the B Steam Generator which has high radiation due to the on-going 75 gpm Steam Generator Tube Leak. After isolating the C Steam Generator, the operator will transition to E-3, "Steam Generator Tube Rupture," based on high radiation in the B Steam Generator.

The scenario will terminate at Step 1 of E-3, after the crew has isolated the B Steam Generator with the exception of the Steam Supply to the CATD Pump.

Critical Tasks:

E-0 E

Manually actuate the minimum required compliment of Containment Cooling Equipment (NS) before transitioning out of E-0.

E-2 A

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

Scenario Event Description

NRC Scenario 1

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	IC - 103	<ul style="list-style-type: none"> • 75% Power • 1A CA Pump OOS • 0EMF 43 A OOS (Enc. 4.14 of OP/0/A/6450/011 complete) • ISE005A/B NS (Failure of NS to Auto Actuate)
<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	See Shift Turnover Information
<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.	
<input type="checkbox"/>	Prior to Crew Briefing	RUN	
<input type="checkbox"/>	Crew Briefing		
	<ol style="list-style-type: none"> 1. Assign Crew Positions based on evaluation requirements 2. Review the Shift Turnover Information with the crew. 3. Handout OP/1/A/6200/001B w/Enclosure 4.2 marked up through Step 3.3.3. 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	NLO Local Actions	Swap NV Pumps

Scenario Event Description

NRC Scenario 1

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	(XMT) SM007 Severity 0 Ramp 60 seconds Trigger 1	Steam Flow Channel fails low
<input type="checkbox"/>	At direction of examiner	(XMT) ILE001 Set 100 Ramp 120 Trigger 3	Pzr Level Channel fails high
<input type="checkbox"/>	At direction of examiner	(MALF) SG001B Set = 10 gpm Ramp 60 Trigger 5	Steam Generator Tube Leak/Downpower
<input type="checkbox"/>	At direction of examiner	(MALF) IRE003A Trigger 7	Uncontrolled Inward Rod Motion.
<input type="checkbox"/>	At direction of examiner	(OVR) SM012D (MALF) SM007C (Ramp = 60 Seconds) (MALF) CA009B Trigger 9	Inadvertent MSIV Closure/Faulted SG/ Failure of Containment Spray to auto actuate/ B CA Pump Trip NOTE: When Trigger #9 is operated MALF SG001B must be changed to 75 gpm over a 900 second ramp.
<input type="checkbox"/>	Terminate the scenario upon direction of Chief Examiner		

Op Test No.: N08-1 Scenario # 1 Event # 1 Page 7 of 43Event Description: **Swap Charging Pumps**

Time	Position	Applicant's Actions or Behavior
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Shortly after taking the watch, the operator will shift from 1A NV Pump to 1B NV Pump in accordance with section 3.3 of Enclosure 4.2, "NV Pump Operation," of OP/1/A/6200/001B, "Chemical and Volume Control System Charging." When the procedure is complete the 1B NV Pump will be operating and the 1A NV Pump will be shutdown.

Booth Operator Instructions: **NLO (John) is standing by locally to support NV Pump swap.**

Indications Available: NA

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6200/001B, CHEMICAL AND VOLUME CONTROL SYSTEM CHARGING ENCLOSURE 4.2			
	BOP	(Step 3.3.4) Start 1NV Lube Oil Pump 1B.	
			NOTE: A Plant Announcement is expected to be made prior to the start of the pump. SRO may ask U2 Operator to make announcement.
	BOP	(Step 3.3.5) IF this is a routine start of the 1B NV Pump, do NOT continue until 1B NV Lube Oil Pump has run for 1 minute.	
	BOP	(Step 3.3.6) Start 1B NV Pump.	
	BOP	(Step 3.3.7) Place in "AUTO" 1B NV Lube Oil Pump.	
	BOP	(Step 3.3.8) Depress "STP" for 1B NV Lube Oil Pump.	
			Booth Operator: As NLO (John) report "Pump status is Good."
	BOP	(Step 3.3.9) Check "START" pushbutton released AND "OFF" lit for 1B NV Lube Oil Pump.	

Op Test No.: N08-1 Scenario # 1 Event # 1 Page 8 of 43Event Description: **Swap Charging Pumps**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.3.10) Calculate DP between Seal Balance Line Pressure and Suction Pressure for 1B NV pump:	
			Booth Operator: When called as NLO (John) report "Seal Balance Line Pressure = 51 psig, and Suction Pressure = 31.2 psig."
	BOP	(Step 3.3.11) IF DP between Seal Balance Line Pressure and Suction Pressure greater than 50 psid, notify System Engineer.	
	BOP	(Step 3.3.12) Stop 1A NV Pump.	
	BOP	(Step 3.3.13) Adjust charging flow and seal flow as needed.	
	BOP	(Step 3.3.14) Evaluate back leakage through 1A NV Pump as follows:	
		<ul style="list-style-type: none"> WHEN Pzr level stable at setpoint, check 1NV-238 (Charging Line Flow Control) demand position. 	
		<ul style="list-style-type: none"> IF 1NV-238 demand position greater than 74%, notify System Engineering for guidance. 	
At the discretion of the Lead Examiner move to Event #2.			

Op Test No.: N08-1 Scenario # 1 Event # 2 Page 9 of 43Event Description: **Steam Flow Channel fails low**

Time	Position	Applicant's Actions or Behavior
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Following this, the controlling Steam Flow Transmitter (FSM-5030) on the B Steam Generator will slowly fail low causing the Feed Regulating Valve to move in the closed direction, and a Steam Generator B Steam Flow Mismatch alarm. The operator will respond by implementing AP-6, "S/G Feedwater Malfunction," recognize the failure and select an operating Steam Flow channel.

Booth Operator Instructions: Operate Trigger #1 (XMT-SM007 (0))**Indications Available:**

- Annunciator 1AD-4/A2, "S/G B Flow Mismatch Lo Stm Flow."
- Annunciator 1AD-4/C2, "S/G B Flow Mismatch Lo CF Flow."
- B FCV moves in closed direction.
- B CF flow decreases.
- B NR Level decreases.

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010E, ANNUNCIATOR RESPONSE FOR PANEL 1AD-4 A2, S/G B FLOW MISMATCH LO STM FLOW			
	SRO	(IA Step 1) IF Channel in Test, no further action required.	NOTE: Crew may NOT address ARP, but enter AP6 directly.
	SRO	(IA Step 2) IF loss of feedwater, go to AP/1/A/5500/006 (SG Feedwater Malfunction).	
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. 	

Op Test No.: N08-1 Scenario # 1 Event # 2 Page 10 of 43Event Description: **Steam Flow Channel fails low**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 2) IF CF pump speed control has failed, THEN perform the following:	
	RO	(Step 3) On each S/G, check the following channels – INDICATING the SAME:	NOTE: Channel I Steam Flow has failed low on B SG.
		<ul style="list-style-type: none"> • Steam 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.
	RO	(Step 4) Check unit status as follows:	
		<ul style="list-style-type: none"> • Reactor trip breakers – CLOSED • Pzr pressure – GREATER THAN P-11 (1955 PSIG). 	
	RO	(Step 5) IF AT ANY TIME S/G NR level approaches 17% OR 83%, THEN perform the following:	
		<ul style="list-style-type: none"> • Trip reactor. • 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.	

Op Test No.: N08-1 Scenario # 1 Event # 2 Page 11 of 43Event Description: **Steam Flow Channel fails low**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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: 1B CF Control Valve will be in MANUAL.
		(Step 11 RNO) WHEN the following conditions met, THEN place affected CF control valve in automatic: <ul style="list-style-type: none"> Automatic control – DESIRED Affected S/G level(s) – AT PROGRAM LEVEL Selected control channels – INDICATE CORRECTLY ON CHART RECORDER: <ul style="list-style-type: none"> Feed flow Steam flow S/G level 	NOTE: operator will place 1B CF Control Valve back in AUTO.
	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: SRO will likely conduct a Focus Brief.

At the discretion of the Lead Examiner move to Event #3.

Op Test No.: N08-1 Scenario # 1 Event # 2 Page 12 of 43

Event Description: **Steam Flow Channel fails low**

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 #3.			

Op Test No.: N08-1 Scenario # 1 Event # 3 Page 13 of 43Event Description: **Pzr Level Channel fails high**

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

Booth Operator Instructions: Operate Trigger #3 (XMT-ILE001 (100))

Indications Available:

- Annunciator 1AD-6/C7, "Pzr Hi Level Dev Control."
- Annunciator 1AD-7/F2, "Charging Line Demand Lo Flow."
- Charging flow decreases
- Actual Pzr Level decreases

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010G, ANNUNCIATOR RESPONSE FOR PANEL 1AD-6 C7, PZR HI LEVEL DEV CONTROL			
	BOP	(IA Step 1) Check backup heaters are on and charging flow is decreasing.	
	BOP	(IA Step 2) IF instrument malfunction, manually control charging flow at the appropriate man/auto station:	
		<ul style="list-style-type: none"> • Pzr Level Master Cntrl 	
		<ul style="list-style-type: none"> • 1NV-238 (Charging Line Flow Control) 	NOTE: operator 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: operator will select position 3-2 on Pzr Level Control.

Op Test No.: N08-1 Scenario # 1 Event # 3 Page 14 of 43Event Description: **Pzr Level Channel fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments						
	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: Operator may isolate Letdown. If so, Enter AP12 to re-establish Letdown.						
	SRO	(SA Step 2) Refer to Tech Specs for minimum instrumentation requirements.	NOTE: SRO will likely conduct a Focus Brief.						
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION									
	SRO	Reactor Trip System (RTS) Instrumentation	Examiner NOTE: Addressing TS takes 8-10 minutes. May want to address after scenario.						
	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. (9. Pressurizer Water level – HIGH)							
		ACTIONS							
		<table border="1"> <thead> <tr> <th>CONDITION</th> <th>REQUIRED ACTION</th> <th>COMPLETION TIME</th> </tr> </thead> <tbody> <tr> <td>A. One or more functions with one or more required channels inoperable.</td> <td>A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).</td> <td>Immediately</td> </tr> </tbody> </table>	CONDITION	REQUIRED ACTION	COMPLETION TIME	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	
CONDITION	REQUIRED ACTION	COMPLETION TIME							
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							

Op Test No.:	<u> N08-1 </u>	Scenario #	<u> 1 </u>	Event #	<u> 3 </u>	Page	<u> 15 </u> of <u> 43 </u>
Event Description:		Pzr Level Channel fails high					
Time	Position	Applicant's Actions or Behavior					

Time	Pos.	Expected Actions/Behavior			Comments
		M. One channel inoperable.	M.1 Place channel in trip. OR M.2 Reduce THERMAL POWER to < P-7.	6 hours 12 hours	
TECHNICAL SPECIFICATION 3.3.3, PAM INSTRUMENTATION					
	SRO	Post Accident Monitoring (PAM) Instrumentation			
	SRO	LCO 3.3.3			
		The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE. (11 – Pressurizer Level)			
		APPLICABILITY:			
		MODES 1, 2, and 3.			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		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.	Immediately	
		B. One or more Functions with one required channel inoperable.	B.1 Restore required channel to OPERABLE status.	30 days	

Op Test No.: N08-1 Scenario # 1 Event # 3 Page 16 of 43

Event Description: **Pzr Level Channel fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments						
TECHNICAL SPECIFICATION 3.3.4, REMOTE SHUTDOWN SYSTEM									
	SRO	3.3.4 Remote Shutdown System							
	SRO	LCO 3.3.4							
		The Remote Shutdown System Functions in Table 3.3.4-1 shall be OPERABLE (4 RCS Inventory control a. Pressurizer Level).							
		APPLICABILITY:							
		MODES 1, 2, and 3.							
		ACTIONS							
		<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 30%;">CONDITION</th> <th style="width: 30%;">REQUIRED ACTION</th> <th style="width: 40%;">COMPLETION TIME</th> </tr> </thead> <tbody> <tr> <td>A. One or more required Functions inoperable.</td> <td>A.1 Restore required Function to OPERABLE status.</td> <td>30 days</td> </tr> </tbody> </table>	CONDITION	REQUIRED ACTION	COMPLETION TIME	A. One or more required Functions inoperable.	A.1 Restore required Function to OPERABLE status.	30 days	
CONDITION	REQUIRED ACTION	COMPLETION TIME							
A. One or more required Functions inoperable.	A.1 Restore required Function to OPERABLE status.	30 days							
At the discretion of the Lead Examiner move to Event #4.									

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>17</u>	of	<u>43</u>
Event Description:	Steam Generator Tube Leak/Downpower								
Time	Position	Applicant's Actions or Behavior							

Subsequently, a 10 gpm Steam Generator Tube Leak will develop on the B Steam Generator. The Operator will respond by implementing AP-10, "NC System Leakage Within the Capacity of Both NV Pumps." The operator will address Technical Specification 3.4.13, "RCS Operational Leakage," and 3.7.16, "Secondary Specific Activity." The operator will reduce load to be in Mode 3 within 3 hours in accordance with AP4, "Rapid Downpower."

Booth Operator Instructions: Operate Trigger #5 (MALF SG001B (10 gpm))

Indications Available:

- Annunciator 1RA-1/B1, "1 EMF 33 Cond Air Eject Exh Hi Rad."
- Annunciator 1RA-1/C1, "1EMF 71 S/G A Leakage Hi Rad."
- Annunciator 1RA-1/D1, "1EMF 72 S/G B Leakage Hi Rad."
- Annunciator 1RA-1/D2, "1EMF 73 S/G C Leakage Hi Rad."
- Annunciator 1RA-1/D3, "1EMF 74 S/G D Leakage Hi Rad."
- 1 EMF 72 S/G B Leakage Hi Rad indicates higher than other SGs.

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			
	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. 	
		<ul style="list-style-type: none"> • Open 1NV-241 (Seal Inj Flow control) while maintaining NC pump seal flow greater than 6 GPM. 	NOTE: Operator may open 1NV-241 to maintain 6 gpm Seal Supply flow.
		<ul style="list-style-type: none"> • Reduce or isolate letdown. 	NOTE: Operator will decide NOT to reduce Letdown due to the small size of the leak.

Op Test No.: N08-1 Scenario # 1 Event # 4 Page 18 of 43 Event Description: **Steam Generator Tube Leak/Downpower**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Start additional NV pump. 	NOTE: Operator will elect to NOT start a second NV Pump due to the small size of Leak.
	BOP	(Step 2) IF AT ANY TIME Pzr level goes down in an uncontrolled manner OR cannot be maintained greater than 4%, THEN perform Step 1.	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
			NOTE: The SRO may direct two NLOs to standby with Enclosure 3 of AP10 to isolate the 1B SG. If so, Booth Instructor: Set LOA-SA003 = 0, (1SA-2/78)
	BOP	(Step 3) Identify affected S/G:	
		<ul style="list-style-type: none"> Any S/G N/R level – GOING UP IN AN UNCONTROLLED MANNER. 	
		OR	
		<ul style="list-style-type: none"> Check any of the following EMFs- ABOVE NORMAL: 	
		<ul style="list-style-type: none"> 1EMF-24 (SG/A Steamline Hi Rad) 	
		<ul style="list-style-type: none"> 1EMF-25 (SG B Steamline Hi Rad) 	NOTE: 1EMF-25 will be at Trip 1 set point.
		<ul style="list-style-type: none"> 1EMF-26 (S/G C Steamline Hi Rad) 	
		<ul style="list-style-type: none"> 1EMF-27 (S/G D Steamline Hi Rad) 	
		<ul style="list-style-type: none"> 1EMF 71 (S/G A Leakage Hi Rad) 	
		<ul style="list-style-type: none"> 1EMF 72 (S/G B Leakage Hi Rad) 	NOTE: 1EMF-72 will be at Trip 2 set point, and higher than other SGs.
		<ul style="list-style-type: none"> 1EMF 73 (S/G C Leakage Hi Rad) 	
		<ul style="list-style-type: none"> 1EMF 74 (S/G D Leakage Hi Rad) 	
		OR	
		<ul style="list-style-type: none"> Check CF Flow – LOWER IN ANY S/G COMPARED TO ALL. 	
		OR	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>19</u>	of	<u>43</u>
Event Description: Steam Generator Tube Leak/Downpower									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Secondary Chemistry or RP has determined affected S/G by sampling or evaluation of available EMF data. 	NOTE: SRO and Crew will identify 1B SG as leaking SG.
	SRO	(Step 4) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	SRO	(Step 5) 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 6) IF AT ANY TIME NC leakage exceeds Tech Spec limits, THEN:	NOTE: SRO and Crew will acknowledge that leak exceeds TS limit.
		<ul style="list-style-type: none"> Ensure Outside Air Pressure Filter train in service PER OP/0/A6450/011 (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 call WCC to address. If so, Booth Instructor acknowledge as WCC.
	BOP	(Step 7) Check if unit shutdown or reactor trip required:	
		<ul style="list-style-type: none"> Check VCT makeup – IN PROGRESS 	
	BOP	(Step 7a RNO) GO TO Step 7c.	
	BOP	(Step 7c) check S/G tube leak size – LESS THAN 90 GPM.	NOTE: SRO and Crew will determine that leak is ≈10 gpm.

Op Test No.: N08-1 Scenario # 1 Event # 4 Page 20 of 43Event Description: **Steam Generator Tube Leak/Downpower**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	<ul style="list-style-type: none"> (Step 7d) Leakage in one S/G – GREATER THAN 125 GPD (GALLON PER DAY). 	
		<ul style="list-style-type: none"> (Step 7e) Observe the following limits while reducing load in Step 8: 	
		<ul style="list-style-type: none"> Ensure reactor power is less than 50% within 1 hour of exceeding 125 GPD. 	
		<ul style="list-style-type: none"> Be in Mode 3 within 3 hours of exceeding 125 GPD. 	
	SRO	(Step 8) Reduce load PER one of the following, while continuing with this AP as time allows beginning at Step 9.	<p>Floor Instructor: Allow SRO to determine which procedure to use to conduct shutdown.</p> <p>If SRO chooses to conduct shutdown using OP, as Station Management, prompt crew to Shutdown plant to Mode 3 within 1 hour using AP04.</p>
		<ul style="list-style-type: none"> AP/1/A/5500/04 	
		OR	
		<ul style="list-style-type: none"> OP/1/A/6100/003 (Controlling Procedure For Unit Operation), Enclosure 4.2 (Power Reduction). 	
AP/1/A/5500/4, RAPID DOWNPOWER			
	SRO	(Step 1) Monitor Foldout page.	
	SRO	(Step 2) Announce occurrence on page.	<p>NOTE: SRO may ask U2 RO to make Plant Announcement.</p> <p>If so, Floor Instructor acknowledge as U2 RO.</p>
	RO	(Step 3) Check turbine control – IN AUTO.	

Op Test No.: N08-1 Scenario # 1 Event # 4 Page 21 of 43Event Description: **Steam Generator Tube Leak/Downpower**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 4) Check "MW LOOP" – IN SERVICE.	
	SRO	(Step 5) Check shutdown to Mode 3 – DESIRED.	
	SRO	(Step 6) Check if "Shutdown Via Reactor Trip from 15% Power – DESIRED.	NOTE: Trip from 15% will be desired.
		<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 	NOTE: One MD CA Pump is OOS (A). Still two pumps available (1B MD and 1TD CA Pumps).
	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: SRO will determine 60% load reduction.
	RO	(Step 9) Check control rods – IN AUTO.	
	BOP	(Step 10) Notify SOC of load reduction (red dispatcher phone).	Booth Instructor: Acknowledge as SOC.
	RO	(Step 11) Initiate turbine load reduction to desired load at desired rate.	NOTE: RO will start load reduction.
	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) 	

Op Test No.: N08-1 Scenario # 1 Event # 4 Page 22 of 43Event Description: **Steam Generator Tube Leak/Downpower**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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: 	NOTE: BOP will determine 600 gallons.
		<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)). 	
	RO	(Step 13) Check control rods – MOVING IN AS REQUIRED TO MAINTAIN T-AVE AT T-REF.	NOTE: RO will observe Control Rods stepping in.
	RO	(Step 14) Display rod Insertion Limits on OAC by entering turn on code "RIL".	
	RO/ BOP	(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. 	
	RO	(Step 16) IF AT ANY TIME during this procedure C-7A is received, THEN ensure Transient Monitor freeze is triggered.	
	RO	(Step 17) Check turbine impulse pressure – GREATER THAN 260 PSIG.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>23</u>	of	<u>43</u>
Event Description:		Steam Generator Tube Leak/Downpower							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 18) REFER TO the following:	NOTE: SRO may ask OSM to address. If so, Floor Instructor acknowledge as OSM.
		<ul style="list-style-type: none"> RP/0/A/5700/000 (Classification of Emergency) 	
		<ul style="list-style-type: none"> RP/0/A/5700/010 (NRC Immediate Notification Requirements). 	
	SRO	(Step 19) Notify Reactor Group Duty Engineer of load reduction.	NOTE: SRO may call WCC to address. If so, Booth Instructor acknowledge as WCC.
	SRO	(Step 20) Check target load – LESS THAN 1000 MW.	
	Ro	(Step 21) Check Unit 2 – AVAILABLE TO SUPPLY AUX STEAM (AS) HEADER.	Floor Instructor: As U2 RO report "Yes."
	SRO	(Step 22) Dispatch operator to ensure the following valves are open:	
		<ul style="list-style-type: none"> 1AS-74 (Unit 1 and Unit 2 AS Hdr Crosstie) service bldg, 739+12, room 202, R-27, over B RL Pump) 	
		<ul style="list-style-type: none"> Unit 2 valve 2AS-74 (Unit 2 AS Hdr Isol) (service bldg, 739+14, room 202, S-27, above RL strainer) 	
		<ul style="list-style-type: none"> 1AS-253 (Unit 1 AS Hdr Isol) (service bldg, 739+15, P-28, room 202, above overhead door to Unit 1 turbine bldg). 	NOTE: SRO will dispatch NLOs. Floor Instructor: After 3-4 minutes, as NLO report "Valves are Open."

Op Test No.: N08-1 Scenario # 1 Event # 4 Page 24 of 43 Event Description: **Steam Generator Tube Leak/Downpower**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments						
			<p>NOTE: SRO will likely conduct a Focus Brief.</p> <p>After the Brief the SRO may continue in AP10, while the plant is shutting down.</p>						
TECHNICAL SPECIFICATION 3.4.13, RCS OPERATIONAL LEAKAGE									
	SRO	3.4.13 RCS Operational LEAKAGE	<p>Examiner NOTE: The SRO most likely will NOT address TS while maneuvering the plant. May want to address after scenario.</p>						
	SRO	LCO 3.4.13							
		RCS operational LEAKAGE shall be limited to:							
		<ul style="list-style-type: none"> 135 gallons per day primary to secondary LEAKAGE through any one steam generator (SG). 							
		APPLICABILITY: MODES 1, 2, 3, and 4.							
		ACTIONS							
		<table border="1"> <thead> <tr> <th>CONDITION</th> <th>REQUIRED ACTION</th> <th>COMPLETION TIME</th> </tr> </thead> <tbody> <tr> <td>A. RCS Operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.</td> <td>A.1 Reduce LEAKAGE to within limits.</td> <td>4 hours</td> </tr> </tbody> </table>	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 to within limits.	4 hours	
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 to within limits.	4 hours							

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>4</u>	Page	<u>25</u>	of	<u>43</u>
Event Description:	Steam Generator Tube Leak/Downpower								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior			Comments
TECHNICAL SPECIFICATION 3.7.16, SECONDARY SPECIFIC ACTIVITY					
	SRO	3.7.16 Secondary Specific Activity			
	SRO	LCO 3.7.16			
		The specific activity of the secondary coolant shall be $\leq 0.10 \mu\text{Ci/gm}$ DOSE EQUIVALENT I-131.			
		APPLICABILITY:			
		MODES 1, 2, 3, and 4.			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. Specific activity not within limit.	A.1 Be in MODE 3.	6 hours	
			AND	A.2 Be in MODE 5.	36 hours
At the discretion of the Lead Examiner move to Event #5.					

Op Test No.: N08-1 Scenario # 1 Event # 5 Page 26 of 43Event Description: **Uncontrolled Inward Rod Motion**

Time	Position	Applicant's Actions or Behavior
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During the downpower, uncontrolled inward rod motion will occur with Rod Control in automatic. The operator will respond in accordance with AP14, "Rod Control Malfunction," and take manual control of the control rods. (The rods will remain in manual control throughout the remainder of the scenario).

Booth Operator Instructions: Operate Trigger #7 (MALF-IRE003A)

Indications Available:

- Continuous inward rod motion with Tave-Tref matched or negative.

Time	Pos.	Expected Actions/Behavior	Comments
			Examiner NOTE: This event may take 3-5 minutes to diagnose with the plant maneuvering.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
			NOTE: Crew will carry out Immediate Actions of AP14, prior to the SRO addressing the AP.
	RO	(Step 1) IF more than one rod dropped, THEN:	
		<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:	

Op Test No.: N08-1 Scenario # 1 Event # 5 Page 27 of 43Event Description: **Uncontrolled Inward Rod Motion**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> • "1A NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "1B NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "1C NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "1D NC LOOP T-AVG" 	
		<ul style="list-style-type: none"> • "TURB IMP PRESS CH 1" 	
		<ul style="list-style-type: none"> • T-Ref indication. 	
	RO	(Step 7) Check Nuclear Power P/R Channels – NORMAL.	
	SRO	(Step 9) IF this AP entered due to unwarranted rod insertion or withdrawal, THEN GO TO Enclosure 4 (Response To Continuous rod Movement).	<p>NOTE: The SRO will address Enclosure 4.</p> <p>The load decrease may be stopped to stabilize the plant.</p>
AP/1/A/5500/14, ROD CONTROL MALFUNCTION ENCLOSURE 4, RESPONSE TO CONTINUOUS ROD MOVEMENT			
	SRO	(Step 1) Announce occurrence on paging system.	<p>NOTE: SRO may ask U2 RO to make Plant Announcement.</p> <p>If so, Floor Instructor acknowledge as U2 RO.</p>
	RO	(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. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>5</u>	Page	<u>28</u>	of	<u>43</u>
Event Description:	Uncontrolled Inward Rod Motion								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 4) Check the following channels – NORMAL:	
		• “1A NC LOOP T-AVG”	
		• “1B NC LOOP T-AVG”	
		• “1C NC LOOP T-AVG”	
		• “1D NC LOOP T-AVG”	
	SRO	(Step 5) Check if failed channel – HAS BEEN IDENTIFIED.	
	RO / BOP	(Step 5 RNO) Perform the following:	
		• Notify rod control system qualified IAE personnel to investigate problem with Rod Control System.	NOTE: SRO may call WCC (IAE) to address. If so, Booth Instructor acknowledge as WCC (IAE).
		• Maintain T-Ave within 1°F of programmed T-Ref as follows:	
		• Adjust Turbine load	
		OR	
		• Borate/dilute NC System.	
At the discretion of the Lead Examiner move to Events # 6 - 8.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>29</u>	of	<u>43</u>
Event Description: Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip									
Time	Position	Applicant's Actions or Behavior							

Shortly afterwards, the C MSIV inadvertently closes causing a major Steam Line Rupture to occur on the C Steam Generator inside the Containment. A Reactor Trip/Safety Injection will occur and the operator will enter E-0, "Reactor Trip or Safety Injection." The Containment Spray (NS) bistable will fail to energize, and require manual operator action. The SGTL in the B SG will degrade to about 75 gpm over the next 15 minutes due to the plant transient. Additionally, the B CA Pump will auto start but trip on overcurrent within 30 seconds of pump start. This will leave the CATD Pump as the only source of CA to the intact Steam Generators. Upon completion of E-0, an Orange Path on Containment will require a transition to FR-Z.1, "Response to High Containment Pressure." Upon completion of FR-Z.1, the operator will transition to E-2, "Faulted Steam Generator Isolation," and isolate the C Steam Generator. Upon Steam Generator isolation the steam supply for the CATD Pump will be provided from the B Steam Generator which has high radiation due to the on-going 75 gpm Steam Generator Tube Leak. After isolating the C Steam Generator, the operator will transition to E-3, "Steam Generator Tube Rupture," based on high radiation in the B Steam Generator. The scenario will terminate at Step 1 of E-3, after the crew has isolated the B Steam Generator with the exception of the Steam Supply to the CATD Pump.

Booth Operator Instructions: **Operate Trigger #9 (OVR-SM012D, SM007C)**
Change MALF SG001B to 75 gpm (900 Second Ramp)

Indications Available:

- C MSIV Closes
- C SG Pressure increases, then decreases below SGs A, B, and D.
- Containment Pressure increases

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: Crew will carry out Immediate Actions of E-0, prior to the SRO addressing the EP.
			<p>NOTE: The SRO may direct two NLOs standing by with Enclosure 3 of AP10 to isolate the 1B SG.</p> <p>If so, Booth Instructor: Set LOA-SA003 = 0, (1SA-2/78).</p> <p>NOTE: If so, this action will be undone at a later time or all CA flow will be lost when the 1C SG is isolated in E-2.</p>

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>30</u>	of	<u>43</u>
Event Description:	Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
E-0, REACTOR TRIP OR SAFETY INJECTION			
	SRO	(Step 1) Monitor Foldout page.	
	RO	(Step 2) check Reactor Trip:	
		<ul style="list-style-type: none"> All rod bottom lights – LIT Reactor trip and bypass breakers – OPEN I/R amps – GOING DOWN. 	
	BOP	(Step 3) Check Turbine Trip:	
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	
	RO / BOP	(Step 5) Check if S/I is actuated:	
		<ul style="list-style-type: none"> “SAFETY INJECTION ACTUATED” status light (1SI-18) – LIT. Both LOCA Sequencer Actuated status lights (1SI-14) – LIT. 	
	SRO	(Step 6) 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 7) Check ESF Monitor Light Panel on energized train(s):	
		<ul style="list-style-type: none"> Groups 1,2,5 – DARK. Group 3 – LIT. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>31</u>	of	<u>43</u>
Event Description:	Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> OAC – IN SERVICE. 	
		<ul style="list-style-type: none"> Group 4, Rows A through F – LIT AS REQUIRED. 	NOTE: BOP may recognize that Containment Spray did NOT actuate and actuate CS manually.
	SRO	<ul style="list-style-type: none"> GO TO Step 8. 	
	RO / BOP	(Step 8) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	NOTE: Neither MD CA Pump will be running at this time. The only source of CA flow is the TD CA Pump.
	RO / BOP	(Step 8a RNO) Start pumps.	NOTE: The SRO will verify that the TD CA is running.
	BOP	(Step 9) Check all KC pumps – ON.	
	BOP	Check both RN pumps – ON.	
	SRO	(Step 11) Notify Unit 2 to start 2A RN pump.	Floor Instructor: As U2 RO report "2A RN Pump is running."
	RO	(Step 12) Check all S/G pressures – GREATER THAN 775 psig.	NOTE: 1C SG Pressure is decreasing uncontrollably.
	Ro	(Step 12 RNO) Perform the following:	
		<ul style="list-style-type: none"> Check the following closed: <ul style="list-style-type: none"> All MSIVs All MSIV bypass valves All SM PORVs. 	

Op Test No.: N08-1 Scenario # 1 Event # 6, 7, & 8 Page 32 of 43Event Description: **Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 13) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment Pressure is > 3 psig.
	BOP	(Step 13 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), THEN perform the following: 	
		<ul style="list-style-type: none"> Initiate Phase B and Containment Spray signal. 	
Critical Task: (E-0 E) Manually actuate the minimum required compliment of Containment Cooling Equipment (NS) (At least one Train) before transitioning out of E-0.			
		<ul style="list-style-type: none"> Stop all NC pumps while maintaining seal injection flow. 	
		<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). 	NOTE: SRO will dispatch NLO. Booth Instructor: As NLO, report in 5 minutes that all Unit 1 NF AHUs are stopped.

Op Test No.: N08-1 Scenario # 1 Event # 6, 7, & 8 Page 33 of 43Event Description: **Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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>The SRO may ask U2 BOP to perform this action.</p> <p>If so, Floor Instructor: Acknowledge as U2 BOP.</p>
E-0, REACTOR TRIP OR SAFETY INJECTION			
ENCLOSURE 2, Phase B HVAC Equipment			
	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). 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>34</u>	of	<u>43</u>
Event Description: Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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/RO	(Step 14) 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 pressures – LESS THAN 1600 PSIG. 	
	BOP/RO	(Step 14b 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). 	
		<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 15. 	
	SRO	(Step 15) 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.	<p>NOTE: SRO may ask OSM to address.</p> <p>If so, Floor Instructor acknowledge as OSM.</p>

Op Test No.: N08-1 Scenario # 1 Event # 6, 7, & 8 Page 35 of 43Event Description: **Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO / BOP	(Step 16) 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. 	
		<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	
		<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%. 	NOTE: Adverse Containment Numbers will be used.
	RO	(Step 17) Check NC temperatures:	
		<ul style="list-style-type: none"> IF all NC pumps off, THEN check NC T-Cold – STABLE OR TRENDING TO 557°F 	NOTE: All NC Pumps will be OFF.
	RO	(Step 17 RNO) Perform the following based on plant conditions:	NOTE: The SRO may assign the RO to perform this action.
		<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). 	If so, RO Examiner follow actions of Enclosure 3.
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.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>36</u>	of	<u>43</u>
Event Description:	Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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, 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.	
	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. 	
E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 18) Check Pzr PORV and spray valves:	
		<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>37</u>	of	<u>43</u>
Event Description: Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Normal Pzr spray valves – CLOSED. 	
	BOP	(Step 19) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	
	RO	(Step 20) Check if main steamlines intact:	
		<ul style="list-style-type: none"> All S/G pressure – STABLE OR GOING UP 	
		<ul style="list-style-type: none"> All S/Gs – PRESSURIZED. 	
	SRO	(Step 20 RNO) IF any S/G is faulted, THEN:	
		<ul style="list-style-type: none"> IF fault is outside containment, THEN: 	
		<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-2 (Faulted Steam Generator Isolation). 	
		<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). 	
		<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. 	
		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-2 (Faulted Steam Generator Isolation). 	<p>NOTE: Upon transition to E-2, an ORANGE Path will exist on Containment.</p> <p>The SRO will transition to FR-Z.1, rather than E-2.</p>
FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>38</u>	of	<u>43</u>
Event Description:	Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
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.
	SRO	(Step 2) Monitor Foldout Page.	
	RO / 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 NC Cold Leg 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.	
	BOP	(Step 7) Check any NS pump – ON.	NOTE: By this time both NS Pumps should be ON.

Op Test No.: N08-1 Scenario # 1 Event # 6, 7, & 8 Page 39 of 43Event Description: **Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 8) Perform the remainder of this EP as time allows.	NOTE: SRO will transition to E-2.
E-2, FAULTED STEAM GENERATOR ISOLATION			
	SRO	(Step 1) Monitor Foldout page.	
	SRO	(Step 2) Maintain at least one S/G available for NC System cooldown in subsequent steps.	NOTE: Both 1A/1D SGs are available for cooldown. The 1B SG has a SGTL.
	SRO	(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: <ul style="list-style-type: none"> All MSIVs All MSIV bypass valves. 	
	RO	(Step 5) check at least one S/G pressure – STABLE OR GOING UP.	NOTE: Both 1A/1D SGs pressures are increasing. The 1B SG pressure is also increasing, but has a SGTL.
	RO	(Step 6) Identify faulted S/G(s): <ul style="list-style-type: none"> Any S/G pressure – GOING DOWN IN AN UNCONTROLLED MANNER OR <ul style="list-style-type: none"> Any S/G – DEPRESSURIZED. 	NOTE: The 1C SG is faulted.
	RO	(Step 7) Check faulted S/G(s) SM PORV – CLOSED.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>40</u>	of	<u>43</u>
Event Description:	Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 8) Reset CA modulating valves.	
	RO / BOP	(Step 9) IF TD CA pump is the only source of feedwater, THEN maintain steam flow to it from at least one S/G.	<p>NOTE: The TD CA Pump is the only source of feed, and its steam source must be maintained from 1B SG.</p> <p>If the steam was previously isolated from the 1B SG to the TD CA Pump, the SRO will most likely unisolate 1B SG at this time.</p> <p>If necessary, Booth Instructor:</p> <p>LOA-SA003 = 1.0</p> <p>Then, report actions as NLO.</p>
	RO / BOP	(Step 10) Isolate faulted S/G(s) as follows:	
		<ul style="list-style-type: none"> For 1C S/G: 	
		<ul style="list-style-type: none"> Check "SG C FDW ISOLATED" status light (1SI-4) – LIT. 	
		<ul style="list-style-type: none"> Close 1CA-50B (U1 TD CA Pump Disch To 1C S/G Isol). 	
		<ul style="list-style-type: none"> Close 1CA-46B (1B CA Pump Disch To 1C S/G Isol). 	
		<ul style="list-style-type: none"> Dispatch operator to unlock and close: 	<p>NOTE: The SRO will dispatch an NLO to close 1SA-1 and 77.</p> <p>Floor/Booth Instructor:</p> <p>Acknowledge as appropriate.</p>
		<ul style="list-style-type: none"> 1SA-1 (1C S/G SM Supply to Unit 1 TD CA Pump Turb Maint Isol) (Unit 1 interior doghouse, 767+10, FF-53, above ladder) 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>1</u>	Event #	<u>6, 7, & 8</u>	Page	<u>41</u>	of	<u>43</u>
Event Description:	Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1SA-77 (1C S/G SM Supply to Unit 1 TD CA Pump Turb Loop Seal Isol) (Unit 1 interior doghouse, 767+10, FF-53). 	Booth Instructor: Set LOA-SA002 = 0, (1SA-1/77). Wait 2 minutes and report as NLO that 1SA-1 and 77 are CLOSED.
		<ul style="list-style-type: none"> Check BB valves – CLOSED: 	
		<ul style="list-style-type: none"> 1BB-3B (1C S/G Blowdown Cont Outside Isol Control) 	
		<ul style="list-style-type: none"> 1BB-7A (C S/G BB Cont Inside Isol). 	
		<ul style="list-style-type: none"> Close 1SM-95 (C SM Line Drain Isol). 	
Critical Task: (E-2 A) Isolate the Faulted Steam Generator before transitioning out of E-2.			
	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: 	
		<ul style="list-style-type: none"> 1EMF-24 (S/G A) 	
		<ul style="list-style-type: none"> 1EMF-25 (S/G B) 	NOTE: 1B SG was previously identified as leaking. 1EMF-25 is NOT Normal.
		<ul style="list-style-type: none"> 1EMF-26 (S/G C) 	
		<ul style="list-style-type: none"> 1EMF-27 (S/G D). 	
		(Step 12a RNO) GO TO EP/1A/5000/E-3 (Steam Generator Tube Rupture).	NOTE: The SRO will transition to E-3.

Op Test No.: N08-1 Scenario # 1 Event # 6, 7, & 8 Page 42 of 43

Event Description: **Inadvertent MSIV Closure/Faulted SG – Auto Failure of NS/B CA Pump Trip**

Time	Position	Applicant's Actions or Behavior
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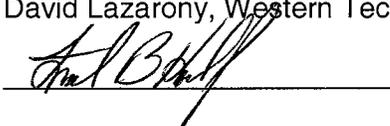
Time	Pos.	Expected Actions/Behavior	Comments
		(Step 12b) IF any S/G has previously been identified as ruptured, THEN GO TO EP/1/A/5000/E-3 (Steam Generator Tube Rupture).	
At the discretion of the Lead Examiner terminate the exam.			

PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 24
TOPIC: NRC Simulator Exam
Scenario N08-1-2

REFERENCES:

1. PT/1/A/4350/002B, "Diesel Generator Operability Test."
2. OP/1/A/6100/010G, "Annunciator Response For Panel 1AD-6."
3. AP/1/A/5500/014, "Rod Control Malfunction."
4. McGuire Technical Specifications
5. OP/1/A/6100/010H, "Annunciator Response For Panel 1AD-7."
6. AP/1/A/5500/012, "Loss of Letdown, Charging or Seal Injection."
7. OAC Alarm Response for M1A0689, "U1 Gland Steam Seal Header Pressure."
8. OAC Alarm Response for M1P1385, "U1 Reactor Thermal Power, Best."
9. OP/1/A/6100/010F, "Annunciator Response For Panel 1AD-5."
10. McGuire Control Room Expectations Manual
11. OP/1/A/6100/010C, "Annunciator Response For Panel 1AD-2."
12. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
13. EP/1/A/5000/FR-Z-1, "Response to High Containment Pressure."
14. EP/1/A/5000/E-1, "Loss of Reactor or Secondary Coolant."
15. EP/1/A/5000/ES-1.2, "Post-LOCA Cooldown and Depressurization."
16. EP/1/A/5000/ES-1.3, "Transfer to Cold Leg Recirculation."
17. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review: 

March 4th, 2008
Rev. 2

Facility: McGuire		Scenario No.: 2	Op Test No.: N08-1
Examiners: _____		Operators: (SRO)	
_____		(OATC)	
_____		(BOP)	
Initial Conditions:	The Plant is at 100% power Steady-State (BOL), and has been for the last 12 days following Refueling Outage. The Diesel Generator 1B Operability Test is in progress and the Diesel has operated for 2.5 hours per System Engineer request. It is presently loaded at 3800 KW and is ready to be shutdown in accordance with PT/1/A/4350/002B. The operation of the 1B DG was a Slow Start and conducted from the Control Room at the request of Maintenance.		
Turnover:	The following equipment is Out-Of-Service: 1B NI Pump (Expected back in 8 hours), 1NV-265B, Boric Acid to NV Pumps, out for Limit Switch replacement (Expected back in 2 hours), PNV-5230, NCP 1A #1 Seal Differential Pressure indicator, failed last shift (IAE is investigating) and MCB Annunciator 1AD-12, C-2, "KR Storage Tank Low Level," has failed (IAE is investigating). An NLO (Wayne) is standing by at the 1B DG to assist in the shutdown. OTG is expected to be conducting some testing inside the TDCA Panel for about an hour early in the shift.		
Event No.	Malf. No.	Event Type*	Event Description
1	NA	N-BOP N-SRO	Shutdown 1B DG
2	^{XMT} NC099	I-RO I(TS)-SRO	Thot Instrument fails high
3	NV030 NV023A	I-BOP I-SRO	Letdown Pressure Transmitter Failure/Letdown Relief Sticks open
4	SM010	C-RO C-SRO	Steam Seal Pressure Regulator Failure
5	^{OVR} CA022	C-BOP C(TS)-SRO	Inadvertent Start of the TD CA Pump
6	IRE006	C-RO C-SRO	Sequential Dropped Rods
7	NC014A	M-RO M-BOP M-SRO	Pzr Steam Space LOCA
8	NI001A	NA	A NI Pump fails to Auto Start
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description

NRC Scenario 2

McGuire 2008 NRC Scenario #2

The Plant is at 100% power Steady-State (BOL), and has been for the last 12 days following Refueling Outage. The Diesel Generator 1B Operability Test is in progress and the Diesel has operated for 2.5 hours per System Engineer request. It is presently loaded at 3800 KW and is ready to be shutdown in accordance with PT/1/A/4350/002B. The operation of the 1B DG was a Slow Start and conducted from the Control Room at the request of Maintenance.

The following equipment is Out-Of-Service: 1B NI Pump (Expected back in 8 hours), 1NV-265B, Boric Acid to NV Pumps, out for Limit Switch replacement (Expected back in 2 hours), PNV-5230, NCP 1A #1 Seal Differential Pressure indicator, failed last shift (IAE is investigating) and MCB Annunciator 1AD-12, C-2, "KR Storage Tank Low Level," has failed (IAE is investigating). An NLO (Wayne) is standing by at the 1B DG to assist in the shutdown. OTG is expected to be conducting some testing inside the TDCA Panel for about an hour early in the shift.

Shortly after taking the watch, the operator will shutdown the 1B Diesel Generator in accordance with step 2.52 of Enclosure 13.1, "1B D/G Slow Start," of PT/1/A/4350/002B, "Diesel Generator Operability Test." The operator will adjust load to 2800-3000 KW and establish a 5 minute wait period.

During this five minute wait period, the Loop B Thot (TNC-8170) will fail high causing a Tavg-Tef mismatch and controls rods to insert. The operator will respond in accordance with ARP1AD-6/A-10, "Auct Hi T-AVG, B-10, "T-REF/T-AUCT Abnormal," and D-10, "Loop T-AVG Deviation." The operator will implement AP-14, "Rod Control Malfunction," and defeat the failed channel. The operator will address Technical Specifications 3.3.1, "RTS Instrumentation," and 3.3.2, "ESFAS Instrumentation."

After this or during this time, the operator will continue the shutdown on the 1B Diesel Generator (Time compression will be used to satisfy cooldown requirements) in accordance with Enclosure 13.1, "1B D/G Slow Start," of PT/1/A/4350/002B, "Diesel Generator Operability Test."

Subsequently, the Letdown line Pressure Transmitter will fail low causing NV-124 to close in an attempt to maintain setpoint pressure. With letdown flow closed off, actual Letdown line pressure will increase lifting the Letdown Line Relief Valve NV-6. Upon initial lift of this valve, NV-6 will fail in the open position. The operator will respond in accordance with ARP1AD-7/I-14, "Letdn Relief Hi Temp," and then implement AP-12, "Loss of Letdown, Charging or Seal Injection," due to the loss of Letdown flow. The operator will isolate normal Letdown and establish Excess Letdown.

Following this, the Steam Seal Header Pressure Control Valve, 1TL-6, will fail closed. The operator will respond to OAC alarm M1A0689, "U1 Gland Steam Seal Header Pressure," and restore Main Turbine and CFPT Sealing Steam Pressure before a low Main Condenser Vacuum condition develops.

Shortly afterwards, the TDCA Pump will inadvertently start due an OTG error while working inside the TDCA Panel. The operator will respond to OAC alarm M1P1385, "U1 Reactor Thermal Power, Best," and ARP1AD-5/F-2, "TD CA Pump Lo Suct Flow." The operator will respond in accordance with the Control Room Expectations Manual for the condition in which CA operation occurs above 10% power. The stated expectation is that CA flow should be throttled/isolated as soon as practical. The operator will address Technical Specification 3.7.5, "Auxiliary Feedwater System," and SLC 16.9.7, "Standby Shutdown System."

Scenario Event Description

NRC Scenario 2

After this, one Control Bank D Control Rod will drop into the core. The operator will respond in accordance with ARP1AD-2/D-9, "RPI at Bottom Rod Drop" and will implement AP-14, "Rod Control Malfunction." Shortly afterwards, a second rod will drop requiring that the operator manually trip the reactor. The operator will enter E-0, Reactor Trip or Safety Injection."

Upon the reactor trip a small break LOCA will occur in the Pressurizer Steam Space, and Safety Injection will be actuated. Upon the actuation of Safety Injection, the 1A NI Pump will fail to auto start and must be manually started. Upon completion of E-0, the operator will transition to E-1, "Loss of Reactor or Secondary Coolant," and the Reactor Coolant Pumps (NCPs) will be required to be manually tripped upon reaching the established NCP trip criteria. On the transition, an Orange Path will exist on the Containment Critical Safety Function, and the transition will be made to 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 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

Trip the reactor within 30 seconds of the second dropped rod (4600/113/E13.19)

SS (E1C)

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

E0J

Establish flow from at least one Intermediate Head ECCS Pump before transition out of E-0.

Scenario Event Description

NRC Scenario 2

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		IC – 106 (May, 2008)	
<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>	<ul style="list-style-type: none"> • 100% Steady-State BOL • MALF NI001B, 1B NI Pump OOS • OVR-NV102A = OFF, OVR-NV102C = OFF (1NV-265 OOS) • XMT-NV004 = 0, PNV-5230 OOS • ANN-AD12-C02 = ON, AD-12/C2 Failed ON
<input type="checkbox"/>		(MALF) NI001A	1A NI Pump fails to Auto Start
<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.	
<input type="checkbox"/>	Prior to Crew Briefing	RUN	

Scenario Event Description

NRC Scenario 2

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>		Crew Briefing	
		1. Assign Crew Positions based on evaluation requirements	
		2. Review the Shift Turnover Information with the crew.	
		3. Provide SRO with copy of PT/1/A/4350/002B, "Diesel Generator Operability Test," with Enclosure 13.1, marked up for placekeeping through Step 2.52.1.4.	
		4. Provide SRO with Complex Plan associated with maintenance activities on 1NV-265B.	
		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	NLO (Wayne) respond to assist in 1B DG Shutdown.	Shutdown 1B DG
<input type="checkbox"/>	At direction of examiner	(XMT) NC099 Severity 650 Trigger 1	Thot Instrument fails high
<input type="checkbox"/>	At direction of examiner	(MALF) NV030 Set 0 (MALF) NV023A Set OPEN Trigger 3	Letdown Pressure Transmitter Failure/Letdown Relief Sticks open
<input type="checkbox"/>	At direction of examiner	(MALF) SM010 Set 0 Trigger 5	Steam Seal Pressure Regulator Failure
<input type="checkbox"/>	At direction of examiner	(OVR) CA022 Set ON Trigger 7	Inadvertent Start of the TD CA Pump
<input type="checkbox"/>	At direction of examiner	(MALF) IRE006 – M12 Trigger 9 (MALF) IRE006 – D4 Trigger 11	Sequential Dropped Rods

Scenario Event Description

NRC Scenario 2

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	(MALF) NC014A Set 100 Trigger 13 (Conditional: Rx Trip)	Pzr Steam Space LOCA NOTE: Trigger #13 set to jpplp4(1) (Rx Trip)
<input type="checkbox"/>	Terminate the scenario upon direction of Chief Examiner		

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>56</u>
Event Description:	Shutdown 1B DG								
Time	Position	Applicant's Actions or Behavior							

Shortly after taking the watch, the operator will shutdown the 1B Diesel Generator in accordance with step 2.52 of Enclosure 13.1, "1B D/G Slow Start," of PT/1/A/4350/002B, "Diesel Generator Operability Test." The operator will adjust load to 2800-3000 KW and establish a 5 minute wait period. After Event 2 or during this time, the operator will continue the shutdown on the 1B Diesel Generator (Time compression will be used to satisfy cooldown requirements) in accordance with Enclosure 13.1, "1B D/G Slow Start," of PT/1/A/4350/002B, "Diesel Generator Operability Test."

Booth Operator Instructions: **An NLO (Wayne) is standing by at the 1B DG to assist in the shutdown.**

Indications Available: NA

Time	Pos.	Expected Actions/Behavior	Comments
PT/1/A/4350/002B, DIESEL GENERATOR OPERABILITY TEST ENCLOSURE 13.1, 1B D/G SLOW START			
	BOP	(Step 2.52.2) Lower D/G load to 2800-3000 KW using "1B D/G Gov Cntrl."	
	BOP	(Step 2.52.3) Maintain power factor 0.90 – 0.92 lagging using "1B D/G Volt Adjust"	
When BOP has established a 5 minute wait period, move to Event #2. (Return after Event #2, starting with Step 2.53 below)			
	BOP	(Step 2.53) WHEN D/G has operated at 2800-3000 KW for at least 5 minutes, perform the following:	NOTE: By this time, the 1B D/G has been operating at 2800-3000 KW in excess of 5 minutes.
		<ul style="list-style-type: none"> Lower D/G load to 1800 – 2000 KW using "1B D/G Gov Cntrl" 	
		<ul style="list-style-type: none"> Maintain power factor 0.90 – 0.92 lagging using "1B D/G Volt Adjust" 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>1</u>	Page	<u>9</u>	of	<u>56</u>
Event Description:	Shutdown 1B DG								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 2.54) WHEN D/G has operated at 1800 – 2000 KW for 10 minutes, perform the following:	NOTE: After BOP adjusts load on 1B D/G to 1800-2000 KW, Floor Instructor: Report 10 minutes has elapsed (Time Compression).
		<ul style="list-style-type: none"> Lower D/G load to 800 – 1000 KW using "1 B D/G Gov Cntrl" 	
		<ul style="list-style-type: none"> Maintain power factor 0.90 – 0.92 lagging using "1B D/G Volt Adjust" 	
	BOP	(Step 2.55) WHEN D/G has operated at 800 – 1000 KW for 10 minutes, perform the following:	NOTE: After BOP adjusts load on 1B D/G to 800-1000 KW, Floor Instructor: Report 10 minutes has elapsed (Time Compression).
		<ul style="list-style-type: none"> Check "1ETB Normal Breaker" or "1 ETB Stdby Breaker" closed. 	
		<ul style="list-style-type: none"> Lower D/G load to less than 200 KW using "1B D/G Gov Cntrl". 	
		<ul style="list-style-type: none"> Open "1ETB Emerg Breaker". 	
	BOP	(Step 2.56) IF performing a routine monthly 1B D/G Operability Test during the RN Fouling Season (August, September, October), contact Engineering to determine if a Super Flush required.	NOTE: Not in RN Fouling Season. If contacted, Booth Instructor: Report No Super Flush required.
	BOP	(Step 2.58) Allow D/G to idle unloaded for 15 minutes.	NOTE: The remainder of the 1B D/G shutdown will be performed locally by the NLO (Wayne).
At the discretion of the Lead Examiner move to Event #3.			

Op Test No.: N08-1 Scenario # 2 Event # 2 Page 10 of 56

Event Description: **Thot Instrument fails high**

Time	Position	Applicant's Actions or Behavior
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During this five minute wait period (Event 1), the Loop B Thot (TNC-8170) will fail high causing a TavG-Tef mismatch and controls rods to insert. The operator will respond in accordance with ARP1AD-6/A-10, "Auct Hi T-AVG, B-10, "T-REF/T-AUCT Abnormal," and D-10, "Loop T-AVG Deviation." The operator will implement AP-14, "Rod Control Malfunction," and defeat the failed channel. The operator will address Technical Specifications 3.3.1, "RTS Instrumentation," and 3.3.2, "ESFAS Instrumentation."

Booth Operator Instructions: Operate Trigger #1 (XMT-NC099 (650))

Indications Available:

- 1AD-6/A10, "Auct Hi T-avg"
- 1AD-6/B10, "T-ref/T-auct Abnormal"
- 1AD-6/D10, "Loop T-avg Deviation"
- 1AD-6/E10, "Loop D/T Deviation"
- 1AD-6/F7, "OTDT Protection Alert"
- 1AD-6/F8, "OPDT Protection Alert"
- Rods move in Auto

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010G, ANNUNCIATOR RESPONSE FOR PANEL 1AD-6 A10, AUCT HI TAVG			
	SRO	(IA Step 1) IF channel in test, no further action required.	NOTE: Crew may NOT address ARP, but enter AP14 directly.
	SRO	(IA Step 2) IF Control Rod malfunction, go to AP/1A/5500/014 (Rod Control Malfunction)	
	RO	(IA Step 3) IF at power, place "CRD Bank Selector" in "MAN"	
	RO	(IA Step 4) IF load rejection, go to AP/1/A/5500/003 (Load Rejection).	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>11</u>	of	<u>56</u>
Event Description:	Thot Instrument fails high								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(SA Step 1) IF instrument failure, refer to Tech Specs for minimum instrumentation requirements.	
	SRO	(SA Step 2) IF in Mode 1 or 2, notify SWM to ensure transient monitor freeze triggered. {PIP M-98-4253}	
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
			NOTE: Crew will carry out Immediate Actions of AP14, prior to the SRO addressing the AP.
	RO	(Step 1) IF more than one rod dropped, THEN:	
		<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). 	
	RO	(Step 2) Place control rods in manual.	NOTE: RO has previously placed 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:	
		<ul style="list-style-type: none"> • “1A NC LOOP T-AVG” 	
		<ul style="list-style-type: none"> • “1B NC LOOP T-AVG” 	NOTE: Loop 1B Tavg has failed.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>12</u>	of	<u>56</u>
Event Description:		Thot Instrument fails high							
Time	Position	Applicant's Actions or Behavior							

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” 	
		<ul style="list-style-type: none"> T-Ref indication. 	
	RO/ BOP	(Step 6 RNO) IF “NC LOOP T-AVE channel failed, THEN:	
		<ul style="list-style-type: none"> Place “D/T DEFEAT” switch to failed loop. 	
		<ul style="list-style-type: none"> Place “T-AVE DEFEAT” switch to failed loop. 	
		<ul style="list-style-type: none"> Monitor CF pump speed control response. 	
		<ul style="list-style-type: none"> Monitor S/G NR levels. 	
		<ul style="list-style-type: none"> IF AT ANY TIME CF pumps speed control fails to respond properly, THEN take manual control of CF pump(s) as necessary to stabilize. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	GO TO Enclosure 4 (Response To Continuous Rod Movement).	NOTE: BOP may need to take manual control of 1NV-238 and manually adjust Charging Flow.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION ENCLOSURE 4, 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.
	RO	(Step 2) Evaluate the following prior to any control rod withdrawal:	
		<ul style="list-style-type: none"> Ensure no inadvertent mode change will occur. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>2</u>	Page	<u>13</u>	of	<u>56</u>
Event Description:		Thot Instrument fails high							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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/ BOP	(Step 4) check the following channels – NORMAL:	
		<ul style="list-style-type: none"> “1A NC LOOP T-AVG” 	
		<ul style="list-style-type: none"> “1B NC LOOP T-AVG” 	NOTE: Loop 1B Tavg has failed.
		<ul style="list-style-type: none"> “1C NC LOOP T-AVG” 	
		<ul style="list-style-type: none"> “1D NC LOOP T-AVG” 	
	RO/ BOP	(Step 4 RNO) Perform the following:	
		<ul style="list-style-type: none"> Perform any of the following as necessary to maintain T-Ave at T-Ref: 	<p>NOTE: Rods may have stepped in as many as 10 steps.</p> <p>RO will withdraw rods to original position, and may take 5-10 minutes to restore rods to original position.</p>
		<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. 	
	RO	<ul style="list-style-type: none"> WHEN T-Ave at T-Ref $\pm 1^\circ\text{F}$, AND auto rod control is desired, THEN return rod control to auto. 	NOTE: RO will place Rods in AUTO upon restoring rods to their original position.

Op Test No.: N08-1 Scenario # 2 Event # 2 Page 14 of 56Event Description: **Thot Instrument 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"> Ensure P-12 interlock is in required state for existing unit conditions (Tech Spec 3.3.2.8.c). 	
	SRO	<ul style="list-style-type: none"> Instruct IAE to trip bistables associated with failed loop within 6 hours of failure PER IP/0/A/3090/014 (Tripping Inoperable Protection Channels): 	<p>NOTE: SRO may call WCC/IAE to address.</p> <p>If so, Booth Instructor acknowledge as WCC/IAE as appropriate.</p>
		<ul style="list-style-type: none"> OPDT (Tech Spec 3.3.1.7) 	
		<ul style="list-style-type: none"> OTDT (Tech Spec 3.3.1.6) 	
		<ul style="list-style-type: none"> Low T-Ave (Tech Spec 3.3.2.5.d). 	
	SRO	<ul style="list-style-type: none"> WHEN problem is repaired, THEN perform the following: 	
		<ul style="list-style-type: none"> Instruct IAE to place the following bistables for failed loop back in service: 	
		<ul style="list-style-type: none"> Place the following switches to "OFF". 	
		<ul style="list-style-type: none"> Exit this procedure. 	<p>NOTE: SRO will likely conduct a Focus Brief.</p>
			<p>NOTE: Crew may need prompt to return to 1B D/G Shutdown.</p> <p>If so, Booth Instructor as NLO (Wayne) ask SRO/BOP about 1B D/G Shutdown.</p>
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION			
	SRO	3.3.1 Reactor Trip System (RTS) Instrumentation	<p>Examiner NOTE: Addressing TS takes 8-10 minutes. May want to address after scenario, or may occur with BOP continues with shutdown of 1B D/G.</p>

Op Test No.: N08-1 Scenario # 2 Event # 2 Page 15 of 56
 Event Description: **Thot Instrument fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	LCO 3.3.1			
		The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.			
	SRO	APPLICABILITY:			
		According to Table 3.3.1-1.6 – Over temperature ΔT 7 – Overpower ΔT.			
	SRO	Actions			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		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	
		E. One channel inoperable.	E.1 Place channel in trip. OR E.2 Be in MODE 3.	6 hours	
TECHNICAL SPECIFICATION 3.3.1, ESFAS INSTRUMENTATION					
	SRO	3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation			
	SRO	LCO 3.3.2			
		The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.			
	SRO	APPLICABILITY:			

Op Test No.: N08-1 Scenario # 2 Event # 2 Page 16 of 56

Event Description: **Thot Instrument fails high**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments																		
		According to Table 3.3.2-1 5.b.4 Feedwater Isolation/Tavg low; 8.c ESFAS Interlocks/Tavg low-low P-12.																			
	SRO	Actions																			
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">CONDITION</th> <th style="width: 30%;">REQUIRED ACTION</th> <th style="width: 40%;">COMPLETION TIME</th> </tr> </thead> <tbody> <tr> <td>A. One or more Functions with one or more required channels or trains inoperable.</td> <td>A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).</td> <td>Immediately</td> </tr> <tr> <td rowspan="2">J. One channel inoperable.</td> <td>J.1 Place channel in trip.</td> <td>6 hours</td> </tr> <tr> <td>OR J.2 Be in MODE 3.</td> <td>12 hours</td> </tr> <tr> <td rowspan="3">Q. One channel inoperable.</td> <td>Q.1 Verify interlock is in required state for existing unit condition</td> <td>1 hour</td> </tr> <tr> <td>OR Q.2.1 Be in MODE 3.</td> <td>7 hours</td> </tr> <tr> <td>AND Q.2.2 Be in MODE 4.</td> <td>13 hours</td> </tr> </tbody> </table>	CONDITION	REQUIRED ACTION	COMPLETION TIME	A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately	J. One channel inoperable.	J.1 Place channel in trip.	6 hours	OR J.2 Be in MODE 3.	12 hours	Q. One channel inoperable.	Q.1 Verify interlock is in required state for existing unit condition	1 hour	OR Q.2.1 Be in MODE 3.	7 hours	AND Q.2.2 Be in MODE 4.	13 hours	
CONDITION	REQUIRED ACTION	COMPLETION TIME																			
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately																			
J. One channel inoperable.	J.1 Place channel in trip.	6 hours																			
	OR J.2 Be in MODE 3.	12 hours																			
Q. One channel inoperable.	Q.1 Verify interlock is in required state for existing unit condition	1 hour																			
	OR Q.2.1 Be in MODE 3.	7 hours																			
	AND Q.2.2 Be in MODE 4.	13 hours																			

At the discretion of the Lead Examiner, Return to Event #1 to complete the remaining portions on Page 8.

Op Test No.: N08-1 Scenario # 2 Event # 3 Page 17 of 56 Event Description: **Letdown Pressure Transmitter Failure/Letdown Relief Sticks Open**

Time	Position	Applicant's Actions or Behavior
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Subsequently, the Letdown line Pressure Transmitter will fail low causing NV-124 to close in an attempt to maintain setpoint pressure. With letdown flow closed off, actual Letdown line pressure will increase lifting the Letdown Line Relief Valve NV-6. Upon initial lift of this valve, NV-6 will fail in the open position. The operator will respond in accordance with ARP1AD-7/I-4, "Letdn Relief Hi Temp," and then implement AP-12, "Loss of Letdown, Charging or Seal Injection," due to the loss of Letdown flow. The operator will isolate normal Letdown and establish Excess Letdown.

Booth Operator Instructions: Operate Trigger #3 (MALF-NV030(0)/NV023A (OPEN))

Indications Available:

- 1AD-7/I4, "Letdn Relief Hi Temp."
- Letdown Pressure lowers to bottom of scale
- Letdown flow lowers
- If prolonged PRT Level/Temperature rise

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010H, ANNUNCIATOR RESPONSE FOR PANEL 1AD-7 I4, LETDN RELIEF HI TEMP			
	RO	(IA Step 1) Monitor letdown pressure and correct if necessary.	NOTE: Crew may NOT address ARP, but enter AP12 directly.
	RO	(SA Step 1) Monitor VCT and PRT.	NOTE: The crew will manually isolate Letdown due to the leak and enter AP12. If the crew enters AP10 instead, the leak will be isolated when Letdown is isolated and excess Letdown will need to be established in accordance with AP12 for inventory control.
AP/1/A/5500/12, LOSS OF LETDOWN, CHARGING OR SEAL INJECTION			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>3</u>	Page	<u>18</u>	of	<u>56</u>
Event Description:		Letdown Pressure Transmitter Failure/Letdown Relief Sticks Open							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 1) IF a loss of charging through the Regenerative HX has occurred, THEN 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"> 1 NV-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 2) Check Pzr level – LESS THAN 96%.	
	BOP	(Step 3) IF AT ANT TIME “REGEN HX LETDN HI TEMP” alarms (1AD-7, 1-2), THEN close the following valves:	
		<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). 	
	SRO	(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.	
	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-475A (45 GPM L/D Orifice Outlet Cont Isol) 	

Op Test No.: N08-1 Scenario # 2 Event # 3 Page 19 of 56Event Description: **Letdown Pressure Transmitter Failure/Letdown Relief Sticks Open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NV-35A (Variable L/D Orifice Outlet Cont Isol). 	
	BOP	(Step 37) "NC SYS M/U CONTROLLER" in "AUTO".	
	BOP	(Step 38) Ensure charging flow going down to maintain Pzr at program level.	
	BOP	(Step 39) Check "LETDN RELIEF HI TEMP" alarm (1AD-7, 1-4) – 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) 	

Op Test No.: N08-1 Scenario # 2 Event # 3 Page 20 of 56Event Description: **Letdown Pressure Transmitter Failure/Letdown Relief Sticks Open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NV-2A (NC L/D Isol To Regen Hx). 	
	SRO	(Step 42 RNO) IF normal letdown known to be unavailable, THEN GO TO Step 49.	NOTE: Normal Letdown is unavailable because it was isolated to stop the Leak.
	BOP	(Step 49) Establish excess letdown:	
		<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. 	
		<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. 	
		<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). 	
		<ul style="list-style-type: none"> Ensure 1NV-27B (Excess L/D Hx Otlt 3-Way Cntrl) selected to "VCT" position. 	
		<ul style="list-style-type: none"> Open 1NV-26 (Excess L/D Hx Outlet Cntrl). 	
		<ul style="list-style-type: none"> Wait 2 minutes. 	
		<ul style="list-style-type: none"> Close 1NV-26 (Excess L/D Hx Outlet Cntrl). 	
		<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). 	
		<ul style="list-style-type: none"> Open 1NV-24B (C NC Loop To Exs L/D Hx Isol). 	

Op Test No.: N08-1 Scenario # 2 Event # 3 Page 21 of 56Event Description: **Letdown Pressure Transmitter Failure/Letdown Relief Sticks Open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Open 1NV-25B (C NC Loop To Exs L/D Hx Isol). 	
		<ul style="list-style-type: none"> Check the following: 	
	RO	<ul style="list-style-type: none"> Reactor – CRITICAL 	
	BOP	<ul style="list-style-type: none"> 1NV-27B – ALIGNED TO VCT 	
		<ul style="list-style-type: none"> Closely monitor reactor response once excess letdown is in service. 	
		<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	<ul style="list-style-type: none"> GO TO Step 49.r. 	
		<ul style="list-style-type: none"> Notify Primary Chemistry that excess letdown is in service. 	NOTE: SRO 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. 	
		<ul style="list-style-type: none"> Operate Pzr heaters as desired. 	
	SRO	<ul style="list-style-type: none"> WHEN time allows, THEN notify engineering to document the following transients: 	NOTE: SRO may call WCC to address. If so, Booth Instructor acknowledge as WCC.
		<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 spray nozzle transient. 	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”. 	

Op Test No.: N08-1 Scenario # 2 Event # 3 Page 22 of 56Event Description: **Letdown Pressure Transmitter Failure/Letdown Relief Sticks Open**

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 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. The SRO will make both board operators aware.
		<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	<ul style="list-style-type: none"> WHEN normal letdown available, THEN establish normal letdown PER Steps 42 through 48. 	
	SRO / BOP	<ul style="list-style-type: none"> WHEN desired to isolate excess letdown, THEN perform the following: 	
		<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). 	
		<ul style="list-style-type: none"> Close 1KC-315B (Excess L/D Hx Ret Hdr Cont Otsd Isol). 	
	SRO	<ul style="list-style-type: none"> RETURN TO procedure and step in effect. 	NOTE: SRO may call WCC to address. If so, Booth Instructor acknowledge as WCC.
			NOTE: SRO may address AP10 to deal with Relief Valve Leak into PRT.
At the discretion of the Lead Examiner move to Event #4.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>4</u>	Page	<u>23</u>	of	<u>56</u>
Event Description: Steam Seal Pressure Regulator Failure									
Time	Position	Applicant's Actions or Behavior							

Following this, the Steam Seal Header Pressure Control Valve, 1TL-6, will fail closed. The operator will respond to OAC alarm M1A0689, "U1 Gland Steam Seal Header Pressure," and restore Main Turbine and CFPT Sealing Steam Pressure before a low Main Condenser Vacuum condition develops.

Booth Operator Instructions: Operate Trigger #5 (MALF- SM010 (0))

Indications Available:

- OAC Alarm M1A0689, "U1 Gland Steam Seal Header Pressure."
- OAC Alarm M1A0801, "1A & 1B CFPT Sealing Steam Pressure."
- If prolonged, Main Condenser vacuum starts to lower.

Time	Pos.	Expected Actions/Behavior	Comments
M1A0689, U1 GLAND STEAM SEAL HEADER PRESSURE			
	RO	(Step 1) throttle open 1TL-8 (HP STEAM SEAL BYPASS VALVE) to maintain "STM SEAL HEADER PRESS" between 90 to 120 psig.	NOTE: RO will throttle open 1TL-8.
	SRO	(Step 2) Notify Maintenance to troubleshoot 1TL-6 (STEAM SEAL HDR PRESSURE CONTROL VALVE).	NOTE: SRO may call WCC to address. If so, Booth Instructor acknowledge as WCC.
	RO	(Step 3) If "STM SEAL HEADER PRESS" cannot be maintained at least 90 psig, dispatch an operator to look for steam leaks and verify valve alignment per OP/1/B/6300/005 (Steam Seal System).	NOTE: SRO may dispatch NLO to locally investigate. If so, Booth Instructor acknowledge as NLO, and report parameters as expected.
M1A0801, 1A & 1B CFPT SEALING STEAM PRESSURE			

Op Test No.: N08-1 Scenario # 2 Event # 4 Page 24 of 56Event Description: **Steam Seal Pressure Regulator Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO / NLO	(Step 1) Ensure valve 1TF-2 (CF PUMP TURB STEAM SEAL CTRL) working properly to maintain steam seal pressure between 1 to 4 psig.	NOTE: If the RO corrects the Gland Steam Seal Header Pressure by throttling 1TL-8, the Steam Seal concern with the CFPTs will be corrected as well.
	RO / NLO	If necessary, open 1TF-4 (CF PUMP TURB STEAM SEAL CTRL BYP) to maintain steam seal pressure between 1 to 4 psig.	
At the discretion of the Lead Examiner move to Event #5.			

ACT FUNC KEY OR TURN-ON CODE: ALMRESP >

1.47 A | 1.47 B | SPDS

MDA0689	UI GLAND STEAM SEAL HEADER PRESSURE	105	PSIG	GOOD
MODE	LO-LO	LO	HI	HI-HI
MODE 1	N/A	75	125	N/A

PAGE 1 of 2

AUTOMATIC ACTIONS

NONE

RESPONSE

- HI - 1. IF 1TL-8 (HP STEAM SEAL BYPASS VALVE) IS OPEN, THROTTLE 1TL-8 (HP STEAM SEAL BYPASS VALVE) CLOSED TO MAINTAIN "STM SEAL HEADER PRESS" BETWEEN 90 TO 120 PSIG.
- 2. IF 1TL-8 (HP STEAM SEAL BYPASS VALVE) IS CLOSED:
 - A. SIMULTANEOUSLY CLOSE 1TL-5 (HP STEAM SEAL SHUTOFF VALVE) AND OPEN 1TL-8 (HP STEAM SEAL BYPASS VALVE).
 - B. THROTTLE 1TL-8 (HP STEAM SEAL BYPASS VALVE) TO MAINTAIN "STM SEAL HEADER PRESS" BETWEEN 90 TO 120 PSIG.
 - C. NOTIFY MAINTENANCE TO TROUBLESHOOT 1TL-5 (STEAM SEAL HDR PRESSURE CONTROL VALVE).

LO - CONTINUED NEXT PAGE

MLAD689	UL GLAND STEAM SEAL HEADER PRESSURE	104	PSIG	GOOD
MODE	LO-LO	LO	HI	HI-HI
MODE-1	N/A	75	125	N/A

- 1. THROTTLE OPEN ITL-8 (HP STEAM SEAL BYPASS VALVE) TO MAINTAIN "STM SEAL HEADER PRESS" BETWEEN 90 TO 120 PSIG.
- 2. NOTIFY MAINTENANCE TO TROUBLESHOOT ITL-6 (STEAM SEAL HDR PRESSURE CONTROL VALVE).
- 3. IF "STM SEAL HEADER PRESS" CANNOT BE MAINTAINED AT LEAST 90 PSIG, DISPATCH AN OPERATOR TO LOOK FOR STEAM LEAKS AND VERIFY VALVE ALIGNMENT PER OP/1/B/6300/005 (STEAM SEAL SYSTEM).

SETPOINT BASIS

ENGINEERING JUDGEMENT BASED ON WESTINGHOUSE I.L. 1250-4333.

DESCRIPTION

NONE

REFERENCES

OP/1/B/6300/005, I.L. 1250-4333

CT FLNC. KEY OR TURN-ON CODE ALMRESP > 1.47 A 1.47 B SPDS

M1A0801	1A & 1B CFPT SEALNG STEAM PRESS	3.0	PSIG	GOOD
MODE	LO-LO	LO	HI	HI-HI
MODE 1	N/A	0.5	5.0	N/A

PAGE 1 OF 1

AUTOMATIC ACTIONS

NONE

RESPONSE

- ENSURE VALVE 1TF-2 (CF PUMP TURB STEAM SEAL CTRL) WORKING PROPERLY TO MAINTAIN STEAM SEAL PRESSURE BETWEEN 1 TO 4 PSIG.
- IF NECESSARY, OPEN 1TF-4 (CF PUMP TURB STEAM SEAL CTRL BYP) TO MAINTAIN STEAM SEAL PRESSURE BETWEEN 1 TO 4 PSIG.

SETPOINT BASIS

ENGINEERING JUDGEMENT BASED ON WESTINGHOUSE INSTRUCTION BOOK MCM 1200.01-0152, WESTINGHOUSE I.L. 1250-4333 AND WESTINGHOUSE DRAWING 4527-D-89-2

DESCRIPTION

STEAM SEAL CONTROL AND BYPASS VALVES ARE LOCATED IN THE OVERHEAD OF UNIT 1 TURBINE BUILDING ELEVATION 760 FT. ON THE WEST SIDE OF COLUMN 1L-24 ABOVE THE CABLE TRAYS.

REFERENCES

MCM 1200.01-0152, WESTINGHOUSE I.L. 1250-4333, MC-1223.58-01, DWG. 4527-D-89-2

Op Test No.: N08-1 Scenario # 2 Event # 5 Page 25 of 56Event Description: **Inadvertent Start of the TD CA Pump**

Time	Position	Applicant's Actions or Behavior
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Shortly afterwards, the TDCA Pump will inadvertently start due to an OTG error while working inside the TDCA Panel. The operator will respond to OAC alarm M1P1385, "U1 Reactor Thermal Power, Best," and ARP1AD-5/F-2, "TD CA Pump Lo Suct Flow." The operator will respond in accordance with the Control Room Expectations Manual for the condition in which CA operation occurs above 10% power. The stated expectation is that CA flow should be throttled/isolated as soon as practical. The operator will address Technical Specification 3.7.5, "Auxiliary Feedwater System," and SLC 16.9.7, "Standby Shutdown System."

Booth Operator Instructions: Operate Trigger #7 (OVR- CA022 (ON))

Indications Available:

- OAC Alarm M1P1385, "U1 Reactor Thermal Power, Best."
- 1AD-5/F2, "TD CA Pump Lo Suct Flow."
- CA Flow indicated to all four Steam Generators
- Valve position indicators for 1SA-48ABC and 1SA-49AB have red status lights lit.
- TD CA Pump at 3800 RPM.

Time	Pos.	Expected Actions/Behavior	Comments
M1P1385, REACTOR THERMAL POWER, BEST			
	RO	(Step 1) HI HI IF "FAILED" or "BAD QUALITY" status, refer to PT/1/A/4600/021 A (LOSS OF OPERATOR AID COMPUTER WHILE IN MODE 1).	NOTE: Crew may or may NOT refer to alarm response. Regardless, Thermal Power will need to be reduced.
	RO	(Step 2) Ensure reactor power is reduced to less than or equal to 100% (3411 MWT).	
			Simulator Instructor: 2 minutes after Pump start call Control Room as IAE and report that you inadvertently started the TD CA Pump while working inside the TD CA Control Panel.
	RO	(Step 3) Check the following have not been exceeded:	
		<ul style="list-style-type: none"> • M1P2372 (U1 THERMAL POWER 15 MINUTE RUNNING AVERAGE) 	

Op Test No.: N08-1 Scenario # 2 Event # 5 Page 26 of 56Event Description: **Inadvertent Start of the TD CA Pump**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> M1P0856 (U1 AVG RATED THERMAL POWER, HOURLY) 	
		<ul style="list-style-type: none"> M1P0779 (U1 THERMAL POWER OUTPUT, 4 HOUR AVG) 	
		<ul style="list-style-type: none"> M1P0965 (U1 THERMAL POWER 12 HOUR RUNNING AVERAGE) 	
	SRO	(Step 4) Refer to TS 3.4.1.	
	SRO	(Step 5) Refer to SOMP 01-02 (REACTIVITY MANAGEMENT).	
	RO	(Step 6) Perform the following for swings of unknown origin.	
		<ul style="list-style-type: none"> Type "TABLOG" in OAC input window. 	
		<ul style="list-style-type: none"> Depress "F3" to access dialog box "ENTER LOG NAME FOR ACTIVATION". 	
		<ul style="list-style-type: none"> Type "TPBE" in dialog box. 	
		<ul style="list-style-type: none"> Click "OK". 	
		<ul style="list-style-type: none"> Check "TPBE ACTIVATED" in status column. 	
		<ul style="list-style-type: none"> Contact Reactor Duty Engineer with the time "TPBE" was activated. 	
	SRO	(Step 7) Initiate a PIP for reactor power exceeding 101.5%.	NOTE: The SRO will probably call Security to implement Comp Measures for the inoperability of the SSF (10 minute Action required by SLC 16.9.7).

ACT FUNC. KEYWORD TURN-ON CODE ALMRESP >

1.47 A

1.47 B

SPDS

MIP1385	UI REACTOR THERMAL POWER, BEST	99.77564	%	GOOD
MODE	LO-LO	LO	HI	HI-HI
MODE 1	N/A	N/A	101.25000	101.50000

PAGE

1 of 4

AUTOMATIC ACTIONS

NONE

RESPONSE

- 1. IF "FAILED" OR "BAD QUALITY" STATUS, REFER TO PT/1/A/4600/021 A (LOSS OF OPERATOR AID COMPUTER WHILE IN MODE 1).
- 2. ENSURE REACTOR POWER IS REDUCED TO LESS THAN OR EQUAL TO 100% (3411 MWt)
- 3. CHECK THE FOLLOWING HAVE NOT BEEN EXCEEDED:
 - MIP2372 (UI THERMAL POWER 15 MINUTE RUNNING AVERAGE)
 - MIP0856 (UI AVG RATED THERMAL POWER, HOURLY)
 - MIP0779 (UI THERMAL POWER OUTPUT, 4 HOUR AVG)
 - MIP0965 (UI THERMAL POWER 12 HOUR RUNNING AVERAGE)
- 4. REFER TO TS 3.4.1.
- 5. REFER TO SOMP 01-02 (REACTIVITY MANAGEMENT).

CONTINUED

PREV

CANC

F1= CLEAR

F2=

F3=

F4=

F5=

F6=

ACT/FUNC KEY OR TURN-ON CODE ALMRESP >

1.47 A 1.47 B SPDS

MIPI385	UI REACTOR THERMAL POWER, BEST	99.77564	%	GOOD
MODE	LO-LO	LO	HI	HI-HI
MODE 1	N/A	N/A	101.25000	101.50000
				PAGE 2 of 4

6. PERFORM THE FOLLOWING FOR SWINGS OF UNKNOWN ORIGIN.
 - A. TYPE "TABLOG" IN DAC INPUT WINDOW.
 - B. DEPRESS "F3" TO ACCESS DIALOG BOX "ENTER LOG NAME FOR ACTIVATION".
 - C. TYPE "TPBE" IN DIALOG BOX.
 - D. CLICK "OK".
 - E. CHECK "TPBE ACTIVATED" IN STATUS COLUMN.
 - F. CONTACT REACTOR DUTY ENGINEER WITH THE TIME "TPBE" WAS ACTIVATED.
7. INITIATE A PIP FOR REACTOR POWER EXCEEDING 101.5%

CONTINUED

GET FUNC KEY OR TURN-ON CODE ALMRESP >

MIP1385	UI REACTOR THERMAL POWER, BEST		99.93433	%	GOOD
MODE	LO-LO	LO	HI	HI-HI	
MODE 1	N/A	N/A	101.25000	101.50000	PAGE

- HI - 1. IF "FAILED" OR "BAD QUALITY" STATUS, REFER TO PT/L/A/4600/02L A (LOSS OF OPERATOR AID COMPUTER WHILE IN MODE 1).
2. EVALUATE IF REACTOR POWER SHOULD BE REDUCED.
3. CHECK THE FOLLOWING HAVE NOT BEEN EXCEEDED:
- MIP2372 (UI THERMAL POWER 15 MINUTE RUNNING AVERAGE)
 - MIP0856 (UI AVG RATED THERMAL POWER, HOURLY)
 - MIP0779 (UI THERMAL POWER OUTPUT, 4 HOUR AVG)
 - MIP0965 (UI THERMAL POWER 12 HOUR RUNNING AVERAGE)
4. REFER TO JS 3.4.1.
5. REFER TO SOMP 01-02 (REACTIVITY MANAGEMENT).

CONTINUED

MIP1385	U1 REACTOR THERMAL POWER, BEST	99.93433	GOOD
MODE	LO-LO LO HI HI-HI		
MODE 1	N/A N/A	101.25000 101.50000	PAGE

6. PERFORM THE FOLLOWING FOR SWINGS OF UNKNOWN ORIGIN.
 - A. TYPE "TABLOG" IN OAC INPUT WINDOW.
 - B. DEPRESS "F3" TO ACCESS DIALOG BOX "ENTER LOG NAME FOR ACTIVATION".
 - C. TYPE "TPBE" IN DIALOG BOX.
 - D. CLICK "OK".
 - E. CHECK "TPBE ACTIVATED" IN STATUS COLUMN.
 - F. CONTACT REACTOR DUTY ENGINEER WITH THE TIME "TPBE" WAS ACTIVATED.

SETPOINT BASIS

PREVENT REACTOR POWER FROM EXCEEDING 102%.

DESCRIPTION

CALCULATED TOTAL THERMAL REACTOR POWER.

REFERENCES

TS 3.4.1, SOMP 01-02, MCM 10553, PIP-MI-5308, MD-100474

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>5</u>	Page	<u>27</u>	of	<u>56</u>
Event Description:	Inadvertent Start of the TD CA Pump								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010F, ANNUNCIATOR RESPONSE FOR PANEL 1AD-5 F2, TD CA PUMP LO SUCT FLOW			
	BOP	(Step IA) IF recirculation control does NOT establish minimum flow of 360 – 720 gpm suction flow:	
		<ul style="list-style-type: none"> • Ensure open: 	
		<ul style="list-style-type: none"> • 1CA-231 (#1 TD CA Pump Mini Flow 2 nd Isol) 	
		<ul style="list-style-type: none"> • 1CA-255 (#1 TD CA Pump Mini Flow 1 st Isol) 	
CONTROL ROOM EXPECTATIONS MANUAL			
	SRO	CA Operation above 10% power.	
	SRO	CA flow should be throttled/isolated as soon as practical. This will make the effected CA pumps inoperable due to the control valve not being fully open above 10% as required by the CA SR.	
	SRO	Feeding SGs with CA pumps results in feeding slightly oxygenated water from the CASTs. This could result in exceeding Action Level 2 limits for SG oxygen.	
	BOP	Close the following valves:	NOTE: The SRO will direct that the Flow Control Valves from the TD CA Pump be closed, which will render the TD CA Pump inoperable.
		<ul style="list-style-type: none"> • 1CA-64 (TD CA Pump to S/G A) 	
		<ul style="list-style-type: none"> • 1CA-52 (TD CA Pump to S/G B) 	
		<ul style="list-style-type: none"> • 1CA-48 (TD CA Pump to S/G C) 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>5</u>	Page	<u>28</u>	of	<u>56</u>
Event Description: Inadvertent Start of the TD CA Pump									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior			Comments
		<ul style="list-style-type: none"> 1CA-36 (TD CA Pump to S/G D) 			
TECHNICAL SPECIFICATION 3.7.5, AUXILIARY FEEDWATER SYSTEM					
	SRO	LCO 3.7.5 Three AFW trains shall be OPERABLE.			Examiner NOTE: Addressing TS takes 8-10 minutes. May want to address after scenario.
	SRO	APPLICABILITY:			
		MODES 1, 2, and 3, MODE 4 when steam generator is relied upon for heat removal.			
	SRO	ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		B. One AFW train inoperable in MODE 1, 2 or 3 for reasons other than Condition A.	B.1 Restore AFW train to OPERABLE status.	72 hours AND 10 days from discovery of failure to meet the LCO	
SELECTED LICENSEE COMMITMENT 16.9.7, STANDBY SHUTDOWN SYSTEM					
	SRO	COMMITMENT			
		The Standby shutdown System (SSS) shall be operable.			
	SRO	APPLICABILITY			
		MDOES 1, 2, and 3.			
	SRO	REMEDIAL ACTIONS			

Op Test No.: N08-1 Scenario # 2 Event # 5 Page 29 of 56Event Description: **Inadvertent Start of the TD CA Pump**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		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.			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. One or more required SSS components identified in Table 16.9.7-1 inoperable.	A.1 Verify the OPERABILITY of fire detection and suppression systems in the associated areas identified in Table 16.9.7-1. AND A.2 Restore the component to OPERABLE status.	1 hour 7 days	
At the discretion of the Lead Examiner move to Event #6.					

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>6</u>	Page	<u>30</u>	of	<u>56</u>
Event Description: Sequential Dropped Rods									
Time	Position	Applicant's Actions or Behavior							

After this, one Control Bank D Control Rod will drop into the core. The operator will respond in accordance with ARP1AD-2/D-9, "RPI at Bottom Rod Drop" and will implement AP-14, "Rod Control Malfunction." Shortly afterwards, a second rod will drop requiring that the operator manually trip the reactor. The operator will enter E-0, Reactor Trip or Safety Injection."

Booth Operator Instructions: Operate Trigger #9 (MALF- IRE006 – M12)

Indications Available:

- 1AD-2/D9, "RPI At Bottom Rod Drop."
- 1AD-2/A10, "Rod Control Urgent Failure."
- 1AD-2/D10, "RPI Urgent Failure."
- 1AD-2/B1, "P/R Lower Det Hi Flux Dev or Auto Defeat."
- 1AD-2/B2, "P/R Upper Det Hi Flux Dev or Auto Defeat."
- 1AD-2/B3, "P/R Channel Deviation."
- 1AD-2/A8, "OTDT Runback/Rod Stop Alert."
- 1AD-2/B8, "OPDT Runback/Rod Stop Alert."
- NC Temperature drops ($T_{avg} < T_{ref}$)

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010C, ANNUNCIATOR RESPONSE FOR PANEL 1AD-2 D9, RPI At BOTTOM ROD DROP			
	SRO	(IA Step 1) Go to AP/1/A/5500/014 (Rod Control Malfunction).	NOTE: Crew may NOT address ARP, but enter AP14 directly.
	SRO	(SA Step 1) IF desired to have Engineering evaluation as to cause for alarm, freeze the Transient Monitor.	
	SRO	(SA Step 2) Refer to Tech Specs.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>6</u>	Page	<u>31</u>	of	<u>56</u>
Event Description: Sequential Dropped Rods									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
			NOTE: Crew will carry out Immediate Actions of AP14, prior to the SRO addressing the AP.
	RO	(Step 1) IF more than one rod dropped, THEN:	NOTE: Only ONE Rod has dropped.
		<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). 	
	RO	(Step 2) Place control rods in manual.	NOTE: RO has previously placed 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 T-Ave has gone down, THEN lower Turbine load as necessary to restore T-Ave to T-Ref. 	NOTE: Tave has decreased, and RO will drop Turbine Load.
		<ul style="list-style-type: none"> • IF two or more rods are misaligned greater than 24 steps, THEN: 	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"> • IF any rod is dropped AND another rod is misaligned, THEN: 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> • Trip reactor. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>6</u>	Page	<u>32</u>	of	<u>56</u>
Event Description:	Sequential Dropped Rods								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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 one rod dropped, THEN GO TO Enclosure 1 (Response To A Dropped Rod). 	NOTE: The SRO will address Enclosure 1.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION ENCLOSURE 1, RESPONSE TO A DROPPED 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 correct cause of dropped rod.	NOTE: SRO may call WCC/IAE to address. If so, Booth Instructor acknowledge as WCC/IAE as appropriate.
	SRO	(Step 3) Check "ROD CONTROL URGENT FAILURE" alarm (1AD-2, A-10) – DARK.	
	RO	(Step 3 RNO) Perform the following:	
		<ul style="list-style-type: none"> Do not move control rods while the "ROD CONTROL URGENT FAILURE" alarm is lit, unless instructed by IAE. 	
		<ul style="list-style-type: none"> IF AT ANY TIME IAE desires to reset 'ROD CONTROL URGENT FAILURE' alarm, THEN depress the 'ROD CONTROL ALARM RESET' pushbutton. 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
	SRO	<ul style="list-style-type: none"> IF AT ANY TIME while in this procedure a runback occurs AND no rods will move, 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>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>6</u>	Page	<u>33</u>	of	<u>56</u>
Event Description:	Sequential Dropped Rods								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 4) Use OAC point MP1385 (Reactor Thermal Power, Best Estimate), to determine reactor power in subsequent steps.	
	SRO/ RO	(Step 5) Check AFD (Tech Spec 3.2.3) – WITHIN TECH SPEC LIMITS.	
	SRO	(Step 6) Check QPTR (Tech Spec 3.2.4) – WITHIN TECH SPEC LIMITS.	NOTE: When SRO checks QPTR, the OAC shows 1.14. The power reduction must be 3% for every one % over 1.02, or ≈36%.
	RO	(Step 6 RNO) Reduce reactor power as required by Tech Specs as follows:	
		<ul style="list-style-type: none"> Do not move rods until IAE determines rod movement is available. 	
	BOP	<ul style="list-style-type: none"> Borate as required during power reduction to maintain T-Ave at T-Ref. 	
	RO	<ul style="list-style-type: none"> Monitor AFD during load reduction. 	
	SRO	<ul style="list-style-type: none"> IF AT ANY TIME AFD reaches Tech Spec limit AND reactor power is greater than 50%, THEN: 	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). 	
	RO/ BOP	<ul style="list-style-type: none"> Reduce load PER one of the following procedures: 	NOTE: RO or BOP will start the load decrease.
		<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). 	

Booth Operator Instructions: Operate Trigger #11 (MALF- IRE006 – D4)

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>6</u>	Page	<u>34</u>	of	<u>56</u>
Event Description:	Sequential Dropped Rods								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: SRO recognizes that conditions have changed and that AP14 must be restarted from the beginning.
	RO	(Step 1) IF more than one rod dropped, THEN:	NOTE: Two rods have dropped.
		<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). 	
Critical Task:		(SS - 4600/113/E13.19) Trip the reactor within 30 seconds of the second dropped rod.	
Move to Events #7 & 8.			

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 35 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Upon the reactor trip a small break LOCA will occur in the Pressurizer Steam Space, and Safety Injection will be actuated. Upon the actuation of Safety Injection, the 1A NI Pump will fail to auto start and must be manually started. Upon completion of E-0, the operator will transition to E-1, "Loss of Reactor or Secondary Coolant," and the Reactor Coolant Pumps (NCPs) will be required to be manually tripped upon reaching the established NCP trip criteria. On the transition, an Orange Path will exist on the Containment Critical Safety Function, and the transition will be made to 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 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: NA - Trigger #13 is Conditional on Rx Trip (MALF-NC014A (100))

Indications Available:

- All Rods on the bottom
- Neutron Flux decreasing
- NC Pressure dropping rapidly
- Pzr Level remains abnormally high for plant conditions
- Many MCB Annunciators

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.	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.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>36</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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 / BOP	(Step 5) 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. 	
	SRO	(Step 6) 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 7) 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. 	
	BOP	<ul style="list-style-type: none"> 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.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>37</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 7.d RNO) Perform the following:	
		<ul style="list-style-type: none"> Ensure both trains Phase A Isolation are initiated. 	
		<ul style="list-style-type: none"> Align or start S/I and Phase A components with individual windows in Group 4 as required. 	
		<ul style="list-style-type: none"> GO TO Step 7.f. 	
	BOP	<ul style="list-style-type: none"> Check LOCA Sequencer Actuated status light (1SI-14) on energized train(s) – LIT. 	
		<ul style="list-style-type: none"> Check the following windows on Monitor Light Panel Group 4 – LIT: 	
		<ul style="list-style-type: none"> C-3 "CONT ISOL PHASE A TRN A VLVS ALIGNED" 	
		<ul style="list-style-type: none"> C-6 "CONT ISOL PHASE A TRN B VLVS ALIGNED" 	
		<ul style="list-style-type: none"> F-4 "SAFETY INEJECTION TRAIN A COMPONENTS ALIGNED" 	
		<ul style="list-style-type: none"> F-5 "SAFETY INEJECTION TRAIN B COMPONENTS ALIGNED". 	
	BOP	(Step 8) 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 9) Check all KC pumps - ON	
	BOP	(Step 10) Check both RN pumps – ON.	
	SRO	(Step 11) Notify Unit 2 to start 2A RN pump.	Floor Instructor: As U2 RO report "2A RN Pump is running."

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 38 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 12) Check all S/G pressures – GREATER THAN 775 PSIG.	
	BOP	(Step 13) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment pressure is ≈5 psig due to the LOCA.
	BOP	(Step 13 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), THEN perform the following: 	
		<ul style="list-style-type: none"> Initiate Phase B and Containment Spray signal. 	
		<ul style="list-style-type: none"> Stop all NC pumps while maintaining seal injection flow. 	
Critical Task: (E-1 C/SS-4600/113/E13.1) Trip NC Pumps within <u>5 minutes</u> of loss of SCM.			
		<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). 	NOTE: SRO will dispatch NLO. Booth Instructor: As NLO, report in 5 minutes that all Unit 1 NF AHUs are stopped.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>39</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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>The SRO may ask U2 BOP to perform this action.</p> <p>If so, Floor Instructor: Acknowledge as U2 BOP.</p>
E-0, REACTOR TRIP OR SAFETY INJECTION			
ENCLOSURE 2, Phase B HVAC Equipment			
	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). 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>40</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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			
	RO/ BOP	(Step 14) Check S/I 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 "NV PMPS TO COLD LEG FLOW" gauge – INDICATING FLOW. 	
		<ul style="list-style-type: none"> Check NC pressures – LESS THAN 1600 PSIG. 	
		<ul style="list-style-type: none"> Check NI pumps – INDICATING FLOW. 	
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 286 PSIG 	
Critical Task: (E-0 J) Establish flow from at least one Intermediate Head ECCS Pump before transition out of E-0.			
	RO/ BOP	(Step 14.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). 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>41</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> If valve(s) open on all running ND pumps, THEN GO TO Step 15. 	
	SRO	(Step 15) 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 / BOP	(Step 16) Check CA flow:	
		<ul style="list-style-type: none"> Total CA flow – GREATER THAN 450 GPM. 	
	BOP	<ul style="list-style-type: none"> BOP 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%. 	NOTE: Adverse Containment Numbers will be used.
	RO	(Step 17) 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	(Step 17 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.
		<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). 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>42</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/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.	
	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. 	
		<ul style="list-style-type: none"> IF cooldown stopped, THEN exit this enclosure. 	
	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). 	

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 43 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 7) Check MSIVs – ANY OPEN.	
	RO	(Step 8) Close 1SM-15 (U1 SM to MSR 2 nd Stg Tube Bundles Isol).	
	RO	(Step 9) Check any NC pump – ON.	
	RO	(Step 9 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF any NC T-Cold is still going down, THEN GO TO Step 11. 	
	RO	(Step 11) Notify Control Room SRO that cooldown is continuing.	
	SRO / RO	IF cooldown continues, THEN close:	
		<ul style="list-style-type: none"> All MSIVs All MSIV bypass valves. 	
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 18) Check Pzr PORV and spray valves:	
		<ul style="list-style-type: none"> All PZR PORVs – CLOSED. Normal Pzr spray valves – CLOSED. 	
	BOP	(Step 19) Check NC subcooling based on core exit T/C – GREATER THAN 0°F.	

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 44 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 19 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.
Critical Task: (E-1 C/SS-4600/113/E13.1) Trip NC Pumps within <u>5 minutes</u> of loss of SCM.			
	RO	(Step 20) 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 21) 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 22) 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.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>45</u>	of	<u>56</u>
Event Description:	Pzr Steam Space LOCA/ A NI Pump fails to Auto Start								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 22 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF H₂ Igniters are off, THEN perform the following: 	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"> Implant 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). 	<p>NOTE: Upon transition to E-1, an ORANGE Path will exist on Containment.</p> <p>The SRO will transition to FR-Z.1, rather than E-1.</p>
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.
	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.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>46</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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.	
	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 49.
	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” 	

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 47 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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 10a RNO) GO TO Step 10.d.	
	BOP	<ul style="list-style-type: none"> Check NS suction – ALIGNED TO FWST AS FOLLOWS: 	
		<ul style="list-style-type: none"> Check 1NS-18A (A NS Pump Suct From Cont Sump) – CLOSED 	
		<ul style="list-style-type: none"> Check 1NS-20A (A NS Pump Suct From FWST) – OPEN 	
		<ul style="list-style-type: none"> Check 1NS-1B (B NS Pump Suct From Cont Sump) – CLOSED 	
		<ul style="list-style-type: none"> Check 1NS-3B (B NS Pump Suct From FWST) - 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 NS pump discharge valves – OPEN: 	
		<ul style="list-style-type: none"> 1NS-32A (A NS Pump Disch Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-29A (A NS Pump Disch Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-12B (B NS Pump Disch Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-15B (B NS Pump Disch Cont Outside Isol). 	
		<ul style="list-style-type: none"> Check NS pumps – ON. 	

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 48 of 56 Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 11) check Phase B HVAC equipment PER Enclosure 3 (Phase B HVAC Equipment).	NOTE: The SRO may assign the BOP to perform this action. If so, BOP Examiner follow actions of BOP previously performed as Enclosure 2 of E-0. The SRO may ask U2 BOP to perform this action. If so, Floor Instructor: Acknowledge as U2 BOP.
	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 	
		<ul style="list-style-type: none"> All S/Gs – PRESSURIZED. 	
	BOP	(Step 14) Check if one or two trains of ND aux spray should be aligned:	
		<ul style="list-style-type: none"> Any ND Train – OPERATING IN COLD LEG RECIRC MODE. 	
	SRO	(Step 14a 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. 	
		<ul style="list-style-type: none"> GO TO Step 15. 	

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 49 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

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

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>50</u>	of	<u>56</u>
Event Description:	Pzr Steam Space LOCA/ A NI Pump fails to Auto Start								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 2 RNO) IF at least one NV OR NI pump on, THEN stop all NC pumps while maintaining seal injection flow.	NOTE: The NC Pumps should be stopped by this time.
	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. 	
	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 EMFs – NORMAL:	
		<ul style="list-style-type: none"> 1EMF-33 (Condenser Air Ejector Exhaust) 1EMF-34(L) (S/G Sample (Lo Range)) 1EMF-24 (S/G A) 1EMF-25 (S/G B) 1EMF-26 (S/G C) 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. All Pzr PORVs – CLOSED. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>51</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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 7a RNO) GO TO Step 7.f	
	RO / SRO	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. 	
		<ul style="list-style-type: none"> Containment pressure – LESS THAN 2 PSIG. 	
	SRO	(Step 8b RNO) Perform the following:	
		<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.
		<ul style="list-style-type: none"> GO TO Step 9. 	
	BOP	(Step 9) check if ND pumps should be stopped:	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>2</u>	Event #	<u>7 & 8</u>	Page	<u>52</u>	of	<u>56</u>
Event Description: Pzr Steam Space LOCA/ A NI Pump fails to Auto 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. 	
		<ul style="list-style-type: none"> NC pressure – STABLE OR GOING UP. 	
	SRO	(Step 9b RNO) GO TO Step 10.	
	RO / BOP	(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"> Reset the following: 	
		<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.

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 53 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12) Check containment H ₂ concentration:	
		<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. 	NOTE: The H2 Analyzers are NOT in service.
	SRO	(Step 12b 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.
		<ul style="list-style-type: none"> GO TO Step 13. 	
	BOP	(Step 13) Initiate evaluation of plant status:	
		<ul style="list-style-type: none"> Check Cold Leg Recirc capability: 	
		<ul style="list-style-type: none"> Any ND pump – AVAILABLE. 	
		<ul style="list-style-type: none"> Power to following valves – AVAILABLE: 	
		<ul style="list-style-type: none"> 1ND-19A (A ND Pump Suct From FWST or NC) 	
		<ul style="list-style-type: none"> 1NI-185A (RB Sump To Train A ND & NS) 	
		<ul style="list-style-type: none"> 1ND-58A (Train A ND To NV & NI Pumps) 	
		<ul style="list-style-type: none"> 1ND-4B (B ND Pump Suct From FWST or NC) 	
	BOP	<ul style="list-style-type: none"> 1NI-184B (RB Sump To Train B ND & NS) 	

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 54 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NI-136B (B NI Pump Suction Fr4om ND) 	
		<ul style="list-style-type: none"> 1NI-332A (NV & NI Pumps Suction X-Over) 	
		<ul style="list-style-type: none"> 1NI-333B (NV & NI Pumps Suction X-Over. 	
		<ul style="list-style-type: none"> 1NI-334B (NV & NI Pumps Suct X-Over Blk) 	
		<ul style="list-style-type: none"> 1NI-147A (NI Pumps Miniflow Hdr Isol) 	
		<ul style="list-style-type: none"> 1NI-115B (A NI Pump Miniflow) 	
		<ul style="list-style-type: none"> 1NI-144B (B NI Pump Miniflow). 	
		<ul style="list-style-type: none"> "S LATCHED" on following switches – LIT: 	
		<ul style="list-style-type: none"> 1NI-184B control permissive for recirc mode 	
		<ul style="list-style-type: none"> 1NI-185A control permissive for recirc mode. 	
		<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. 	
	SRO	<ul style="list-style-type: none"> WHEN the TSC is staffed, THEN request TSC to evaluate obtaining samples. 	NOTE: Any attempts to reach the TSC fail (The TSC is NOT yet staffed).
		<ul style="list-style-type: none"> Consult station management to start additional plant equipment to assist in recovery as necessary. 	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:	
		<ul style="list-style-type: none"> NC pressure – GREATER THAN 286 PSIG. 	

Op Test No.: N08-1 Scenario # 2 Event # 7 & 8 Page 55 of 56Event Description: **Pzr Steam Space LOCA/ A NI Pump fails to Auto 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 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: 100% NCS [B] 1314 ppm Pzr [B]: 1312 ppm Xe: Per OAC

Power History: At this power since startup Core Burnup: 12.1 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 Steady-State (BOL), and been for the last 12 days following Refueling Outage.
- The Diesel Generator 1B Operability Test is in progress and the Diesel has operated for 2.5 hours per System Engineer request. It is presently loaded at 3800 KW and is ready to be shutdown in accordance with PT/1/A/4350/002B. The operation of the 1B DG was a Slow Start and conducted from the Control Room at the request of Maintenance. An NLO (Wayne) is standing by at the 1B DG to assist in the shutdown.
- OTG is expected to be conducting some testing inside the TDCA Panel for about an hour early in the shift.

The following equipment is Out-Of-Service:

- 1B NI Pump (Expected back in 8 hours).
- 1NV-265B, Boric Acid to NV Pumps, out for Limit Switch replacement (Expected back in 2 hours).
- PNV-5230, NCP 1A #1 Seal Differential Pressure indicator, failed last shift (IAE is investigating).
- MCB Annunciator 1AD-12, C-2, "KR Storage Tank Low Level," has failed (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

PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 24
TOPIC: NRC Simulator Exam
Scenario N08-1-3

REFERENCES:

1. OP/1/A/6100/003, "Controlling Procedure for Unit Operations."
2. OP/1/A/6300/001, "Turbine-Generator Startup/Shutdown."
3. OP/1/A/6150/009, "Boron Concentration Control."
4. OP/1/A/6100/010G, "Annunciator Response For Panel 1AD-6."
5. AP/1/A/5500/011, "Pressurizer Pressure Anomalies."
6. McGuire Technical Specifications
7. OP/1/A/6100/010R, "Annunciator Response For Panel 1RAD-2."
8. AP/1/A/5500/018, "High Activity in Reactor Coolant."
9. AP/1/A/5500/AP1, "Steam Leak."
10. AP/1/A/5500/AP2, "Turbine Generator Trip."
11. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
12. EP/1/A/5000/E-2, "Faulted Steam Generator Isolation."
13. EP/1/A/5000/ECA-2.1, "Uncontrolled Depressurization of All Steam Generators."
14. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review: _____

March 5th, 2008
Rev. 2

Facility: McGuire		Scenario No.: 3	Op Test No.: N08-1
Examiners: _____		Operators: (SRO)	
_____		(OATC)	
_____		(BOP)	
Initial Conditions:		The Plant is at 29% power (BOL) in a Chemistry Hold, during plant startup. It is expected to raise power on the upcoming shift.	
Turnover:		The following equipment is Out-Of-Service: 1B CA Pump (Expected back in 24 hours), PSM-5170, D Steam Generator Pressure (Channel1), failed last shift (Channel has been defeated and IAE is investigating) and MCB Annunciator 1AD-5, G-3, "CACST Not Full," has been in constant alarm over the last hour (IAE is investigating).	
Event No.	Malf. No.	Event Type*	Event Description
1	NA	R-RO N-BOP N-SRO	Raise Power
2	NC012B	C-BOP C(TS)-SRO	PORV Leakage
3	CH001	C-BOP C(TS)-SRO	Crud Burst/High Activity
4	SM001A	C-RO C-SRO	A SG PORV failure
5	DEH001	C-RO C-SRO	Turbine Generator Trip
6	^{XMT} SM025	M-RO M-BOP M-SRO	Inadvertent MSI
7	SM005 A-D	NA	SM Safety Valves fail
8	NI009A/B	NA	NI-9/10 fail to open
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description

NRC Scenario 3

McGuire 2008 NRC Scenario #3

The Plant is at 29% power (BOL) in a Chemistry Hold, during plant startup. It is expected to raise power on the upcoming shift.

The following equipment is Out-Of-Service: 1B CA Pump (Expected back in 24 hours), PSM-5170, D Steam Generator Pressure (Channel1), failed last shift (Channel has been defeated and IAE is investigating) and MCB Annunciator 1AD-5, G-3, "CACST Not Full," has been in constant alarm over the last hour (IAE is investigating).

Shortly after taking the watch, the operator will raise power in accordance with Step 3.21 of Enclosure 4.1, "Power Increase," of OP/1/A/6100/003, "Controlling Procedure for Unit Operations." The RO will control the Turbine Generator in accordance with Enclosure 4.1, "Turbine-Generator Load Change," of OP/1/A6300/001, "Turbine-Generator Startup/Shutdown," 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 up-power seat leakage will develop on the Pzr PORV, 1NC-34A. The operator will respond in accordance with ARP1AD-6/F-5, "NC1, 2, or 3 Flo Detected," and implement AP11, "Pressurizer Pressure Anomalies." The operator will recognize the failure and close the associated PORV Block Valve. The operator will address Technical Specifications 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits," 3.4.11, "Power Operated Relief Valves," and 3.4.13, "RCS Operational Leakage."

Following this, a Crud Burst will occur and 1EMF48, "Reactor Coolant Water Radiation Monitor," will alarm. The operator will respond in accordance with ARP1RAD-2/C-3, "1EMF 48 Reactor Coolant Hi Rad," and implement AP18, "High Activity in Reactor Coolant." The operator will raise Letdown flow at the request of Chemistry and address Technical Specification 3.4.16, "RCS Specific Activity."

Subsequently, the A Steam Generator PORV will fail such that the valve fails fully open. The operator will respond in accordance with OP/1/A/5500/AP1, "Steam Leak."

After this, the Main Turbine will trip inadvertently. The Operator will respond by implementing AP2, "Turbine Generator Trip." The operator will stabilize reactor power at 12-15% with control rods in manual.

Shortly afterwards, PSM-5190, D Steam Generator Pressure (Channel 4) will fail low completing the logic for an MSI actuation and all four MSIVs will go closed. On the trip the low set Safety Valve on each Steam Generator will lift and fail to re-close. Additionally, upon Safety Injection actuation, NI-9/10, the NV to Cold Leg Isolation Valves, will fail to automatically open and need to be opened manually. The operator will enter E-0, "Reactor Trip or Safety Injection," and transition to E-2, "Faulted Steam Generator Isolation."

Upon entry into E-2, the operator will recognize that all four Steam Generators are depressurizing and transition to ECA-2.1, "Uncontrolled Depressurization of All Steam Generators." The operator will throttle CA flow to each Steam Generator to maintain a minimum of 25 gpm to each Steam Generator.

The scenario will terminate at Step 5 of ECA-2.1, after the crew has throttled CA flow as required.

Scenario Event Description

NRC Scenario 3

Critical Tasks:

E-0 I

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

ECA-2.1 A

Control the CA Flowrate to not exceed < 25 gpm per SG in order to minimize the NC Cooldown rate before a severe challenge (Orange Path) develops to the integrity CSF.

Scenario Event Description

NRC Scenario 3

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		IC - 113	
<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	See Shift Turnover Information
<input type="checkbox"/>		(LOA) CA009	Rackout breaker for "1B" Auxiliary Feedwater Pump
<input type="checkbox"/>		(XMT) SM0023 Set = 0	PSM-5170, D Steam Generator Pressure (Channel1), failed Swap to Channel #2.
<input type="checkbox"/>		(ANN) AD05-G03 = ON	MCB Annunciator AD-5, G-3, "CACST Not Full," in constant alarm
<input type="checkbox"/>		(MALF) NI009A (MALF) NI009B	Failure of automatic opening of NI-9/10.
<input type="checkbox"/>		(MALF) SM005A-D Set: A = 100 B = 50 C = 20 D = 20 Conditional Trigger 11 (RTB Open)	SM Safety Valves fail
<input type="checkbox"/>		Freeze.	
<input type="checkbox"/>		Update Fresh Tech. Spec. Log.	

Scenario Event Description

NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	(XMT) SM025 Set = 0 Trigger 9	Inadvertent MSI Conditional Trigger #11 (Rx Trip) SM Safety Valves fail (T=0) Failure of automatic opening of NI-9/10 (T=0)
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

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		
	<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 3.20.18 – 3.20.23.1 and 3.20.23.4 checked off. 3.20.17 should be blank. 3.20.23.2-3 should be NA. 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		Raise Power
<input type="checkbox"/>	At direction of examiner	(MALF) NC012B Severity 20 Trigger 1	PORV Leakage
<input type="checkbox"/>	At direction of examiner	(MALF) CH001 Trigger 3	Crud Burst/High Activity
	At direction of examiner	(MALF) SM001A Severity 100 Trigger 5	A SG PORV failure
<input type="checkbox"/>	At direction of examiner	(MALF) DEH001 Trigger 7	Turbine Generator Trip

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>44</u>
Event Description:	Raise Power								
Time	Position	Applicant's Actions or Behavior							

Shortly after taking the watch, the operator will raise power in accordance with Step 3.21 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) Increase power to 45% RTP as follows:	
	RO	(Step 3.21.1) Maintain control rods within insertion and withdrawal limits per COLR.	
	RO	(Step 3.21.2) Maintain AFD within target band per OP/1/A/6100/022 (Unit 1 Data Book), Enclosure 4.3, Graph(s) 1.1.	
	RO	(Step 3.21.3) IF initial startup following refueling outage, check Bank D Control Rods greater than or equal to 200 steps withdrawn.	
	SRO	(Step 3.21.4) Notify IAE to stand by for periodic adjustments of Power Range NI channels	NOTE: SRO may contact WCC or IAE. If so, Booth Instructor: acknowledge appropriately.
	RO	(Step 3.21.5) IF "Power Mismatch %" (Excore/Thermal Power Mismatch) indicates greater than 4% during power increase, perform the following:	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>1</u>	Page	<u>9</u>	of	<u>44</u>
Event Description:	Raise Power								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3.21.6) Begin power increase to 45% RTP.	
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".	
	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. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>1</u>	Page	<u>10</u>	of	<u>44</u>
Event Description:	Raise Power								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Adjust "BA Blend Disch Cntrl" output to control reactor makeup water flowrate. 	
OP/1/A/6300/001A, TURBINE-GENERATOR STARTUP/SHUTDOWN ENCLOSURE 4.1, TURBINE-GENERATOR LOAD CHANGE			
	RO	(Step 3.5) Changing Turbine Load	
		<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". 	
		<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. 	
OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATIONS ENCLOSURE 4.1, POWER INCREASE			
	RO	(Step 3.21.7) Maintain one pen selected to PR channel on "Nuclear Power (%)" recorder. (1ENBCR9450)	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>1</u>	Page	<u>11</u>	of	<u>44</u>
Event Description:		Raise Power							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3.21.8) Maintain other pen as desired on "Nuclear Power (%)" recorder. (1ENBCR9450)	
After 15-25 MWe increase, <u>OR</u> at the discretion of the Lead Examiner move to Event #2.			

Op Test No.: N08-1 Scenario # 3 Event # 2 Page 12 of 44

Event Description: **PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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During the up-power seat leakage will develop on the Pzr PORV, 1NC-34A. The operator will respond in accordance with ARP1AD-6/F-5, "NC1, 2, or 3 Flo Detected," and implement AP11, "Pressurizer Pressure Anomalies." The operator will recognize the failure and close the associated PORV Block Valve. The operator will address Technical Specifications 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits," 3.4.11, "Power Operated Relief Valves," and 3.4.13, "RCS Operational Leakage."

Booth Operator Instructions: Operate Trigger #1 (NC012B (20))

Indications Available:

- 1AD-6/F5, "NC 1, 2, OR 3 Flo Detected."
- 1AD-6/B9, "Pzr PORV Disch Hi Temp."
- 1AD-6/B10, "Tref/Tauct Abnormal."
- Dual indication on PORV 1NC-34A.
- Pzr Pressure decreasing.

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010G, "ANNUNCIATOR RESPONSE FOR PANEL 1AD-6" F-5, NC 1, 2, OR 3 FLO DETECTED			
	BOP	(IA) Check pressurizer pressure is less than safety relief setpoint (2485 psig).	NOTE: Crew may NOT address ARP, but enter AP11 directly.
	BOP	(SA Step 1) Monitor outlet temperature of 1NC-1, 1NC-2, and 1NC-3 to determine which safety relief valve is leaking.	
	SRO	(SA Step 2) Notify OSM.	
	SRO	(SA Step 3) Refer to Tech Specs for primary system leakage.	
	SRO	(SA Step 4) IF in Mode 1, 2, or 3, ensure transient monitor freeze triggered. {PIP M-98-4253}	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>13</u>	of	<u>44</u>
Event Description:		PORV Leakage							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010G, "ANNUNCIATOR RESPONSE FOR PANEL 1AD-6" B-9, PZR PORV DISCH TEMP HI			
	SRO	(IA Step 1) IF excessive leakage, go to AP/1/A/5500/010 (NC System Leakage Within Capacity of Both NV Pumps).	NOTE: Crew may NOT address ARP, but enter AP11 directly.
	SRO	(IA Step 2) IF Pzr pressure decreasing, go to AP/1/A/5500/011 (Pressurizer Pressure Anomalies).	
	BOP	(SA Step 1) Monitor PRT temperature, pressure, and level.	
	SRO	(SA Step 2) Refer to Tech Specs for leakage limiting conditions for operation.	
AP/1/A/5500/11, PRESSURIZER PRESSURE ANOMALIES			
			NOTE: Crew will carry out Immediate Actions of AP11, prior to the SRO addressing the AP.
	BOP	(Step 1) Check actual Pzr pressure – HAS GONE DOWN.	
	BOP	(Step 2) Check all Pzr pressure channels – INDICATING THE SAME.	
	BOP	(Step 3) Check Pzr PORVs – CLOSED.	
	BOP	(Step 3 RNO) Perform the following:	
		<ul style="list-style-type: none"> • Close PORVs. • IF PORV will not close, THEN close PORV isolation valve. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>14</u>	of	<u>44</u>
Event Description:		PORV Leakage							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 4) Check Pzr spray valves – CLOSED.	NOTE: Crew may stop load increase and place Control Rods in AUTO, while investigating PORV leakage.
	BOP	(Step 5) Check Pzr PORVs – CLOSED.	
	BOP	(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: 	
		<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). 	NOTE: BOP will close 1NC-270.
	BOP	(Step 6) Check PZR spray valves – CLOSED.	<p>NOTE: SRO may recognize that Step 6 was written to address Spray Valves that have failed. Because this is NOT the case, the SRO may elect to not take the action of Step 6 RNO.</p> <p>If OSM concurrence is sought, Floor Instructor, as OSM, concur.</p>
	SRO	(Step 7) GO TO Step 9.	
	SRO	(Step 9) Announce occurrence on page.	<p>NOTE: SRO may ask U2 RO to make Plant Announcement.</p> <p>If so, Floor Instructor acknowledge as U2 RO.</p>

Op Test No.: N08-1 Scenario # 3 Event # 2 Page 15 of 44Event Description: **PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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 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.	
		• WHEN Pzr pressure returns to normal AND automatic Pzr pressure control desired, THEN place “PZR PRESS MASTER” in auto.	
	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”.	
	BOP	(Step 15) Check “1NC-29 PRESSURIZER SPRAY EMERGENCY CLOSE” switch – SELECTED TO “NORMAL”.	
	SRO	(Step 16) GO TO Step 24.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>16</u>	of	<u>44</u>
Event Description:		PORV Leakage							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 24) Ensure "PZR PRESS REC SELECT" is on operable channel.	NOTE: SRO will likely conduct a Focus Brief.
			NOTE: SRO may contact Station Management regarding continued load increase. If so, Booth Instructor: as Station Management direct SRO to hold at present power level temporarily.
TECHNICAL SPECIFICATION 3.4.11, PRESSURIZER POWER OPERATED RELIEF VALVES (PORVs)			
	SRO	3.4.11 Pressurizer Power Operated Relief Valves (PORVs)	Examiner NOTE: Addressing TS takes 8-10 minutes. May want to address after scenario.
	SRO	LCO 3.4.11 Each PORV and associated block valve shall be OPERABLE.	
	SRO	APPLICABILITY: MODES 1, 2, and 3.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>2</u>	Page	<u>17</u>	of	<u>44</u>
Event Description:		PORV Leakage							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior			Comments
	SRO	ACTIONS			
		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	
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			
		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.			
		APPLICABILITY: MODE 1.			

Op Test No.: N08-1 Scenario # 3 Event # 2 Page 18 of 44Event Description: **PORV Leakage**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		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.	
At the discretion of the Lead Examiner move to Event #3.					

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>3</u>	Page	<u>19</u>	of	<u>44</u>
Event Description:	Crud Burst/High Activity								
Time	Position	Applicant's Actions or Behavior							

Following this, a Crud Burst will occur and 1EMF48, "Reactor Coolant Water Radiation Monitor," will alarm. The operator will respond in accordance with ARP1RAD-2/C-3, "1EMF 48 Reactor Coolant Hi Rad," and implement AP18, "High Activity in Reactor Coolant." The operator will raise Letdown flow at the request of Chemistry and address Technical Specification 3.4.16, RCS Specific Activity."

Booth Operator Instructions: Operate Trigger #3 (CH001)

Indications Available:

- 1RAD-2/C-3, "1EMF 48 Reactor Coolant Hi Rad."
- 1RAD-3/D-3, "1EMF 18 Reactor Coolant Filter 1A."
- 1RAD-1/E-2, "1EMF 38 Containment Particulate."

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010R, "ANNUNCIATOR RESPONSE FOR PANEL 1RAD-2" C-3, 1 EMF 48 REACTOR COOLANT HI RAD			
	SRO	(SA Step 1) Go to AP/1/A/5500/018 (High Activity in Reactor Coolant).	NOTE: SRO will enter AP/1/A/5500/18.
	SRO	(SA Step 2) Notify chemistry.	NOTE: SRO may contact Chemistry. If so, Booth Instructor: acknowledge as Chemistry.
	SRO	(SA Step 3) Notify RP.	NOTE: SRO may contact RP. If so, Booth Instructor: acknowledge as RP.
AP/1/A/5500/18, HIGH ACTIVITY IN REACTOR COOLANT			
	BOP	(Step 1) Check 1NV-127A (L/D Hx Outlet 3-Way Temp Cntrl) – ALIGNED TO DEMIN.	
	SRO	(Step 2) Determine cause of high activity:	

Op Test No.: N08-1 Scenario # 3 Event # 3 Page 20 of 44Event Description: **Crud Burst/High Activity**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Request Chemistry to check decontamination factor of mixed bed demineralizer. 	<p>NOTE: SRO will contact Chemistry.</p> <p>If so, Booth Instructor: acknowledge as Chemistry.</p>
		<ul style="list-style-type: none"> Notify Chemistry to perform an NC System isotopic analysis to determine if high activity is from a crud burst or failed fuel. 	
			<p>Booth Instructor: as Chemistry (Time Compression) report that you suspect a Crud Burst, but DEI is 1.2 µc/ml.</p>
	BOP	(Step 3) IF AT ANY TIME it is determined that high activity is from crud burst, THEN raise letdown flow to 120 GPM.	
		<ul style="list-style-type: none"> Slowly adjust 1NV-459 open. 	<p>NOTE: This activity is within the tasks identified as "Skill of the Craft" within SOMP 04-02, Section 12, and therefore is NOT governed by a specific procedure.</p>
		<ul style="list-style-type: none"> Monitor letdown flow Increase. 	
		<ul style="list-style-type: none"> Maintain LD pressure 350 psig (may place controller in manual). 	
		<ul style="list-style-type: none"> Monitor increase in Chg flow. 	
		<ul style="list-style-type: none"> Set-up OAC to monitor Pzr level. 	
		<ul style="list-style-type: none"> Adjust 1NV-241 as Chg flow increases. 	
	SRO	IF AT ANY TIME it is determined that high activity is from failed fuel, THEN:	<p>NOTE: This is a Continuous Action. The SRO will make both board operators aware.</p>
		<ul style="list-style-type: none"> Ensure mixed bed demineralizer in service. 	
		<ul style="list-style-type: none"> Notify Chemistry to consult with Reactor Group and RP to determine if the caution bed demineralizer should be placed in service. 	

Op Test No.: N08-1 Scenario # 3 Event # 3 Page 21 of 44Event Description: **Crud Burst/High Activity**

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 Chemistry requests cation bed demineralizer be placed in service, THEN place in service PER OP/1/A/6200/001D (Chemical and Volume Control System Demineralizers), Enclosure 4.3 (Removing/Returning the Cation Bed Demineralizer from/to Service). 	
		<ul style="list-style-type: none"> REFER TO RP/0/A/5700/000 (Classification of Emergency). 	
		<ul style="list-style-type: none"> Notify Reactor Group to perform OP/0/A/6550/017 (Estimate of Failed Fuel Based on Iodine-131 Concentration). 	
	SRO	Notify Radwaste to ensure VCT H ₂ purge flow is established.	<p>NOTE: SRO will contact Radwaste.</p> <p>If so, Booth Instructor: acknowledge as Radwaste.</p>
	SRO	REFER TO Tech Spec 3.4.16 (RCS Specific Activity).	
TECHNICAL SPECIFICATION 3.4.16, RCS SPECIFIC ACTIVITY			
	SRO	3.4.16 RCS Specific Activity	<p>Examiner NOTE: Addressing TS may take several minutes. May want to address after scenario.</p>
	SRO	LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.	
	SRO	APPLICABILITY: MODES 1 and 2, MODE 3 with RCS average temperature (T _{avg}) ≥ 500°F.	

Op Test No.: N08-1 Scenario # 3 Event # 3 Page 22 of 44Event Description: **Crud Burst/High Activity**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. DOSE EQUIVALENT I-131 > 1.0 μ Ci/gm.	A.1 Verify Dose Equivalent I-131 within the acceptable region of Figure 3.4.16-1. AND A.2 Restore Dose Equivalent I-131 to within limit.	Once per 4 hours 48 hours	
At the discretion of the Lead Examiner move to Event #4.					

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>4</u>	Page	<u>23</u>	of	<u>44</u>
Event Description: A SG PORV failure									
Time	Position	Applicant's Actions or Behavior							

Subsequently, the A Steam Generator PORV will fail such that the valve fails fully open. The operator will respond in accordance with OP/1/A/5500/AP1, "Steam Leak."

Booth Operator Instructions: Operate Trigger #5 (SM001A (100))

Indications Available:

- 1AD-6/C-6, "Pzr Lo Press Control."
- 1A SG PORV Red Status Light is LIT.

Time	Pos.	Expected Actions/Behavior	Comments
			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:	
		• 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.	
	SRO	(Step 3 RNO) GO TO Step 5.	
	RO	(Step 5) Check Pzr pressure prior to event – GREATER THAN P-11 (1955 PSIG).	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>4</u>	Page	<u>24</u>	of	<u>44</u>
Event Description:	A SG PORV failure								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 6) Check Pzr level – STABLE OR GOING UP.	
	BOP	(Step 6 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. 	
		<ul style="list-style-type: none"> Open 1NV-241 (Seal Inj Flow Control) while maintaining NC pump seal flow greater than 5 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 Pzr level going down with maximum charging flow, THEN GO TO Step 9. 	
	BOP	(Step 7) IF AT ANY TIME while in this procedure Pzr level cannot be maintained stable, THEN RETURN TO Step 6.	
	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:	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>4</u>	Page	<u>25</u>	of	<u>44</u>
Event Description:		A SG PORV failure							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Close affected S/G SM PORV manual loader. 	
		<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.
At the discretion of the Lead Examiner move to Event #5.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>5</u>	Page	<u>26</u>	of	<u>44</u>
Event Description:		Turbine Generator Trip							
Time	Position	Applicant's Actions or Behavior							

After this, the Main Turbine will trip inadvertently. The Operator will respond by implementing AP2, "Turbine Generator Trip." The operator will stabilize reactor power at 12-15% with control rods in manual.

Booth Operator Instructions: Operate Trigger #7 (DEH001)

Indications Available:

- 1AD-6/C-6, "Pzr Lo Press Control."
- Many MCB Annunciators go into alarm.
- MWe goes to "0."
- Control Rods drive inward in Automatic.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/02, TURBINE GENERATOR TRIP			
	RO	(Step 1) Check Turbine Trip: <ul style="list-style-type: none"> • All throttle valves – CLOSED. 	
	RO	(Step 2) Check P/R meters – LESS THAN 20%.	NOTE: By the time power level stabilizes, power level may be < 20%. If so, move forward to Step 3.
	RO	(Step 2 RNO) Perform the following: <ul style="list-style-type: none"> • Ensure control rods moving in to reduce T-Ave. • Designate an operator to continuously monitor reactor power. • WHEN reactor power is less than 20%, THEN: <ul style="list-style-type: none"> • Place control rods in manual. • Perform Step 3 to stabilize reactor power. 	

Op Test No.: N08-1 Scenario # 3 Event # 5 Page 27 of 44Event Description: **Turbine Generator Trip**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3) Stabilize reactor power as follows:	
		<ul style="list-style-type: none"> Place control rods in manual. 	NOTE: The RO will place Control Rods in MANUAL.
		<ul style="list-style-type: none"> Check P/R meters – GREATER THAN 5%. 	
		<ul style="list-style-type: none"> Stabilize reactor power, as indicated on P/R meters, between 12% - 15% with control rods in manual. 	
		<ul style="list-style-type: none"> WHEN reactor power is stabilized between 12% - 15%, THEN maintain I/R startup rate at "0" to ensure a constant power level. 	
	RO	(Step 4) IF AT ANY TIME reactor power goes below 5%, THEN:	NOTE: Power level should remain > 5%.
		<ul style="list-style-type: none"> Do not pull control rods. 	
		<ul style="list-style-type: none"> Insert control rods as necessary to maintain negative SUR on I/R startup rate meters. 	
	BOP	(Step 5) Check "C-9 COND AVAILABLE FOR STEAM DUMP" status light (1SI-18) – LIT.	
	RO / BOP	(Step 6) Check any CF pump – IN SERVICE.	NOTE: The 1A CF Pump is in service.
	RO	(Step 7) Check both generator breakers – OPEN.	NOTE: Both Main Generator Breakers are Open.
	RO	(Step 8) Check "EXCITATION" – OFF.	
	RO / BOP	(Step 9) IF AT ANY TIME T-Ave is less than 551°F AND going down, 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. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>5</u>	Page	<u>28</u>	of	<u>44</u>
Event Description: Turbine Generator Trip									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
	RO	(Step 10) Check all control rods – ALIGNED WITH ASSOICATED BANK.	
	RO	(Step 11) Check MSR “RESET” light – LIT.	
	SRO	(Step 12) Announce “UNIT 1 TURBINE TRIP, NON-ESSENTIAL PERSONNEL STAY OUT OF UNIT 1 TURBINE BLDG”.	<p>NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.</p>
	RO	(Step 13) Check S/G CF control bypass valves – IN MANUAL AND FULL OPEN.	<p>NOTE: The S/G CF control bypass valves will be closed.</p>
	SRO	(Step 13 RNO) GO TO Step 16.	
	RO	(Step 16) Check condenser dump valves – MODULATING OPEN.	
	BOP	(Step 17) Check Pzr pressure control response:	
		<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 17 RNO) WHEN Pzr pressure is less than 2315 PSIG, THEN perform the following:	
		<ul style="list-style-type: none"> Ensure Pzr PORVs are closed. 	<p>NOTE: 1NC-34A NOT closed from previous malfunction.</p>

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>5</u>	Page	<u>29</u>	of	<u>44</u>
Event Description:		Turbine Generator Trip							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF any PORV cannot be closed, THEN close its isolation and inlet drain valve as follows: 	
		<ul style="list-style-type: none"> IF 1NC-34A (PZR PORV) failed, THEN close: 	NOTE: 1NC-34A PORV isolation will be closed from previous malfunction.
		<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 17d) Check Pzr spray control valves – CLOSED. 	
		<ul style="list-style-type: none"> (Step 17d RNO) IF AT ANY TIME Pzr pressure is less than 2100 PSIG, THEN perform the following: 	
		<ul style="list-style-type: none"> Ensure spray valves closed. 	
		<ul style="list-style-type: none"> IF any spray valve cannot be closed AND uncontrolled depressurization occurs, THEN REFER TO AP/1/A/5500/11 (Pressurizer Pressure Anomalies). 	
	BOP	(Step 18) Check Pzr level – TRENDING TO PROGRAM.	
	RO	(Step 19) Ensure Bearing Lift pump in "AUTO".	
	RO	(Step 20) WHEN bearing oil pressure goes down to 11-12 PSIG, THEN ensure AC Bearing Oil pump starts.	
At the discretion of the Lead Examiner move to Events #6-8.			

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Event Description: **Turbine Generator Trip**

Time	Position	Applicant's Actions or Behavior
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Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>6, 7, & 8</u>	Page	<u>31</u>	of	<u>44</u>
Event Description: Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open									
Time	Position	Applicant's Actions or Behavior							

Shortly afterwards, PSM-5190, D Steam Generator Pressure (Channel 4) will fail low completing the logic for an MSI actuation and all four MSIVs will go closed. On the trip the low set Safety Valve on each Steam Generator will lift and fail to re-close. Additionally, upon Safety Injection actuation, NI-9/10, the NV to Cold Leg Isolation Valves, will fail to automatically open and need to be opened manually. The operator will enter E-0, "Reactor Trip or Safety Injection," and transition to E-2, "Faulted Steam Generator Isolation." Upon entry into E-2, the operator will recognize that all four Steam Generators are depressurizing and transition to ECA-2.1, "Uncontrolled Depressurization of All Steam Generators." The operator will throttle CA flow to each Steam Generator to maintain a minimum of 25 gpm to each Steam Generator. The scenario will terminate at Step 5 of ECA-2.1, after the crew has throttled CA flow as required.

Booth Operator Instructions: Operate Trigger #9 (XMTSM025 (0))
 Trigger #11 is Conditional on Rx Trip (MALF-SM005A (100), SM005B (50), SM005C (20) and SM005D (20))

Indications Available:

- All MSIVs close
- Steam Flow decreases
- CF Pumps stop

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			
	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. 	
	RO	(Step 3) Check Turbine Trip:	

Op Test No.: N08-1 Scenario # 3 Event # 6, 7, & 8 Page 32 of 44Event Description: **Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> All throttle valves – CLOSED 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	
	RO / BOP	(Step 5) Check if S/I is actuated:	NOTE: Crew will most likely manually actuate SI based on lowering Pzr Pressure.
		<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 6) 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 7) 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. 	NOTE: 1NV-9/10 lights will NOT be LIT due to failure of auto Open.
	BOP	(Step 7.d RNO) Perform the following:	
		<ul style="list-style-type: none"> Ensure both trains Phase A Isolation are initiated. 	
		<ul style="list-style-type: none"> Align or start S/I and Phase A components with individual windows in Group 4 as required. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>6, 7, & 8</u>	Page	<u>33</u>	of	<u>44</u>
Event Description: Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
Critical Task: (E-0 I) Establish flow from at least one high-head ECCS Pump before transition out of E-0.			
		<ul style="list-style-type: none"> GO TO Step 7.f. 	
	BOP	<ul style="list-style-type: none"> Check LOCA Sequencer Actuated status light (1SI-14) on energized train(s) – LIT. 	
		<ul style="list-style-type: none"> Check the following windows on Monitor Light Panel Group 4 – LIT: 	
		<ul style="list-style-type: none"> C-3 “CONT ISOL PHASE A TRN A VLVS ALIGNED” 	
		<ul style="list-style-type: none"> C-6 “CONT ISOL PHASE A TRN B VLVS ALIGNED” 	
		<ul style="list-style-type: none"> F-4 “SAFETY INEJECTION TRAIN A COMPONENTS ALIGNED” 	
		<ul style="list-style-type: none"> F-5 “SAFETY INEJECTION TRAIN B COMPONENTS ALIGNED” 	
	RO / BOP	(Step 8) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	NOTE: The 1B MD CA Pump is OOS. The 1A MD Pump is running.
	RO / BOP	(Step 8a RNO) Start pumps.	
	RO / BOP	(Step 8b) Check proper CA pump status:	
		<ul style="list-style-type: none"> N/R level in at least 3 S/Gs – GREATER THAN 17%. 	
	RO / BOP	(Step 8b RNO) Ensure TD CA pump on.	NOTE: The SRO will verify that the TD CA is running.

Op Test No.: N08-1 Scenario # 3 Event # 6, 7, & 8 Page 34 of 44Event Description: **Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 9) Check all KC pumps – ON.	
	BOP	(Step 10) Check both RN pumps – ON.	
	SRO	(Step 11) Notify Unit 2 to start 2A RN pump.	Floor Instructor: As U2 RO report “2A RN Pump is running.”
	RO	(Step 12) Check all S/G pressures – GREATER THAN 775 PSIG.	NOTE: All SG Pressures are decreasing uncontrollably at varying rates.
	RO	(Step 12 RNO) Perform the following:	
		• Check the following closed:	
		• All MSIVs	
		• All MSIV bypass valves	
		• All SM PORVs.	NOTE: 1A SG PORV has failed open due to a previous malfunction. It should be isolated.
		• IF any valve open, THEN:	
		• Initiate Main Steam Isolation signal.	NOTE: MSI will be actuated manually, however it was previously inadvertently actuated.
		• IF any valve still open, THEN close valve.	
	BOP	(Step 13) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment Pressure is normal.
	BOP	(Step 14) Check S/I flow:	
		• Check “NV PMPS TO COLD LEG FLOW” gauge – INDICATING FLOW.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>6, 7, & 8</u>	Page	<u>35</u>	of	<u>44</u>
Event Description: Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 1600 PSIG. 	
		<ul style="list-style-type: none"> Check NI pumps – INDICATING FLOW. 	
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 286 PSIG. 	
	BOP	(Step 14d 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). 	
		<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 15. 	
	SRO	(Step 15) 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.	<p>NOTE: SRO may ask OSM to address.</p> <p>If so, Floor Instructor acknowledge as OSM.</p>
	RO / BOP	(Step 16) 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. 	
		<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 / BOP	(Step 17) Check NC temperatures:	

Op Test No.: N08-1 Scenario # 3 Event # 6, 7, & 8 Page 36 of 44Event Description: **Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open**

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 NC pump on, THEN check NC T-avg – STABLE OR TRENDING TO 557°F. 	
	RO / BOP	(Step 17 RNO) Perform the following based on plant conditions:	
		<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). 	<p>NOTE: The SRO may assign the RO to perform this action. If so, RO Examiner follow actions of Enclosure 3.</p>
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: 1A SG PORV is OPEN, but isolated.
	RO	(Step 2 RNO) Perform the following:	
		<ul style="list-style-type: none"> Close affected SM PORV manual loader. IF SM PORV can not be closed, THEN: <ul style="list-style-type: none"> Close SM PORV isolation valve. 	
	RO	(Step 3) Check MSR “RESET” light – LIT.	
	RO	(Step 4) Check any NC pump – ON.	
	RO	(Step 5) Check NC T-avg – GOING DOWN.	
	RO	(Step 6) Control feed flow as follows:	

Op Test No.: N08-1 Scenario # 3 Event # 6, 7, & 8 Page 37 of 44Event Description: **Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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.	
	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. 	
E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 18) Check Pzr PORV and spray valves:	
		<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. 	NOTE: 1NC-34A NOT closed from previous malfunction.
	BOP	(Step 18 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 can not be closed, THEN: 	
		<ul style="list-style-type: none"> IF 1NC-34A (PZR PORV) failed, THEN close 1NC-270 (PZR PORV Drn Isol For 1NC-34A). 	NOTE: 1NC-34A PORV isolation will be closed from previous malfunction.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>3</u>	Event #	<u>6, 7, & 8</u>	Page	<u>38</u>	of	<u>44</u>
Event Description: Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 18b) Normal Pzr spray valves – CLOSED.	NOTE: Pzr Spray Valves will be Closed.
	RO	(Step 19) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	NOTE: NC System Subcooling will be ≈100°F.
	RO	(Step 20) Check if main steamlines intact:	Booth Instructor: as Security report that you see large amounts of Steam Flow from the top of both Doghouses.
	SRO	(Step 20 RNO) IF any S/G is faulted, THEN:	
		<ul style="list-style-type: none"> IF fault is outside containment, THEN: 	
		<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-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.	
	SRO	(Step 2) Maintain at least one S/G available for NC System cooldown in subsequent steps.	
	SRO	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:	
		<ul style="list-style-type: none"> All MSIVs 	
		<ul style="list-style-type: none"> All MSIV bypass valves. 	

Op Test No.: N08-1 Scenario # 3 Event # 6, 7, & 8 Page 39 of 44
 Event Description: **Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 5) Check at least one S/G pressure – STABLE OR GOING UP.	NOTE: All SG Pressures will be decreasing.
	SRO	(Step 5 RNO) IF all S/Gs faulted, THEN GO TO EP/1/A/5000/ECA-2.1 (Uncontrolled Depressurization of All Steam Generators).	
ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS			
	SRO	(Step 1) Monitor Foldout page.	
	SRO	(Step 2) IF TD CA pump is the only source of feedwater, THEN maintain steam flow to it from at least one S/G.	NOTE: 1A MD CA Pump is running. The SRO will keep TD CA Pump running as long as possible.
	RO	(Step 3) check secondary pressure boundary:	
		<ul style="list-style-type: none"> • For 1A S/G: • Check the following – CLOSED: • MSIV • MSIV bypass valve. • Check SM PORV – CLOSED. 	
	RO	(Step 3a2 RNO) Perform the following:	
		<ul style="list-style-type: none"> • Close SM PORV. • IF PORV can not be closed; THEN close SM PORV isolation valve. 	NOTE: 1A SG PORV has failed open due to a previous malfunction. It should be isolated.
	RO	<ul style="list-style-type: none"> • (Step 3a3) Check “S/G A FDW ISOLATED” status light (1SI-4) – LIT. 	

Op Test No.: N08-1 Scenario # 3 Event # 6, 7, & 8 Page 40 of 44Event Description: **Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 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 (A S/G BB Cont Inside Isol). 	
		<ul style="list-style-type: none"> Close 1SM-83 (A SM Line Drain Isol). 	
		<ul style="list-style-type: none"> For 1B S/G: 	
		<ul style="list-style-type: none"> Check the following – CLOSED: 	
		<ul style="list-style-type: none"> MSIV 	
		<ul style="list-style-type: none"> MSIV bypass valve. 	
		<ul style="list-style-type: none"> Check SM PORV – CLOSED. 	
		<ul style="list-style-type: none"> Check “S/G B FDW ISOLATED” status light (1SI-4) – LIT. 	
		<ul style="list-style-type: none"> Check BB valves – CLOSED: 	
		<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 1SM-89 (B SM Line Drain Isol). 	
	RO	<ul style="list-style-type: none"> Dispatch operator to unlock and close: 	<p>NOTE: SRO will dispatch NLO.</p> <p>Floor/Booth Instructor: Acknowledge as appropriate.</p>
		<ul style="list-style-type: none"> 1SA-2 (SM 1B to TD CA Pump Manual Isol) (Unit 1 interior doghouse, 767+12, FF-53) 	
		<ul style="list-style-type: none"> 1SA-78 (SM 1B to TD CA Pump Loop Seal Isol) (Unit 1 interior doghouse, 767+10, FF-53). 	<p>Booth Instructor: Wait 2 minutes, Insert LOA:</p> <p>SA003 = 0</p> <p>And then, report as NLO that Valves are closed.</p>
		<ul style="list-style-type: none"> For 1C S/G: 	
		<ul style="list-style-type: none"> Check the following – CLOSED: 	

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Event Description: Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> MSIV 	
		<ul style="list-style-type: none"> MSIV bypass valve. 	
		<ul style="list-style-type: none"> Check SM PORV – CLOSED. 	
		<ul style="list-style-type: none"> Check “S/G C FDW ISOLATED” status light (1SI-4) – LIT. 	
		<ul style="list-style-type: none"> Check BB Valves – CLOSED: 	
		<ul style="list-style-type: none"> 1BB-3B (1C S/G Blowdown Cont Outside Isol Control) 	
		<ul style="list-style-type: none"> 1BB-7A (C S/G BB Cont Inside Isol). 	
		<ul style="list-style-type: none"> Close 1SM-95 (C SM Line Drain Isol). 	
		<ul style="list-style-type: none"> Dispatch operator to unlock and close: 	<p>NOTE: SRO will dispatch NLO.</p> <p>Floor/Booth Instructor: Acknowledge as appropriate.</p>
		<ul style="list-style-type: none"> 1SA-1 (SM 1C to TD CA Pump Manual Isol) (Unit 1 interior doghouse 767+10, FF-53, above ladder) 	
		<ul style="list-style-type: none"> 1SA-77 (SM 1C to TD CA Loop Seal Isol) (Unit 1 interior doghouse, 767+10, FF-53). 	<p>Booth Instructor: Wait 2 minutes, Insert LOA:</p> <p>SA002 = 0</p> <p>And then, report as NLO that Valves are closed.</p>
		<ul style="list-style-type: none"> For 1D S/G: 	
		<ul style="list-style-type: none"> Check the following – CLOSED: 	
		<ul style="list-style-type: none"> MSIV 	
		<ul style="list-style-type: none"> MSIV bypass valve. 	
	RO	<ul style="list-style-type: none"> Check SM PORV – CLOSED. 	
		<ul style="list-style-type: none"> Check “S/G D FDW ISOLATED” status light (1SI-4) – LIT. 	
		<ul style="list-style-type: none"> Check BB valves – CLOSED: 	
		<ul style="list-style-type: none"> 1BB-4B (1D S/G Blowdown Cont Outside Isol Control) 	

Op Test No.: N08-1 Scenario # 3 Event # 6, 7, & 8 Page 42 of 44Event Description: **Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1BB-8A (D S/G BB Cont Inside Isol). 	
		<ul style="list-style-type: none"> Close 1SM-101 (D SM Line Drain Isol). 	
	SRO	(Step 4) Monitor shutdown margin during cooldown as follows:	
		<ul style="list-style-type: none"> WHEN the TSC is staffed, THEN request TSC to evaluate obtaining samples. 	NOTE: Any attempts to reach the TSC fail (The TSC is NOT yet staffed).
		<ul style="list-style-type: none"> WHEN each NC boron sample obtained, THEN: 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Perform shutdown margin calculation for Cold Shutdown Per OP/0/A/6100/006 (Reactivity Balance Calculation). 	
		<ul style="list-style-type: none"> Check shutdown margin – ADEQUATE. 	
	RO / BOP	(Step 5) Control feed flow as follows:	
		<ul style="list-style-type: none"> Check all S/G N/R levels – GREATER THAN 11% (32% ACC). 	
	RO / BOP	(Step 5a RNO) Maintain a minimum feed flow of 25 GPM to any S/G with a N/R level less than 11% (32% ACC).	
	RO / BOP	<ul style="list-style-type: none"> (Step 5b) Check cooldown rate in NC T-Colds – LESS THAN 100°F IN AN HOUR. 	
	RO / BOP	(Step 5b RNO) Perform the following:	
		<ul style="list-style-type: none"> Reduce feed flow to 25 GPM to each S/G. 	

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Event Description: Inadvertent MSI/ SM Safety Valves fail/ NI-9/10 fail to open									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		Critical Task: (ECA-2.1 A) Control the CA Flowrate to not exceed < 25 gpm per SG in order to minimize the NC Cooldown rate before a severe challenge (Orange Path) develops to the integrity CSF.	
At the discretion of the Lead Examiner terminate the exam.			



PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 24
TOPIC: NRC Simulator Exam
Scenario N08-1-4

REFERENCES:

1. PT/0/A/4150/041, "RCCA Bank Repositioning."
2. PT/1/A/4600/001, "RCCA Withdrawal Test."
3. OP/1/A/6100/010C, "Annunciator Response For Panel 1AD-2."
4. McGuire Technical Specifications.
5. OP/1/A/6100/010G, "Annunciator Response For Panel 1AD-6."
6. AP/1/A/5500/11, "Pressurizer Pressure Anomalies."
7. OP/1/A/6100/010H, "Annunciator Response For Panel 1AD-7."
8. AP/1/A/5500/012, "Loss of Letdown, Charging or Seal Injection."
9. AP/1/A/5500/005, "Generator Voltage and Electrical Grid Disturbances."
10. AP/1/A/5500/04, "Rapid Downpower."
11. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
12. EP/1/A/5000/FR-P.1, "Response to Imminent Pressurized thermal Shock Condition."
13. EP/1/A/5000/FR-Z.1, "Response to High Containment Pressure."
14. EP/1/A/5000/E-1, "Loss of Reactor or Secondary Coolant."
15. EP/1/A/5000/ES-1.3, "Transfer to Cold Leg Recirc."
16. EP/1/A/5000/F-0, "Critical Safety Function Status Trees."
17. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review: _____

March 6th, 2008
Rev. 2

Facility: McGuire		Scenario No.: 4	Op Test No.: N08-1
Examiners: _____		Operators: (SRO)	
_____		(OATC)	
_____		(BOP)	
Initial Conditions:		The Plant is at 100% power Steady-State (EOL), and been for the last 485 days. An RCCA Movement Test is in progress in accordance with PT/0/A/4150/041, "RCCA Bank Repositioning," and it is expected to be continued starting with Control Bank D on the upcoming shift.	
Turnover:		The following equipment is Out-Of-Service: 1A NV Pump (Expected back in 24-36 hours), 1FW-5020, FWST Level, failed last shift (IAE is investigating) and MCB Annunciator AD-12, E-5, "FWST Lo-Lo Temp," has alarmed spuriously several times over the last hour (IAE is investigating).	
Event No.	Malf. No.	Event Type*	Event Description
1	EDA349	I-RO I(TS)-SRO	RCCA Withdrawal Test/DRPI Failure
2	ILE003B	C-BOP C(TS)-SRO	Spray Valve fails open
3	NV029B	C-BOP C(TS)-SRO	NV Pump B trips/Loss of Charging
4	PLP-014	C-RO C-SRO	Electrical Grid Disturbances
5	NA	R-BOP N-RO N-SRO	Rapid Downpower
6	^(ANN) AD13E07	NA	Seismic Event
7	NC008B	M-RO M-BOP M-SRO	Large Break LOCA
8	ND001A ND001B	NA	1A/1B ND Pumps fail to auto start
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

McGuire 2008 NRC Scenario #4

The Plant is at 100% power Steady-State (EOL), and been for the last 485 days. An RCCA Movement Test is in progress in accordance with PT/0/A/4150/041, "RCCA Bank Repositioning," and it is expected to be continued starting with Control Bank D on the upcoming shift.

The following equipment is Out-Of-Service: 1A NV Pump (Expected back in 24-36 hours), 1FW-5020, FWST Level, failed last shift (IAE is investigating) and MCB Annunciator AD-12, E-5, "FWST Lo-Lo Temp," has alarmed spuriously several times over the last hour (IAE is investigating).

Shortly after taking the watch, the operator will perform the RCCA Movement Test on Control Bank D in accordance with PT/0/A/4150/041, "RCCA Bank Repositioning." After Control Bank D has been inserted 10 steps into the core, the DRPI for Control Rod D-4 will fail when the operator attempts to withdrawal the Control Bank D rods back to their original position. The operator will respond in accordance with 1AD-2/D-10, "RPI Urgent Failure," and address Technical Specification 3.1.7, "Rod Position Indication."

Following this, the controller for Pressurizer Spray Valve 1NC-29 will fail causing the Spray Valve to open, causing Pressurizer pressure to drop. The operator will respond in accordance with ARP1AD-6/C-6, "PZR Lo Press Control," and implement AP/1/A/5500/11, "Pressurizer Pressure Anomalies." The operator will address Technical Specification 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits."

After this, the 1B NV Pump will trip causing a Charging Line abnormal flow alarm. The operator will respond in accordance with 1AD-7/G-2, "Charging Line Abnormal Flow," and implement AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection." The operator will start the NV PD Pump to maintain Seal Injection flow. With two NV Pumps OOS the operator will address Technical Specification 3.5.2, "ECCS-Operating," and enter Technical Specification 3.0.3.

A short time later, SOC notifies McGuire Nuclear Station that sporadic grid voltage disturbances have been experienced in the region and that these may affect MNS operation. Over the next several minutes, grid voltage cycles between 216-231KV. The operator will respond in accordance with AP/1/A/5500/05, "Generator Voltage and Electrical Grid Disturbances," and make adjustments of Main Generator voltage.

Due to the degraded Charging (NV) System and the grid voltage fluctuations station management will direct a shutdown using AP/1/A/5500/04, "Rapid Downpower."

During the shutdown, the O.B.E. Exceeded alarm comes in, indicating that an earthquake has occurred. Within seconds a Large Break LOCA will occur on Loop B, and a Reactor Trip/Safety Injection will occur. The operator will enter E-0, "Reactor Trip or Safety Injection." On the Safety Injection, the 1A and 1B ND pumps fail to start automatically and will require manual action to start the pumps.

Upon completion of E-0, the operator will transition to E-1, "Loss of Reactor or Secondary Coolant." However, upon transition an Orange Path will exist on both the Integrity and Containment Critical Safety Functions. The operator will first address FR-P.1, "Response to Imminent Pressurized thermal Shock Condition," and then transition to FR-Z.1, "Response to High Containment Pressure." If these procedures are completed the operator will transition to E-1, "Loss of Reactor or Secondary Coolant" however, it is more likely that Cold Leg

Scenario Event Description

NRC Scenario 4

Recirculation transition criteria will be met during the performance of the two Functional Recovery Procedures. If so, the operator will transition to ES-1.3, "Transfer to Cold Leg Recirc," on low FWST level.

The operator will place Cold Leg Recirculation in service in accordance with ES-1.3. The scenario will terminate at Step 8 of ES-1.3 when the operator is directed to check if NS should be aligned for Recirc.

Critical Tasks:

SS (4600/113/E13.19)

Close the Spray Valve within 1 minute to avoid a reactor trip.

E-0 H

Manually start at least one ND Pump before transition out of E-0.

SS (4600/113/E13.8 1.b)

Align ECCS such that FW-27A is closed by 195 seconds after FWST Lo Level alarm, and ND-58A/NI-136 B are opened by 355 seconds after FWST Lo Level alarm.

Scenario Event Description

NRC Scenario 4

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		IC - 112	
<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	See Shift Turnover Information
<input type="checkbox"/>		(LOA) NV046 Set = Racked Out	1A NV Pump OOS
<input type="checkbox"/>		(XMT) FW006 Set = 0	1FW-5020, FWST Level Failed Low
<input type="checkbox"/>		(MALF) ND001A (MALF) ND001B	1A/1B ND Pumps fail to auto start
<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.	
<input type="checkbox"/>	Prior to Crew Briefing	RUN	
<input type="checkbox"/>	Crew Briefing		
	<ol style="list-style-type: none"> 1. Assign Crew Positions based on evaluation requirements 2. Review the Shift Turnover Information with the crew. 3. Provide SRO with marked up copy of PT/0/A/4150/041 (marked up through section 12.1.7.5 with all repositioned Banks left at 226 Steps). Also provide Enclosure 13.1 of PT/1/A/4600/001 marked up through each Shutdown Bank. 4. Direct the crew to Review the Control Boards taking note of present conditions, alarms. 		

Scenario Event Description

NRC Scenario 4

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	T-0	Begin Familiarization Period	
<input type="checkbox"/>	At direction of examiner	(MALF) EDA349 Set = INSERT Trigger 1	RCCA Withdrawal Test/DRPI Failure
<input type="checkbox"/>	At direction of examiner	(MALF) ILE003B Severity 100 Ramp 10 Trigger 3	Spray Valve fails open
<input type="checkbox"/>	At direction of examiner	(MALF) NV029B Set = INSERT Trigger 5	NV Pump B trips/Loss of Charging
<input type="checkbox"/>	At direction of examiner	PLP-014 Set = 216 Ramp = 120 seconds Trigger 7 After Adjustment: Set = 231 Ramp = 120 seconds	Electrical Grid Disturbances
	At direction of examiner	NA	Rapid Downpower
<input type="checkbox"/>	At direction of examiner	(ANN) AD13E07 Set = ON Trigger 9	Seismic Event
<input type="checkbox"/>	At direction of examiner	(MALF) NC008B Set = INSERT Trigger 9 (45 Seconds Delayed)	Large Break LOCA T=0; 1A/1B ND Pumps fail to auto start
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>1</u>	Page	<u>7</u>	of	<u>52</u>
Event Description: RCCA Withdrawal Test/DRPI Failure									
Time	Position	Applicant's Actions or Behavior							

Shortly after taking the watch, the operator will perform the RCCA Movement Test on Control Bank D in accordance with PT/0/A/4150/041, "RCCA Bank Repositioning." After Control Bank D has been inserted 10 steps into the core, the DRPI for Control Rod D-4 will fail when the operator attempts to withdrawal the Control Bank D rods back to their original position. The operator will respond in accordance with 1AD-2/D-10, "RPI Urgent Failure," and address Technical Specification 3.1.7, "Rod Position Indication."

Booth Operator Instructions: NA

Indications Available: NA

Time	Pos.	Expected Actions/Behavior	Comments
PT/0/A/4150/041, RCCA BANK REPOSITIONING			
	RO	(Step 12.1.7.6) Control Bank D (CBD):	
		<ul style="list-style-type: none"> Select "CBD" with "CRD Bank Select". 	
		<ul style="list-style-type: none"> Check "GRP SELECT" light B on the Power Cabinets 1BD and is illuminated 2BD 	NOTE: RO will contact IAE to determine. If so, Booth Instructor report Both lights are LIT.
		<ul style="list-style-type: none"> Insert CBD 10 steps. 	
Booth Operator Instructions: At the START of Rod Withdrawal Operate Trigger #1 (EDA349).			
Indications Available:			
<ul style="list-style-type: none"> 1AD-2/D-10, "RPI Urgent Failure." 1AD-2/D-9, "RPI at Bottom Rod Drop." 1AD-2/E-10, "RPI Non-Urgent Failure." Rod Bottom Light. No accompanying NCS Temperature Change. (However Rods have been inserted 10 steps) 			
OP/1/A/6100/010C, ANNUNCIATOR RESPONSE FOR PANEL 1AD-2 D10, RPI URGENT FAILURE			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>52</u>
Event Description: RCCA Withdrawal Test/DRPI Failure									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(IA Step 1) Check to see which rod(s) is affected.	NOTE: Rod D-4 is affected.
	SRO	(IA Step 2) IF Unit is in Mode 2 (pulling rods toward criticality), 3, 4, or 5, move rods to ensure OAC DRPI application is updating.	NOTE: Unit is in Mode 1, SRO recognizes NOT applicable.
	SRO	(IA Step 3) IF actual rod misalignment exists or rod control system malfunctions, go to AP/1/A/5500/014 (Rod Control Malfunction).	NOTE: Actual Rod Misalignment does NOT exist. Examiner NOTE: If the crew misdiagnoses and goes to AP14, allow crew time to determine that they do NOT have a Dropped Rod. If crew goes to AP14, <u>when RE asked to conduct Flux Map, Booth Instructor:</u> report as RE, that a Rod has NOT dropped.
	SRO	(IA Step 4) IF in Mode 1-2:	
		<ul style="list-style-type: none"> IF failure on only one Data train (either Data A or Data B) AND does NOT clear: 	
		<ul style="list-style-type: none"> Using the keypad control, page to the "(A or B) DATA ONLY" page (DATA ONLY that is NOT in alarm) 	
		<ul style="list-style-type: none"> Compare DATA ONLY data to Rod Demand Step Counter for Tech Spec rod alignment. 	
		<ul style="list-style-type: none"> Refer to Tech Specs. 	NOTE: SRO will refer to TS 3.1.7.
		<ul style="list-style-type: none"> Contact System Engineering. 	NOTE: SRO may call WCC/SE to address. If so, Booth Instructor acknowledge as WCC/SE as appropriate.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>1</u>	Page	<u>9</u>	of	<u>52</u>
Event Description: RCCA Withdrawal Test/DRPI Failure									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(IA Step 5) IF both channels of DRPI and OAC Rods indication lost, refer to ITS 3.1.7.	
	SRO	(SA Step 1) Have Engineering determine and correct problem.	NOTE: SRO may call WCC/SE to address. If so, Booth Instructor acknowledge as WCC/SE as appropriate.
	SRO	(SA Step 2) Check proper VL and RV alignment per OP/1/A/6450/001 (Containment Ventilation System) to maintain desired lower containment temperature.	
	SRO	(SA Step 3) Have Reactor Group run OP/0/A/6150/012 (Non-Indicating RCCA Position Determination) as necessary per ITS 3.1.7.	NOTE: SRO may call WCC/RG to address. If so, Booth Instructor acknowledge as WCC/RG as appropriate.
			Booth Instructor: Delete Malf-EDA349 As IAE report that DRPI problem has been fixed, and that they should verify this.
PT/0/A/4150/041, RCCA BANK REPOSITIONING			
	RO	<ul style="list-style-type: none"> (Step 12.1.7.6) Withdraw 10 steps. 	NOTE: The SRO have the RO restore rods to desired position (226).
		<ul style="list-style-type: none"> Ensure both group demand counters are on the same step. 	
TECHNICAL SPECIFICATION 3.1.7, ROD POSITION INDICATION			

Op Test No.: N08-1 Scenario # 4 Event # 1 Page 10 of 52Event Description: **RCCA Withdrawal Test/DRPI Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments						
	SRO	3.1.7 Rod Position Indication							
	SRO	LCO 3.1.7 The Digital Rod Position Indication (DRPI) System and the Demand Position Indication System shall be OPERABLE.							
	SRO	APPLICABILITY: MODES 1 and 2.							
	SRO	ACTIONS							
		<table border="1"> <thead> <tr> <th>CONDITION</th> <th>REQUIRED ACTION</th> <th>COMPLETION TIME</th> </tr> </thead> <tbody> <tr> <td>A. One DRPI per group inoperable for one or more groups.</td> <td>A.1 Verify the position of the rods with inoperable position indicators by using movable incore detectors. OR A.2 Reduce THERMAL POWER to $\leq 50\%$ RTP.</td> <td>Once per 8 hours 8 hours</td> </tr> </tbody> </table>	CONDITION	REQUIRED ACTION	COMPLETION TIME	A. One DRPI per group inoperable for one or more groups.	A.1 Verify the position of the rods with inoperable position indicators by using movable incore detectors. OR A.2 Reduce THERMAL POWER to $\leq 50\%$ RTP.	Once per 8 hours 8 hours	
CONDITION	REQUIRED ACTION	COMPLETION TIME							
A. One DRPI per group inoperable for one or more groups.	A.1 Verify the position of the rods with inoperable position indicators by using movable incore detectors. OR A.2 Reduce THERMAL POWER to $\leq 50\%$ RTP.	Once per 8 hours 8 hours							
At the discretion of the Lead Examiner move to Event #2.									

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>2</u>	Page	<u>11</u>	of	<u>52</u>
Event Description:		Spray Valve fails open							
Time	Position	Applicant's Actions or Behavior							

Following this, the controller for Pressurizer Spray Valve 1NC-29 will fail causing the Spray Valve to open, causing Pressurizer pressure to drop. The operator will respond in accordance with ARP1AD-6/C-6, "PZR Lo Press Control," and implement AP/1/A/5500/11, "Pressurizer Pressure Anomalies." The operator will address Technical Specification 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits."

Booth Operator Instructions: Operate Trigger #3 (ILE003B (100)).

Indications Available:

- Increasing output on Controller for 1NC-29.
- 1AD-6, C-6, "Pzr Lo Press Control."
- Pzr pressure decreases (to approximately 2160 psig).

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010G, ANNUNCIATOR RESPONSE FOR PANEL 1AD-6 C-6, PZR LO PRESS CONTROL			
	SRO	(IA) IF Pzr pressure decreasing, go to AP/1/A/5500/011 (Pressurizer Pressure Anomalies).	NOTE: Crew may NOT address ARP, but enter AP11 directly.
	SRO	(SA) Refer to Tech Specs for minimum instrumentation requirements.	
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.	
	BOP	(Step 3) Check Pzr PORVs – CLOSED.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>2</u>	Page	<u>12</u>	of	<u>52</u>
Event Description:	Spray Valve fails open								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 4) Check Pzr spray valves – CLOSED.	NOTE: 1NC-29 will be OPEN.
		(Step 4 RNO) Perform the following:	
		<ul style="list-style-type: none"> Close Pzr spray valve(s). 	NOTE: The BOP will take manual control of and close 1NC-29.
		<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.
Critical Task: (SS-4600/113/E13.19) Close the Spray Valve within 1 minute to avoid a reactor trip.			
	BOP	(Step 5) Check Pzr PORVs – CLOSED.	
	BOP	(Step 6) Check Pzr spray valves – CLOSED.	NOTE: Both Spray Valves will be CLOSED.
	SRO	(Step 7) GO TO Step 9.	
	SRO	(Step 9) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 10) Check 1NV-21A (NV Spray To PZR Isol) – CLOSED.	
	BOP	(Step 11) Check the following Pzr heaters – ON:	
		<ul style="list-style-type: none"> 1A 	
		<ul style="list-style-type: none"> 1B 	
		<ul style="list-style-type: none"> 1D 	

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Event Description: **Spray Valve fails open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12) Check 1C Pzr heaters – ON.	
	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”.	
	BOP	(Step 15) Check “1NC-29 PRESSURIZER SPRAY EMERGENCY CLOSE” switch – SELECTED TO “NORMAL”.	NOTE: 1NC-29 Switch will be selected to CLOSE.
	SRO	(Step 15 RNO) Notify station management to ensure switch restored to “NORMAL” once spray valve is repaired.	NOTE: SRO may call WCC to address. 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.	
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	
	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.	

Op Test No.: N08-1 Scenario # 4 Event # 2 Page 14 of 52Event Description: **Spray Valve fails open**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	APPLICABILITY: MODE 1.			
	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.	
At the discretion of the Lead Examiner move to Event #3.					

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>15</u>	of	<u>52</u>
Event Description: NV Pump B Trips/ Loss of Charging									
Time	Position	Applicant's Actions or Behavior							

After this, the 1B NV Pump will trip causing a Charging Line abnormal flow alarm. The operator will respond in accordance with 1AD-7/G-2, "Charging Line Abnormal Flow," and implement AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection." The operator will start the NV PD Pump to maintain Seal Injection flow. With two NV Pumps OOS the operator will address Technical Specification 3.5.2, "ECCS-Operating," and enter Technical Specification 3.0.3.

Booth Operator Instructions: Operate Trigger #5 (NV029B).

Indications Available:

- 1AD-7, G-2, "Charging Line Abnormal Flow."
- 1AD-7, J-1, "NC Pump Seal Inj Lo Flow."

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010H, ANNUNCIATOR RESPONSE FOR PANEL 1AD-7 G-2, CHARGING LINE ABNORMAL FLOW			
	SRO/ RO	(IA Step 1) IF High flow:	NOTE: Crew may NOT address ARP, but enter AP12 directly.
	SRO	(IA Step 2) IF Low flow:	
		<ul style="list-style-type: none"> • IF 1A(1B) NV pump trips, go to AP/1/A/5500/012 (Loss of Letdown, Charging or Seal Injection). 	
		<ul style="list-style-type: none"> • IF failure of "PD Pump Speed Cntrl" or 1NV-238 (Charging Line Flow control), place controller in "MAN" and establish normal charging flow. 	
AP/1/A/5500/12, LOSS OF LETDOWN, CHARGING OR SEAL INJECTION			
			NOTE: Crew will carry out Immediate Actions of AP12, prior to the SRO addressing the AP.
	BOP	(Step 1) IF a loss of charging through the Regenerative HX has occurred, THEN ensure the following are closed:	

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Event Description:		NV Pump B Trips/ Loss of Charging							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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). 	NOTE: Normal Letdown will be isolated.
	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) 	
		<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.
			NOTE: SRO may call WCC to address and/or dispatch NLO to check out pump. If so, Booth Instructor acknowledge as WCC, Floor Instructor acknowledge as NLO.
	SRO	(Step 6) IF this AP entered due to loss of letdown only, THEN GO TO Step 36.	NOTE: AP entered due to Loss of Charging; continue.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>17</u>	of	<u>52</u>
Event Description:	NV Pump B Trips/ Loss of Charging								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 7) Check any of the following charging pumps – ON.	NOTE: Both 1A and 1B NV are OFF.
	SRO	(Step 7 RNO) IF all pumps off, THEN GO TO Step 11.	
	BOP	(Step 11) Monitor NC pump parameters:	
		<ul style="list-style-type: none"> Lower bearing temperature – LESS THAN 225°F 	
		<ul style="list-style-type: none"> Number 1 seal outlet temperature – LESS THAN 235°F 	
		<ul style="list-style-type: none"> “NC PUMP HI-HI VIBRATION” alarm (1AD-6, F-11) – DARK. 	
	BOP	(Step 12) IF AT ANY TIME NC pump temperature(s) reach trip criteria, OR continuous HI-HI vibration alarm occurs, THEN trip associated NC pump(s) as follows:	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Close spray valve on affected NC pump(s). 	
		<ul style="list-style-type: none"> Stop any dilution in progress. 	
		<ul style="list-style-type: none"> IF in Mode 1 or 2, THEN: <ul style="list-style-type: none"> Trip reactor. Stop affected NC pump(s). 	
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection) while continuing with this procedure as time allows. 	
		<ul style="list-style-type: none"> Stop affected NC pump(s). 	
	BOP	(Step 13) Check NC pump thermal barriers as follows:	
		<ul style="list-style-type: none"> Check the following valves – OPEN: 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>18</u>	of	<u>52</u>
Event Description:	NV Pump B Trips/ Loss of Charging								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1KC-394A (A NC Pump Therm Bar OtIt) 	
		<ul style="list-style-type: none"> 1KC-345A (C NC Pump Therm Bar OtIt) 	
		<ul style="list-style-type: none"> 1KC-364B (B NC Pump Therm Bar OtIt) 	
		<ul style="list-style-type: none"> 1KC-413B (D NC Pump Therm Bar OtIt). 	
	SRO	<ul style="list-style-type: none"> Contact station management to evaluate the following: 	<p>NOTE: SRO may call WCC to address.</p> <p>If so, Booth Instructor acknowledge as WCC.</p>
		<ul style="list-style-type: none"> Evaluate lowering KC temperature to improve thermal barrier cooling. 	
	BOP	(Step 14) Check "SEAL WATER INJ FILTER HI D/P" alarm (1AD-7, L-4) – DARK.	
	BOP	(Step 15) align NV pump to available suction source:	
		<ul style="list-style-type: none"> Check VCT – AVAILABLE AS SUCTION SOURCE. 	
		<ul style="list-style-type: none"> Ensure the following valves are open: 	
		<ul style="list-style-type: none"> 1NV-141A (VCT Outlet Isol) 	
		<ul style="list-style-type: none"> 1NV-142B (VCT Outlet Isol). 	
	SRO	(Step 16) Check if gas binding of NV pumps – SUSPECTED:	<p>NOTE: Gas Binding is NOT suspected.</p> <p>Booth Instructor As NLO report back Overcurrent Relay (51) has operated for 1B NV Pump.</p>
	SRO	(Step 16 RNO) GO TO Step 20.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>19</u>	of	<u>52</u>
Event Description: NV Pump B Trips/ Loss of Charging									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 20) Check any of the following charging pumps – ON:	NOTE: No NV Pumps are ON.
		• 1A NV pump	
		OR	
		• 1B NV pump	
		OR	
		• PD pump.	
	BOP	(Step 20 RNO) IF all pumps off, THEN perform the following:	
		• Fully open 1NV-241 (Seal Inj Flow Control).	
		• Close 1NV-238 (Charging Line Flow Control).	
	BOP	(Step 21) Check both of the following – OPEN:	
		• 1NV-244A (Charging Line Cont Outside Isol)	
		• 1NV-245B (Charging Line Cont Outside Isol).	
	BOP	(Step 22) Check one of the following – OPEN:	
		• 1NV-13B (NV Supply To A NC Loop Isol)	
		OR	
		• 1NV-16A (NV Supply To D NC Loop Isol).	
	BOP	(Step 23) Check all NC pumps – ON.	NOTE: All NC Pumps are ON.
	BOP	(Step 24) Check any of the following charging pumps – ON:	NOTE: No NV Pumps are ON.
		• 1A NV pump	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>20</u>	of	<u>52</u>
Event Description: NV Pump B Trips/ Loss of Charging									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		OR	
		<ul style="list-style-type: none"> 1B NV pump 	
		OR	
		<ul style="list-style-type: none"> PD pump. 	
	SRO	(Step 24 RNO) IF all pumps off, THEN GO TO Step 26.	
	BOP	(Step 26) Start 1A or 1B NV pump as follows:	NOTE: 1A NV is OOS.
		<ul style="list-style-type: none"> Start associated NV Lube Oil pump. 	
		<ul style="list-style-type: none"> Start 1A or 1B NV pump. 	
	BOP	(Step 26 RNO) IF PD pump is available, THEN start PD pump as follows:	NOTE: PD Pump will be started.
		<ul style="list-style-type: none"> IF SI has occurred OR 1ETA is deenergized, THEN GO TO Step 27. 	
		<ul style="list-style-type: none"> Ensure 1RN-42A (AB Non Ess Supply Isol) is open. 	
		<ul style="list-style-type: none"> Open the following valves: 	
		<ul style="list-style-type: none"> 1RN-64A (AB Non Ess Return Isol) 	
		<ul style="list-style-type: none"> 1RN-63B (AB Non Ess Return Isol). 	
		<ul style="list-style-type: none"> Place PD pump speed control in manual and set for minimum speed. 	
		<ul style="list-style-type: none"> Open 1NV-1047A (PD Pump Recirculation). 	
		<ul style="list-style-type: none"> Start the PD pump. 	
		<ul style="list-style-type: none"> Ensure 1NV-1047A closes after 2 minutes. 	
	BOP	<ul style="list-style-type: none"> (Step 26c) Place associated NV Lube Oil pump in "AUTO". 	

Op Test No.: N08-1 Scenario # 4 Event # 3 Page 21 of 52Event Description: **NV Pump B Trips/ Loss of Charging**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 27) Check any of the following charging pumps – ON.	
		<ul style="list-style-type: none"> • PD pump. 	
	BOP	(Step 28) Check seal injection flow to any NC pump – LESS THAN 6 GPM.	
	BOP	(Step 29) Slowly restore seal injection flow to limit cooldown of NC pump lower bearing temperature to 1°F per minute by performing the following steps concurrently:	
		<ul style="list-style-type: none"> • Monitor NC pump lower bearing temperatures. 	
		<ul style="list-style-type: none"> • Slowly establish charging flow by performing one of the following: 	
		<ul style="list-style-type: none"> • Throttle open 1NV-238 (Charging Line Flow Control) 	
		OR	
		<ul style="list-style-type: none"> • WHEN 1NV-1047A (PD Pump Recirculation) is closed, THEN raise PD pump speed control in manual. 	
		<ul style="list-style-type: none"> • Slowly raise seal injection flow by throttling close 1NV-241 (Seal Inj Flow Control). 	
	BOP	(Step 30) Check seal injection flow – ESTABLISHED.	
	SRO	(Step 31) GO TO Step 33.	
	BOP	(Step 33) Check Unit 1 Standby Makeup pump – OFF.	
	BOP	(Step 34) Check normal or excess letdown – IN SERVICE.	NOTE: Normal Letdown is NOT in service.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>22</u>	of	<u>52</u>
Event Description:	NV Pump B Trips/ Loss of Charging								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 34 RNO) GO TO Step 36.	
	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".	
	BOP	(Step 38) Ensure charging flow going down to maintain Pzr at program level.	
	BOP	(Step 39) Check "LETDN RELIEF HI TEMP" alarm (1AD-7, I-4) – HAS REMAINED DARK.	
	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. 	NOTE: One Spray Valve is available, the other is isolated due to a previous malfunction.
		<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. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>23</u>	of	<u>52</u>
Event Description:	NV Pump B Trips/ Loss of Charging								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 42) Check the following valves – 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). 	
	SRO	(Step 43) GO TO Step 48.	
	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). 	
		<ul style="list-style-type: none"> Establish cooling to Regenerative HX by performing the following concurrently: 	
	BOP	<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. 	
		<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. 	
		<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-235A (Variable L/D Orifice Outlet Cont Isol). 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>24</u>	of	<u>52</u>
Event Description:		NV Pump B Trips/ Loss of Charging							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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. 	
		<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. 	
		<ul style="list-style-type: none"> IF more letdown flow required OR a different letdown orifice is desired, THEN REFER TO: 	
		<ul style="list-style-type: none"> OP/1/A/6200/001 A (Chemical and Volume Control System Letdown), Enclosure 4.5 (Establishing Maximum Normal Letdown) 	
		OR	
		<ul style="list-style-type: none"> OP/1/A/6200/001 A (Chemical and Volume Control System Letdown), Enclosure 4.3 (Swapping Letdown Orifices). 	
		<ul style="list-style-type: none"> Check 1NV-124 (letdown Pressure Control) – IN MANUAL. 	
		<ul style="list-style-type: none"> Check potentiometer setting for 1NV-124 (Letdown Pressure Control) set at – APPROXIMATELY 5.8. 	
		<ul style="list-style-type: none"> Manually adjust 1NV-124 to obtain letdown pressure of 350 PSIG. 	
		<ul style="list-style-type: none"> Place 1NV-124 in “AUTO”. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>25</u>	of	<u>52</u>
Event Description: NV Pump B Trips/ Loss of Charging									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Ensure letdown pressure controlled at 350 PSIG. 	
		<ul style="list-style-type: none"> Check 1A or 1B NV pump – SUPPLYING NORMAL CHARGING. 	NOTE: PD Pump is supplying Charging flow.
		<ul style="list-style-type: none"> IF #1 PD pump is supplying normal charging, THEN GO TO 48.p. 	
		<ul style="list-style-type: none"> Notify Chemistry that normal letdown is in service. 	NOTE: BOP may call Chemistry. If so, Booth Instructor acknowledge as Chemistry.
		<ul style="list-style-type: none"> Check position of 1NV-127A (L/D Hx Outlet 3-Way Temp Cntrl) – ALIGNED TO “DEMIN”. 	
		<ul style="list-style-type: none"> Operate Pzr heaters as desired. 	
		<ul style="list-style-type: none"> WHEN time allows, THEN notify engineering to document the following transients: 	NOTE: SRO may call WCC to address. If so, Booth Instructor acknowledge as WCC.
		<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 spray nozzle transient. 	
		<ul style="list-style-type: none"> Check excess letdown – ISOLATED. 	
	SRO	<ul style="list-style-type: none"> RETURN TO procedure and step in effect. 	NOTE: SRO will likely conduct a Focus Brief.
			Booth Instructor: Call as SOC and report that there have been sporadic Grid Voltage Disturbances that may affect MNS. (This will set up Event 4).
TECHNICAL SPECIFICATION 3.5.2, ECCS-OPERATING			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>3</u>	Page	<u>26</u>	of	<u>52</u>
Event Description: NV Pump B Trips/ Loss of Charging									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior			Comments
	SRO	3.5.2 ECCS – Operating			
	SRO	LCO 3.5.2 Two ECCS trains shall be OPERABLE.			
	SRO	APPLICABILITY: MODES 1, 2, and 3.			
	SRO	ACTIONS			
	SRO	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	
	SRO	Enter T.S. 3.0.3 based on two NV Pumps inoperable.			<p>NOTE: Operator may or may not start downpower at this time.</p> <p>Examiner NOTE: Before any downpower is started move to Event #4.</p>
At the discretion of the Lead Examiner move to Event #4.					

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>4</u>	Page	<u>27</u>	of	<u>52</u>
Event Description:		Electrical Grid Disturbances							
Time	Position	Applicant's Actions or Behavior							

A short time later, SOC notifies McGuire Nuclear Station that sporadic grid voltage disturbances have been experienced in the region and that these may affect MNS operation. Over the next several minutes, grid voltage cycles between 216-231KV. The operator will respond in accordance with AP/1/A/5500/05, "Generator Voltage and Electrical Grid Disturbances," and make adjustments of Main Generator voltage.

Booth Operator Instructions: Operate Trigger #7 (PLP-014 (216)).

Indications Available:

- OAC Alarm M1A0960 Line Voltage Up/Down
- MVARs outside Main Generator Capability Curve on OAC.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/05, GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES			
	SRO	(Step 1) Announce occurrence on page.	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	SRO	(Step 2) GO TO appropriate enclosure:	
		<ul style="list-style-type: none"> • Enclosure 1 (Abnormal Generator or Grid Voltage) 	
AP/1/A/5500/05, GENERATOR VOLTAGE AND ELECTRIC GRID DISTURBANCES ENCLOSURE 1, ABNORMAL GENERATOR OR GRID VOLTAGE			
	RO	(Step 1) Check Generator – TIED TO GRID.	
	RO	(Step 2) Monitor Generator capability Curve as follows:	
		<ul style="list-style-type: none"> • IF generator voltage less than 24KV, THEN REFER TO Enclosure 4 (Generator Capability Curve – 22.8 KV) 	
		OR	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>4</u>	Page	<u>28</u>	of	<u>52</u>
Event Description:		Electrical Grid Disturbances							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF generator voltage greater than or equal to 24KV, THEN REFER TO Enclosure 5 (Generator Capability Curve – 24 KV). 	
	RO	(Step 3) Check Generator MVARs – EXCEED GENERATOR CAPABILITY CURVE.	
	RO	(Step 4) Adjust MVARs to within the capability curve by performing one of the following:	
		<ul style="list-style-type: none"> Depress “LOWER” on the “VOLTAGE ADJUST” to reduce lagging MVARs 	
		OR	
		<ul style="list-style-type: none"> Depress “RAISE” on the “VOLTAGE ADJUST” to reduce leading MVARs. 	
	RO	(Step 5) Check Generator MVARs – WITHIN LIMITS OF GENERATOR CAPABILITY CURVE.	NOTE: After the adjustment MVARs will be within Capability Curve.
Booth Operator Instructions: Change <u>PLP-014</u> to <u>231</u> over <u>120</u> Second Ramp.			
NOTE: This will require a second MVAR adjustment by RO.			
	RO	(Step 4) Adjust MVARs to within the capability curve by performing one of the following:	
		<ul style="list-style-type: none"> Depress “LOWER” on the “VOLTAGE ADJUST” to reduce lagging MVARs 	
		OR	
		<ul style="list-style-type: none"> Depress “RAISE” on the “VOLTAGE ADJUST” to reduce leading MVARs. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>4</u>	Page	<u>29</u>	of	<u>52</u>
Event Description:		Electrical Grid Disturbances							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 5) Check Generator MVARs – WITHIN LIMITS OF GENERATOR CAPABILITY CURVE.	NOTE: After the adjustment MVARs will be within Capability Curve.
	RO	(Step 6) Determine status of voltage regulator as follows:	
		<ul style="list-style-type: none"> Check status of voltage regulator on OAC using turn on code "MAINGEN". 	
		<ul style="list-style-type: none"> Dispatch operator to check for alarms on Unit 1 local panel. 	NOTE: SRO may dispatch NLO from Control Room. If so, Floor Instructor acknowledge. Wait 5 minutes and then report that there are NO alarms on the Unit 1 Local Panel.
		<ul style="list-style-type: none"> Contact dispatcher to determine if generator voltage problem is due to disturbances on the grid. 	NOTE: SRO may NOT contact Dispatcher since SOC has notified them of possible Grid Disturbances. If SRO does contact SOC, Booth Instructor acknowledge, and report that they may continue. The source is unknown.
	SRO	(Step 7) Evaluate the following:	
		<ul style="list-style-type: none"> Stopping any ongoing surveillance testing. 	
		<ul style="list-style-type: none"> Stopping any ongoing maintenance activities. 	
		<ul style="list-style-type: none"> Returning systems to normal/functional. 	
	SRO	(Step 8) Contact the following personnel for guidance:	NOTE: SRO may call WCC to address. If so, Booth Instructor acknowledge as WCC.
		<ul style="list-style-type: none"> System Engineering 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>4</u>	Page	<u>30</u>	of	<u>52</u>
Event Description:	Electrical Grid Disturbances								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Maintenance Technical Support. 	
	SRO	(Step 9) IF AT ANY TIME System Engineering or Maintenance Technical Support request operation of the voltage regulator from the local panel, THEN dispatch licensed operator to perform applicable section(s) of OP/1/A/6300/001 (Turbine Generator Startup/Shutdown), Enclosure 4.10 (Voltage Regulator Operation From U1 Gen Voltage Reg Local Control Panel).	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
At the discretion of the Lead Examiner move to Event #5.			

Op Test No.: N08-1 Scenario # 4 Event # 5 Page 31 of 52Event Description: **Rapid Downpower**

Time	Position	Applicant's Actions or Behavior
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Due to the degraded Charging (NV) System and the grid voltage fluctuations station management will direct a shutdown using AP/1/A/5500/04, "Rapid Downpower."

Floor Instructor: **As OSM, because of TS 3.0.3 and Grid Voltage Fluctuations, direct that the Unit be taken off line within 2 hours in accordance with AP4, Rapid Downpower.**

Indications Available: NA

Time	Pos.	Expected Actions/Behavior	Comments
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.	
	RO	(Step 4 RNO) Depress "MW IN/MW OUT" pushbutton.	
	SRO	(Step 5) Check shutdown to Mode 3 – DESIRED.	
	SRO	(Step 6) Check if "Shutdown Via Reactor Trip form 15% Power" appropriate:	NOTE: Trip from 15% will be desired.
		<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. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>5</u>	Page	<u>32</u>	of	<u>52</u>
Event Description:		Rapid Downpower							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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: SRO will determine 85% load reduction.
	RO	(Step 9) Check control rods – IN AUTO.	
	RO	(Step 9 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF auto control available, THEN place control rods in auto. 	NOTE: If NOT in AUTO, RO will place Rods in AUTO.
	SRO	(Step 10) Notify SOC of load reduction (red dispatcher phone).	Booth Instructor: Acknowledge as SOC.
	RO	(Step 11) Initiate turbine load reduction to desired load at desired rate.	NOTE: RO will start load reduction.
	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: 	NOTE: BOP will determine 600 gallons.
		<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.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>5</u>	Page	<u>33</u>	of	<u>52</u>
Event Description:	Rapid Downpower								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 13) check control rods – MOVING IN AS REQUIRED TO MAINTAIN T-AVE AT T-REF.	NOTE: RO will observe Control Rods stepping in.
	RO	(Step 14) Display rod Insertion Limits on OAC by entering turn on code "RIL".	
	RO/ BOP	(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. 	
	RO	(Step 16) IF AT ANY TIME during this procedure C-7A is received, THEN ensure Transient Monitor freeze is triggered.	
After Emergency Borate Valve 1NV-265B is closed, <u>OR</u> at the discretion of the Lead Examiner move to Events #6-8.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>34</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

During the shutdown, the O.B.E. Exceeded alarm comes in, indicating that an earthquake has occurred. Within seconds a Large Break LOCA will occur on Loop B, and a Reactor Trip/Safety Injection will occur. The operator will enter E-0, "Reactor Trip or Safety Injection." On the Safety Injection, the 1A and 1B ND pumps fail to start automatically and will require manual action to start the pumps. Upon completion of E-0, the operator will transition to E-1, "Loss of Reactor or Secondary Coolant." However, upon transition an Orange Path will exist on both the Integrity and Containment Critical Safety Functions. The operator will first address FR-P.1, "Response to Imminent Pressurized thermal Shock Condition," and then transition to FR-Z.1, "Response to High Containment Pressure." If these procedures are completed the operator will transition to E-1, "Loss of Reactor or Secondary Coolant" however, it is more likely that Cold Leg Recirculation transition criteria will be met during the performance of the two Functional Recovery Procedures. If so, the operator will transition to ES-1.3, "Transfer to Cold Leg Recirc," on low FWST level. The operator will place Cold Leg Recirculation in service in accordance with ES-1.3. The scenario will terminate at Step 8 of ES-1.3 when the operator is directed to check if NS should be aligned for Recirc.

Booth Operator Instructions: Operate Trigger #9 (ANN-AD13E07, NC008B (45 Seconds Delayed)).

Indications Available:

- 1AD-13, E-7, "O.B.E. Exceeded."
- Reactor Trip/Safety Injection.
- NC System Pressure goes down.
- Containment Pressure Increases

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			
	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. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>35</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3) Check Turbine Trip:	
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	
	RO / BOP	(Step 5) 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. 	
	SRO	(Step 6) 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 7) 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. 	NOTE: BOP may recognize that neither ND Pump started automatically and manually start both.
	BOP	(Step 7d RNO) Perform the following	
		<ul style="list-style-type: none"> Ensure both trains Phase A Isolation are initiated. 	
		<ul style="list-style-type: none"> Align or start S/I and Phase A components with individual windows in Group 4 as required. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>36</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> GO TO Step 7f. 	
	BOP	<ul style="list-style-type: none"> (Step 7f) Check LOCA Sequencer Actuated status light (1SI-14) on energized train(s) – LIT. 	
		<ul style="list-style-type: none"> Check the following windows on Monitor Light Panel Group 4 – LIT: 	
		<ul style="list-style-type: none"> C-3, "CONT ISOL PHASE A TRN A VLVS ALIGNED" 	
		<ul style="list-style-type: none"> C-6 "CONT ISOL PHASE A TRN B VLVS ALIGNED" 	
		<ul style="list-style-type: none"> F-4 "SAFETY INJECTION TRAIN A COMPONENTS ALIGNED" 	
		<ul style="list-style-type: none"> F-5 "SAFETY INJECTION TRAIN B COMPONENTS ALIGNED". 	
	BOP	(Step 8) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	
		<ul style="list-style-type: none"> (Step 8b) N/R level in at least 3 S/Gs – GREATER THAN 17%. 	
	BOP	(Step 9) Check all KC pumps – ON.	
	BOP	(Step 10) Check both RN pumps – ON.	
	SRO	(Step 11) Notify Unit 2 to start 2A RN pump.	Floor Instructor: As U2 RO report "2A RN Pump is running."
	RO	(Step 12) Check all S/G pressures – GREATER THAN 775 PSIG.	
	BOP	(Step 13) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment Pressure is > 3 psig.

Op Test No.: N08-1 Scenario # 4 Event # 6, 7, & 8 Page 37 of 52Event Description: **Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 13 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), THEN perform the following: 	
		<ul style="list-style-type: none"> Initiate Phase B and Containment Spray signal. 	
		<ul style="list-style-type: none"> IF Row G window is still dark, THEN: 	
		<ul style="list-style-type: none"> Check OAC Monitor Light Program ("MONL") for Phase B, and align valves. 	
		<ul style="list-style-type: none"> IF OAC is out of service, THEN ensure Phase B valves closed PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 12 (Phase B Valve Checklist), while continuing in this EP. 	
		<ul style="list-style-type: none"> Stop all NC pumps while maintaining seal injection flow. 	
		<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". 	
		<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>

Op Test No.: N08-1 Scenario # 4 Event # 6, 7, & 8 Page 38 of 52Event Description: **Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> WHEN 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>The SRO may ask U2 BOP to perform this action.</p> <p>If so, Floor Instructor: Acknowledge as U2 BOP.</p>
E-0, REACTOR TRIP OR SAFETY INJECTION ENCLOSURE 2, Phase B HVAC Equipment			
	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). 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>39</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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			
	RO/ BOP	(Step 14) Check S/I flow:	
		<ul style="list-style-type: none"> Check “NV PMPS TO COLD LEG FLOW” gauge – INDICATING FLOW. 	NOTE: Neither 1A or 1B NV Pump is running.
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 1600 PSIG. 	
		<ul style="list-style-type: none"> Check NI pumps – INDICATING FLOW. 	
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 286 PSIG. 	NOTE: BOP may recognize that neither ND Pump started automatically and manually start both.
		<ul style="list-style-type: none"> Check ND pumps – INDICATING FLOW TO COLD LEGS. 	
		<ul style="list-style-type: none"> Start ND pumps and align valves. 	
Critical Task: (E-0 H) Manually start at least one ND Pump before transition out of E-0.			
	SRO	(Step 15) 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.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>40</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 16) 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. 	
		<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%. 	NOTE: Adverse Containment Numbers will be used.
	RO	(Step 17) 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	(Step 17 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.
		<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). 	
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.	
	RO	(Step 3) Check MSR “RESET” light – LIT.	

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Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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, 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.	
	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. 	
E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 18) 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. 	

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Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 19) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	NOTE: There is NO NC Subcooling.
		(Step 19 RNO) IF at least one NV OR NI pump on, THEN stop all NC pumps while maintaining seal injection flow.	
	RO	(Step 20) 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 21) 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). 	
		<ul style="list-style-type: none"> S/G levels – STABLE OR GOING UP IN A CONTROLLED MANNER. 	
	BOP	(Step 22) Check if NC System intact:	
		<ul style="list-style-type: none"> Check containment EMFs – NORMAL: 	
		<ul style="list-style-type: none"> 1EMF-38(L) (Containment Particulate (LR)) 	NOTE: 1EMF-38(L) is in Trip 2.
		<ul style="list-style-type: none"> 1EMF-39(L) (Containment Gas (Lo Range)) 	NOTE: 1EMF-39(L) is in Trip 2.
		<ul style="list-style-type: none"> 1EMF-40 (Containment Iodine) 	

Op Test No.: N08-1 Scenario # 4 Event # 6, 7, & 8 Page 43 of 52Event Description: **Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto 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-9 (Reactor Bldg Incore Inst Rm) 	
		<ul style="list-style-type: none"> 1EMF-16 (Containment Refueling Brdg). 	
	BOP	(Step 22 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF H₂ Igniters are off, THEN perform the following: 	
		<ul style="list-style-type: none"> Energize H₂ Igniters by depressing "ON" and "OVERRIDE". 	
		<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: This action has been previously performed.</p> <p>If not reported Booth Instructor: As NLO, report that all Unit 1 NF AHUs are stopped.</p>
		<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). 	<p>NOTE: Containment Pressure has NOT remained < 3 psig.</p>
		<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). 	<p>NOTE: Upon transition to E-1, an ORANGE Path will exist on NC Integrity and Containment.</p> <p>The SRO will transition to FR-P.1, rather than E-1.</p>
FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION			
	BOP	(Step 1) Check NC pressure – GREATER THAN 286 PSIG.	<p>NOTE: NC Pressure will be 5-10 psig.</p>

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>44</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 1 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF ND pump flow is greater than 500 GPM, THEN RETURN TO procedure and step in effect. 	<p>NOTE: Both ND Pumps will be operating.</p> <p>The SRO will transition to FR-Z.1, rather than E-1.</p>
FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE			
			<p>Examiner NOTE: If at any time during the performance of FR-Z.1 the FWST Lo Level Alarm comes in, the Crew will immediately transition to ES-1.3.</p> <p>If this occurs, proceed to Page 48.</p>
	SRO	(Step 1) IF loss of emergency coolant recirc has occurred, THEN this procedure may be completed as time allows.	<p>NOTE: Loss of Emergency Coolant Recirc has NOT occurred.</p>
	SRO	(Step 2) Monitor Foldout Page.	
	BOP	(Step 3) Stop all NC pumps.	<p>NOTE: All NC Pumps are stopped.</p>
	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:	<p>NOTE: SRO will dispatch NLO.</p> <p>Floor/Booth Instructor: Acknowledge as appropriate.</p>
		<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) 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>45</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1EMXB1-6B (1B ND To C&D NC Cold Leg Cont Outside Isol Motor (1NI-178B)) (aux bldg, 733, GG-55, GG-556). 	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 ≈5-10 psig due to the LOCA.
	BOP	(Step 7) Check any NS pump - 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 48 and await entry into ES-1.3.
	BOP	(Step 9) Check containment isolation:	
		<ul style="list-style-type: none"> Check OAC – IN SERVICE. 	
		<ul style="list-style-type: none"> Check of 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:	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>46</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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 RNO) GO TO Step 10d.	
	BOP	<ul style="list-style-type: none"> (Step 10d) Check NS suction – ALIGNED TO FWST AS FOLLOWS: 	
		<ul style="list-style-type: none"> Check 1NS-18A (A NS Pump Suct From Cont Sump) – CLOSED 	
		<ul style="list-style-type: none"> Check 1NS-20A (A NS Pump Suct From FWST) - OPEN 	
		<ul style="list-style-type: none"> Check 1NS-1B (B NS Pump Suct From Cont Sump) – CLOSED 	
		<ul style="list-style-type: none"> Check 1NS-3B (B NS Pump Suct From FWST) - OPEN 	
		<ul style="list-style-type: none"> Check containment pressure – GREATER THAN 3 PSIG. 	NOTE: Containment pressure is ≈5-10 psig due to the LOCA.
		<ul style="list-style-type: none"> Check NS pump discharge valves – OPEN: 	
		<ul style="list-style-type: none"> 1NS-32A (A NS Pump Disch Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-29A (A NS Pump Disch Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-12B (B NS Pump Disch Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-15B (B NS Pump Disch Cont Outside Isol). 	
		<ul style="list-style-type: none"> Check NS pumps – ON. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>47</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(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 All MSIV bypass valves. 	
	RO	(Step 13) steamlines intact:	
		<ul style="list-style-type: none"> All S/G pressures – STABLE OR GOING UP All S/Gs – PRESSURIZED. 	
	BOP	(Step 14) Check if one or two trains of ND aux spray should be aligned:	
		<ul style="list-style-type: none"> Any ND Train – OPERATING IN COLD LEG RECIRC MODE. Containment pressure – GREATER THAN 3 PSIG. Check the following: <ul style="list-style-type: none"> Time after reactor trip – GREATER THAN 50 MINUTES At least one of the following – ENERGIZED: <ul style="list-style-type: none"> 1NI-173A (Train A ND to A & B CL) 	
		OR	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>48</u>	of	<u>52</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NI-178B (Train B ND to C & D CL). 	
		<ul style="list-style-type: none"> Check the following – CLOSED. 	
		<ul style="list-style-type: none"> 1NS-43A (A ND to NS Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NS-38B (B ND to NS Cont Outside Isol). 	
			Examiner NOTE: Mark Time of FWST Lo Level Alarm (To the Second): _____
ES-1.3, TRANSFER TO COLD LEG RECIRC			
	SRO	(Step 1) Have STA monitor Foldout Page.	NOTE: SRO will address STA. Floor Instructor: Acknowledge as STA.
	SRO	(Step 2) Perform this EP without delay:	
		<ul style="list-style-type: none"> CSF procedures should not be implemented until directed by this procedure. 	
		<ul style="list-style-type: none"> Double 3-way communication is not required. 	
	BOP	(Step 3) Check containment sump level by checking at least one of the following alarms – LIT:	
		<ul style="list-style-type: none"> “CONT SUMP LEVEL GREATER THAN 3 FT” on 1AD-14 – LIT 	
		OR	
		<ul style="list-style-type: none"> “CONT SUMP LEVEL GREATER THAN 3 FT” on 1AD-15 – LIT. 	
	BOP	(Step 4) Check KC flow to each ND heat exchanger – GREATER THAN 5000 GPM.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>49</u>	of	<u>51</u>
Event Description: Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 5) Reset the following:	
		<ul style="list-style-type: none"> S/I. 	
		<ul style="list-style-type: none"> Sequencers. 	
	BOP	(Step 6) Align ND System for recirc:	
		<ul style="list-style-type: none"> Check 1NI-185A (RB Sump to Train A ND & NS) – OPEN. 	
		<ul style="list-style-type: none"> Check 1A ND pump – ON. 	
		<ul style="list-style-type: none"> Check 1NI-184B (RB Sump to Train B ND & NS) – OPEN. 	
		<ul style="list-style-type: none"> Check 1B ND pump – ON. 	
		<ul style="list-style-type: none"> Enable power disconnect and close 1FW-27A (FWST Supply to ND). 	Examiner NOTE: Mark Time of 1FW-27A Closed (To the Second): _____
		<ul style="list-style-type: none"> Check any ND pump – ON. 	
	BOP	(Step 7) Align NV and NI Systems for recirc:	
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 1600 PSIG. 	
		<ul style="list-style-type: none"> Close the following: 	
		<ul style="list-style-type: none"> 1NI-115B (A NI Pump Miniflow) 	
		<ul style="list-style-type: none"> 1NI-144B (B NI Pump Miniflow). 	
		<ul style="list-style-type: none"> Enable power disconnect and close 1NI-147A (NI Pumps Miniflow Hdr Isol). 	
		<ul style="list-style-type: none"> Close the following valves: 	
		<ul style="list-style-type: none"> 1ND-30A (Train A ND to Hot Leg Isol) 	
		<ul style="list-style-type: none"> 1ND-15B (Train B ND to Hot Leg Isol). 	
		<ul style="list-style-type: none"> Check 1NI-334B (NV & NI Pumps Suct X-Over Blk) – OPEN. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>4</u>	Event #	<u>6, 7, & 8</u>	Page	<u>50</u>	of	<u>52</u>
Event Description:		Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start							
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Open the following: 	
		<ul style="list-style-type: none"> 1NI-332A (NV & NI Pumps Suction X-Over) 	
		<ul style="list-style-type: none"> 1NI-333B (NV & NI Pumps Suction X-Over). 	
		<ul style="list-style-type: none"> Align ND discharge to suction of NI and NV pumps as follows: 	
		<ul style="list-style-type: none"> Open 1ND-58A (Train A ND to NV & NI Pumps) 	
		<ul style="list-style-type: none"> Open 1NI-136B (B NI Pump Suction From ND). 	Examiner NOTE: Mark Time of 1NI-136B Opened (To the Second): _____
		<ul style="list-style-type: none"> Isolate FWST from NV and NI pumps: 	
		<ul style="list-style-type: none"> Enable power disconnect and close 1NI-100B (FWST) 	
		<ul style="list-style-type: none"> Close the following 	
		<ul style="list-style-type: none"> 1NV-22A (NV Pumps Suct From FWST) 	
		<ul style="list-style-type: none"> 1NV-222B (NV Pumps Suct From FWST). 	
Critical Task:		(SS-4600/113/E13.8 1.b) Align ECCS such that FW-27A is closed by 195 seconds after FWST Lo Level alarm, <u>and</u> ND-58A/NI-136 B are opened by 355 seconds after FWST Lo Level alarm.	
At the discretion of the Lead Examiner terminate the exam.			

Op Test No.: N08-1 Scenario # 4 Event # 6, 7, & 8 Page 51 of 52

Event Description: **Seismic Event/Large Break LOCA/1A and 1B ND Pumps Fail to Auto Start**

Time	Position	Applicant's Actions or Behavior
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PROGRAM: McGuire Operations Training
MODULE: Initial License Operator Training Class 24
TOPIC: NRC Simulator Exam
Scenario N08-1-5

REFERENCES:

1. OP/1/A/6100/003, "Controlling Procedure for Unit Operation."
2. OP/1/A/6300/001, "Turbine Generator Startup/Shutdown."
3. OP/1/A/6100/010C, "Annunciator Response for Panel 1AD-2."
4. AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation."
5. McGuire Technical Specifications
6. OAC Alarm Response M1A1104, "U1 VCT Level."
7. OP/1/A/6100/010G, "Annunciator Response for Panel 1AD-6."
8. OP/1/A/6100/010E, "Annunciator Response for Panel 1AD-4."
9. AP/1/A/5500/06, "S/G Feedwater Malfunction."
10. AP/1/A/5500/07, "Loss of Electrical Power."
11. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection."
12. EP/1/A/5000/ES 1.1, "Safety Injection Termination."
13. Generic Enclosure 1, "Establishing Normal Letdown."
14. RP/0/A/5700/000, "Classification of Emergencies."

Author: David Lazarony, Western Technical Services, Inc.

Facility Review: _____

March 7th, 2008
Rev. 3

Scenario Event Description

NRC Scenario 5

Facility:	McGuire	Scenario No.:	5	Op Test No.:	N08-1
Examiners:	_____	Operators:	(SRO)		
	_____		(OATC)		
	_____		(BOP)		

Initial Conditions: Both units had been recently shutdown to Mode 3 due to a Hurricane, and now it has become necessary to restart both units. Unit 2 has been restarted and is presently holding at 30% power. The plant has limited personnel, however, station management has approved the start-up. Unit 1 is at 15% power in accordance with OP/1/A/6100/003, "Controlling Procedure for Unit Operation," Enclosure 4.1, "Power Increase," and the Main Turbine is operating at 1800 RPM in accordance with Step 3.11 of Enclosure 4.1, "Startup with Turbine Control in "Operator Auto"," of OP/1/A/6300/001, "Turbine Generator Startup/Shutdown." It is expected that this shift will complete the startup of the main turbine and synchronize the main generator to the electrical grid.

Turnover: The following equipment is Out-Of-Service: 1NCP-5050, NC Loop B Flow, has failed (Channel has been defeated by IAE) and MCB Annunciator 1AD-8, C-6, "Hotwell Lo Level," has been in constant alarm over the last hour (IAE is investigating).

Event No.	Malf. No.	Event Type*	Event Description
1	NA	N-RO N-SRO	Prepare for Synchronization of the Main Generator
2	ENB013C	I-BOP I(TS)-SRO	Power Range Channel Failure
3	^{OVR} MG017A/ B	C-RO C-SRO	Failure of Main Generator Autosynch Circuit
4	^{XMT} NV001	I-BOP I-SRO	VCT Level Failure
5	^{XMT} CF029	I-RO I(TS)-SRO	C SG Narrow Range Level Failure
6	EP009B RN003B KC001C	C-BOP C-SRO	Blackout on 1ETB/1B RN Pump & 1B1 KC Pump fails to Auto Start
7	ISE001C	M-RO M-BOP M-SRO	Spurious SI
8	IPE001A/ B	NA	Auto Reactor Trip fails/manual available

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

Scenario Event Description

NRC Scenario 5

McGuire 2008 NRC Scenario #5

Both units had been recently shutdown to Mode 3 due to a Hurricane, and now it has become necessary to restart both units. Unit 2 has been restarted and is presently holding at 30% power. The plant has limited personnel, however, station management has approved the start-up. Unit 1 is at 15% power in accordance with OP/1/A/6100/003, "Controlling Procedure for Unit Operation," Enclosure 4.1, "Power Increase," and the Main Turbine is operating at 1800 RPM in accordance with Step 3.11 of Enclosure 4.1, "Startup with Turbine Control in "Operator Auto"," of OP/1/A/6300/001, "Turbine Generator Startup/Shutdown." It is expected that this shift will complete the startup of the main turbine and synchronize the main generator to the electrical grid.

The following equipment is Out-Of-Service: 1NCP-5050, NC Loop B Flow, has failed (Channel has been defeated by IAE) and MCB Annunciator AD-8, C-6, "Hotwell Lo Level," has been in constant alarm over the last hour (IAE is investigating).

Upon shift turnover, the operator will perform Step 3.13 of Enclosure 4.1, "Startup with Turbine Control in "Operator Auto," of OP/1/A/6300/001, "Turbine Generator Startup/Shutdown." The operator will place the Voltage Regulator in service and attempt to synchronize the Main Generator to the electrical grid.

Just prior to attempting to synchronize the Main Generator, Power Range N42 Upper Detector will fail low. The operator will respond in accordance with ARP1AD-2/B-3, "P/R Channel Deviation," and implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation." The operator will address Technical Specification 3.3.1, "RTS Instrumentation."

Following this, when the operator attempts to synchronize the Main Generator the autosynch circuit for the breaker that is attempted to be closed first, will fail. The operator will need to recognize the failure and attempt to close the other breaker in accordance with Step 3.15.4.7.B of Enclosure 4.1, "Startup with Turbine Control in "Operator Auto," of OP/1/A/6300/001, "Turbine Generator Startup/Shutdown."

At the time that the Main Turbine is stabilized at 25 MWe, VCT Level Transmitter NVLT-5760 will slowly fail to 40% causing a continual Auto Make-up to the VCT. The operator will perform a channel check of the two VCT Level instruments and recognize that actual VCT level is rising and take manual control of the NC System Makeup Controller. If no action is taken, OAC Alarm M1A1104, "U1 VCT Level," will alarm. If still no action is taken, auto makeup will continue indefinitely and 1NV-137 will divert to the Recycle Holdup Tank causing an increase in waste liquid.

Subsequently, the C SG Narrow Range Level transmitter (LCF-5570) will fail low. The operator will respond in accordance with ARP1AD-4/B-3, "S/G C Level Deviation," and implement AP/1/A/5500/06, "S/G Feedwater Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation," Technical Specification 3.3.2, "ESFAS Instrumentation," and Technical Specification 3.3.3, "PAM Instrumentation."

Shortly after this, the normal supply breaker for 1ETB will open causing a Blackout signal on Essential 4160V Bus 1ETB. The 1B DG will auto start and re-energize the bus, however, the 1B RN Pump and the 1B1 KC Pump will fail to start and need to be manually started. The operator will implement AP/1/A/5500/07, "Loss of Electrical Power."

Scenario Event Description

NRC Scenario 5

During the recovery of 1ETB, Train A Safety Injection will spuriously actuate. The Reactor will fail to trip automatically and the operator will need to trip the Reactor manually. The operator will enter E-0, "Reactor Trip or Safety Injection," and then transition to step 10 of ES-1.1, Safety Injection Termination."

Upon entry into ES-1.1, the operator will stop NI and ND pumps, and restore Normal Letdown in accordance with Generic Enclosure 1, "Establishing Normal Letdown."

The scenario will terminate when normal letdown has been established.

Critical Tasks:

E-0 A

Manually trip the reactor prior to transition to FR-S.1, "Response to Nuclear Generation/ATWS."

SS (4600/113/E13.6)

Terminate SI by closing NI-9/10 within 15 minutes of SI actuation.

Scenario Event Description

NRC Scenario 5

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Sim. Setup	Rod Step On	
<input type="checkbox"/>		IC - 120	
<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	See Shift Turnover Information
<input type="checkbox"/>		(XMT) NC015 Set = 0	1NCP-5050, NC Loop Flow OOS
<input type="checkbox"/>		(ANN) AD08-C06 Set = ON	MCB Annunciator AD-8, C-6, "Hotwell Lo Level" in continuous alarm
<input type="checkbox"/>		(MALF) IPE001A (MALF) IPE001B Set = TRUE	Auto Reactor Trip fails/manual available
<input type="checkbox"/>		(OVR) MG017A (OVR) MG017B Set = OFF	Failure of Main Generator Autosynch Circuit
<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 5

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Prior to Crew Briefing	RUN	
<input type="checkbox"/>	Crew Briefing		
	<ol style="list-style-type: none"> 1. Assign Crew Positions based on evaluation requirements 2. Provide Crew with appropriate handouts (OP/1/A/6100/003, Enclosure 4.1 marked up through 3.26.6.3 and OP/1/A/6300/001, Enclosure 4.1 marked up through Step 3.12, with Steps 3.13.8, 10, 14 marked NA). 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	Prepare for Synchronization of the Main Generator
<input type="checkbox"/>	At direction of examiner	(MALF) ENB013C Severity 0 Trigger 1	Power Range Channel Failure
<input type="checkbox"/>	At direction of examiner	(OVR) MG017A (OVR) MG017B Set = OFF (At T=0)	Failure of Main Generator Autosynch Circuit NOTE: After the first position is selected and fails, remove the other Override so that the second channel will work.
<input type="checkbox"/>	At direction of examiner	(XMT) NV001 Set 40 Trigger 3	VCT Level Failure
<input type="checkbox"/>	At direction of examiner	(XMT) CF029 Set = 0 Trigger 5	C SG Narrow Range Level Failure

Scenario Event Description

NRC Scenario 5

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	(MALF) EP009B (MALF) RN003B (MALF) KC001C Trigger 7	Blackout on 1ETB/1B RN Pump & 1B1 KC Pump fails to Auto Start
<input type="checkbox"/>	At direction of examiner	(MALF) ISE001C Trigger #9 (MALF) IPE001A (MALF) IPE001B Set = TRUE	Spurious SI (Train A) NOTE: Remove Malfunction at Step 6 of E-0 Auto Reactor Trip fails/manual available (At T=0)
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>1</u>	Page	<u>8</u>	of	<u>51</u>
Event Description:	Prepare for Synchronization of the Main Generator								
Time	Position	Applicant's Actions or Behavior							

Upon shift turnover, the operator will perform Step 3.13 of Enclosure 4.1, "Startup with Turbine Control in "Operator Auto," of OP/1/A/6300/001, "Turbine Generator Startup/Shutdown." The operator will place the Voltage Regulator in service and attempt to synchronize the Main Generator to the electrical grid.

Booth Operator Instructions: NLO (Bill) is standing by at the Main Generator Voltage Regulator Panel.

Indications Available: NA

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6300/001, TURBINE GENERATOR STARTUP/SHUTDOWN ENCLOSURE 4.1, STARTUP WITH TURBINE CONTROL IN "OPERATOR AUTO"			
	RO	(Step 3.13) Place Voltage Regulator in service as follows:	
		(Step 3.13.1) Check Turbine speed greater than 1710 rpm.	
		(Step 3.13.2) Locally check closed:	NOTE: RO will contact NLO (Bill). Booth Operator: As NLO (Bill) report " Disconnects are CLOSED. "
		• 1EGB-SC-Q701 (U1 Gen Voltage reg Ch 1 Discon)	
		• 1EGB-SX-Q702 (U1 Gen Voltage Reg Ch 2 Discon)	
		(Step 3.13.3) Check PMG voltage 120 – 140 VAC.	

Op Test No.: N08-1 Scenario # 5 Event # 1 Page 9 of 51 Event Description: **Prepare for Synchronization of the Main Generator**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		(Step 3.13.4) IF any Voltage Regulator Alarms are present at Local control Panel.	NOTE: RO will contact NLO (Bill). Booth Operator: As NLO (Bill) report "There are NO alarms at local panel."
		(Step 3.13.5) Check Voltage Regulator aligned for control Room operation per one of the following:	
		<ul style="list-style-type: none"> OAC Graphic "MAINGEN" 	
		<ul style="list-style-type: none"> U1 Gen Voltage Reg Local control Panel 	
		<ul style="list-style-type: none"> M1D2342 (1 Gen Volt Reg in Local Cabinet Control) 	
	RO	(Step 3.13.6) Check one of the following:	
		<ul style="list-style-type: none"> M1D2348 (U1 Gen Voltage Regulator System) is normal 	
		OR	
		<ul style="list-style-type: none"> Trouble alarms or faults have been reviewed on the following: 	
		<ul style="list-style-type: none"> U1 Gen Voltage Reg Local Control Panel 	
		<ul style="list-style-type: none"> U1 Gen Voltage Reg Ch 1 Panel 	
		<ul style="list-style-type: none"> U1 Gen Voltage Reg Ch 2 Panel 	
	RO	(Step 3.13.7) Ensure Voltage Regulator in "MAN".	
	RO	(Step 3.13.8) IF performing Generator / Automatic Voltage Regulator (AVR) testing, HOLD until Generator / AVR personnel are ready for Operations to continue with Unit 1 Turbine Generator startup.	NOTE: This step has been identified as NA in procedure provided.
	RO	(Step 3.13.9) Ensure Excitation "ON".	

Op Test No.: N08-1 Scenario # 5 Event # 1 Page 10 of 51Event Description: **Prepare for Synchronization of the Main Generator**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3.13.10) IF Generator / AVR personnel are performing post Turbine OPC and Mechanical Overspeed Trip Test turning, HOLD until notified that Unit 1 Turbine Generator startup may continue.	NOTE: This step has been identified as NA in procedure provided.
	RO	(Step 3.13.11) Check Generator Voltage 22.4 – 23.2 KV.	
	RO	(Step 3.13.12) Check "READY" lit on Voltage Regulator.	
	RO	(Step 3.13.13) IF auto Voltage Regulator operation is desired, perform the following: <ul style="list-style-type: none"> Ensure Voltage Regulator in "AUTO". Notify SOC that McGuire Unit 1 Generator Voltage Regulator status is now in "AUTO" AND to update this status in the EMS System. 	NOTE: RO will contact SOC. Booth Operator: As SOC acknowledge.
	RO	(Step 3.13.14) IF manual Voltage Regulator operation is desired	
	RO	(Step 3.13.15) Depress and hold "SYNC" on either "Generator Breaker 1A" or "Generator Breaker 1B".	
	RO	(Step 3.13.16) Using "Voltage Adjust", ensure "Station Run Volts" slightly higher than "Generator Incoming Volts".	
	RO	(Step 3.13.17) Release "SYNC".	

Op Test No.: N08-1 Scenario # 5 Event # 1 Page 11 of 51Event Description: **Prepare for Synchronization of the Main Generator**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3.13.18) Notify System engineer that Exciter field has been flashed.	NOTE: RO will contact WCC/SE. Booth Operator: As WCC/SE (Jim Allgood) acknowledge.
	RO	(Step 3.14) Close Generator MODs as follows:	
	RO	(Step 3.14.1) Ensure Generator Frequency greater than or equal to 59.6 Hz.	
	RO	(Step 3.14.2) IF Control Room operation of Generator Breaker MODs is desired, perform the following:	
		<ul style="list-style-type: none"> Close: 	
		<ul style="list-style-type: none"> MODs for Generator Breaker 1A 	
		<ul style="list-style-type: none"> MODs for Generator Breaker 1B 	
		<ul style="list-style-type: none"> Dispatch operator to locally check: 	NOTE: RO will contact NLO (Bill). Booth Operator: As NLO (Bill) report "MODs 1A and 1B CLOSED, no condensation in IPB Enclosures."
		<ul style="list-style-type: none"> MODs closed for Generator Breaker 1A 	
		<ul style="list-style-type: none"> MODs closed for Generator Breaker 1B 	
		<ul style="list-style-type: none"> No condensation in IPB enclosures through windows at MODs 	
	RO	(Step 3.14.3) IF local operation of MODs is required, perform Enclosure 4.5 (Local Operation of Generator Breaker MODs).	NOTE: This step has been identified as NA in procedure provided.
At the discretion of the Lead Examiner move to Event #2.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>2</u>	Page	<u>12</u>	of	<u>51</u>
Event Description:	Power Range Channel Failure								
Time	Position	Applicant's Actions or Behavior							

Just prior to attempting to synchronize the Main Generator, Power Range N42 Upper Detector will fail low. The operator will respond in accordance with ARP1AD-2/B-3, "P/R Channel Deviation," and implement AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation." The operator will address Technical Specification 3.3.1, "RTS Instrumentation."

Booth Operator Instructions: Operate Trigger #1 (ENB013C (0))

Indications Available:

- 1AD-2/B-3, "P/R Channel Deviation."
- PR42 MCB indication low
- AFD MCB indication low
- N42 Drawer indication low
- N42 Upper Detector Current low

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010C, ANNUNCIATOR RESPONSE FOR PANEL 1AD-2 B-3, P/R CHANNEL DEVIATION			
	RO	(IA Step 1) Check rod bottom lights, annunciator, and rod position indication.	NOTE: Crew may NOT address ARP, but enter AP16 directly.
	SRO / RO	(IA Step 2) IF dropped rod exists, go to AP/1/A/5500/014 (Rod Control Malfunction).	
	BOP / SRO	(IA Step 3) IF channel in test, place the "Comparator Channel Defeat" switch to the channel in test.	
	SRO	(IA Step 4) IF instrument failure, go to AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation).	
	SRO	(SA Step 1) IF desired to have Engineering evaluation as to cause for alarm, freeze the Transient Monitor.	

Op Test No.: N08-1 Scenario # 5 Event # 2 Page 13 of 51Event Description: **Power Range Channel Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(SA Step 2) IF deviation exists due to instrument drift, notify:	
		<ul style="list-style-type: none"> IAE Engineering 	
AP/1/A/5500/16, MALFUNCTION OF NUCLEAR INSTRUMENTATION CASE III, POWER RANGE MALFUNCTION			
			NOTE: Crew will carry out Immediate Actions of AP16, prior to the SRO addressing the AP.
	RO	(Step 1) Place control rods in manual.	
	RO	(Step 2) Check S/G levels – AT PROGRAMMED LEVEL.	
	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.	
	RO	(Step 5) Position “PR TO S/G PROGRAM LEVEL CHANNEL DEFEAT” switch to defeat inoperable channel.	
	RO	(Step 6) Secure any power increase in progress.	
	BOP / RO	(Step 7) Check the following interlocks – IN REQUIRED STATE FOR EXISTING PLANT CONDITIONS:	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>2</u>	Page	<u>14</u>	of	<u>51</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-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:	
		<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 "CHANEL 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:	

Op Test No.: N08-1 Scenario # 5 Event # 2 Page 15 of 51 Event Description: **Power Range Channel Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Remove Control Power fuses from "POWER RANGE A" drawer for failed channel. 	NOTE: Three Additional MCB alarms will come in: <ul style="list-style-type: none"> 1AD-2/A-1 1AD-2/A-3 1AD-2/F-3
		<ul style="list-style-type: none"> <u>IF</u> Power Range Cabinet shows evidence of damage (i.e. visual smoke or abnormal smell), <u>THEN</u> remove Instrument Power fuses from "POWER RANGE B" drawer. 	
	RO / BOP	(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 / BOP	(Step 13) Check the following annunciator lights – LIT:	
		<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). 	
	BOP	(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". 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>2</u>	Page	<u>16</u>	of	<u>51</u>
Event Description:	Power Range Channel Failure								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 15) IF desired to control S/G levels in auto, THEN return affected S/G CF control valves to auto.	NOTE: CF Control Valve Bypass Valves in AUTO, CF Control Valves in MANUAL due to power level.
	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: Control Rods are in MANUAL due to plant power level.
	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. If so, Booth Instructor acknowledge as WCC/IAE.
		• OPDT	
		• OTDT	NOTE: SRO will likely conduct a Focus Brief.
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION			
	SRO	3.3.1 Reactor Trip System (RTS) Instrumentation	
			Examiner NOTE: Addressing TS takes 3-5 minutes. May want to address after scenario.
	SRO	LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.	

Op Test No.: N08-1 Scenario # 5 Event # 2 Page 17 of 51

Event Description: **Power Range Channel 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			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		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 to ≤ 75% RTP.	12 hours	
			OR D.2.1 Place channel in trip. AND D.2.2 Perform SR 3.2.4.2.	6 hours	
		E. One channel inoperable.	D.3 Be in MODE 3.	12 hours	
			E.1 Place channel in trip. OR E.2 Be in MDOE 3.	6 hours 12 hours	

Op Test No.: N08-1 Scenario # 5 Event # 2 Page 18 of 51Event Description: **Power Range Channel Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
		S. One or more channel(s) inoperable.	S.1 Verify interlock is in required state for existing unit conditions.	1 hour	
			OR S.2 Be in MODE 3.	7 hours	
		T. One or more channels(s) inoperable.	T.1 Verify interlock is in required state for existing unit conditions.	1 hour	
			OR T.2 Be in MODE 2.	7 hours	
At the discretion of the Lead Examiner move to Event #3.					

Op Test No.: N08-1 Scenario # 5 Event # 3 Page 19 of 51Event Description: **Failure of Main Generator Autosynch Circuit**

Time	Position	Applicant's Actions or Behavior
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Following this, when the operator attempts to synchronize the Main Generator the autosynch circuit for the breaker that is attempted to be closed first, will fail. The operator will need to recognize the failure and attempt to close the other breaker in accordance with Step 3.15.4.7.B of Enclosure 4.1, "Startup with Turbine Control in "Operator Auto," of OP/1/A/6300/001, "Turbine Generator Startup/Shutdown."

Floor Instructor: As OSM, direct SRO to continue with synchronizing Main Generator to the electrical Grid. Report that SOC needs the power as soon as possible.

Booth Operator Instructions: After the first position is selected and fails, remove the other Override (OVR-MG017A/B) so that the second channel will work.

Indications Available: NA

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6300/001, TURBINE GENERATOR STARTUP/SHUTDOWN ENCLOSURE 4.1, STARTUP WITH TURBINE CONTROL IN "OPERATOR AUTO"			
	RO	(Step 3.15) Synchronize Generator to grid as follows:	
	RO	(Step 3.15.1) Notify SOC (System Operation Center) unit to be paralleled.	NOTE: RO will contact SOC. Booth Operator: As SOC acknowledge.
	RO	(Step 3.15.2) Ensure "Valve Position Limit Display" lit.	
	RO	(Step 3.15.3) Lower limit to 17% using "Valve Position Limit Lower".	
	RO	(Step 3.15.4) IF auto sync of generator is desired, perform the following:	
		• Check Voltage Regulator in "AUTO".	
		• Depress and hold "SYNC" for breaker to be closed.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>3</u>	Page	<u>20</u>	of	<u>51</u>
Event Description: Failure of Main Generator Autosynch Circuit									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	<ul style="list-style-type: none"> Using "Voltage Adjust", ensure "Station Run Voltage" is slightly higher than "Gen Incoming Voltage." 	
		<ul style="list-style-type: none"> Adjust Generator speed until Synchroscope hand moves smoothly and slowly in "FAST" direction. 	
	RO	<ul style="list-style-type: none"> Release "SYNC". 	
		<ul style="list-style-type: none"> Place "Gen Auto/Man Sync Select" to "Auto 1A" or "Auto 1B". 	<p>Booth/Floor Instructor: Observe Gen Auto/Man Sync Select position, and take following action:</p> <p>If placed in AUTO 1A: Delete OVR-MG017B</p> <p>If placed in AUTO 1B: Delete OVR-MG017A</p>
		<ul style="list-style-type: none"> IF the selected generator breaker did NOT close immediately, perform the following: 	
		<ul style="list-style-type: none"> Depress "Auto Sync" on DEH panel. 	
		<ul style="list-style-type: none"> IF selected generator breaker fails to close within 5 minutes, perform Steps 3.15.4.6 – 3.15.4.7 for opposite breaker. 	
		<ul style="list-style-type: none"> IF selected generator breaker(s) failed to close within 5 minutes, notify System Engineer. 	<p>NOTE: SRO will contact WCC/SE.</p> <p>Booth Operator: As WCC/SE (Jim Allgood) acknowledge, and recommend trying other Auto Circuit.</p>
		<ul style="list-style-type: none"> Place "Gen Auto/Man Sync Select" in Man". 	
	RO	(Step 3.15.6) WHEN Generator paralleled to grid, load Generator as follows:	
		<ul style="list-style-type: none"> Maintain Pwr Fact to 0.90 – 0.95 Lag using "Voltage Adjust". 	
		<ul style="list-style-type: none"> Depress "MW IN". 	

Op Test No.: N08-1 Scenario # 5 Event # 3 Page 21 of 51 Event Description: **Failure of Main Generator Autosynch Circuit**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Ensure lit "Valve Position Limit Display". 	
		<ul style="list-style-type: none"> Raise limit to 120% using "Valve Position Limit Raise". 	
		<ul style="list-style-type: none"> Check "Demand" and "Reference" windows match actual load. 	
		<ul style="list-style-type: none"> Load Turbine to 25 MWE per OP/1/A/6300/001 A (Turbine-Generator Load Change). 	
	RO	(Step 3.15.7) Place other Generator Breaker in service as follows:	
		<ul style="list-style-type: none"> Depress and hold "SYNC" for selected breaker. 	
		<ul style="list-style-type: none"> WHEN Synchroscope for selected breaker in 12 o'clock position, depress "CLOSE" for selected breaker until "CLSD" light is lit. 	
		<ul style="list-style-type: none"> Release "SYNC". 	
At the discretion of the Lead Examiner move to Event #4.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>4</u>	Page	<u>22</u>	of	<u>51</u>
Event Description:	VCT Level Failure								
Time	Position	Applicant's Actions or Behavior							

At the time that the Main Turbine is stabilized at 25 MWe, VCT Level Transmitter NVLT-5760 will slowly fail to 40% causing a continual Auto Make-up to the VCT. The operator will perform a channel check of the two VCT Level instruments and recognize that actual VCT level is rising and take manual control of the NC System Makeup Controller. If no action is taken, OAC Alarm M1A1104, "U1 VCT Level," will alarm. If still no action is taken, auto makeup will continue indefinitely and 1NV-137 will divert to the Recycle Holdup Tank causing an increase in waste liquid.

Booth Operator Instructions: Operate Trigger #3 (XMT-NV001 (40))

Indications Available:

- VCT Channel deviation between board indications is 18%
- Auto Makeup occurs (Hear sound of makeup counters)
- OAC Trend VCT level shows prompt drop in VCT (1NV-5760) with out corresponding indication in other channel.

Time	Pos.	Expected Actions/Behavior	Comments
OAC ALARM M1A1104, U1 VCT LEVEL			
	BOP	(Hi-Step 1) Ensure Makeup is secured.	NOTE: BOP will take MU Switch to OFF.
	BOP	(Hi Step 2) Ensure 1NV-137 (NC Filters OTLT 3-way CTRL) is partially diverting letdown flow.	
OP/1/A/6100/010G, ANNUNCIATOR RESPONSE FOR PANEL 1AD-6 F-12, AUTO MAKEUP START BLOCKED			
	BOP	(IA Step 1) Ensure Boric Acid and total makeup flow controllers are set for desired flow, then place the "NC System M/U Controller" switch in "AUTO" and the "NC System Makeup" switch to "START".	NOTE: The System cannot be returned to AUTO with a failed VCT Level instrument.

SELECT FUNC. KEY OR TURN-ON CODE: ALMRESP > [] 1.47 A 1.47 B SPDS

MIAT104	UI VCT LEVEL - 1NVL15761	56.6				6000
MODE	LO-LO	LO	HI	HI-HI		
MODE-1	16.0	20.0	69.0	96.0		PAGE
						1 of 2

AUTOMATIC ACTIONS

NONE

RESPONSE

- HI-HI - 1. GO TO OP/1/A/6100/010H (ANNUNCIATOR RESPONSE FOR PANEL 1AD7-D3, VCT ABNORMAL LEVEL).
- HI - 1. ENSURE MAKEUP IS SECURED.
2. ENSURE 1NV-137 (NC FILTERS OTLT 3-WAY CTRL) IS PARTIALLY DIVERTING LETDOWN FLOW.
- LO - 1. ENSURE AUTOMATIC MAKEUP IS IN EFFECT.
2. ENSURE 1NV-137 (NC FILTERS OTLT 3-WAY CTRL) IS IN FULL VCT POSITION.
3. IF STEPS (1) AND (2) ARE UNSUCCESSFUL, THEN GO TO AP/1/A/5500/010 (NC SYSTEM LEAKAGE WITHIN THE CAPACITY OF BOTH NV PUMPS).
- LO-LO - 1. GO TO OP/1/A/6100/010H (ANNUNCIATOR RESPONSE FOR PANEL 1AD7-D3, VCT ABNORMAL LEVEL).

SETPOINT BASTS

NONE

DESCRIPTION

NONE

OBJECT FUNC: KEY OR TURN-ON CODE ALPRESP > 1.47 A 1.47 B SPDS

MIA1104	UI VCT LEVEL - 1NVL15761	56.8	8	GOOD
MODE	LO-LO	LO	HI	HI-HI
MODE-1	16.0	20.0	69.0	96.0
				PAGE 2 of 2

REFERENCES

OP/1/A/6100/010H (PANEL 1A07-D3) AND AP/1/A/5500/010

Op Test No.: N08-1 Scenario # 5 Event # 4 Page 23 of 51

Event Description: **VCT Level Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(IA Step 2) IF automatic makeup control failure, refer to OP/1/A/6150/009 (Boron Concentration Control) for controlling makeup flow manually.	NOTE: SRO should have BOP refer to OP/1/A/6150/009.
At the discretion of the Lead Examiner move to Event #5.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>5</u>	Page	<u>24</u>	of	<u>51</u>
Event Description:	C SG Narrow Range Level Failure								
Time	Position	Applicant's Actions or Behavior							

Subsequently, the C SG Narrow Range Level transmitter (LCF-5570) will fail low. The operator will respond in accordance with ARP1AD-4/B-3, "S/G C Level Deviation," and implement AP/1/A/5500/06, "S/G Feedwater Malfunction." The operator will address Technical Specification 3.3.1, "RTS Instrumentation," Technical Specification 3.3.2, "ESFAS Instrumentation," and Technical Specification 3.3.3, "PAM Instrumentation."

Booth Operator Instructions: Operate Trigger #5 (XMT-CF029 (0))

Indications Available:

- 1AD-4/B-3, "S/G C Level Deviation."
- 1AD-4/F-3, "S/G C Lo-Lo Level Alert."
- C S/G NR Level drops lo
- C S/G CF Control bypass valve opens
- C S/G Feed flow increases

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010E, ANNUNCIATOR RESPONSE FOR PANEL 1AD-4 B-3, S/G C LEVEL DEVIATION			
	SRO	(IA Step 1) IF loss of feedwater, go to AP/1/A/5500/006 (S/G Feedwater Malfunction).	NOTE: Crew may NOT address ARP, but enter AP6 directly.
	SRO	(SA Step 1) Refer to Tech Specs.	
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. • Restore S/G level to program. 	
	RO	(Step 2) IF CF pump speed control has failed, THEN perform the following:	

Op Test No.: N08-1 Scenario # 5 Event # 5 Page 25 of 51Event Description: **C SG Narrow Range Level Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	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. 	NOTE: Channel I NR Level has failed low on C SG.
	RO	(Step 3 RNO) Select an operable channel on the affected S/G(s).	NOTE: operator will select Channel II on Steam Flow, Feed Flow and NR level.
	RO	(Step 4) Check unit status as follows:	
		<ul style="list-style-type: none"> • Reactor trip breakers – CLOSED 	
		<ul style="list-style-type: none"> • Pzr pressure – GREATER THAN P-11 (1955 PSIG). 	
	RO	(Step 5) IF AT ANY TIME S/G N/R level approaches 17% OR 83%, THEN perform the following:	
		<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.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>5</u>	Page	<u>26</u>	of	<u>51</u>
Event Description:	C SG Narrow Range Level Failure								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	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.	NOTE: The CF Control Valves are in MANUAL due to plant power level.
	RO	(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 Affected S/G level(s) – AT PROGRAM LEVEL Selected control channels – INDICATE CORRECTLY ON CHART RECORDER: <ul style="list-style-type: none"> Feed flow Steam flow S/G level. 	NOTE: The CF Control Valves will remain in MANUAL until power level has been raised.
	RO	(Step 12) Check all S/G CF control bypass valves – IN MANUAL AND FULL OPEN.	NOTE: The 1C CF Control Bypass Valves is in MANUAL due to malfunction.
	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 Affected S/G level(s) – AT PROGRAM LEVEL 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>5</u>	Page	<u>27</u>	of	<u>51</u>
Event Description:	C SG Narrow Range Level Failure								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Selected S/G level control channel – INDICATES CORRECTLY ON CHART RECORDER. 	NOTE: The 1C CF Control Bypass Valve will be returned to AUTO.
	RO	(Step 13) Check both CF pumps – IN AUTO.	NOTE: The CF Pumps are in MANUAL due to plant power level.
	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.... 	
		<ul style="list-style-type: none"> IF one CF pump in auto AND it is desired to place second CF pump in auto.... 	NOTE: The CF Pumps will remain in MANUAL until plant power level is higher.
	RO	(Step 14) Check all CA pumps – OFF.	
			NOTE: SRO will likely conduct a Focus Brief.
			NOTE: SRO may call WCC to address. If so, Booth Instructor acknowledge as WCC.
TECHNICAL SPECIFICATION 3.3.1, RTS INSTRUMENTATION			
	SRO	3.3.1 Reactor Trip System (RTS) Instrumentation	Examiner NOTE: Addressing TS takes 8-10 minutes. May want to address after scenario.
	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.	

Op Test No.: N08-1 Scenario # 5 Event # 5 Page 28 of 51

Event Description: **C SG Narrow Range Level Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		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	
		E. One channel inoperable.	E.1 Place channel in trip. OR E.2 Be in MODE 3.	6 hours 12 hours	
TECHNICAL SPECIFICATION 3.3.2, ESFAS INSTRUMENTATION					
	SRO	3.2.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation			
	SRO	LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.			
	SRO	APPLICABILITY: According to Table 3.3.2-1.			

Op Test No.: N08-1 Scenario # 5 Event # 5 Page 29 of 51
 Event Description: **C SG Narrow Range Level Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or trains(s).	Immediately.	
		D. One channel inoperable.	D.1 Place channel in trip. OR D.2.1 Be in MODE 3. AND D.2.2 Be in MODE 4.	6 hours 12 hours 18 hours	
		J. One channel inoperable.	J.1 Place channel in trip. OR J.2 Be in MODE 3.	6 hours 12 hours	
TECHNICAL SPECIFICATION 3.3.3, PAM INSTRUMENTATION					
	SRO	3.3.3 Post Accident Monitoring (PAM) Instrumentation			
	SRO	LCO 3.3. The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.			
	SRO	APPLICABILITY: MODES 1, 2, and 3.			

Op Test No.: N08-1 Scenario # 5 Event # 5 Page 30 of 51 Event Description: **C SG Narrow Range Level Failure**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior			Comments
	SRO	ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	
		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.	Immediately.	
		B. One or more Functions with one required channel inoperable.	B.1 Restore required channel to OPERABLE status.	30 days	
		E. One or more Functions with two required channels inoperable.	E.1 Restore one channel to OPERABLE status.		
At the discretion of the Lead Examiner move to Event #6.					

Op Test No.: N08-1 Scenario # 5 Event # 6 Page 31 of 51Event Description: **Blackout on 1ETB/1B RN Pump & 1B1 KC Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Shortly after this, the normal supply breaker for 1ETB will open causing a Blackout signal on Essential 4160V Bus 1ETB. The 1B DG will auto start and re-energize the bus, however, the 1B RN Pump and the 1B1 KC Pump will fail to start and need to be manually started. The operator will implement AP/1/A/5500/07, "Loss of Electrical Power."

Booth Operator Instructions: Operate Trigger #7 (EP009B, RN003B, KC001C)

Indications Available:

- Blackout Seq Actuated Train B – Lit on 1SI-14
- 1B DG Starts
- Train B components start to sequence onto 1ETB

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			
	BOP	(Step 1) Check bus energized and sequencer applying loads.	
	SRO	(Step 2) GO TO Step 33.	
	BOP	(Step 33) Check 1A RN pump – ON.	NOTE: The 1A RN Pump is NOT running, and need to be manually started.
	BOP	(Step 33 RNO) Perform the following:	
		<ul style="list-style-type: none"> • Start 1A RN pump. 	
	SRO	<ul style="list-style-type: none"> • IF 1A RN pump is on, THEN GO TO Step 34. 	
	BOP	(Step 34) Check 1B D/G – ON.	NOTE: The 1B D/G has automatically started and is powering 1ETB.

Op Test No.: N08-1 Scenario # 5 Event # 6 Page 32 of 51Event Description: **Blackout on 1ETB/1B RN Pump & 1B1 KC Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 35) Check 1B RN pump – ON.	NOTE: The 1B RN has failed to sequence on, and must be manually started.
	BOP	(Step 35 RNO) Perform the following:	
		<ul style="list-style-type: none"> Start 1 B RN pump. 	
	SRO	<ul style="list-style-type: none"> IF 1B RN pump is on, THEN GO TO Step 36. 	
	SRO	<ul style="list-style-type: none"> (Step 36a & b) Notify Unit 2 RO to start 2A RN pump 	Floor Instructor: As U2 RO report “2A RN Pump is running.”
	BOP	<ul style="list-style-type: none"> Check any Unit 1 6900V Bus – ENERGIZED. 	
	BOP	(Step 37) Check ND System status:	
		<ul style="list-style-type: none"> ND System – IN RHR MODE AT TIME OF B/O 	NOTE: The Unit is NOT in the RHR Mode at the time of the BO.
	SRO	(Step 38 RNO) 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.
	BOP	(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. 	NOTE: The SRO may ask the U2 BOP to perform. If so, Floor Instructor: Acknowledge as U2 BOP.

Op Test No.: N08-1 Scenario # 5 Event # 6 Page 33 of 51 Event Description: **Blackout on 1ETB/1B RN Pump & 1B1 KC Pump fails to Auto Start**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 40) have available licensed operator initiate Enclosure 7 (DC Bus Alignment) within 30 minutes of B/O.	NOTE: The SRO may ask the U2 BOP to perform. If so, Floor Instructor: Acknowledge as U2 BOP.
	BOP	(Step 41) Check D/G on bus that was blacked out – ON.	
	BOP	(Step 42) Check bus energized and sequencer applying loads.	
	BOP	(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:	
		• Check TD CA pump – ON.	NOTE: TD CA Pump is ON.
		• Check VI header pressure – GREATER THAN 60 PSIG.	
		• Control CA flow to maintain S/G N/R levels at program level.	
		• Check reactor power – GREATER THAN 10%.	
		• IF AT ANY TIME CA control valves are throttled closed, THEN have available operator perform the following	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		• IF any TD CA pump control valve throttled closed, THEN immediately notify Security that SSF is inoperable.	
		• Declare associated CA pump inoperable.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>6</u>	Page	<u>34</u>	of	<u>51</u>
Event Description:	Blackout on 1ETB/1B RN Pump & 1B1 KC Pump fails to Auto Start								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 46) Place recirc valve control switch for running KC pumps in "AUTO":	
		<ul style="list-style-type: none"> 1KC-51A (Train A Recirc Isol) 1KC-54B (Train B Recirc Isol). 	
	BOP	(Step 47) Place recirc valve control switch for KC pumps that are off to "CLOSE":	
		<ul style="list-style-type: none"> 1KC-51A (Train A Recirc Isol) 1KC-54B (Train B Recirc Isol). 	
	BOP	(Step 48) Check D/G cooling water aligned as follows:	
		<ul style="list-style-type: none"> 1A D/G – RUNNING. 	NOTE: The 1A D/G is NOT running.
	SRO	(Step 48a RNO) GO TO Step 48c.	
	BOP	<ul style="list-style-type: none"> (Step 48c & d) 1B D/G – RUNNING. 1RN-171B (B D/G Hx Inlet Isol) – OPEN. 	
	OBP	(Step 49) check the following status lights on 1SI-14 – DARK.	
		<ul style="list-style-type: none"> "ELXA STD-BY BKR CLOSED" "ELXB STD-BY BKR CLOSED" "ELXC STD-BY BKR CLOSED" "ELXD STD-BY BKR CLOSED". 	
	BOP	(Step 50) Check 1ETA – ENERGIZED BY D/G.	
	SRO	(Step 50 RNO) GO TO Step 52.	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>6</u>	Page	<u>35</u>	of	<u>51</u>
Event Description:	Blackout on 1ETB/1B RN Pump & 1B1 KC Pump fails to Auto Start								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 52) Check 1ETB – ENERGIZED BY D/G.	
	BOP	(Step 53) Ensure the following equipment loaded as required:	
		• 1ELXB Fdr Breaker – CLOSED.	
		• 1B NV pump – ON.	
		• EVCB Batt Charger – ON.	
		• EVCD Batt Charger – ON	
		• 1ELXD Fdr Breaker – CLOSED.	
		• 1B1 KC pump – ON.	NOTE: The 1B1 KC Pump has failed to sequence on, and must be manually started.
		• 1B2 KC pump – ON.	
		• 1B RN pump – ON.	
		• 1B CA pump – ON/	
		• Check S/I HAS OCCURRED.	NOTE: SI has NOT occurred.
	SRO	(Step 53j RNO) GO TO Step 54.	
At the discretion of the Lead Examiner move to Events #7-8.			

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>7 & 8</u>	Page	<u>36</u>	of	<u>51</u>
Event Description:	Spurious SI/ Auto Reactor Trip fails/manual available								
Time	Position	Applicant's Actions or Behavior							

During the recovery of 1ETB, Train A Safety Injection will spuriously actuate. The Reactor will fail to trip automatically and the operator will need to trip the Reactor manually. The operator will enter E-0, "Reactor Trip or Safety Injection," and then transition to step 10 of ES-1.1, Safety Injection Termination." Upon entry into ES-1.1, the operator will stop NI and ND pumps, and restore Normal Letdown in accordance with Generic Enclosure 1, "Establishing Normal Letdown." The scenario will terminate when normal letdown has been established.

Booth Operator Instructions: Operate Trigger #9 (ISE001C)

Indications Available:

- Train A Safety Injection actuates.
- Reactor does not trip.

Time	Pos.	Expected Actions/Behavior	Comments
			Examiner NOTE: Mark Time of Train A SI Actuation (To the Minute): _____
			NOTE: Crew will carry out Immediate Actions of E-0, prior to the SRO addressing the EP.
E-0, REACTOR TRIP OR SAFETY INJECTION			
	SRO	(Step 1) Monitor Foldout page.	
	RO	(Step 2) Check Reactor Trip:	NOTE: Reactor does not trip on SI Actuation as required, and will need to manually tripped.
		<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. 	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 37 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

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"> • Trip the reactor. 	
Critical Task: (E-0 A) Manually trip the reactor prior to transition to FR-S.1, "Response to Nuclear Generation/ATWS."			
	BOP	(Step 3) Check Turbine Trip:	
		<ul style="list-style-type: none"> • All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	
	RO / BOP	(Step 5) 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. 	
	BOP	(Step 5 RNO) Initiate S/I.	NOTE: Train B of SI must be manually initiated.
	SRO	(Step 6) Announce "Unit 1 Safety Injection".	NOTE: SRO may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
Booth Operator Instructions: Remove Malfunction ISE001C at Step 6 of E-0			
	BOP	(Step 7) 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. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>7 & 8</u>	Page	<u>38</u>	of	<u>51</u>
Event Description:	Spurious SI/ Auto Reactor Trip fails/manual available								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<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 8. 	Booth Operator: As IAE, Call Control Room and report that the Train A SI Actuation was caused inadvertently during maintenance.
	RO / BOP	(Step 8) 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 9) Check all KC pumps – ON.	
	BOP	(Step 10) Check both RN pumps – ON.	
	SRO	(Step 11) Notify Unit 2 to start 2A RN pump.	Floor Instructor: As U2 RO report "2A RN Pump is running."
	RO	(Step 12) Check all S/G pressures – GREATER THAN 775 psig.	
	BOP	(Step 13) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment Pressure is 0 psig.
	BOP	(Step 14) Check s/l flow:	
		<ul style="list-style-type: none"> Check "NV PMPS TO COLD LEG FLOW" gauge – INDICATING FLOW. 	NOTE: NV Flow is ≈320 gpm.
		<ul style="list-style-type: none"> Check NC pressures – LESS THAN 1600 PSIG. 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>7 & 8</u>	Page	<u>39</u>	of	<u>51</u>
Event Description:	Spurious SI/ Auto Reactor Trip fails/manual available								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 14b 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). 	
		<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 15. 	
	SRO	(Step 15) 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.	<p>NOTE: SRO may ask OSM to address.</p> <p>If so, Floor Instructor acknowledge as OSM.</p>
	RO / BOP	(Step 16) 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. 	
		<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	
		<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 17) 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 	<p>NOTE: All NC Pumps will be ON.</p>
	RO	(Step 17 RNO) Perform the following based on plant conditions:	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 40 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<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). 	<p>NOTE: The SRO may assign the RO to perform this action. If so, RO Examiner follow actions of Enclosure 3.</p>
EP/1/A/5000/E-0 REACTOR TRIP OR SAFETY INEJECTION 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 1 RNO) Close steam dump valves as follows:	
		<ul style="list-style-type: none"> Place “STEAM DUMP SELECT” in steam pressure mode. 	
		<ul style="list-style-type: none"> IF steam dumps still open, THEN place “STM PRESS CONTROLLER” in manual and close. 	
		<ul style="list-style-type: none"> IF steam dumps still open, THEN select “OFF RESET” on the following switches: 	
	RO	(Step 2) Check all SM PORVs – CLOSED.	
	RO	(Step 3) Check MSR “RESET” light – LIT.	
	RO	(Step 4) Check any NC pump – ON.	
	RO	(Step 5) Check NC T-avg – GOING DOWN.	
	RO	(Step 5 RNO) IF cooldown stopped, THEN exit this enclosure.	
E-0, REACTOR TRIP OR SAFETY INJECTION			

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 41 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 18) 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. 	
		(Step 18b RNO) IF Pzr pressure is less than 2100 PSIG, THEN perform the following:	
	BOP	(Step 19) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	NOTE: NC System Subcooling will be 85-90°F.
	RO	(Step 20) Check if main steamlines intact:	
		<ul style="list-style-type: none"> All S/G pressure – STABLE OR GOING UP 	NOTE: All SG Pressures are ≈1100psig.
		<ul style="list-style-type: none"> All S/Gs – PRESSURIZED. 	
	BOP	(Step 21) Check if S/G tubes intact:	NOTE: All EMF instrumentation reads normal.
		<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. 	
	BOP	(Step 22) Check if NC System intact:	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 42 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check containment EMFs – NORMAL: 	NOTE: All EMF instrumentation reads normal.
		<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 Gas (Lo Range)) 	
		<ul style="list-style-type: none"> 1EMF-9 (Reactor Bldg Incore Inst Rm) 	
		<ul style="list-style-type: none"> 1EMF-16 (Containment Refueling Brdg). 	
		<ul style="list-style-type: none"> IF offsite power available, THEN check "ICE COND LOWER INLET DOORS OPEN" alarm (1AD-9, A-5) – DARK. 	
		<ul style="list-style-type: none"> Check containment pressure – LESS THAN 1 PSIG 	
		<ul style="list-style-type: none"> Check containment sump level – NORMAL. 	
	RO / BOP	(Step 23) 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 S/G – GREATER THAN 11% 	
		OR	
		<ul style="list-style-type: none"> Total feed flow to S/Gs – 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%. 	
	Bop	(Step 24) Reset the following:	
		<ul style="list-style-type: none"> S/I 	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 43 of 51 Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Sequencers. 	
	BOP	(Step 25) Stop all but one NV pump.	
	BOP	(Step 26) Check NC pressure – STABLE OR GOING UP.	
	BOP	(Step 27) Isolate NV S/I flowpath:	
		<ul style="list-style-type: none"> Check NV pumps miniflow valves – OPEN: 	
		<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"> 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). 	Examiner NOTE: Mark Time of 1NI-9A/10B Closure (To the Minute): _____
Critical Task: (SS-4600/113/E13.6) Terminate SI by closing NI-9/10 within 15 minutes of SI actuation.			
	BOP	(Step 28) Establish charging:	
		<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	
		<ul style="list-style-type: none"> Throttle 1NV-238 (Charging Line Flow Control) to maintain 6-10 GPM seal injection flow to each NC pump. 	
		<ul style="list-style-type: none"> Close 1NV-241 (U1 Seal Water Inj Flow Control). 	
		<ul style="list-style-type: none"> Open the following valves: 	
		<ul style="list-style-type: none"> 1NV-244A (Charging Line Cont Outside Isol) 	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 44 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NV-245B (Charging Line cont Outside Isol). 	
		<ul style="list-style-type: none"> IF AT ANY TIME charging flow is required to be controlled in subsequent steps, THEN: 	NOTE: This is a Continuous Action. The SRO will make both board operators aware.
		<ul style="list-style-type: none"> Slowly throttle 1NV-241. 	
		<ul style="list-style-type: none"> Throttle 1NV-238 while maintaining NC pump seal injection flow. 	
		<ul style="list-style-type: none"> Maintain charging flow less than 200 GPM. 	
	BOP	(Step 29) Control charging flow as required to maintain stable Pzr level.	
	BOP	(Step 30) 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 31) Reset the following:	
		<ul style="list-style-type: none"> Phase A Isolation 	
		<ul style="list-style-type: none"> Phase B Isolation. 	
	BOP	(Step 32) Establish VI to containment:	
		<ul style="list-style-type: none"> Check the following valves – OPEN: 	
		<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. 	
	SRO	(Step 33) Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees).	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 45 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 34) WHEN EP/1/A/5000/ES-1.1 (Safety Injection Termination) is implemented in next step, THEN monitor its Foldout page.	
	SRO	(Step 35) GO TO Step 10 of EP/1/A/5000/ES-1.1 (Safety Injection Termination).	NOTE: The SRO will transition to ES-1.1 Step 10.
ES-1.1, SAFETY INJECTION TERMINATION			
	BOP	(Step 10) Check if NI pumps should be stopped:	
		<ul style="list-style-type: none"> • Check NC pressure - 	
		<ul style="list-style-type: none"> • STABLE OR GOING UP 	
		<ul style="list-style-type: none"> • GREATER THAN 1600 PSIG. 	
		<ul style="list-style-type: none"> • Stop NI pumps. 	
	SRO	<ul style="list-style-type: none"> • GO TO Step 11. 	
	BOP	(Step 11) Check if ND pumps should be stopped:	
		<ul style="list-style-type: none"> • Check any ND pump – ON. 	
		<ul style="list-style-type: none"> • Check running ND pumps suction – ALIGNED TO FWST. 	
		<ul style="list-style-type: none"> • Stop ND pumps. 	
	RO	(Step 12) Check S/I flow not required:	
		<ul style="list-style-type: none"> • NC subcooling based on core exit T/Cs – GREATER THAN 0°F. 	NOTE: NC System Subcooling will be 65-75°F.
	BOP	<ul style="list-style-type: none"> • Pzr level – GREATER THAN 11% (29% ACC). 	NOTE: Pzr Level will be 60-90%

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>7 & 8</u>	Page	<u>46</u>	of	<u>51</u>
Event Description: Spurious SI/ Auto Reactor Trip fails/manual available									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 13) Check steam dumps as follows:	
		<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"> MSIVs on intact S/Gs – OPEN. 	
		<ul style="list-style-type: none"> 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"> Check "P-12 LO-LO TAVG" status light (1SI-18) – DARK. 	
		<ul style="list-style-type: none"> Control steam dumps to maintain NC T-Hots – STABLE. 	
		<ul style="list-style-type: none"> IF AT ANY TIME "STEAM HEADER PRESSURE" is at 1092 PSIG AND auto control desired, 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 "STM PRESS CONTROLLER" setpoint at 1092 PSIG (pot setting of 8.4). 	
		<ul style="list-style-type: none"> Place "STM PRESS CONTROLER" in auto. 	
		<ul style="list-style-type: none"> Ensure steam dumps open as required to control "STEAM HEADER PRESSURE" between 1090 – 1110 PSIG. 	
	SRO	<ul style="list-style-type: none"> GO TO Step 14. 	
	RO	(Step 14) Check NC T-Hots – STABLE.	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 47 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 15) Check letdown can be established:	
		<ul style="list-style-type: none"> Pzr level – GREATER THAN 25% (50% ACC). 	
		<ul style="list-style-type: none"> Check ND pumps – OFF. 	
		<ul style="list-style-type: none"> Open the following: 	
		<ul style="list-style-type: none"> 1KC-1A (Trn A Aux Bldg Non Ess Ret Isol) 	
		<ul style="list-style-type: none"> 1KC-2B (Trn B Aux Bldg Non Ess Ret Isol). 	
		<ul style="list-style-type: none"> Monitor the following while aligning KC to aux bldg non essential header: 	
		<ul style="list-style-type: none"> KC surge tank levels 	
		<ul style="list-style-type: none"> KC System flow. 	
		<ul style="list-style-type: none"> Place the following in "AUTO" for the operating KC train(s): 	
		<ul style="list-style-type: none"> 1KC-51A (Train A Recirc Isol) 	
		<ul style="list-style-type: none"> 1KC-54B (Train B Recirc Isol). 	
		<ul style="list-style-type: none"> Check 1KC-1A – OPEN. 	
		<ul style="list-style-type: none"> Perform the following concurrently: 	
		<ul style="list-style-type: none"> Close 1KC-56A (KC to A ND HX) 	
		<ul style="list-style-type: none"> As flow goes down, open 1KC-50A (Trn A Aux Bldg Non Ess Sup Isol). 	
		<ul style="list-style-type: none"> Check 1KC-2B – OPEN. 	
		<ul style="list-style-type: none"> Perform the following concurrently: 	
		<ul style="list-style-type: none"> Close 1KC-81B (KC to B ND HX) 	
		<ul style="list-style-type: none"> As flow goes down, open 1KC-53B (Trn B Aux Bldg Non Ess Sup Isol). 	
		<ul style="list-style-type: none"> Reset modulating valves using reset buttons on RN control board. 	
	BOP	<ul style="list-style-type: none"> Check: 	
		<ul style="list-style-type: none"> 1EMF-51A (Containment Train A (Hi Range)) – LESS THAN 25 R/HR 	

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>7 & 8</u>	Page	<u>48</u>	of	<u>51</u>
Event Description:	Spurious SI/ Auto Reactor Trip fails/manual available								
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1EMF-51B (Containment Train B (Hi Range)) – LESS THAN 25R/HR. 	
	SRO	<ul style="list-style-type: none"> Establish letdown PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 1 (Establishing Normal Letdown) while continuing in procedure. 	<p>NOTE: SRO directs BOP to establish normal Letdown.</p> <p>SRO and RO will continue in ES-1.1</p>
EP/1/A/5000/G-1, GENERIC ENCLOSURES ENCLOSURE 1, ESTABLISHING NORMAL LETDOWN			
	BOP	(Step 1) Ensure 1NV-459 (U1 Variable L/D Orifice Outlet flow Cntrl) is closed.	
	BOP	(Step 2) Place 1NV-124 (Letdown Pressure Control) in manual between 10-20% open.	
	BOP	(Step 3) Establish cooling to Regenerative Hx by performing the following concurrently:	
		<ul style="list-style-type: none"> Throttle open 1NV-238 (Charging Line Flow Control) to establish at least 65 GPM charging flow. 	
		<ul style="list-style-type: none"> Throttle 1NV-241 (U1 Seal Water Inj Flow Control) to establish approximately 8 GPM seal injection flow to each NC pump. 	
	BOP	Open the following letdown line isolation valves:	
		<ul style="list-style-type: none"> Open 1NV-7B (Letdown Cont Outside Isol). 	
		<ul style="list-style-type: none"> Open 1NV-1A (NC L/D Isol To Regen Hx). 	
		<ul style="list-style-type: none"> Open 1NV-2A (NC L/D Isol To Regen Hx). 	
		<ul style="list-style-type: none"> Open 1NV-35A (Variable L/D Orifice Outlet Cont Isol). 	

Op Test No.: N08-1 Scenario # 5 Event # 7 & 8 Page 49 of 51Event Description: **Spurious SI/ Auto Reactor Trip fails/manual available**

Time	Position	Applicant's Actions or Behavior
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Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 5) Establish desired letdown flow rate (normally 75 GPM) by completing the following concurrently:	
		<ul style="list-style-type: none"> Slowly throttle open 1NV-459 (U1 Variable L/D Orifice Outlet Flow Cntrl) to desired flow rate. 	
		<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	(Step 6) Do not continue until desired flow rate is established.	
	BOP	(Step 7) Adjust charging flow as desired 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"> Regenerative Hx letdown temperature less than 380°F. 	
	BOP	(Step 8) Return valves to normal as follows:	
		<ul style="list-style-type: none"> IF pot setting for 1NV-124 (Letdown Pressure Control) is set at approximately 5.8, THEN perform the following: 	
		<ul style="list-style-type: none"> Manually adjust 1NV-124 to obtain letdown pressure of 350 PSIG. 	
		<ul style="list-style-type: none"> Place 1NV-124 in "AUTO". 	
		<ul style="list-style-type: none"> Ensure letdown pressure controlled at 350 PSIG. 	
		<ul style="list-style-type: none"> GO TO Step 9. 	
	SRO	(Step 9) IF more letdown flow is required, THEN raise flow PER OP/1/A/6200/001 A (Chemical and Volume Control System Letdown), Enclosure 4.5 (Establishing Maximum Normal Letdown).	NOTE: Additional Letdown flow will NOT be needed.

Op Test No.:	<u>N08-1</u>	Scenario #	<u>5</u>	Event #	<u>7 & 8</u>	Page	<u>50</u>	of	<u>51</u>
Event Description: Spurious SI/ Auto Reactor Trip fails/manual available									
Time	Position	Applicant's Actions or Behavior							

Time	Pos.	Expected Actions/Behavior	Comments
	SRO	(Step 10) IF desire to swap letdown orifices, THEN swap PER OP/1/A/6200/001 A (Chemical and Volume Control System Letdown), Enclosure 4.3 (Swapping Letdown Orifices).	NOTE: Additional Letdown flow will NOT be needed.
	SRO	(Step 11) Notify Chemistry that normal letdown is in service.	NOTE: BOP will contact Chemistry. Booth Operator: As Chemistry acknowledge.
	SRO	(Step 12) WHEN time allows, THEN notify engineering to document transients on letdown and charging.	NOTE: BOP will contact WCC/Engineering. Booth Operator: As WCC/Engineering acknowledge.
At the discretion of the Lead Examiner terminate the exam.			

UNIT 1 STATUS:

Power Level: 14% NCS [B] 1606 ppm Pzr [B]: 1610 ppm Xe: Per OAC

Power History: Startup in progress Core Burnup: 250 EFPDs

CONTROLLING PROCEDURE: OP/1/A/6100/003, Enclosure 4.1, Controlling Procedure for Unit Operation.
OP/1/A/6100/001, Enclosure 4.1, Continue with Startup of Turbine Generator starting at Step 3.13

OTHER INFORMATION NEEDED TO ASSUME TO SHIFT:

- Both units had been recently shutdown to Mode 3 due to a Hurricane, and now it has become necessary to restart both units.
- Unit 2 has been restarted and is presently holding at 30% power.
- The plant has limited personnel, however, station management has approved the start-up.
- Unit 1 is at 14% power in accordance with OP/1/A/6100/003, "Controlling Procedure for Unit Operation," Enclosure 4.1, "Power Increase," and the Main Turbine is operating at 1800 RPM in accordance with Step 3.11 of Enclosure 4.1, "Startup with Turbine Control in "Operator Auto"," of OP/1/A/6300/001, "Turbine Generator Startup/Shutdown."
- It is expected that this shift will complete the startup of the main turbine and synchronize the main generator to the electrical grid.

The following equipment is Out-Of-Service:

- 1NCP-5050, NC Loop B Flow, has failed (Channel has been defeated by IAE).
- MCB Annunciator 1AD-8, C-6, "Hotwell Lo Level," has been in constant alarm over the last hour (IAE is investigating).
- NLO (Bill) is standing by at the Main Generator Voltage Regulator Panel.
- Jim Allgood (SE) is available in the WCC (x4276).

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