

Facility:	McGuire	Scenario No.:	1	Op Test No.:	N20-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	
Initial Conditions:	The plant is at 100% power (EOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.				
Turnover:	The following equipment is Out-Of-Service: The 1A NS Pump is OOS for preventative maintenance. ACTION has been taken in accordance with Technical Specification LCO 3.6.6 ACTION A. 1NCPT-5150, Pzr Pressure Channel 2, has failed and has been removed from service in accordance with plant procedures. ACTION has been taken in accordance with Technical Specification LCO 3.3.1 and 3.3.2. MCB Annunciator 1AD-12, F-5, "FWST EMERGENCY LO TEMP," has alarmed spuriously several times over the last hour and has currently failed ON (IAE has verified that the issue is limited to an annunciator card issue).				
Critical Tasks:	See Below				
Event No.	Malf. No.	Event Type*	Event Description		
1	REM CF0075	C-RO C-SRO	High Pressure Heaters Bypass/Overpower		
2	MAL ENB013D	C-BOP C(TS)-SRO	Power Range Failure		
3	REM HS0179	R-RO N-BOP N-SRO	MSR Relief Valve fails OPEN/Downpower		
4	MAL IRE006K2	C-RO C(TS)-SRO	Dropped Rod/Downpower		
5	MAL NCP007BU	C-RO C-BOP C-SRO	1B NCP Pump Bearing Oil Cooler Leak		
6	MAL EPL003C	M-RO M-BOP M-SRO	Loss of VIAC 1EKVC/Inadvertent SI Actuation		
7	MAL DEH003A	C-RO C-SRO	Failure of the Turbine to Trip in AUTO		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

McGuire 2020 NRC Scenario #1

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Shortly after taking the watch, the High-Pressure Heater Bypass Valve (1CF-75) will inadvertently open. The operator will respond in accordance with OAC Alarm Response Procedure M1L2917, "U1 WATER BYPASSING A&B HEATERS," and OMP 4-3, "Use of Emergency and Abnormal Procedures and FLEX Support Guidelines," and immediately reduce Turbine load as needed to maintain Rx power less than pre-transient condition.

After this, Power Range Instrument N42 will drift high. The operator will enter AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation." The operator will address Technical Specification LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation."

When the power range channel is removed from service, MSR Relief Valve 1HS179 will fail open causing a loss of turbine efficiency and an increase in reactor power. The operator will implement AP/1/A/5500/01, "Steam Leak." The operator will recognize the failure and perform a rapid downpower in accordance with AP/1/A/5500/04, "Rapid Downpower," in an attempt to shut the valve. Eventually the valve will re-close and the downpower will be stabilized.

Subsequently, one Control Bank B Control Rod will drop into the core. The operator will respond in accordance with ARP 1AD-2/D-9, "RPI at Bottom Rod Drop" and will implement AP/1/A/5500/14, "Rod Control Malfunction," and ultimately reduce power to less than 50% using AP/1/A/5500/04, "Rapid Downpower." The operator will address Technical Specification LCO 3.1.4, "Rod Group Alignment Limits" and LCO 3.2.4 "Quadrant Power Tilt Ratio (QPTR)".

During the downpower, a leak will develop on the 1B NCP Upper Bearing Oil Reservoir. The operator will respond in accordance with AP/1/A/5500/08, "Malfunction of NC Pump," and the operator will be required to trip the reactor, stop the 1B NCP, and go to EP/1/A/5000/E-0, "Reactor Trip and/or Safety Injection."

Upon the reactor trip, a loss of Vital AC Panel 1EKVC will occur resulting in an inadvertent Safety Injection. Also, on the reactor trip, the Turbine will fail to trip automatically, and must be tripped manually. The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," reset SI and stop all ECCS Pumps except for one NV Pump.

Ultimately, the crew will transition to step 9 of EP/1/A/5000/ES-1.1, "Safety Injection Termination."

Once SI is terminated, the operator may address AP/1/A/5500/15, "Loss of Vital or Aux Control Power."

The scenario will terminate in EP/1/A/5000/ES-1.1 at Step 14.I prior to the operator re-establishing Letdown.

Critical Tasks:

Trip the Reactor prior to stopping the 1B NCP during a low oil level condition and trip the NCP only after Reactor power level has dropped to less than 5%; before the CRS starts to read the Immediate Actions of EP/1/A/5000/E-0, Reactor Trip or Safety Injection to the Control Board Operators to verify that a Reactor Trip has occurred.

Safety Significance: The transient placed on the unit when an NCP is secured at power can challenge both reactor protection and control systems. Station management has decided that the conservative approach to dealing with this transient is to trip the reactor anytime a NCP malfunction warrants stopping a pump in Mode 1. Guidance is given to wait until reactor power is less than 5% before stopping the NC pump to ensure that the NC pump will provide adequate flow/core cooling until reactor power is sufficiently low enough to preclude a challenge to fuel integrity. If the action can be taken, and is not taken, this demonstrates “mis-operation” or incorrect operation that could unnecessarily challenge a fission product barrier (NCS).

Manually trip the Turbine before a valid Orange Path develops on the Integrity Critical Safety Function.

Safety Significance: Failure to trip the Main Turbine when conditions exist that allow the operator to do so, constitutes mis-operation or incorrect operator performance that unnecessarily challenges the Integrity Critical Safety Function. An overcooling event, such as a failure of the Turbine to trip on a reactor trip, in the presence of an inadvertent actuation of Safety Injection creates the potentiality of creating a Pressurized Thermal Shock conditions that otherwise would not exist.

PROGRAM: McGuire Operations Training

MODULE: Initial License Operator Training Class ILT 20-1

TOPIC: NRC Simulator Exam

Scenario N20-1-1

REFERENCES:

1. Technical Specification LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation" (184/166)
2. Technical Specification LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation" (Amendment 184/166)
3. Technical Specification LCO 3.6.6, "Containment Spray System" (Amendment 308/287)
4. PT/0/A/4600/113, "McGuire Time Critical Action/Time Sensitive Actions" (Rev 28)
5. OMP 4-3, "Use of Emergency and Abnormal Procedures and FLEX Support Guidelines" (Rev 48)
6. AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation" (Rev 15)
7. AP/1/A/5500/01, "Steam Leak" (Rev 19)
8. AP/1/A/5500/04, "Rapid Downpower" (Rev 31)
9. AP/1/A/5500/14, "Rod Control Malfunction" (Rev 16)
10. Technical Specification LCO 3.1.4, "Rod Group Alignment Limits" (Amendment 184/166)
11. Technical Specification LCO 3.2.4, "Quadrant Power Tilt Ratio (QPTR)" (Amendment 184/166)
12. OP/1/A/6100/010 C, "Annunciator Response for Panel 1AD-12" (Rev 71)
13. AP/1/A/5500/08, "Malfunction of NC Pump" (Rev 17)
14. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection" (Rev 36)
15. EP/1/A/5000/ES-1.1, "Safety Injection Termination" (Rev 30)

Validation Time: 120 minutes

Author: David Lazarony, Essential Training & Consulting, LLC

Facility Review: _____

Rev. 011320

McGuire 2020 NRC Scenario #1 Objectives:

Given the simulator at an initial condition of 100% power evaluate:

1. the SRO's ability to supervise the control room team during the normal, abnormal, and emergency situations that arise, including compliance with all facility procedures, Technical Specifications, and other commitments.
2. each crew member's ability to effectively communicate as part of a control room team during the normal, abnormal, and emergency situations that arise.
3. the RO's ability to effectively diagnose and mitigate the consequences an overpower event in accordance with OMP 4-3, "Use of Emergency and Abnormal Procedures and FLEX Support Guidelines."
4. each crew member's ability to effectively diagnose an Excore Power Range Instrument failure and the BOP's ability to mitigate the consequences in accordance with AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation."
5. each crew member's ability to effectively diagnose a failed open MSR Relief Valve and the RO and BOP's ability to respond to such an event in accordance with AP/1/A/5500/01, "Steam Leak."
6. each crew member's ability to conduct a rapid downpower in accordance with AP/1/A/5500/04, "Rapid Downpower," whenever plant conditions dictate the need to do so."
7. each crew member's ability to effectively diagnose a dropped control rod at power, and the RO's ability to respond to such an event in accordance with AP/1/A/5500/14, "Rod Control Malfunction."
8. each crew member's ability to effectively diagnose an NCP Pump Bearing Oil Cooler leak, and their ability to respond to such an event in accordance with AP/1/A/5500/08, "Malfunction of NC Pump."
9. each crew member's ability to effectively diagnose an inadvertent actuation of Safety Injection and the RO and BOP's ability to respond to such an event in accordance with EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and EP/1/A/5000/ES-1.1, "Safety Injection Termination."
10. the RO's ability to determine that the Main Turbine has failed to automatically trip during a reactor trip from power and take action to manually trip the Main Turbine.

Scenario Event Description
NRC Scenario 1

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Scenario Event Description
NRC Scenario 1

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>		Reset to Temp IC 230 (Base IC-53, [100% EOL])	T = 0 Malfunctions (From IC-53): insert LOA_NS005 eq RACKED_OUT, insert LOA_NS005A eq RACKED_OUT (1A NS Pump is OOS) insert XMT_NC_1NCPT5150 eq 1700 (1NCPT-5150 is OOS) insertBST_NC_PB_456A SET insertBST_NC_PB_456C SET insertBST_NC_PB_456D SET insertBST_NC_TB_421C SET insert OVR_1AD12_F05 eq ON (MCB Annunciator 1AD12/F5) insert MAL_EPL003C eq ACTIVE (Loss of EKVC); cd = H_X01_094_2 = 1 (RTB Open Light) insert MAL_DEH003A (Failure of the Turbine to Trip in AUTO)
<input type="checkbox"/>		RUN Reset all SLIMs	Place Tagout/O-Stick on: <ul style="list-style-type: none"> • 1A NS Pump (Tagout) • 1NCPT-5150 (O-stick) • MCB Annunciator 1AD12/F5 (O-stick)
<input type="checkbox"/>		Update Status Board, Setup OAC	NOTE: RMWST DO = >1000 ppb.
<input type="checkbox"/>		Freeze.	
<input type="checkbox"/>		Update Fresh Tech. Spec. Log.	
<input type="checkbox"/>		Fill out the AO's Available section of Shift Turnover Info.	
<input type="checkbox"/>	Prior to Crew Briefing	RUN	

Scenario Event Description
NRC Scenario 1

	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. 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	Execute Simulator Scenario N20-1-1.	
<input type="checkbox"/>	At direction of examiner	Event 1 Insert REM_CF0075=0.5, Ramp = 30	High Pressure Heaters Bypass/Overpower
<input type="checkbox"/>	At direction of examiner	Event 2 Insert MAL_ENB013D = 100 (High) Ramp = 20 Seconds	Power Range Failure
<input type="checkbox"/>	At direction of examiner	Event 3 insert REM_HS0179 = 1.0	MSR Relief Valve fails OPEN/Downpower
<input type="checkbox"/>	At direction of examiner	Event 4 insert MAL_IRE006K2 STATIONARY_GRPPR (Control Rod K2 drops)	Dropped Rod/Downpower
<input type="checkbox"/>	At direction of examiner	Event 5 insert MAL_NCP007BU = TRUE	1B NCP Pump Bearing Oil Cooler Leak

Scenario Event Description
NRC Scenario 1

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Post-Rx Trip	Event 6 Insert MAL_EPL003C= ACTIVE (cd = H_X01_094_2 = 1)	Loss of VIAC 1EKVC/Inadvertent SI Actuation NOTE: The Loss of VIAC 1EKVC will occur on Rx Trip.
<input type="checkbox"/>	Post-Rx Trip	Event 7 Insert: MAL_DEH003A = 2	Failure of the Turbine to Trip in AUTO NOTE: The Malfunction is inserted at T=0.
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.: N20-1 Scenario # 1 Event # 1 Page 9 of 61Event Description: **High Pressure Heaters Bypass/Overpower**

Shortly after taking the watch, the High-Pressure Heater Bypass Valve (1CF-75) will inadvertently open. The operator will respond in accordance with OAC Alarm Response Procedure M1L2917, "U1 WATER BYPASSING A&B HEATERS," and OMP 4-3, "Use of Emergency and Abnormal Procedures and FLEX Support Guidelines," and immediately reduce Turbine load as needed to maintain Rx power less than pre-transient condition.

Booth Operator Instructions: **Insert REM_CF0075=0.5, Ramp = 30**

Indications Available:

- OAC Alarm M1L2917 (U1 Water Bypassing A&B Heaters).
- TPBE will update over 100%.
- Excore NI's will read in excess of 100%.
- Main Generator MW output rises.

Time	Pos.	Expected Actions/Behavior	Comments
M1L2917, U1 WATER BYPASSING A&B HEATERS			
	CRS	(Step 1) Dispatch operator to check position of 1CF-75 (HP HTRS Bypass Vlv).	
	CRS	(Step 2) Investigate for leakage through 1CF-75 (HP HTRS Bypass Vlv).	
	CRS	(Step 3) Notify System Engineering.	
			NOTE: The crew may diagnose an overpower condition and adjust turbine load per OMP 4-3.
OMP 4-3, USE OF EMERGENCY AND ABNORMAL PROCEDURES AND FLEX SUPPORT GUIDELINES			
ATTACHMENT 10.1, PRUDENT OPERATOR ACTIONS			
	RO	Transient Load Changes	

Op Test No.: N20-1 Scenario # 1 Event # 1 Page 10 of 61Event Description: **High Pressure Heaters Bypass/Overpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Manual is preferred - Immediately reduce up to 20 MWe and then reduce as needed to maintain reactor power less than pre-transient condition. After the initial load reduction, the operators should use multiple and diverse indications to determine any additional load reduction. 	Examiner Note: There is a possibility that the Technical Specification LCO 3.4.1 (DNB) will be entered and exited during this transient.
		<ul style="list-style-type: none"> TPBE on the OAC updates once per minute. Other indications (PR meters and Delta T meters) will indicate reactor response more quickly and will enable the operators to control the plant more precisely. (This combines the Operator Fundamentals of Conservatism and Controlling Plant Evolutions Precisely.) 	NOTE: After the plant is stabilized the RO will place the Turbine back in AUTO.
			NOTE: The CRS will dispatch an AO. If so, Floor/Booth Instructor acknowledge as AO. Wait 3 minutes of time, and report that 1CF-75 is OPEN.
			NOTE: The CRS may call WCC/IAE to address the valve position. If so, Booth Instructor acknowledge as WCC. If the CRS directs that the valve be closed, Booth Instructor , as the WCC Supervisor, inform CRS that IAE will investigate prior to operating valve.
			NOTE: The CRS will likely conduct a Focus Brief.
At the discretion of the Lead Examiner move to Event #2.			

Op Test No.: N20-1 Scenario # 1 Event # 2 Page 11 of 61Event Description: **Power Range Failure**

After this, Power Range Instrument N42 will drift high. The operator will enter AP/1/A/5500/16, "Malfunction of Nuclear Instrumentation." The operator will address Technical Specification LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation."

Booth Operator Instructions: **Insert MAL_ENB013D = 100 (High) Ramp = 20 Seconds**

Indications Available:

- MCB Annunciator 1AD-2 B3, P/R CHANNEL DEVIATION
- MCB Annunciator 1AD-2 C8, P/R OVERPOWER ROD STOP
- MCB Annunciator 1AD-2 A8, OTDT RUNBACK/ROD STOP ALERT
- MCB Annunciator 1AD-2 E8, DCS TROUBLE
- MCB Annunciator 1AD-6, F8, OPDT PROTECTION ALERT
- MCB PR N42 indicates HIGHER than other Power Range channels
- PR N42 Drawer indicates HIGHER than other Power Range drawers
- PR N42 Drawer Upper Detector indicates HIGH.

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/16, MALFUNCTION OF NUCLEAR INSTRUMENTATION CASE III, POWER RANGE MALFUNCTION			
	RO	(Step 1) Place control rods in manual.	
	RO	(Step 2) Check S/G levels – AT PROGRAMMED LEVEL.	
	CRS	(Step 3) Announce occurrence on paging system.	NOTE: The CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 4) Check P/R channels – ONLY ONE CHANNEL FAILED.	NOTE: A Channel Check will reveal that only N42 has failed.
	CRS	(Step 5) Secure any power increase in progress.	

Op Test No.: N20-1 Scenario # 1 Event # 2 Page 12 of 61Event Description: **Power Range Failure**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 6) Check the following interlocks – IN REQUIRED STATE FOR EXISTING PLANT CONDITIONS:	
		<ul style="list-style-type: none"> P-7 Lo Power Rx Trips Blocked 	NOTE: The status light is DARK as expected.
		<ul style="list-style-type: none"> P-8 Hi Pwr Lo Flo Rx Trip Blocked 	NOTE: The status light is DARK as expected.
		<ul style="list-style-type: none"> P-10 Nuclear at Power. 	NOTE: The status light is LIT as expected.
	BOP	(Step 7) Perform the following actions at the “MISCELLANIOUS CONTROL AND INDICATION PANEL” drawer:	
		<ul style="list-style-type: none"> Place the appropriate “ROD STOP BYPASS” switch to the failed channel position. 	NOTE: The BOP will operate the switch for N42.
		<ul style="list-style-type: none"> Place the “POWER MISMATCH BYPASS” switch to the failed channel position. 	NOTE: The BOP will place the switch in the N42 position.
	BOP	(Step 8) 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. 	NOTE: The BOP will place the switch in the N42 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. 	NOTE: The BOP will place the switch in the N42 position.
		<ul style="list-style-type: none"> Check the “CHANNEL DEFEAT” light for the lower section – LIT. 	
	BOP	(Step 9) Perform the following action at the “COMPARATOR AND RATE” drawer:	
		<ul style="list-style-type: none"> Place the “COMPARATOR CHANNEL DEFEAT” switch to the failed channel position. 	NOTE: The BOP will place the switch in the N42 position.

Op Test No.: N20-1 Scenario # 1 Event # 2 Page 13 of 61Event Description: **Power Range Failure**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check the "COMPARATOR DEFEAT" light – LIT. 	
<p align="center">NOTE</p> <p>Removing fuses from power range drawers may cause associated NIS annunciators to alarm.</p>			
	BOP	(Step 10) Trip bistables of failed channel as follows:	
		<ul style="list-style-type: none"> Remove Control Power fuses from "POWER RANGE A" drawer for failed channel. 	NOTE: This action will cause Annunciators to alarm on MCB Panel 1AD-2.
	BOP	<ul style="list-style-type: none"> IF Power Range Cabinet shows evidence of damage ... 	NOTE: There is no such evidence displayed.
	BOP/ RO	(Step 11) 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) 	
	BOP/ RO	(Step 12) 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/ RO	(Step 13) Check the following status lights on 1SI-18 – LIT:	

Op Test No.: N20-1 Scenario # 1 Event # 2 Page 14 of 61Event Description: **Power Range Failure**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> “P/R LO SETPOINT TRAIN A TRIP BLOCKED” 	
		<ul style="list-style-type: none"> “P/R LO SETPOINT TRAIN B TRIP BLOCKED” 	
	RO	(Step 14) Check all CF control valves – IN AUTO.	
	RO	(Step 15) Adjust control rods to maintain T-Avg at T-Ref.	
	RO	(Step 16) WHEN T-Avg within 1°F of T-Ref AND auto rod control desired, THEN return control rods to auto.	NOTE: The RO may place the Control Rods back in AUTO.
	CRS	(Step 17) Instruct IAE to trip the following bistables associated with failed P/R channel within 72 hours of failure PER IP/1/A/3090/014 (Tripping Inoperable Protection Channels):	NOTE: The CRS may call WCC/IAE to address the failed channel and insert bistables. If so, Booth Instructor acknowledge as WCC (Note that there are already four Channel II Bistables tripped already due to the failed Pzr Pressure Channel).
		<ul style="list-style-type: none"> OPDT 	
		<ul style="list-style-type: none"> OTDT 	
	CRS	(Step 18) IF AT ANY TIME failed P/R channel is repaired prior to IAE tripping bistables,....	NOTE: The Power Range Channel will NOT be repaired.
	CRS	(Step 20) IF AT ANY TIME IAE completes Step 17....	NOTE: IAE will not complete Step 17.
	CRS	(Step 20) WHEN malfunctioning P/R channel repaired,	

Op Test No.: N20-1 Scenario # 1 Event # 2 Page 15 of 61Event Description: **Power Range Failure**

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The CRS will likely conduct a Focus Brief.
TECHNICAL SPECIFICATION 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION			
	CRS	LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE	
	CRS	APPLICABILITY: According to Table 3.3.1-1	
		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 NOTE: The CRS will determine that Functions 2a, 2b, 3, 6, 7, 16b, 16c, and 16d are affected by this failure and that Condition A is required and that ACTION A.1 must be taken.
D. One channel inoperable		D.1.1 Perform SR 3.2.4.2 AND D.1.2 Place channel in trip. OR D.2 Be in MODE 3	12 hours 72 hours 78 Hours NOTE: This Action is associated with Functions 2.a and 3 (Hi Flux Hi setpoint and hi positive rate trips).
E. One channel inoperable.		E.1 Place channel in trip. OR E.2 Be in MODE 3	72 hours 78 hours NOTE: This Action is associated with Functions 2.b,

Op Test No.: N20-1 Scenario # 1 Event # 2 Page 16 of 61Event Description: **Power Range Failure**

Time	Pos.	Expected Actions/Behavior	Comments
			6 and 7 (Hi Flux Lo setpoint, OPDT and OTDT trips).
T. One or more channel(s) inoperable.		T.1 Verify interlock is in required state for existing unit conditions. OR T.2 Be in MODE 2	1 hour 7 hours NOTE: This Action is associated with Functions 16.b and 16.c (P-7 and P-8)
S. One or more channel(s) inoperable.		S.1 Verify interlock is in required state for existing unit conditions. OR S.2 Be in MODE 3	1 hour 7 hours NOTE: This Action is associated with Function 16.c (P-10).
			NOTE: The CRS will likely conduct a Focus Brief.
At the discretion of the Lead Examiner move to Event #3.			

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 17 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

When the power range channel is removed from service, MSR Relief Valve 1HS179 will fail open causing a loss of turbine efficiency and an increase in reactor power. The operator will implement AP/1/A/5500/01, "Steam Leak." The operator will recognize the failure and perform a rapid downpower in accordance with AP/1/A/5500/04, "Rapid Downpower," in an attempt to shut the valve. Eventually the valve will re-close and the downpower will be stabilized.

Booth Operator Instructions:

insert REM_HS0179 = 1.0 (Once inserted reduce size to ensure that leak stays within allowable makeup limit).

Indications Available:

- Turbine MWe lowers rapidly
- Core ΔT s initially lowers and then starts to rise
- Reactor power rises
- Steam pressure initially lowers and then starts to rise
- OAC Alarm: 1C1 L/P TURBINE CROSSOVER STEAM TEMP RATE
- OAC Alarm: 1C2 L/P TURBINE CROSSOVER STEAM TEMP RATE

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The crew may diagnose an overpower condition and adjust turbine load per OMP 4-3.
OMP 4-3, USE OF EMERGENCY AND ABNORMAL PROCEDURES AND FLEX SUPPORT GUIDELINES ATTACHMENT 10.1, PRUDENT OPERATOR ACTIONS			
	RO	Transient Load Changes	
		<ul style="list-style-type: none"> • Manual is preferred - Immediately reduce up to 20 MWe and then reduce as needed to maintain reactor power less than pre-transient condition. After the initial load reduction, the operators should use multiple and diverse indications to determine any additional load reduction. 	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 18 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> TPBE on the OAC updates once per minute. Other indications (PR meters and Delta T meters) will indicate reactor response more quickly and will enable the operators to control the plant more precisely. (This combines the Operator Fundamentals of Conservatism and Controlling Plant Evolutions Precisely.) 	
AP/1/A/5500/01, STEAM LEAK			
			<p>NOTE: The CRS may dispatch AOs to look for steam leaks.</p> <p>If so, Booth Instructor as AO, respond back in 3-5 minutes per script (See Page 20).</p> <p>After 3-5 minutes of Non-investigatory Action, Call as Security and report Steam Release to atmosphere on U1 TB Roof.</p>
	RO/ BOP	(Step 1) Monitor Foldout page.	
		Manual Reactor Trip Criteria: (IF any of the following occur: (1) Steam leak is jeopardizing personnel safety or plant equipment, (2) T-Avg is less than 551°F AND going down, or (3) UST level is less than 1 ft – NOT Expected).	
	RO	(Step 2) Reduce turbine load to maintain the following:	NOTE: The RO may take the Turbine Control to MANUAL.
		<ul style="list-style-type: none"> Excore NI's – LESS THAN OR EQUAL TO 100% 	NOTE: Per OMP 4-3, the RO has the authority to remove ≈20 Mwe initially, and then additional load as needed to stabilize temperature.
		<ul style="list-style-type: none"> NC Loop D/T's – LESS THAN 60°F D/T 	
		<ul style="list-style-type: none"> T-Avg – AT T-REF. 	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 19 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS/ BOP	(Step 3) Check containment entry – IN PROGRESS.	NOTE: There is no Containment Entry in progress.
	CRS	(Step 3 RNO) GO TO Step 5.	
	BOP	(Step 5) Check Pzr pressure prior to event – GREATER THAN P-11 (1955 PSIG)	
	BOP	(Step 6) Check Pzr level – STABLE OR GOING UP	NOTE: If Pzr level is lowering the crew will perform the RNO prior to performing Step 7.
	CRS	(Step 7) IF AT ANY TIME while in this procedure Pzr level cannot be maintained stable, THEN RETURN TO Step 6.	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	(Step 8) GO TO Step 12.	
	CRS	(Step 12) Announce occurrence on paging system.	NOTE: The CRS 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 as follows:	
		<ul style="list-style-type: none"> Check SM PORVs – CLOSED. 	
		<ul style="list-style-type: none"> Check condenser dump valves – CLOSED. 	
	BOP	<ul style="list-style-type: none"> Check containment conditions – NORMAL: 	
		<ul style="list-style-type: none"> Containment temperature 	
		<ul style="list-style-type: none"> Containment pressure 	
		<ul style="list-style-type: none"> Containment humidity 	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 20 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Containment floor and equipment sump level. 	
		<ul style="list-style-type: none"> Check TD CA pump – OFF. 	
		<ul style="list-style-type: none"> Check valves on "STEAM LINE DRAIN VALVES" board (1MC-9) - CLOSED. 	NOTE: The BOP may need to perform the RNO and close valves.
	RO/ BOP	<ul style="list-style-type: none"> Check opposite Unit (Unit 2) "STEAM HEADER PRESSURE" – GREATER THAN 200 PSIG. 	NOTE: The CRS will ask U2 RO. If so, Floor Instructor acknowledge as U2 RO, and report U2 Steam Header Pressure is ≈1000 psig.
	CRS	<ul style="list-style-type: none"> Dispatch operator to check for leaks. 	NOTE: If not already done, the CRS will dispatch AOs to look for steam leaks. After 2-3 minutes, Booth Instructor , as AO , report that MSR 1C1 Shell Side Relief Valve (1HS179) is lifting.
	BOP	(Step 14) Check UST level – STABLE OR GOING UP.	NOTE: The UST level may be rising or lowering. If rising go to Step 15.
	BOP	(Step 14 RNO) Makeup to UST as required to maintain level.	
	CRS	(Step 15) Evaluate unit shutdown as follows:	
		<ul style="list-style-type: none"> Check unit status – IN MODE 1 OR 2. 	
		<ul style="list-style-type: none"> Determine if unit shutdown or load reduction is warranted based on the following criteria: 	
		<ul style="list-style-type: none"> Size of leak 	
		<ul style="list-style-type: none"> Location of leak 	
		<ul style="list-style-type: none"> Rate of depletion of secondary inventory 	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 21 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

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

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 22 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> AP/1/A/5500/04 (Rapid Downpower). 	NOTE: The CRS will transition to AP-4. Floor/Booth Instructor: If it appears likely that the crew will use the OP rather than the AP, state as the Operations Manager that it is desired to use AP-4.
AP/1/A/5500/04, RAPID DOWNPOWER			
	RO/ BOP	(Step 1) Monitor Foldout page.	
		Uncontrolled Cooldown (If Tavg < 551°F and lowering.....Not Expected)	
		Power Factor (Adjust power factor during load reduction to maintain power factor between 0.9 to 1.0 lagging, using "VOLTAGE ADJUST" pushbutton)	NOTE: The RO will adjust MVARs as needed.
		Manual Rx Power Control (< C-5, Not Expected)	
		Turbine Shutdown (Turbine Load < 15 MWe Not Expected)	
	CRS	(Step 2) Announce occurrence on page.	NOTE: The CRS 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.	NOTE: If MW LOOP is NOT in service, the RO will place MW LOOP in service per RNO.
	RO	(Step 4 RNO) Depress "MW IN/MW OUT" pushbutton.	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 23 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 5) Check shutdown to Mode 3 – DESIRED.	
	CRS	(Step 5 RNO) IF turbine will be shutdown during downpower, THEN enter target load of 15 MWE in turbine control panel	
		<ul style="list-style-type: none"> Observe Note prior to Step 8 and GO TO Step 8. 	
<p style="text-align: center;">NOTE</p> <p>The following table can be used to determine unloading rates. Rates other than specified are acceptable.</p>			
	CRS	(Step 8) Determine the required power reduction rate (MW/min).	NOTE: The CRS will reduce load at ≈10-20 MWe/minute.
	BOP	(Step 9) Notify DEC BA (Balancing Authority) of load reduction.	Booth Instructor: as DEC BA, acknowledge.
	RO	(Step 10) Check control rods – IN AUTO.	
	BOP	(Step 11) Borate NC System as follows:	
		<ul style="list-style-type: none"> Energize all backup Pzr heaters. 	
		<ul style="list-style-type: none"> Check unit to be shutdown – VIA REACTOR TRIP FROM 15% POWER. 	
	CRS	(Step 11.B RNO) GO TO Step 11.D.	
	BOP	(Step 11.D) 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) 	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 24 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Total Power change (%). 	NOTE: The total power change will be determined by the CRS and will affect the amount of boron inserted by the BOP. (Expected 300-500 gallons)
		<ul style="list-style-type: none"> Record calculated boration amount: 	
	RO	<ul style="list-style-type: none"> Check auto or manual rod control – AVAILABLE. 	
<p style="text-align: center;">NOTE</p> <p>If load reduction of greater than 60% is planned and Unit 1 is to remain in Mode 1, the final (1/4) addition of boron may not be required based on rate of Xenon production and control rod response.</p>			
	BOP	<ul style="list-style-type: none"> Perform boration in four equal additions during load reduction PER Enclosure 2 (Emergency Boration). 	
			NOTE: The CRS may assign the BOP to perform this action. If so, BOP Examiner follow actions of Enclosure 2. Other Examiners follow AP-4 Actions, Step 12, on Page 25.
<p style="text-align: center;">AP/1/A/5500/04, RAPID DOWNPOWER ENCLOSURE 2, EMERGENCY BORATION</p>			
	BOP	(Step 1) Check OAC - AVAILABLE.	
	BOP	(Step 2) Use OAC point M1P0785 (U1 Gallons Boric Acid Added Via 1NV-265B) to monitor boric acid gallons added while 1NV-265B (U1 NV Pump Boric Acid Sup Isol) is open.	
	BOP	(Step 3) GO TO Step 5.	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 25 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 5) Check boric acid transfer pump - RUNNING.	NOTE: The 1B Boric Acid Transfer Pump is running.
	BOP	(Step 6) OPEN 1NV-265B (U1 NV Pump Boric Acid Sup Isol).	
	BOP	(Step 7) Do not continue until desired amount of boric acid has been added.	
	BOP	(Step 8) CLOSE 1NV-265B (U1 NV Pump Boric Acid Sup Isol).	
	BOP	(Step 9) IF boric acid transfer pump was started in Step 5 RNO, THEN	NOTE: The 1B Boric Acid Transfer Pump was running initially.
	BOP	(Step 10) Repeat enclosure as required.	
AP/1/A/5500/04, RAPID DOWNPOWER			
			Examiner NOTE: Examiners following the CRS/RO continue HERE .
	RO	(Step 12) WHEN boration commenced, THEN initiate turbine load reduction to desired load at desired rate.	
	BOP	(Step 13) Display Rod Insertion Limits on OAC by entering turn on code "RIL."	
NOTE Control Rods may approach rod insertion limits during load reduction.			

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 26 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 14) 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 CRS will make one or more 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. 	
NOTE Unloading rates greater than 55 MW/min will meet C-7A interlock.			
	CRS	(Step 15) IF AT ANY TIME during this procedure C-7A is received, THEN ensure Transient Monitor freeze is triggered.	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	(Step 16) REFER TO the following:	NOTE: The CRS may ask SM to address. If so, Floor Instructor acknowledge as SM.
		<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). 	
	CRS	(Step 17) Notify Reactor Engineer on duty of load reduction.	NOTE: The CRS may call WCC/RE. If so, Booth Instructor acknowledge.

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 27 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 18) Check target load - LESS THAN 1000 MW.	NOTE: The CRS may have selected a target load greater than 1000 MWe. If so, the crew will perform the RNO and wait until target load is reached. If not, continue to Step 19
Booth Operator Instructions:		Insert REM_HS0179 = 0 (Remove 1HS179 Relief Valve Failure – At direction of Lead Examiner and after the 1st boration is complete.)	
			Booth Instructor: as AO, report that 1HS179 Relief Valve has reseated.
			NOTE: The CRS will direct the RO to go to HOLD on the Turbine. The BOP may adjust boron concentration as needed to stabilize the plant.
	CRS	(Step 19) Check Unit 2 available to supply aux steam as follows:	NOTE: The CRS will ask U2 RO. Floor Instructor: As U2 RO report "All these conditions are met."
		<ul style="list-style-type: none"> Unit 2 Reactor power - GREATER THAN 15% 	
		<ul style="list-style-type: none"> Unit 2 2AS-12 (U2 SM to AS Hdr Control Inlet Isol) - OPEN 	
		<ul style="list-style-type: none"> Unit 2 - AVAILABLE TO SUPPLY AS HEADER. 	
	RO	(Step 20) Check SM flow on all S/Gs – GREATER THAN 25%.	

Op Test No.: N20-1 Scenario # 1 Event # 3 Page 28 of 61Event Description: **MSR Relief Valve fails OPEN/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 21) WHEN all SM flows are less than 75%, THEN ensure the following valves ramp CLOSED:	NOTE: This is a conditional step. The CRS will make the RO aware of this action, if NOT already done.
		• 1CF-104AB (1A S/G CF Control Bypass)	
		• 1CF-105AB (1B S/G CF Control Bypass)	
		• 1CF-106AB (1C S/G CF Control Bypass)	
		• 1CF-107AB (1D S/G CF Control Bypass)	Examiner NOTE: It may be necessary to allow the crew to stabilize the plant prior to moving to Event 4.
			NOTE: The CRS may continue beyond this step in AP-4, however, it is expected that the plant will be stabilizing, and Event 4 is imminent.
After the RO has lowered Turbine Load by 10MWe, AND an AUTO Rod motion signal exists with Tavg > Tref by $\approx 1.5^{\circ}\text{F}$ and Lead Examiner concurrence, move to Event #4.			

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 29 of 61Event Description: **Dropped Rod/Downpower**

Subsequently, one Control Bank B Control Rod will drop into the core. The operator will respond in accordance with ARP 1AD-2/D-9, "RPI at Bottom Rod Drop" and will implement AP/1/A/5500/14, "Rod Control Malfunction," and ultimately reduce power to less than 50% using AP/1/A/5500/04, "Rapid Downpower." The operator will address Technical Specification LCO 3.1.4, "Rod Group Alignment Limits" and LCO 3.2.4 "Quadrant Power Tilt Ratio (QPTR)".

Booth Operator Instructions:

insert MAL_IRE006K2
STATIONARY_GRPPR (Control Rod K2 drops)

Indications Available:

- DRPI for Control Rod K-2 indicates Rod on Bottom
- MCB Annunciator 1AD-2/B-3, P/R CHANNEL DEVIATION
- MCB Annunciator 1AD-2/B-10, ROD CONTROL NON URGENT FAILURE
- MCB Annunciator 1AD-2/D-9, RPI AT BOTTOM ROD DROP
- Tref > Tavg

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
	RO	(Step 1) IF two or more rods are either dropped OR misaligned by greater than 24 steps,...	Immediate Action NOTE: Only one Rod Dropped during this event.
	RO	(Step 2) Place control rods in manual.	Immediate Action NOTE: The RO will place the rods in Manual.
	RO	(Step 3) Check rod movement – STOPPED.	Immediate Action
	RO	(Step 4) Check all rods – ALIGNED WITH ASSOCIATED BANK.	
	RO	(Step 4 RNO) Perform the following.	

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 30 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
NOTE DRPI problems are not addressed by this AP.			
		<ul style="list-style-type: none"> IF misaligned rod(s) due to DRPI indication failure only,... 	NOTE: The misaligned rod is NOT a DRPI indication failure.
		<ul style="list-style-type: none"> IF T-Avg has gone down, THEN lower Turbine load as necessary to restore T-Avg to T-Ref. 	NOTE: The RO may adjust load on the Turbine to maintain Tavg-Tref = 1°F.
		<ul style="list-style-type: none"> GO TO Enclosure 1 (Response To Dropped or Misaligned Rod) 	
			NOTE: The CRS will transition to Enclosure 1.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION ENCLOSURE 1, RESPONSE TO DROPPED OR MISALIGNED ROD			
	CRS	(Step 1) Announce occurrence on paging system.	NOTE: The CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	CRS	(Step 2) Dispatch rod control system qualified IAE to perform the following:	NOTE: The CRS may call WCC/IAE to address. If so, Booth Instructor acknowledge as WCC/IAE as appropriate.
		<ul style="list-style-type: none"> Correct cause of misaligned rod. 	
		<ul style="list-style-type: none"> Notify Control Room operators when auto or manual rod motion is available for reactivity control. 	
	RO	(Step 3) Do not move rods until IAE determines rod movement is available.	
	RO	(Step 4) IF AT ANY TIME a runback occurs while in this procedure, THEN observe the following guidance:	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 31 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF IAE has determined that it is permissible to move rods, THEN respond to the runback PER AP/1/A/5500/03 (Load Rejection). 	
		<ul style="list-style-type: none"> For all other circumstances, assume rod control is not available and respond to the runback as follows: 	
		<ul style="list-style-type: none"> Trip Reactor. 	
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
	RO	(Step 5) Check "ROD CONTROL URGENT FAILURE" alarm (1AD-2, A-10) – DARK.	
	RO	(Step 6) Use OAC point M1P1385 (Reactor Thermal Power, Best Estimate) to determine reactor power in subsequent steps.	
	RO	(Step 7) Check AFD (Tech Spec 3.2.3) – WITHIN TECH SPEC LIMITS.	
<p style="text-align: center;">NOTE</p> <p>If any control rod is misaligned more than 12 steps, Step 15 will provide guidance for performing any Tech Spec required power reduction.</p>			
	CRS	(Step 8) REFER TO the following Tech Specs while continuing in the enclosure:	
		<ul style="list-style-type: none"> Tech Spec 3.1.4 (Rod Group Alignment Limits). 	NOTE: The CRS may check the TS now and conclude that LCO 3.1.4 must be entered.
		<ul style="list-style-type: none"> Tech Spec 3.1.5 (Shutdown Bank Insertion Limits). 	
		<ul style="list-style-type: none"> Tech Spec 3.1.6 (Control Bank Insertion Limits). 	NOTE: The CRS may check the TS now and conclude that LCO 3.1.6 is <u>NOT</u> required to be entered.

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 32 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Tech Spec 3.2.4 (QPTR) 	NOTE: The CRS may check the TS now and conclude that LCO 3.2.4 must be entered.
		<ul style="list-style-type: none"> Ensure shutdown margin calculation is performed within 1 hour. 	NOTE: The CRS may ask the U2 BOP or call WCC to perform SDM calculation. If so, Floor/Booth Instructor acknowledge as WCC as appropriate.
	CRS	(Step 9) Contact Reactor Engineer for instructions.	NOTE: The CRS may call WCC/RE to address. If so, Booth Instructor acknowledge as WCC/RE as indicate that a dropped Rod recovery plan will be developed.
	CRS	(Step 10) If Tech Specs permit continued operation in the current mode for an unlimited period of time with control rods misaligned.....	NOTE: The CRS may direct the SM to evaluate. If so, Floor Instructor , acknowledge as SM.
	CRS	(Step 11) IF AT ANY TIME IAE desires to operate the lift coil disconnect switches as part of troubleshooting activities, THEN REFER TO OP/1/A/6150/008 (Rod Control), Enclosure 4.9 (Operating Lift Coil Disconnect Switches for Maintenance Troubleshooting).	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	RO	(Step 12) Check reactor power – GREATER THAN OR EQUAL TO 5%	
	RO/ BOP	(Step 13) Maintain T-Avg within 1°F of T-Ref as follows:	
		<ul style="list-style-type: none"> Adjust Turbine load. 	NOTE: The RO may adjust load on the Turbine as needed.
		OR	

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 33 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Borate/Dilute NC System. 	NOTE: The BOP may adjust NCS Boron Concentration as needed.
	CRS	(Step 14) Determine if power reduction is required as follows:	
		<ul style="list-style-type: none"> Check any misaligned rod – GREATER THAN 12 STEPS MISALIGNED. 	
	RO	<ul style="list-style-type: none"> Check only one rod – MISALIGNED. 	NOTE: Control Rod K-2 is dropped.
		<ul style="list-style-type: none"> Check reactor power – GREATER than 50% 	NOTE: Power is > 50%.
	CRS	(Step 15) Reduce reactor power below 50% prior to rod realignment as follows:	Booth Instructor: If the CRS contacts the WCC, as the Operations Manager direct that AP-4 be used; and lower power to 40% at 10MWe/min within 30 minutes .
		<ul style="list-style-type: none"> Ensure reactor power is less than 75% within 2 hours of rod misalignment to comply with Tech Spec 3.1.4. 	NOTE: The CRS may check the TS now and conclude that LCO 3.1.4 must be entered.
		<ul style="list-style-type: none"> Check QPTR (Tech Spec 3.2.4) – WITHIN TECH SPEC LIMITS. 	NOTE: The CRS may check the TS now and conclude that LCO 3.2.4 must be entered.
		(Step 15.b RNO) Ensure reactor power is also reduced in subsequent steps as required PER Tech Spec 3.2.4 (QPTR).	
		<ul style="list-style-type: none"> Continue reducing load as directed in subsequent steps until reactor power is less than 50% to comply with Reactor Engineering requirements. 	
	RO/ BOP	<ul style="list-style-type: none"> Observe the following limitations during power reduction: 	
		<ul style="list-style-type: none"> Do not move rods until IAE determines rod movement is available. 	
		<ul style="list-style-type: none"> Borate as required during power reduction to maintain T-Avg at T-Ref. 	

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 34 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Monitor AFD during load reduction. 	
		<ul style="list-style-type: none"> IF AT ANY TIME AFD reaches Tech Spec limit AND reactor power is greater than 50%, THEN perform the following: 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> Trip Reactor 	
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
		<ul style="list-style-type: none"> Reduce reactor power to less than 50% PER one of the following procedures: 	
		<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 Instructor: If the CRS contacts the WCC, as the Operations Superintendent direct that AP-4 be used; and lower power to 40% at 10MWe/min within 30 minutes.
			NOTE: The CRS will likely conduct a Focus Brief.
AP/1/A/5500/04, RAPID DOWNPOWER			
	RO/ BOP	(Step 1) Monitor Foldout page.	
		Uncontrolled Cooldown (If Tavg < 551°F and lowering.....Not Expected)	
		Power Factor (Adjust power factor during load reduction to maintain power factor between 0.9 to 1.0 lagging, using "VOLTAGE ADJUST" pushbutton)	NOTE: The RO will adjust MVARS as needed.
		Manual Rx Power Control (< C-5, Not Expected)	

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 35 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		Turbine Shutdown (Turbine Load < 15 MWe Not Expected)	
	CRS	(Step 2) Announce occurrence on page.	
	RO	(Step 3) Check turbine control – IN AUTO.	
	RO	(Step 4) Check “MW LOOP” – IN SERVICE.	NOTE: MW Loop may be in service
	RO	(Step 4 RNO) Depress “MW IN/MW OUT” pushbutton.	
	CRS	(Step 5) Check shutdown to Mode 3 – DESIRED.	
	CRS	(Step 5 RNO) IF turbine will be shutdown during downpower, THEN enter target load of 15 MWE in turbine control panel	
		<ul style="list-style-type: none"> Observe Note prior to Step 8 and GO TO Step 8. 	
<p style="text-align: center;">NOTE</p> <p>The following table can be used to determine unloading rates. Rates other than specified are acceptable.</p>			
	CRS	(Step 8) Determine the required power reduction rate (MW/min).	NOTE: The CRS will reduce load at ≈10-12 MWe/minute.
	BOP	(Step 9) Notify DEC BA (Balancing Authority) of load reduction.	Booth Instructor: as DEC BA, acknowledge.
	RO	(Step 10) Check control rods – IN AUTO.	NOTE: The control rods are in MANUAL for the dropped Rod event.

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 36 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 10 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF auto control available,... 	NOTE: AUTO rod control is NOT available.
		<ul style="list-style-type: none"> IF manual control available, THEN... 	NOTE: MANUAL rod control is NOT available.
	BOP	<ul style="list-style-type: none"> IF rods cannot be moved in auto or manual, THEN perform the following: 	
		<ul style="list-style-type: none"> Borate as required to maintain T-Avg at T-Ref. 	
		<ul style="list-style-type: none"> Monitor AFD during load reduction. 	
	RO/ BOP	<ul style="list-style-type: none"> IF AT ANY TIME AFD reaches Tech Spec limit AND reactor power is greater than 50%, THEN perform the following: 	NOTE: This is a Continuous Action. The CRS will make one or more 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). 	
<p style="text-align: center;">CAUTION</p> <p>Power reduction without rod control may require periodically halting or varying the load reduction rate to allow boration time to take effect. Focused coordination of load reduction rate and boration will be required to maintain T-Avg at T-Ref.</p>			
		<ul style="list-style-type: none"> Maintain T-Avg at T-Ref 	
	BOP	(Step 11) Borate NC System as follows:	
		<ul style="list-style-type: none"> Energize all backup Pzr heaters. 	NOTE: All Pzr Heaters are expected to be energized.
		<ul style="list-style-type: none"> Check unit to be shutdown – VIA REACTOR TRIP FROM 15% POWER. 	
	CRS	(Step 11.B RNO) GO TO Step 11.D.	
	BOP	(Step 11.D) Determine boration amount based on the following:	

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 37 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
		<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 (%). 	NOTE: The total power change will be determined by the CRS and will affect the amount of boron inserted by the BOP.
		<ul style="list-style-type: none"> Record calculated boration amount: 	
	RO	<ul style="list-style-type: none"> Check auto or manual rod control – AVAILABLE. 	
<p style="text-align: center;">NOTE</p> <p>If load reduction of greater than 60% is planned and Unit 1 is to remain in Mode 1, the final (1/4) addition of boron may not be required based on rate of Xenon production and control rod response.</p>			
	BOP	<ul style="list-style-type: none"> Perform boration in four equal additions during load reduction PER Enclosure 2 (Emergency Boration). 	
			<p>NOTE: The CRS may assign the BOP to perform this action.</p> <p>If so, BOP Examiner follow actions of Enclosure 2.</p> <p>Other Examiners follow AP-4 Actions, Step 12, on Page 38.</p>
<p style="text-align: center;">AP/1/A/5500/04, RAPID DOWNPOWER</p> <p style="text-align: center;">ENCLOSURE 2, EMERGENCY BORATION</p>			
	BOP	(Step 1) Check OAC - AVAILABLE.	
	BOP	(Step 2) Use OAC point M1P0785 (U1 Gallons Boric Acid Added Via 1NV-265B) to monitor boric acid gallons added while 1NV-265B (U1 NV Pump Boric Acid Sup Isol) is open.	

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 38 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3) GO TO Step 5.	
	BOP	(Step 5) Check boric acid transfer pump - RUNNING.	NOTE: The 1B Boric Acid Transfer Pump is running.
	BOP	(Step 6) OPEN 1NV-265B (U1 NV Pump Boric Acid Sup Isol).	
	BOP	(Step 7) Do not continue until desired amount of boric acid has been added.	
	BOP	(Step 8) CLOSE 1NV-265B (U1 NV Pump Boric Acid Sup Isol).	
	BOP	(Step 9) IF boric acid transfer pump was started in Step 5 RNO, THEN	NOTE: The 1B Boric Acid Transfer Pump was running initially.
	BOP	(Step 10) Repeat enclosure as required.	
AP/1/A/5500/04, RAPID DOWNPOWER			
			Examiner NOTE: Examiners following the CRS/RO continue HERE .
	RO	(Step 12) WHEN boration commenced, THEN initiate turbine load reduction to desired load at desired rate.	
			Examiner NOTE: Once the 1 st boration is initiated MOVE to Event #5 .
TECHNICAL SPECIFICATION 3.1.4, ROD GROUP ALIGNMENT LIMITS			

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 39 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	LCO 3.1.4 All shutdown and control rods shall be OPERABLE, with all individual indicated rod positions within 12 steps of their group step counter demand position.	
	CRS	APPLICABILITY: MODES 1 and 2.	
		ACTIONS	
CONDITION		REQUIRED ACTION	COMPLETION TIME
B. One rod not within alignment limits.		B.1 Restore rod to within alignment limits.	1 hour
		OR B.2.1.1 Verify SDM is within the limit specified in the COLR.	1 hour
		OR B.2.1.2 Initiate boration to restore SDM to within limit.	1 hour
		AND B.2.2 Reduce THERMAL POWER to $\leq 75\%$ RTP.	2 hours
		AND B.2.3 Verify SDM is within the limit specified in the COLR.	Once per 12 hours
		AND B.2.4 Perform SR 3.2.1.1.	72 hours
		AND B.2.5 Perform SR 3.2.2.1.	72 hours
		AND B.2.6 Re-evaluate safety analyses and confirm results remain valid for duration of operation under these conditions.	5 days
			NOTE: The CRS will determine that Condition B is required and that ACTION B.1 or B.2.1.1 and B.2.1.2 and B.2.2, B.2.3, B.2.4, B.2.5 and B.2.6 must be taken.
TECHNICAL SPECIFICATION 3.2.4, QPTR			
	CRS	LCO 3.2.4 The QPTR shall be ≤ 1.02 .	

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 40 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP.	IF power > 75% RTP the crew should NOT enter 3.2.4 until either an incore flux map is completed or power is , 75% and QPTR>1.02
		ACTIONS	
CONDITION		REQUIRED ACTION	COMPLETION TIME
A. QPTR not within limit		A.1.1 Reduce THERMAL POWER $\geq 3\%$ from RTP for each 1% of QPTR > 1.02. <u>AND</u>	2 hours
		A.2.2 Perform SR 3.2.4.1 and reduce THERMAL POWER $\geq 3\%$ from RTP for each 1% of QPTR > 1.02. <u>AND</u>	Once per 12 hours
		A.3 Perform SR 3.2.2.1 and SR 3.2.2.1. <u>AND</u>	24 hours AND Once per 7 days thereafter
		A.4 Reduce Power Range Neutron Flux – High Trip Setpoint $\geq 3\%$ for each 1% of QPTR > 1.02. <u>AND</u>	72 hours
		A.5 Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition. <u>AND</u>	Prior to increasing THERMAL POWER above the more restrictive limit of Required Action A.1 or A.2.
		A.6 Calibrate excore detectors to show zero QPT. <u>AND</u>	Prior to increasing THERMAL POWER above the more restrictive limit of Required Action A.1 or A.2.
		A.7 Perform SR 3.2.1.1 and SR 3.2.21	Within 24 hours after reaching RTP. OR Within 48 hours after increasing THERMAL

Op Test No.: N20-1 Scenario # 1 Event # 4 Page 41 of 61Event Description: **Dropped Rod/Downpower**

Time	Pos.	Expected Actions/Behavior	Comments
			POWER above the more restrictive limit of Required Action A1 or A.2.
			NOTE: The CRS will determine that Condition A is required and that ACTION A.1, A.2, A.3, A.4, A.5, A.6, and A.7 must be taken.
			Examiner Note: The CRS may request Chemistry to sample for Dose Equivalent Iodine per Technical Specification LCO 3.4.16.
Move to Event #5 after the crew has lowered power to 75% and concurrence of the Lead Examiner.			

Op Test No.: N20-1 Scenario # 1 Event # 5 Page 42 of 61

Event Description: **1B NCP Pump Bearing Oil Cooler Leak**

During the downpower, a leak will develop on the 1B NCP Upper Bearing Oil Reservoir. The operator will respond in accordance with AP/1/A/5500/08, "Malfunction of NC Pump," and the operator will be required to trip the reactor, stop the 1B NCP, and go to EP/1/A/5000/E-0, "Reactor Trip and/or Safety Injection."

Booth Operator Instructions: **insertMAL_NCP007BU = TRUE**

Indications Available:

- OAC Alarm M1P2764 1B NCP UPPER OIL RESERVOIR LVL 1 MIN AVG
- OAC Alarm M1A0732 1B NCP MTR UPPER BRG TEMP (will alarm 8-9 minutes after the first OAC alarm)

Time	Pos.	Expected Actions/Behavior	Comments
OAC ALARM M1P2764 1B NCP UPPER OIL RESERVOIR LVL 1 MIN AVG			
	CRS	(LO-LO Step 1) Go To AP/1/A/5500/08, Malfunction of NC Pump.	
			NOTE: The CRS will enter AP-08.
AP/1/A/5500/08, MALFUNCTION OF NC PUMP CASE II, NC PUMP MOTOR BEARING MALFUNCTION			
NOTE			
Step 1 RNO should be used to validate the abnormal parameter unless it has been previously validated or is clearly known to be valid.			
	BOP	(Step 1) Check abnormal NC pump parameter – KNOWN TO BE VALID.	NOTE: The BOP will use the Step 1 RNO and Enclosure 1 to determine that the parameter is known to be valid. (NOT scripted)
	BOP	(Step 2) Check NC pump parameters within operating limits:	
		<ul style="list-style-type: none"> • All NC pump stator winding temperatures – LESS THAN 311°F. 	
		<ul style="list-style-type: none"> • All NC pump motor bearing temperatures – LESS THAN 195°F. 	

Op Test No.: N20-1 Scenario # 1 Event # 5 Page 43 of 61Event Description: **1B NCP Pump Bearing Oil Cooler Leak**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 3) IF AT ANY TIME any operating limit in Step 2 exceeded, THEN GO TO Step 5.	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	(Step 4) GO TO Step 6.	
	CRS	(Step 6) Announce occurrence on paging system.	NOTE: CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO/ BOP	(Step 7) Correct any of the following which may affect NC Pump stator or motor bearing cooling:	
		• High ambient temperature	
		• Abnormal NC Pump bus voltage	
		• Interference with ventilation	
		• Abnormal RN alignment and flow	
		• Abnormal KC alignment and flow	
		• High KC temperature.	
	RO/ BOP	(Step 8) Check all NC Pump oil reservoir level computer alarms - CLEAR.	NOTE: The 1B NC Pump oil reservoir level computer alarm is NOT clear.
	RO/ BOP	(Step 8 RNO) Perform the following:	
		• Evaluate clearing level alarm by adjusting KC temperature to NC Pump oil cooler.	
		• IF upper oil reservoir in alarm, THEN trend the following indications on affected NC pump:	
		• Motor upper bearing temperature	
		• Motor upper thrust bearing temperature	

Op Test No.: N20-1 Scenario # 1 Event # 5 Page 44 of 61Event Description: **1B NCP Pump Bearing Oil Cooler Leak**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Motor lower thrust bearing temperature. 	
		<ul style="list-style-type: none"> IF lower oil reservoir in alarm, THEN trend motor lower bearing temperature on affected NC pump. 	
		<ul style="list-style-type: none"> IF AT ANY TIME oil level is in alarm AND associated bearing temperature is greater than 160°F, THEN RETURN TO Step 5 to trip affected NC pump. 	NOTE: The CRS will return to Step 5 and stop the 1B NC Pump.
	BOP	(Step 5) Stop affected NC pump as follows:	
	BOP	<ul style="list-style-type: none"> IF A or B NC pump is the affected pump, THEN CLOSE associated spray valve: 	NOTE: The 1B NC Pump is the affected NC Pump.
		<ul style="list-style-type: none"> 1NC-29C (B NC Loop PZR Spray Control). 	
		<ul style="list-style-type: none"> Check unit status – IN MODE 1 OR 2. 	
	RO	<ul style="list-style-type: none"> Trip reactor. 	
	BOP	<ul style="list-style-type: none"> WHEN reactor power less than 5%, THEN stop affected NC pump. 	NOTE: The plant power is currently < 5%.
	CRS	<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	

Op Test No.: N20-1 Scenario # 1 Event # 5 Page 45 of 61Event Description: **1B NCP Pump Bearing Oil Cooler Leak**

Time	Pos.	Expected Actions/Behavior	Comments
<u>Critical Task:</u> Trip the Reactor prior to stopping the 1B NCP during a low oil level condition and trip the NCP only after Reactor power level has dropped to less than 5% but before the CRS starts to read the Immediate Actions of EP/1/A/5000/E-0, Reactor Trip or Safety Injection, to the Control Board Operators to verify that a Reactor Trip has occurred. Safety Significance: The transient placed on the unit when an NCP is secured at power can challenge both reactor protection and control systems. Station management has decided that the conservative approach to dealing with this transient is to trip the reactor anytime a NCP malfunction warrants stopping a pump in Mode 1. Guidance is given to wait until reactor power is less than 5% before stopping the NC pump to ensure that the NC pump will provide adequate flow/core cooling until reactor power is sufficiently low enough to preclude a challenge to fuel integrity. If the action can be taken, and is not taken, this demonstrates "mis-operation" or incorrect operation that could unnecessarily challenge a fission product barrier (NCS).			
At the discretion of the Lead Examiner, move to Events #6-7.			

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 46 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Upon the reactor trip, a loss of Vital AC Panel 1EKVC will occur resulting in an inadvertent Safety Injection. Also, on the reactor trip, the Turbine will fail to trip automatically, and must be tripped manually. The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," reset SI and stop all ECCS Pumps except for one NV Pump. Ultimately, the crew will transition to step 9 of EP/1/A/5000/ES-1.1, "Safety Injection Termination." Once SI is terminated, the operator may address AP/1/A/5500/15, "Loss of Vital or Aux Control Power." The scenario will terminate in EP/1/A/5000/ES-1.1 at Step 14.I prior to the operator re-establishing Letdown.

Booth Operator Instructions:**MAL_DEH003A (Failure of the Turbine to Trip in AUTO)****MAL_EPL003C = ACTIVE (Loss of EKVC); cd = H_X01_094_2 = 1(RTB Open Light)****(Both malfunctions occur on Rx Trip - No Action Needed)****Indications Available:**

- All Control Rods Fully Inserted
- 3rd Row of Status Lights are all LIT
- Safety Injection actuation has occurred (1SI-18 is LIT)
- Main Turbine Governor Valves are OPEN

Time	Pos.	Expected Actions/Behavior	Comments
			Examiner Note: It is a management expectation that an inadvertent SI will be mitigated by closing NI-9 and 10 within 15 minutes.
			NOTE: Crew will carry out Immediate Actions of E-0, prior to the CRS addressing the EP.
E-0, REACTOR TRIP OR SAFETY INJECTION			
	RO/ BOP	(Step 1) Monitor Foldout page.	
		NC Pump Trip Criteria (Not Expected)	
		CA Suction Sources (CA storage tank (water tower) goes below 1.5 ft – Not expected)	
		Position Criteria for 1NV-150B and 1NV-151A (U1 NV Pump Recirc Isol)	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 47 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF NV S/I flowpath aligned AND NC pressure is less than 1500 PSIG, THEN CLOSE 1NV-150B and 1NV-151A. 	NOTE: The BOP will monitor these conditions.
		<ul style="list-style-type: none"> IF NC pressure is greater than 2000 PSIG, THEN OPEN 1NV-150B and 1NV-151A. 	
		Ruptured S/G Aux Feedwater Isolation Criteria (Not expected)	
		Faulted S/G Aux Feedwater Isolation Criteria (Not expected)	
	RO	(Step 2) Check Reactor Trip:	Immediate Action
		<ul style="list-style-type: none"> All rod bottom lights – LIT 	
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R power – GOING DOWN. 	
	RO	(Step 3) Check Turbine Trip:	Immediate Action
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	NOTE: The Turbine will fail to Auto Trip.
	RO	(Step 3 RNO) Perform the following:	Immediate Action
		<ul style="list-style-type: none"> Trip turbine. 	
		<ul style="list-style-type: none"> IF turbine will not trip.... 	

Critical Task:

Manually trip the Turbine before a valid Orange Path develops on the Integrity Critical Safety Function.

Safety Significance: Failure to trip the Main Turbine when conditions exist that allow the operator to do so, constitutes mis-operation or incorrect operator performance that unnecessarily challenges the Integrity Critical Safety Function. An overcooling event, such as a failure of the Turbine to trip on a reactor trip, in the presence of an inadvertent actuation of Safety Injection creates the potentiality of creating a Pressurized Thermal Shock conditions that otherwise would not exist.

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 48 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	Immediate Action
	RO / BOP	(Step 5) Check if S/I is actuated:	Immediate Action
		<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. 	
	CRS	(Step 6) Announce “Unit 1 Safety Injection”.	NOTE: CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 7) Check all Feedwater Isolation status lights (1SI-4) - LIT	
	BOP	(Step 8) Check Phase A “RESET” lights – DARK.	
	BOP	(Step 9) 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"> Group 4 – LIT AS REQUIRED. 	
		<ul style="list-style-type: none"> Group 6 – LIT. 	
	CRS	<ul style="list-style-type: none"> GO TO Step 10. 	
	RO / BOP	(Step 10) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 49 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> N/R level in at least 3 S/Gs – GREATER THAN 17%. 	
	BOP	(Step 11) Check all KC pumps - ON	
	BOP	(Step 12) Check both RN pumps – ON.	
	CRS	(Step 13) Notify Unit 2 to perform the following:	Floor Instructor: As U2 RO report “2A RN Pump is running.”
		<ul style="list-style-type: none"> Start 2A RN pump. 	
		<ul style="list-style-type: none"> THROTTLE Unit 2 RN flow to minimum for existing plant conditions. 	Booth Instructor: insert LOA_RN087 (Start 2A RN Pump) insert LOA_RN083 8050.000000 delay=0 ramp=10 (Unit 2 Train A Demand Flow)
	RO	(Step 14) Check all S/G pressures – GREATER THAN 775 psig.	
	BOP	(Step 15) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment Pressure is ≈0.15 psig.
	BOP	(Step 16) Check S/I 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. 	NOTE: NC System pressure is ≈ 2250-2300 psig.
	BOP	(Step 16b RNO) Perform the following:	
		<ul style="list-style-type: none"> Ensure ND pump miniflow valve on running pump(s) open: 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 50 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<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). 	
	CRS	<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 17. 	
	CRS	(Step 17) Notify Shift Manager or other SRO to perform EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 22 (Shift Manager Actions Following an S/I) within 10 minutes.	NOTE: CRS may ask SM to address. If so, Floor Instructor acknowledge as SM.
	RO / BOP	(Step 18) 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 each S/G N/R level is greater than 11% (32% ACC), THEN control CA flow to maintain that S/G N/R level between 11% (32% ACC) and 50%. 	
	RO	(Step 19) 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 	NOTE: All NC Pumps will be ON, except the 1B NCP.
	RO	(Step 19 RNO) Perform the following based on plant conditions:	Examiner NOTE: If Tavg is stable or trending to 557°F, Enclosure 3 of E-0 will NOT be performed. Proceed to Step 20 of E-0 on Page 52.

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 51 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

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). 	NOTE: The CRS may assign the RO (BOP) to perform this action. If so, RO (BOP) Examiner follow actions of Enclosure 3. Other Examiners follow E-0 Actions, Step 20, on Page 52.
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION ENCLOSURE 3, UNCONTROLLED NC SYSTEM COOLDOWN			
	RO/ (BOP)	(Step 1) Check steam dump valves – CLOSED.	
	RO/ (BOP)	(Step 2) Check all SM PORVs – CLOSED.	
	RO/ (BOP)	(Step 3) Check MSR “RESET” light - LIT	
	RO/ (BOP)	(Step 4) Check any NC pump – ON.	NOTE: All NC Pumps are ON except the 1B NCP.
	RO/ (BOP)	(Step 5) Check NC T-Avg - GOING DOWN.	
	RO/ (BOP)	(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... 	
		<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: 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 52 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<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/ (BOP)	(Step 7) Check MSIVs – ANY OPEN.	NOTE: All MSIVs are OPEN.
	RO/ (BOP)	(Step 8) CLOSE 1SM-15 (U1 SM To MSR 2 nd Stg Tube Bundles Isol).	
	RO/ (BOP)	(Step 9) Check any NC pump - ON.	NOTE: All NC Pumps are ON except the 1B NCP.
	RO/ (BOP)	(Step 10) Check NC T-Avg - STABLE.	
	RO/ (BOP)	(Step 11) Notify Control Room Supervisor of the following:	
		<ul style="list-style-type: none"> NC temperature trend 	
		<ul style="list-style-type: none"> Status of MSIV and Bypass Valves 	
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP	(Step 20) Check Pzr PORV and spray valves:	Examiner NOTE: Examiners following the CRS/BOP(RO) continue HERE .
		<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. 	
		<ul style="list-style-type: none"> Normal Pzr spray valves – CLOSED. 	NOTE: depending on NC System pressure the Spray Valve may be OPEN requiring performance of the Step 20.b RNO (Close Spray valves).

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 53 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> At least one Pzr PORV isolation valve – OPEN. 	
	BOP	(Step 21) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	NOTE: NC System Subcooling will be ≈80-90°F.
	RO	(Step 22) 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 23) 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 24) Check if NC System intact:	NOTE: All EMF instrumentation reads normal.
		<ul style="list-style-type: none"> 1EMF-38(L) (Containment Particulate (LR)) - NORMAL 	
		<ul style="list-style-type: none"> 1EMF-39(L) (Containment Gas (Lo Range)) - NORMAL 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 54 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1EMF-40 (Containment Iodine) - NORMAL 	
		<ul style="list-style-type: none"> Check containment pressure – LESS THAN 1 PSIG 	NOTE: Containment Pressure is ≈0.20 psig.
		<ul style="list-style-type: none"> Check containment sump level – NORMAL. 	
	RO / BOP	(Step 25) 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 26) Reset the following:	
		<ul style="list-style-type: none"> S/I 	
		<ul style="list-style-type: none"> Sequencers. 	
	BOP	(Step 27) Stop all but one NV pump.	NOTE: The BOP will stop one of the two NV Pumps.
	BOP	(Step 28) Check NC pressure – STABLE OR GOING UP.	
	BOP	(Step 29) Isolate NV S/I flowpath as follows:	
		<ul style="list-style-type: none"> Check NV pumps miniflow valves – OPEN: 	
		<ul style="list-style-type: none"> 1NV-150B (U1 NV Pump Recirc Isol) 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 55 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NV-151A (U1 NV Pump Recirc Isol). 	
		<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: It is a management expectation that an inadvertent SI will be mitigated by closing NI-9 and 10 within 15 minutes.
	BOP	(Step 30) Establish charging as follows:	
	BOP	<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	
	BOP	<ul style="list-style-type: none"> THROTTLE 1NV-238 (U1 Charging Hdr Control) to maintain 6-10 GPM seal injection flow to each NC pump. 	
	BOP	<ul style="list-style-type: none"> Close 1NV-241 (U1 Seal Water Inj Flow Control). 	
	BOP	<ul style="list-style-type: none"> Check one of the following valves – OPEN: 	
		<ul style="list-style-type: none"> 1NV-13B (U1 NV Supply to 1A NC Loop Isol). 	NOTE: 1NV-13B is OPEN.
		OR	
		<ul style="list-style-type: none"> 1NV-16A (U1 NV Supply to 1D NC Loop Isol). 	
	BOP	<ul style="list-style-type: none"> Check 1NV-21A (U1 NV Spray to U1 Aux PZR Spray Isol) – CLOSED. 	
	BOP	<ul style="list-style-type: none"> Open the following valves: 	
		<ul style="list-style-type: none"> 1NV-244A (Charging Hdr Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NV-245B (Charging Hdr Cont Outside Isol). 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 56 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> WHEN controlling NV flow in subsequent steps, THEN maintain flow within the following limits while THROTTLING charging and seal injection control valves: 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> Charging flow – LESS THAN 200 GPM. 	
		<ul style="list-style-type: none"> Seal injection flow to each NC pump – 6-10 GPM. 	
	BOP	(Step 31) Control charging flow as follows:	
		<ul style="list-style-type: none"> Control charging flow as required to maintain Pzr level stable. 	
		<ul style="list-style-type: none"> Check Pzr level – STABLE OR GOING UP. 	
	BOP	(Step 32) Reset the following:	
		<ul style="list-style-type: none"> Phase A Isolation 	
		<ul style="list-style-type: none"> Phase B Isolation. 	
	BOP	(Step 33) Establish VI to containment as follows:	
		<ul style="list-style-type: none"> OPEN the following valves: 	
		<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. 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 57 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 34) Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees).	NOTE: The CRS will direct the STA to implement this action. Floor Instructor: As STA, acknowledge.
			Examiner NOTE: A Red path will exist on the Subcriticality Critical Safety Function Status Tree because of the previously failed N42.
	CRS	(Step 35) WHEN EP/1/A/5000/ES-1.1 (Safety Injection Termination) is implemented in next step, THEN monitor its Foldout page.	
	CRS	(Step 35) GO TO Step 9 of EP/1/A/5000/ES-1.1 (Safety Injection Termination).	NOTE: The CRS will transition to ES-1.1 Step 9.
ES-1.1, SAFETY INJECTION TERMINATION			
	RO/ BOP	Foldout Page	NOTE: None of the Foldout Page Criteria are expected to apply.
		<ul style="list-style-type: none"> S/I Reinitiation Criteria (applies after Step 10 in body of this procedure) 	
		<ul style="list-style-type: none"> Secondary Integrity Criteria: 	
		<ul style="list-style-type: none"> Cold Leg Recirc Switchover Criteria: 	
		<ul style="list-style-type: none"> CA Suction Sources: 	
	BOP	(Step 9) Check if NI pumps should be stopped:	Examiner NOTE: After transition to ES-1.1, terminate Exam at Lead Examiner discretion.
		<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. 	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 58 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Stop NI pumps. 	NOTE: The BOP will stop both NI Pumps.
	CRS	<ul style="list-style-type: none"> GO TO Step 10. 	
	BOP	(Step 10) 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. 	NOTE: The BOP will stop both ND Pumps.
	RO	(Step 11) 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 ≈65-85°F.
	BOP	<ul style="list-style-type: none"> Pzr level – GREATER THAN 11% (29% ACC). 	NOTE: Pzr Level will be 60-90%.
	RO	(Step 12) Check steam dumps:	
		<ul style="list-style-type: none"> Check condenser available as follows: 	
		<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. 	
	RO	<ul style="list-style-type: none"> Using “STEAM DUMP SELECT” switch, place steam dumps 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"> Ensure steam dumps maintain NC T-Hots stable using auto or manual control. 	
	CRS	<ul style="list-style-type: none"> GO TO Step 13. 	
	RO	(Step 13) Check NC T-Hots – STABLE.	

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 59 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO/ BOP	(Step 14) Check if letdown can be established:	
		<ul style="list-style-type: none"> Pzr level – GREATER THAN 25% 	
		<ul style="list-style-type: none"> Check ND pumps – OFF. 	
	BOP	<ul style="list-style-type: none"> OPEN the following valves: 	
		<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. 	
	BOP	<ul style="list-style-type: none"> Place the following in “AUTO” for the operating KC train(s): 	
		<ul style="list-style-type: none"> 1KC-54B (Train B Recirc Isol). 	
		<ul style="list-style-type: none"> Check 1KC-1A – OPEN. 	
	BOP	<ul style="list-style-type: none"> Perform the following concurrently: 	
		<ul style="list-style-type: none"> CLOSE 1KC-56A (1A ND Hx KC Inlet Isol) 	
		<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. 	
	BOP	<ul style="list-style-type: none"> Perform the following concurrently: 	
		<ul style="list-style-type: none"> CLOSE 1KC-81B (1B ND Hx KC Inlet Isol) 	
		<ul style="list-style-type: none"> As flow goes down, OPEN 1KC-53B (Trn B Aux Bldg Non Ess Sup Isol). 	
NOTE			
Resetting modulating valves establishes control of RN to KC Hx control.			

Op Test No.: N20-1 Scenario # 1 Event # 6-7 Page 60 of 61Event Description: **Loss of VIAC 1EKVC/Inadvertent SI Actuation/ Failure of the Turbine to Trip in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none">Reset modulating valves using reset buttons on RN control board.	
		<ul style="list-style-type: none">Check the following:	
		<ul style="list-style-type: none">1EMF-51A (Containment Train A (Hi Range)) – LESS THAN 25 R/HR	
		<ul style="list-style-type: none">1EMF-51B (Containment Train B (Hi Range)) – LESS THAN 25 R/HR.	
		<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.	
At the discretion of the Lead Examiner terminate the exam.			

UNIT 1 STATUS:

Power Level: 100% NCS [B] 85 ppm Pzr [B]: 85 ppm Xe: Per OAC

Power History: At this power level for 357 days Core Burnup: 471.1 EFPDs

UNIT 2 STATUS:

Power Level: 100%

CONTROLLING PROCEDURE:

- OP/1/A/6100/003 (Controlling Procedure for Unit Operation)

OTHER INFORMATION NEEDED TO ASSUME THE SHIFT:

- The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.

The following equipment is Out-Of-Service:

- The 1A NS Pump is OOS for preventive maintenance. ACTION has been taken in accordance with Technical Specification LCO 3.6.6 ACTION A.
- 1NCPT-5150, Pzr Pressure Channel 2, has failed and has been removed from service in accordance with plant procedures. ACTION has been taken in accordance with Technical Specification LCO 3.3.1 and 3.3.2.
- MCB Annunciator 1AD-12, F-5, "FWST EMERGENCY LO TEMP," has alarmed spuriously several times over the last hour and has currently failed ON (IAE has verified that the issue is limited to an annunciator card issue).

Crew Directions:

- Maintain Steady-State operations.

Work Control SRO

Jim

Field SRO

Joe (FB)

AO's AVAILABLE**Unit 1**

Aux Bldg. John

Turb Bldg. Bob (FB)

Extra(s) Bill (FB) Ed (FB) Gus (RW) Carol

Unit 2

Aux Bldg. Chris

Turb Bldg. Mike (FB)

Facility: McGuire		Scenario No.: 2		Op Test No.: N20-1	
Examiners: _____		Operators: _____ (SRO)			
_____		_____ (RO)			
_____		_____ (BOP)			
Initial Conditions:		The plant is at 75% power (MOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.			
Turnover:		The following equipment is Out-Of-Service: The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-11, L-1, "ETA DEGRADED VOLTAGE," has alarmed spuriously several times over the last hour, and has currently failed ON (IAE has verified that the issue is limited to an annunciator card issue). The crew will raise power to 100% after taking the shift.			
Critical Tasks:		See Below			
Event No.	Malf. No.	Event Type*	Event Description		
1	NA	R-RO N-BOP N-SRO	Power Increase w/Simple Dilute		
2	MAL DCS1288	C-RO C-SRO	Uncontrolled outward Rod Motion in AUTO		
3	MAL DCS1762 DCS1763	C-BOP C(TS)-SRO	Pzr Spray Valve (1NC-27) Controller fails OPEN		
4	REM RN0018B	C-BOP C(TS)-SRO	1B RN Pump Suction Valve inadvertently CLOSES		
5	MAL LF003B IRE009 SG001C	C-RO C-BOP C-SRO	1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual		
6	REM SM003AB MAL IPE001A/B IPE002A/B SG001C SM004C1	M-RO M-BOP M-SRO	1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR		
7	MAL CA004A CA004B CA005	C-BOP C-SRO	TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

McGuire 2020 NRC Scenario #2

The plant is at 75% power (MOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.

The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-11, L-1, "ETA DEGRADED VOLTAGE," has alarmed spuriously several times over the last hour, and has currently failed ON (IAE has verified that the issue is limited to an annunciator card issue). The crew will raise power to 100% after taking the shift.

Shortly after taking the watch, the operator will commence a load increase to 100% starting with Step 3.37.11 of Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." The operator will dilute the NC System Boron concentration in accordance with Enclosure 4.19, "Simple Dilution," of OP/1/A/6150/009, "Boron Concentration Control," and raise Turbine load in accordance with OP/1/A/6300/001 A, "Turbine-Generator Load Change."

After the load increase is started, the Control Rods will fail such that rods are moving outward in AUTO. The operator will enter AP/1/A/5500/14, "Rod Control Malfunction." The control rods will subsequently remain in MANUAL.

After this, the Pzr Spray Valve Controller, 1NC-27C A Spray, demand will fail to full output. The operator will enter AP/1/A/5500/11, "Pressurizer Pressure Anomalies." The operator will address Technical Specification LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits."

Next, the 1B RN Pump Suction Isolation valve will inadvertently CLOSE. The operator will respond using one or more Annunciator Response Procedures and ultimately enter AP/1/A/5500/20, "Loss of RN," to place the standby train in service. The operator will address Technical Specification LCO 3.7.7, "Nuclear Service Water System (NSWS)," and Technical Specification LCO 3.8.1, "AC Sources-Operating."

Subsequently, the 1B CF Pump will trip causing the turbine to automatically runback to 55%. Simultaneously, a 40 gpm Steam Generator Tube Leak (SGTL) will occur in the 1C Steam Generator. The operator will implement AP/1/A/5500/03, "Load Rejection." During the runback the operator will need to drive rods in manually.

When the plant is stabilized or AP/1/A/5500/10 is entered to mitigate the SGTL, the 1C MSIV will inadvertently CLOSE, and the Reactor will fail to trip automatically and manually. Additionally, the low set Safety Valve on the 1C Steam Generator will lift and stick fully OPEN. Additionally, the TD CA Pump will trip on overspeed on auto start, and both MDCA Pumps will fail to start automatically. The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and then transition to EP/1/A/5000/FR-S.1, "Response to Nuclear Power Generation/ATWS." During the performance of FR-S.1, the operator will continuously drive rods in manually, successfully trip the Reactor locally, and manually start the MDCA Pumps and establish 450 gpm of flow the Steam Generators.

The SGTL will degrade to a tube rupture in the 1C Steam Generator when the reactor is locally tripped.

After completion of FR-S.1, the operator will transition back to E-0, and then to EP/1/A/5000/E-2, "Faulted Steam Generator Isolation." After the 1C Steam Generator is isolated, the operator will transition to EP/1/A/5000/E-3, "Steam Generator Tube Rupture."

The scenario will terminate at Step 6 of E-3 after the operator has transitioned to EP/1/A/5000/ECA-3.1, "SGTR with Subcooled Recovery Desired," or at Step 9 of E-3 upon initiating an NCS cooldown.

Critical Tasks:

Manually close the Failed OPEN Pzr Spray Valve before the Pressurizer pressure drops to \leq 1945 psig.

Safety Significance: failure to close the Spray Valve and stop the pressure transient, under the postulated plant conditions, results in an unnecessary transient to the plant and challenge to the Reactor Protection System. Performance of the critical task would stabilize the pressure transient. A failure to stabilize the pressure transient, when able to do so, constitutes a mis-operation or incorrect crew performance which leads to incorrect NCS pressure control.

Start one or more MD CA Pumps before entry into FR-H.1 is required.

Safety Significance: Failure to establish a Secondary Heat Sink through the initiation of CA flow unnecessarily challenges both the HEAT SINK and the CORE COOLING Critical Safety Functions. Additionally, the FSAR Safety Analysis results are predicated on the assumption that at least one train of safeguards actuates and delivers a minimum amount of AFW flow to the Steam Generators. Failure to perform this task, when the ability to do so exists, results in a violation of the Facility License Condition and places the plant in an unanalyzed condition.

PROGRAM: McGuire Operations Training

MODULE: Initial License Operator Training Class ILT 20-1

TOPIC: NRC Simulator Exam

Scenario N20-1-2

REFERENCES:

1. OP/1/A/6100/003, "Controlling Procedure for Unit Operation" (Rev 212)
2. OP/1/A/6150/009, "Boron Concentration Control" (Rev 138)
3. OP/1/A/6300/001 A, "Turbine-Generator Load Change" (Rev 13)
4. AP/1/A/5500/14, "Rod Control Malfunction" (Rev 16)
5. AP/1/A/5500/11, "Pressurizer Pressure Anomalies" (Rev 12)
6. Technical Specification LCO 3.4.1, "RCS Pressure, Temperature and Flow Departure From Nucleate Boiling (DNB) Limits" (Amendment 219/201)
7. MCEI -0400-379, "McGuire 1 Cycle 27 Core Operating Limits Report" (Rev 1)
8. AP/1/A/5500/20, "Loss of RN" (Rev 38)
9. Technical Specification LCO 3.7.7, "Nuclear Service Water System (NSWS)" (Amendment 308/287)
10. Technical Specification LCO 3.8.1, "AC Sources - Operating" (Amendment 314/293)
11. AP/1/A/5500/03, "Load Rejection" (Rev 34)
12. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection" (Rev 36)
13. EP/1/A/5000/E-2, "Faulted Steam Generator Isolation" (Rev 10)
14. EP/1/A/5000/E-3, "Steam Generator Tube Rupture" (Rev 27)
15. EP/1/A/5000/ECA-3.1, "SGTR With Loss of Reactor Coolant- Subcooled Recovery Desired" (Rev 20)
16. EP/1/A/5000/FR-S.1, "Response To Nuclear Power Generation/ATWS" (Rev 17)

Validation Time: 110 minutes

Author: David Lazarony, Essential Training & Consulting, LLC

Facility Review: _____

Rev. 011420

McGuire 2020 NRC Scenario #2 Objectives:

Given the simulator at an initial condition of 75% power with a normal power increase planned evaluate:

1. the SRO's ability to supervise the control room team during the normal, abnormal, and emergency situations that arise, including compliance with all facility procedures, Technical Specifications, and other commitments.
2. each crew member's ability to effectively communicate as part of a control room team during the normal, abnormal, and emergency situations that arise.
3. the RO and BOP's ability to effectively raise power in accordance with Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation," and the Simple Dilution process.
4. each crew member's ability to effectively diagnose an uncontrolled withdrawal of the Control Rods when operating in AUTO, and the RO's ability to respond to such an event in accordance with AP/1/A/5500/14, "Rod Control Malfunction."
5. each crew member's ability to effectively diagnose a failure of a Pressurizer Spray Valve controller when operating in AUTO, and the BOP's ability to respond to such an event in accordance with AP/1/A/5500/11, "Pressurizer Pressure Anomalies."
6. each crew member's ability to effectively diagnose an inadvertent closure of an RN Pump Suction Valve, and the BOP's ability to respond to such an event in accordance with AP/1/A/5500/20, "Loss of RN."
7. each crew member's ability to effectively diagnose a trip of a CF Pump, and their ability to respond to such an event in accordance with AP/1/A/5500/03, "Load Rejection," including RO's ability to control rods in MANUAL during a downpower.
8. each crew member's ability to effectively diagnose a Steam Generator Tube Leak in accordance with AP/1/A/5500/10, "NC System Leakage within Capacity of Both NV Pumps."
9. each crew member's ability to effectively diagnose an ATWS event and the RO and BOP's ability to respond to such an event in accordance with EP/1/A/5000/FR-S.1, "Response to Nuclear Power Generation/ATWS."
10. each crew member's ability to effectively diagnose a ruptured-faulted Steam Generator and the RO and BOP's ability to respond to such an event in accordance with EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," EP/1/A/5000/E-2, "Faulted Steam Generator Isolation," EP/1/A/5000/E-3, "Steam Generator Tube Rupture," and EP/1/A/5000/ECA-3.1, "SGTR with Subcooled Recovery Desired."

Scenario Event Description
NRC Scenario 2

Facility:	McGuire	Scenario No.:	2	Op Test No.:	N20-1
Examiners:	_____	Operators:	_____		(SRO)
	_____		_____		(RO)
	_____		_____		(BOP)
Initial Conditions:		The plant is at 75% power (MOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.			
Turnover:		The following equipment is Out-Of-Service: The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-11, L-1, "ETA DEGRADED VOLTAGE," has alarmed spuriously several times over the last hour, and has currently failed ON (IAE has verified that the issue is limited to an annunciator card issue). The crew will raise power to 100% after taking the shift.			
Critical Tasks:		See Below			
Event No.	Malf. No.	Event Type*	Event Description		
1	NA	R-RO N-BOP N-SRO	Power Increase w/Simple Dilute		
2	MAL DCS1288	C-RO C-SRO	Uncontrolled outward Rod Motion in AUTO		
3	MAL DCS1762 DCS1763	C-BOP C(TS)-SRO	Pzr Spray Valve (1NC-27) Controller fails OPEN		
4	REM RN0018B	C-BOP C(TS)-SRO	1B RN Pump Suction Valve inadvertently CLOSES		
5	MAL LF003B IRE009 SG001C	C-RO C-BOP C-SRO	1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual		
6	REM SM003AB MAL IPE001A/B IPE002A/B SG001C SM004C1	M-RO M-BOP M-SRO	1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR		
7	MAL CA004A CA004B CA005	C-BOP C-SRO	TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Scenario Event Description
NRC Scenario 2

McGuire 2020 NRC Scenario #2

The plant is at 75% power (MOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.

The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-11, L-1, "ETA DEGRADED VOLTAGE," has alarmed spuriously several times over the last hour, and has currently failed ON (IAE has verified that the issue is limited to an annunciator card issue). The crew will raise power to 100% after taking the shift.

Shortly after taking the watch, the operator will commence a load increase to 100% starting with Step 3.37.11 of Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." The operator will dilute the NC System Boron concentration in accordance with Enclosure 4.19, "Simple Dilution," of OP/1/A/6150/009, "Boron Concentration Control," and raise Turbine load in accordance with OP/1/A/6300/001 A, "Turbine-Generator Load Change."

After the load increase is started, the Control Rods will fail such that rods are moving outward in AUTO. The operator will enter AP/1/A/5500/14, "Rod Control Malfunction." The control rods will subsequently remain in MANUAL.

After this, the Pzr Spray Valve Controller, 1NC-27C A Spray, demand will fail to full output. The operator will enter AP/1/A/5500/11, "Pressurizer Pressure Anomalies." The operator will address Technical Specification LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits."

Next, the 1B RN Pump Suction Isolation valve will inadvertently CLOSE. The operator will respond using one or more Annunciator Response Procedures and ultimately enter AP/1/A/5500/20, "Loss of RN," to place the standby train in service. The operator will address Technical Specification LCO 3.7.7, "Nuclear Service Water System (NSWS)," and Technical Specification LCO 3.8.1, "AC Sources-Operating."

Subsequently, the 1B CF Pump will trip causing the turbine to automatically runback to 55%. Simultaneously, a 40 gpm Steam Generator Tube Leak (SGTL) will occur in the 1C Steam Generator. The operator will implement AP/1/A/5500/03, "Load Rejection." During the runback the operator will need to drive rods in manually.

When the plant is stabilized or AP/1/A/5500/10 is entered to mitigate the SGTL, the 1C MSIV will inadvertently CLOSE, and the Reactor will fail to trip automatically and manually. Additionally, the low set Safety Valve on the 1C Steam Generator will lift and stick fully OPEN. Additionally, the TD CA Pump will trip on overspeed on auto start, and both MDCA Pumps will fail to start automatically. The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and then transition to EP/1/A/5000/FR-S.1, "Response to Nuclear Power Generation/ATWS." During the performance of FR-S.1, the operator will continuously drive rods in manually, successfully trip the Reactor locally, and manually start the MDCA Pumps and establish 450 gpm of flow the Steam Generators.

The SGTL will degrade to a tube rupture in the 1C Steam Generator when the reactor is locally tripped.

Scenario Event Description
NRC Scenario 2

After completion of FR-S.1, the operator will transition back to E-0, and then to EP/1/A/5000/E-2, "Faulted Steam Generator Isolation." After the 1C Steam Generator is isolated, the operator will transition to EP/1/A/5000/E-3, "Steam Generator Tube Rupture."

The scenario will terminate at Step 6 of E-3 after the operator has transitioned to EP/1/A/5000/ECA-3.1, "SGTR with Subcooled Recovery Desired," or at Step 9 of E-3 upon initiating an NCS cooldown.

Critical Tasks:

Manually close the Failed OPEN Pzr Spray Valve before the Pressurizer pressure drops to ≤ 1945 psig.

Safety Significance: failure to close the Spray Valve and stop the pressure transient, under the postulated plant conditions, results in an unnecessary transient to the plant and challenge to the Reactor Protection System. Performance of the critical task would stabilize the pressure transient. A failure to stabilize the pressure transient, when able to do so, constitutes a misoperation or incorrect crew performance which leads to incorrect NCS pressure control.

Start one or more MD CA Pumps before entry into FR-H.1 is required.

Safety Significance: Failure to establish a Secondary Heat Sink through the initiation of CA flow unnecessarily challenges both the HEAT SINK and the CORE COOLING Critical Safety Functions. Additionally, the FSAR Safety Analysis results are predicated on the assumption that at least one train of safeguards actuates and delivers a minimum amount of AFW flow to the Steam Generators. Failure to perform this task, when the ability to do so exists, results in a violation of the Facility License Condition and places the plant in an unanalyzed condition.

Scenario Event Description
NRC Scenario 2

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>		Reset to Temp IC 231 (Base IC-37 [75% MOL])	T = 0 Malfunctions: Insert REM_SV0025 = 0 (Close 1SV-25 [1D S/G PORV Isolation]) Insert LOA_SV004= Racked_Out (SG PORV Breaker Racked Out) H_X02_098_3 = 0 (1D PORV Controller LEFT lamp) H_X02_098_4 = 0 (1D PORV Controller RIGHT lamp) Insert LOA_SV020=0 (SM PORV D LOCAL OPERATION) insert XMT_KFTT5130 = 0 (Spent Fuel Pool Temperature Failure) insert OVR_1AD11_L01 = ON (MCB Annunciator 1AD11/L1) Insert MAL_IPE001A = TRUE (ATWS) Insert MAL_IPE001B = TRUE (ATWS) Insert MAL_IPE002A = TRUE (ATWS) Insert MAL_IPE002B = TRUE (ATWS) insert MAL_CA004A = AUTO (1BA MDCA Pump Start Failure [auto]) insert MAL_CA004B = AUTO (1B MDCA Pump Start Failure [auto]) insert MAL_CA005 TRIP insert MAL_SM004C1 = 100 cd='H_X02_078_3 EQ 1' delay=0 (Safety Valve on 1C SG sticks OPEN on C MSIV CLOSE Indicating Light) insert MAL_SG001C = 300 cd='H_X01_094_2 EQ 1' delay=0 (300 gpm SGTR occurs on 1C SG on Reactor Trip Breaker Open Indicating Light)
<input type="checkbox"/>		RUN Reset all SLIMs	Place Tagout/O-Stick on: <ul style="list-style-type: none"> • 1SV-25 (Tagout) • 1KFP-5130 (O-Stick) • MCB Annunciator 1AD-11, L-1 (O-stick)
<input type="checkbox"/>		Update Status Board, Setup OAC	NOTE: RMWST DO = >1000 ppb.

Scenario Event Description
NRC Scenario 2

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>		Freeze.	
<input type="checkbox"/>		Update Fresh Tech. Spec. Log.	
<input type="checkbox"/>		Fill out the AO'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 as required. 4. Provide the crew with OP/1/A/6150/009 (Boron Concentration Control) and OP/1/A/6300/1 A (Turbine-Generator Load Change). 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	Execute Simulator Scenario N20-1-2.	
<input type="checkbox"/>	At direction of examiner	Event 1 NA	Power Increase w/Simple Dilute
<input type="checkbox"/>	After adequate power ascension/ direction of examiner	Event 2 insert MAL_DCS1288 = TRUE	Uncontrolled outward Rod Motion in AUTO

Scenario Event Description
NRC Scenario 2

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	At direction of examiner	Event 3 Insert MAL_DCS1762 = PRESSED Insert MAL_DCS1763 = PRESSED 10 Second Delay = MAL_DCS1763 = NORMAL	Pzr Spray Valve (1NC-27) Controller fails OPEN
<input type="checkbox"/>	At direction of examiner	Event 4 insert REM_RN0018B_1=0, Ramp = 30 seconds	1B RN Pump Suction Valve inadvertently CLOSES
<input type="checkbox"/>	Upon entry into AP-10 or at direction of examiner	Event 5 Insert: insert MAL_LF003B = TRUE insert MAL_IRE009 = FAIL_OF_AUTO insert MAL_SG001C = 40, Ramp = 600 seconds	1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual
<input type="checkbox"/>	At direction of examiner	Event 6 insert REM_SM003AB =0.0 Ramp = 10 seconds insert: MAL_IPE001A MAL_IPE001B MAL_IPE002A MAL_IPE002B insert MAL_SM004C1 = 100 Insert MAL_SG001C = 300	1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR Note: Malfunctions inserted at T = 0.

Scenario Event Description
NRC Scenario 2

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Post-Rx Trip	Event 7 Insert: MAL_CA004A = Auto MAL_CA004B = Auto MAL_CA005	TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO Note: Malfunctions inserted at T = 0.
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.: N20-1 Scenario # 2 Event # 1 Page 10 of 72Event Description: **Power Increase w/Simple Dilute**

Shortly after taking the watch, the operator will commence a load increase to 100% starting with Step 3.37.11 of Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." The operator will dilute the NC System Boron concentration in accordance with Enclosure 4.19, "Simple Dilution," of OP/1/A/6150/009, "Boron Concentration Control," and raise Turbine load in accordance with OP/1/A/6300/001 A, "Turbine-Generator Load Change."

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			
	CRS	(Step 3.37.11) Prior to increasing to greater than 75% RTP, check all Main Turbine governor valves open.	NOTE: The power increase will be at 3 MWe/minute.
	RO/ BOP	(Step 3.37.12) WHEN 77-80% RTP, enable, OTDT DCS alarming as follows:	NOTE: Based on the extent of the power increase, this action may or may not be taken.
		<ul style="list-style-type: none"> On DCS graphics, select "MAINTENANCE MENU". 	
		<ul style="list-style-type: none"> Select "TAVG, DELTA T INPUTS & ALARM CHECKING" graphic. 	
		<ul style="list-style-type: none"> Select "ON" for the following: 	
		<ul style="list-style-type: none"> NCAA 5422 	
		<ul style="list-style-type: none"> NCAA 5462 	
		<ul style="list-style-type: none"> NCAA 5502 	
		<ul style="list-style-type: none"> NCAA 5542 	
		<ul style="list-style-type: none"> OTDELTAT-FAIL 	
	CRS	(Step 3.37.13) IF startup from refueling outage.....	

Op Test No.: N20-1 Scenario # 2 Event # 1 Page 11 of 72Event Description: **Power Increase w/Simple Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 3.37.14) IF performing Generator/Automatic Voltage Regulator (AVR) testing at 78% RTP...	
OP/1/A/6150/009, BORON CONCENTRATION CONTROL ENCLOSURE 4.19, SIMPLE DILUTION			
	BOP	(Step 3.1) Evaluate all outstanding Clearances that may impact performance of this procedure.	NOTE: The BOP may repeat this task as needed during the power increase.
	BOP	(Step 3.2) Determine current blender contents AND evaluate any potential Reactivity effects prior to performing this enclosure:	NOTE: The BOP will recognize from the Turnover that the Blender is filled with Rx Makeup Water.
		• Rx Makeup Water	
		• Blend	
		• Boron	
	BOP	(Step 3.3) Evaluate energizing additional pressurizer heaters per OP/1/A/6100/003 (Controlling Procedure For Unit Operation) to enhance system mixing when changing NC System boron concentration. (R.M.)	
	BOP	(Step 3.4) Determine amount of reactor makeup water needed to obtain desired boron concentration using McGuire Data Book, OAC, Reactor Group Guidance, or plant parameters (T-Ave, Steam Pressure, Xenon worth, etc.). (R.M.)	NOTE: The BOP will add 400 gallons of Rx Makeup Water as recommended by RE.
		Total Reactor Makeup Water:	
	BOP	(Step 3.5) Ensure the following reset to zero: (R.M.)	
		• Total Make Up Flow Counter	
		• Boric Acid Flow Counter	

Op Test No.: N20-1 Scenario # 2 Event # 1 Page 12 of 72Event Description: **Power Increase w/Simple Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.6) Set Total Make Up Flow Counter to value determined in Step 3.4. (R.M.)	
	BOP	(Step 3.7) Select "DILUTE" on "NC Sys M/U Controller".	
	BOP	(Step 3.8) IF AT ANY TIME it is desired to lower VCT level, perform the following:	
		(Step 3.8.1) Monitor Letdown Pressure.	
NOTE An increase in Letdown Pressure greater than 20 psig during diverts may be indicative of excessive NB Feed Filter DP. {NCR 01597088}			
		(Step 3.8.2) Select "HUT" on 1NV-137A (U1 NC Filters Otlft to VCT 3-Way Diversion Contrl).	NOTE: The BOP may do this at any time to lower VCT level.
		(Step 3.8.3) IF Letdown Pressure increases greater than 20 psig, notify CRS.	
		(Step 3.8.4) WHEN desired level achieved, THEN select "AUTO" on 1NV-137A (U1 NC Filters Otlft to VCT 3-Way Diversion Contrl).	
NOTE Steps 3.9 - 3.17 may be completed and then checked off as time allows.			
	BOP	(Step 3.9) IF AT ANY TIME plant parameters require termination of dilution, perform the following:	
		(Step 3.9.1) Place "NC System Make Up" to "STOP". (R.M.)	
		(Step 3.9.2) IF 1NV-137A (U1 NC Filters Otlft to VCT 3-Way Diversion Contrl) was placed to HUT, place to "AUTO".	

Op Test No.: N20-1 Scenario # 2 Event # 1 Page 13 of 72Event Description: **Power Increase w/Simple Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.10) Momentarily select "START" on "NC System Make Up". (R.M.)	
	BOP	(Step 3.11) Check "NC System Make Up" red light lit.	
	BOP	(Step 3.12) Check 1NV-171A (U1 Boric Acid Blender To VCT Inlet Control) open.	
	BOP	(Step 3.13) Check 1NV-252A (Rx M/U Water Supply To U1 BA Blender Cntrl) open or throttled as required.	
	BOP	(Step 3.14) Check Rx M/U Water Pump starts.	
	BOP	(Step 3.15) Monitor Total Make Up Flow Counter. (R.M.)	
	BOP	(Step 3.16) HOLD until one of the following occurs:	
		<ul style="list-style-type: none"> Amount of reactor makeup water recorded per Step 3.4 added 	
		OR	
		<ul style="list-style-type: none"> Reactor makeup water addition manually terminated 	
	BOP	(Step 3.17) Ensure dilution terminated as follows: (R.M.)	
		(Step 3.17.1) IF in "AUTO", ensure the following off:	
		<ul style="list-style-type: none"> 1A Rx M/U Water Pump 	
		<ul style="list-style-type: none"> 1B Rx M/U Water Pump 	
	BOP	(Step 3.17.2) Ensure the following closed:	

Op Test No.: N20-1 Scenario # 2 Event # 1 Page 14 of 72Event Description: **Power Increase w/Simple Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NV-171A (U1 Boric Acid Blender To VCT Inlet Control) 	
		<ul style="list-style-type: none"> 1NV-252A (RX M/U Water Supply To U1 BA Blender Cntrl) 	
	BOP	(Step 3.18) Ensure 1NV-137A (U1 NC Filters Off to VCT 3-Way Diversion Cntrl) in "AUTO".	
NOTE CRS concurrence required if flush of blender not performed.			
	BOP	(Step 3.19) IF desired to flush blender....	NOTE: It is NOT desired to flush the blender.
	BOP	(Step 3.20) Select "AUTO" for "NC Sys M/U Controller".	
	BOP	(Step 3.21) Momentarily select "START" on "NC System Make Up".	
	BOP	(Step 3.22) Check "NC System Make Up" red light lit.	
	BOP	(Step 3.23) Ensure the following reset to zero: (R.M.)	
		<ul style="list-style-type: none"> Total Make Up Flow Counter 	
		<ul style="list-style-type: none"> Boric Acid Flow Counter 	
	BOP	(Step 3.24) Record in Narrative Log that final blender content is Rx Makeup Water.	
OP/1/A/6300/001A, TURBINE-GENERATOR STARTUP/SHUTDOWN ENCLOSURE 4.1, TURBINE-GENERATOR LOAD CHANGE			

Op Test No.: N20-1 Scenario # 2 Event # 1 Page 15 of 72Event Description: **Power Increase w/Simple Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
NOTE If reducing power to a level greater than 50%, it is preferable to reduce power at a rate less than 12% per hour in order to minimize sodium peaks. [NCR01574291]			
	RO	(Step 3.4.1) IF Turbine in "OPERATOR AUTO", perform the following:	
		(Step 3.4.1.1) Ensure desired change within "Calculated Capability Curve".	
		(Step 3.4.1.2) IF turbine load will raise or lower more than 10 MWs, notify Dispatcher of expected load change.	
		(Step 3.4.1.3) IF desired to change load rate, THEN perform the following:	
		<ul style="list-style-type: none"> Depress "LOAD RATE". 	
		<ul style="list-style-type: none"> Enter desired load rate in "VARIABLE DISPLAY". 	NOTE: the RO will select 2 MWe/Min loading rate.
		<ul style="list-style-type: none"> Depress "ENTER". 	
		(Step 3.4.1.4) IF desired to change desired load, THEN perform the following:	
		<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" 	
		<ul style="list-style-type: none"> Check load changes at selected rate. 	
OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATIONS ENCLOSURE 4.1, POWER INCREASE			
	CRS	(Step 3.37.13) Continue power increase to 95% RTP.	NOTE: The power increase will be at 3 MWe/minute.
After adequate power increase/discretion of the Lead Examiner move to Event #2.			

Op Test No.: N20-1 Scenario # 2 Event # 2 Page 16 of 72Event Description: **Uncontrolled outward Rod Motion in AUTO**

After the load increase is started, the Control Rods will fail such that rods are moving outward in AUTO. The operator will enter AP/1/A/5500/14, "Rod Control Malfunction." The control rods will subsequently remain in MANUAL.

Booth Operator Instructions: **insert MAL_DCS1288 = TRUE (Rods Out Demand)**

Indications Available:

- Rods stepping out continuously with no demand.
- WHITE "Rods Out" light is LIT

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: When the malfunction is diagnosed the CRS may go to HOLD on the Turbine.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION			
	RO	(Step 1) IF two or more rods are either dropped or misaligned by greater than 24 steps, THEN.....	Immediate Action NOTE: No control rods dropped during this event.
	RO	(Step 2) Place control rods in manual.	Immediate Action
	RO	(Step 3) Check rod movement – STOPPED.	Immediate Action NOTE: There was no rod motion when the Rods were taken to Manual.
	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 "T-AVG/T-REF FAILURE ROD STOP" alarm (1AD-2, B-7) – DARK.	

Op Test No.: N20-1 Scenario # 2 Event # 2 Page 17 of 72Event Description: **Uncontrolled outward Rod Motion in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step7) IF this AP entered due to unwarranted rod insertion or withdrawal, THEN GO TO Enclosure 3 (Response to Continuous Rod Movement).	NOTE: The SRO will transition to AP-14, Enclosure 3.
AP/1/A/5500/14, ROD CONTROL MALFUNCTION ENCLOSURE 3, RESPONSE TO CONTINUOUS ROD MOVEMENT			
	CRS	(Step 1) Announce occurrence on paging system.	NOTE: The CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	CRS	(Step 2) Notify IAE to investigate problem.	NOTE: The CRS may call WCC/IAE to address the Rod Control malfunction. If so, Booth Instructor acknowledge as WCC.
	RO	(Step 3) 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 4) Check T-Ref indication – NORMAL.	
	RO	(Step 5) Do not move rods until IAE determines rod motion is permissible.	
	RO	(Step 6) Maintain T-Avg within 1°F of programmed T-Ref as follows:	

Op Test No.: N20-1 Scenario # 2 Event # 2 Page 18 of 72Event Description: **Uncontrolled outward Rod Motion in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Adjust Turbine load 	NOTE: The RO will adjust Turbine Load as needed to maintain T-avg.
		OR	
		<ul style="list-style-type: none"> Borate/dilute NC System. 	
	RO	(Step 7) IF AT ANY TIME a runback occurs while in this procedure, THEN observe the following guidance:	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> IF IAE has determined that it is permissible to move rods, THEN respond to the runback PER AP/1/A/5500/03 (Load Rejection). 	NOTE: The CRS may call WCC/IAE to address. If so, Booth Instructor acknowledge as WCC. After 5 minutes , report that the Control Rods must be kept in MANUAL , and that they can move rods in MANUAL as needed.
		<ul style="list-style-type: none"> For all other circumstances, assume rod control is not available and respond to the runback as follows: 	
		<ul style="list-style-type: none"> Trip Reactor. 	
		<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	
	RO	(Step 8) IF AT ANY TIME while in this procedure a unit shutdown is required AND rods cannot be moved, THEN perform the following:	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> Borate as required during shutdown to maintain T-Avg at T-Ref. 	
		<ul style="list-style-type: none"> Monitor AFD during load reduction. 	
		<ul style="list-style-type: none"> IF AT ANY TIME AFD reaches Tech Spec limit AND reactor power is greater than 50%, THEN perform the following: 	
		<ul style="list-style-type: none"> Trip Reactor. 	

Op Test No.: N20-1 Scenario # 2 Event # 2 Page 19 of 72Event Description: **Uncontrolled outward Rod Motion in AUTO**

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).	
			NOTE: The CRS may call WCC/IAE to address. If so, Booth Instructor acknowledge as WCC. After 5 minutes , report that the Control Rods must be kept in MANUAL , and that they can move rods in MANUAL as needed.
	RO	(Step 9) WHEN problem is repaired, THEN perform the following:	NOTE: The CRS will likely conduct a Focus Brief.
At the discretion of the Lead Examiner move to Event #3.			

Op Test No.: N20-1 Scenario # 2 Event # 3 Page 20 of 72Event Description: **Pzr Spray Valve (1NC-27) Controller fails OPEN**

After this, the Pzr Spray Valve Controller, 1NC-27C A Spray, demand will fail to full output. The operator will enter AP/1/A/5500/11, "Pressurizer Pressure Anomalies." The operator will address Technical Specification LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits."

Booth Operator Instructions:

Insert MAL_DCS1762 = PRESSED
Insert MAL_DCS1763 = PRESSED
10 Second Delay = MAL_DCS1763 = NORMAL

Indications Available:

- NCS/Pzr pressure lowers
- OAC Alarm: U1 PZR PRESS I through IV
- 1NC-27C SLIMs LS indication 50 or 100%
- MCB Annunciator 1AD6/C-6 PZR LO PRESS CONTROL

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The BOP may take all the necessary actions in the Immediate Actions, before CRS reads AOP.
AP/1/A/5500/11, PRESSURIZER PRESSURE ANOMALIES			
	BOP	(Step 1) Check Pzr pressure – HAS GONE DOWN.	Immediate Action
	BOP	(Step 2) Check Pzr PORVs – CLOSED.	Immediate Action
	BOP	(Step 3) Check Pzr spray valves - CLOSED	Immediate Action NOTE: 1NC-27C is OPEN.
	BOP	(Step 3 RNO) CLOSE Pzr spray valve(s).	NOTE: The BOP will close 1NC-27C using the SLIMS or the Emergency Close Switch.

Op Test No.: N20-1 Scenario # 2 Event # 3 Page 21 of 72Event Description: **Pzr Spray Valve (1NC-27) Controller fails OPEN**

Time	Pos.	Expected Actions/Behavior	Comments
<u>Critical Task:</u>			
Manually close the Failed OPEN Pzr Spray Valve before the Pressurizer pressure drops to ≤ 1945 psig.			
Safety Significance: failure to close the Spray Valve and stop the pressure transient, under the postulated plant conditions, results in an unnecessary transient to the plant and challenge to the Reactor Protection System. Performance of the critical task would stabilize the pressure transient. A failure to stabilize the pressure transient, when able to do so, constitutes a mis-operation or incorrect crew performance which leads to incorrect NCS pressure control.			
	BOP	(Step 4) Check Pzr PORVs – CLOSED.	
	BOP	(Step 5) Check Pzr spray valves – CLOSED.	NOTE: IF the BOP has already used the EMERG SWITCH, the CRS may answer YES, and continue to Step 6. If NOT, the Step 5 RNO will be performed.
	BOP	(Step 5 RNO) IF NC pressure below desired pressure, THEN perform the following:	
		<ul style="list-style-type: none"> Ensure Pzr spray emergency close switch on 1MC-10 is in the "CLOSE" position for failed spray valve. 	
		<ul style="list-style-type: none"> IF Pzr spray valve closed, THEN GO TO Step 6. 	
	CRS	(Step 6) Announce occurrence on page.	NOTE: CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 7) Check 1NV-21A (NV Spray to PZR Isol) – CLOSED.	
	BOP	(Step 8) Check the following Pzr heaters – ON:	

Op Test No.: N20-1 Scenario # 2 Event # 3 Page 22 of 72Event Description: **Pzr Spray Valve (1NC-27) Controller fails OPEN**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1A 	
		<ul style="list-style-type: none"> 1B 	
		<ul style="list-style-type: none"> 1D 	
	BOP	(Step 9) Check 1C Pzr heaters – ON.	
	BOP	(Step 10) Check “PZR PRESS MASTER” – IN AUTO.	
	BOP	(Step 11) Check “1NC-27 PRESSURIZER SPRAY EMERGENCY CLOSE” switch – SELECTED TO “NORMAL”.	NOTE: In order to close the malfunctioning Spray Valve, the BOP likely had to take the EMERG SWITCH to CLOSE.
	CRS	(Step 11 RNO) Notify station management to ensure switch restored to “NORMAL” once spray valve is repaired.	NOTE: The CRS may call WCC/Station Management to address the switch position. If so, Booth Instructor acknowledge as WCC.
	BOP	(Step 12) Check “1NC-29 PRESSURIZER SPRAY EMERGENCY CLOSE” switch – SELECTED TO “NORMAL”.	
	BOP	(Step 13) Check Pzr pressure – GOING UP TO DESIRED PRESSURE.	
	CRS	(Step 14) Exit this procedure.	NOTE: The CRS may call WCC/IAE to address the valve failure. If so, Booth Instructor acknowledge as WCC.
			NOTE: The CRS will likely conduct a Focus Brief.
TECHNICAL SPECIFICATION 3.4.1, RCS PRESSURE, TEMPERATURE, AND FLOW DEPARTURE FROM NUCLEATE BOILING (DNB) LIMITS			

Op Test No.: N20-1 Scenario # 2 Event # 3 Page 23 of 72Event Description: **Pzr Spray Valve (1NC-27) Controller fails OPEN**

Time	Pos.	Expected Actions/Behavior		Comments
	CRS	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.		NOTE: According to Table 3.4.1-1, Parameter 2, indicated Pressurizer Pressure will be ≥ The limit specified in the COLR.
	CRS	APPLICABILITY: MODE 1.		NOTE: According to Table 4 of the COLR, indicated Pressurizer Pressure (with four channels available) must be ≥ 2212.3 psig via the meter indication and ≥ 2209.1 psig via the OAC. During this failure Pressurizer Pressure will lower below these values.
	CRS	ACTIONS		
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
				NOTE: When Pressurizer Pressure drops to < 2209.1 psig (OAC) on the failure, the CRS will determine that Condition A is required and that ACTION A.1 must be taken.
At the discretion of the Lead Examiner, move to Event #4.				

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 24 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Next, the 1B RN Pump Suction Isolation valve will inadvertently CLOSE. The operator will respond using one or more Annunciator Response Procedures and ultimately enter AP/1/A/5500/20, "Loss of RN," to place the standby train in service. The operator will address Technical Specification LCO 3.7.7, "Nuclear Service Water System (NSWS)," and Technical Specification LCO 3.8.1, "AC Sources-Operating."

Booth Operator Instructions: insert REM_RN0018B_1 = 0, Ramped = 30 seconds

Indications Available:

- OAC Alarm M1Q0180, 1RN18B RN PUMP SUCTION ISOL, alarms.
- Numerous MCB Annunciator 1AD12 alarms associated with RN.
- 1RN-18B Green status light is LIT.
- Low flow in RN header.

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: If the load increase has been restarted, the RO will likely stop the load increase.
			Examiner NOTE: The BOP may attempt to manually open the suction valve and if unsuccessful, stop the 1B RN Pump.
AP/1/A/5500/20, LOSS OF RN CASE I, LOSS OF OPERATING RN TRAIN			
	BOP	(Step 1) Check both D/Gs - OFF.	
	BOP	(Step 2) Check for potential loss of LLI as follows:	
		<ul style="list-style-type: none"> • Check Unit 2 RN pump(s) that are aligned to LLI – OPERATING PROPERLY. 	Floor Instructor: If asked, As U2 RO report "2A RN Pump is running properly."
		<ul style="list-style-type: none"> • Check suction flowpath – AVAILABLE. 	NOTE: The crew should recognize that the LLI flowpath is available, but that the Suction Valve to the 1B RN Pump has closed and continue to Step 3.

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 25 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 3) Announce occurrence on page.	NOTE: CRS may ask U2 RO to make Plant Announcement that AP-20 has been entered. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 4) Check Any RN pump – ON.	NOTE: The crew should recognize that the 1B RN Pump is operating with its suction valve closed and stop the pump. This will result in both RN pumps being OFF.
	CRS	(Step 4 RNO) Perform the following:	Examiner NOTE: If the 1B RN Pump has been stopped the RNO will be performed (Go to Step 7). If the 1B RN Pump is still running, Steps 5 and 6 will be performed.
		<ul style="list-style-type: none"> IF strainer fouling has not occurred, THEN GO TO Step 7. 	
	BOP	(Step 5) Check VI header pressure – GREATER THAN 60 PSIG.	
	BOP	(Step 6) Check the following annunciators - DARK:	
		<ul style="list-style-type: none"> "RN STRNR A HI D/P" (1AD-12, D-2) 	
		<ul style="list-style-type: none"> "RN STRNR B HI D/P" (1AD-12, D-3). 	
	BOP	(Step 6 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF discharge pressure on running RN pump(s) is less than 50 PSIG, THEN reduce RN flow to raise discharge pressure. 	
		<ul style="list-style-type: none"> REFER TO appropriate annunciator response. 	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 26 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	<ul style="list-style-type: none"> IF adequate RN flow cannot be maintained to RN cooled components OR it is desired to place idle RN train in service, THEN GO TO Step 7. 	
	BOP	(Step 7) Place RN train in service as follows:	Examiner NOTE: Since the 1B RN Pump is running with its suction valve closed, the CRS should direct the BOP to stop the 1B RN Pump by now.
		<ul style="list-style-type: none"> Check both RN pumps - OFF. 	
	BOP	(Step 7.A RNO) IF one train of RN is operating properly, THEN....	NOTE: There is no Train of RN that is operating properly.
		<ul style="list-style-type: none"> (Step 7.B) Check RN train – AVAILABLE TO START. 	NOTE: The CRS may dispatch an AO. If so, Booth Instructor acknowledge as the AO.
	BOP	<ul style="list-style-type: none"> Start one train of RN as follows: 	
		<ul style="list-style-type: none"> To start 1A RN pump perform the following: 	
		<ul style="list-style-type: none"> Ensure flowpath available. 	
	BOP	<ul style="list-style-type: none"> Place manual loader for 1RN-89A (RN to A KC Hx Control) to 10% OPEN. 	
	BOP	<ul style="list-style-type: none"> Start 1A RN pump. 	NOTE: The BOP will start the 1A RN Pump.
		<ul style="list-style-type: none"> Ensure the following valve for train being started – OPEN. 	
		<ul style="list-style-type: none"> 1RN-86A (A KC Hx Inlet Isol). 	
		<ul style="list-style-type: none"> Check the following cross-tie valves – OPEN: 	
		<ul style="list-style-type: none"> 1RN-40A (Train A To Non Ess Hdr Isol) 	
		<ul style="list-style-type: none"> 1RN-41B (Train B TO Non Ess Hdr Isol) 	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 27 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1RN-43A (Train B To Non Ess Hdr Isol). 	
	BOP	<ul style="list-style-type: none"> Ensure malfunctioning RN pump is off. 	NOTE: The BOP will stop the 1B RN if not done already.
	BOP	<ul style="list-style-type: none"> Check if local venting of RN pump has been performed PER one of the following: 	NOTE: Local venting of RN pump has NOT been performed.
		<ul style="list-style-type: none"> Enclosure 5 (1A RN Pump Venting) 	
		OR	
		<ul style="list-style-type: none"> Enclosure 6 (1B RN Pump Venting). 	
	CRS	(Step 7.G RNO) GO TO Step 7.I.	
	BOP	<ul style="list-style-type: none"> (Step 7.I) Check Enclosure 7 (NV Pump Cooling Via Gravity Drain To Sump) – HAS BEEN PERFORMED. 	NOTE: Enclosure 7 has NOT been performed.
	CRS	(Step 7.I RNO) GO TO Sep 7.K	
	BOP	<ul style="list-style-type: none"> Check Case II (Loss of Low Level or RC Supply Crossover) – HAS BEEN IMPLEMENTED. 	NOTE: Case II has NOT been performed.
	CRS	(Step 7.K RNO) GO TO Step 8.	
	BOP	(Step 8) Ensure cooling to KC as follows:	
	BOP	<ul style="list-style-type: none"> Check 1A KC pump(s) – RUNNING. 	NOTE: The B Train of KC is operating.
	CRS	(Step 8.A RNO) GO TO Step 8.H.	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 28 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Check 1B KC pump(s) – RUNNING. 	
	BOP	<ul style="list-style-type: none"> Ensure 1B KC pumps aligned to reactor bldg non essential header as follows: 	
		<ul style="list-style-type: none"> OPEN the following valves: 	
		<ul style="list-style-type: none"> 1KC-18B (Trn B Rx Bldg Non Ess Ret Isol). 	
		<ul style="list-style-type: none"> 1KC-228B (Trn B Rx Bldg Non Ess Sup Isol). 	
		<ul style="list-style-type: none"> CLOSE the following valves: 	
		<ul style="list-style-type: none"> 1KC-230A (Trn A Rx Bldg Non Ess Sup Isol). 	
		<ul style="list-style-type: none"> 1KC-3A (Trn A Rx bldg Non Ess Ret Isol). 	
	BOP	<ul style="list-style-type: none"> Check 1B RN pump – OFF. 	
	BOP	<ul style="list-style-type: none"> Check 1RN-187B (B KC Hx Inlet Isol) – LOCALLY THROTTLED DURING THIS PROCEDURE. 	NOTE: 1RN-187B has NOT been locally throttled.
	BOP	(Step 8.K RNO) Perform the following:	
		<ul style="list-style-type: none"> IF VI header pressure is less than 60 PSIG, THEN.... 	
	BOP	<ul style="list-style-type: none"> Place 1RN-187B “MODE SELECT” switch to manual. 	
	BOP	<ul style="list-style-type: none"> OPEN 1RN-187B (B KC Hx Inlet Isol). 	
	BOP	<ul style="list-style-type: none"> THROTTLE 1RN-89A (RN to A KC Hx Control) to maintain 1A RN pump discharge pressure greater than 50 PSIG. 	
		<ul style="list-style-type: none"> IF 1A RN pump discharge pressure is greater than 50 PSIG, THEN GO TO Step 9. 	
	BOP	(Step 9) Maintain RN flow within operating limits as follows:	
		<ul style="list-style-type: none"> Check VI header pressure - GREATER THAN 60 PSIG. 	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 29 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check 1A RN pump - RUNNING 	
		<ul style="list-style-type: none"> THROTTLE 1RN-89A (RN to A KC Hx Control) to maintain 1A RN pump discharge pressure greater than 50 PSIG. 	
		<ul style="list-style-type: none"> Check 1A RN pump flow - LESS THAN 14,000 GPM. 	
		<ul style="list-style-type: none"> Check 1B RN pump - RUNNING. 	NOTE: 1B RN Pump is OFF.
	BOP	(Step 9.E RNO) GO TO Step 10.	
	BOP/ CRS	(Step 10) Investigate reason for loss of RN train as follows:	NOTE: The CRS may dispatch an AO. If so, Floor/Booth Instructor acknowledge as the AO.
		<ul style="list-style-type: none"> Dispatch operator to check RN pump. 	
		<ul style="list-style-type: none"> Dispatch operator to check RN pump breaker. 	
		<ul style="list-style-type: none"> Check suction flowpath alignment. 	
		<ul style="list-style-type: none"> Check discharge flowpath alignment. 	NOTE: The CRS may call WCC/IAE to address the Pump malfunction, and request that the 1B RN Pump Breaker be racked out. If so, Booth Instructor acknowledge as WCC , and indicate that the 1B RN Pump Breaker will be Racked Out . Use: LOA_RN006 = Racked_Out (1B RN Pump BKR) LOA_RN006A = Racked_Out (1B RN Pump Cntrl Pwr)

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 30 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 11) Ensure Control Room Area Chiller in service PER Enclosure 2 (VC/YC Operation).	NOTE: The CRS may assign the RO to perform this action, or have the BOP perform these actions prior to continuing with Step 12. If actions are performed in parallel, Appropriate Examiner follow actions of Enclosure 2. Other Examiners follow AP-20 Actions, Step 12 , below.
AP/1/A/5500/20, LOSS OF RN ENCLOSURE 2, VC/YC OPERATION			
			Examiner NOTE: Follow the actions associated with Enclosure 2 if RO is assigned by CRS to perform.
	RO/ BOP	(Step 1) Check train selected Control Room Area Chiller – ON.	NOTE: The Chiller is expected to be ON. If not, the RO/BOP will take action per the RNO to restart the Chiller.
AP/1/A/5500/20, LOSS OF RN CASE I, LOSS OF OPERATING RN TRAIN			
			Examiner NOTE: Examiners following the CRS/BOP continue HERE .
	BOP	(Step 12) Align operating train of equipment with running RN pump as follows:	
		• Check 1A RN pump – ON.	
		• Check the following equipment – ON:	
		• 1A1 and 1A2 KC pumps - ON	
	CRS	(Step 12.B RNO) GO TO Step 12.I.	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 31 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12.I) Perform one of the following as necessary to align operating RN train with train of equipment cooled by RN:	
		<ul style="list-style-type: none"> Swap operating equipment to opposite train as follows: 	
		<ul style="list-style-type: none"> IF desired to swap KC trains, THEN perform Enclosure 1 (Shifting KC Trains). 	
			NOTE: The CRS will transition to Enclosure 1.
AP/1/A/5500/20, LOSS OF RN ENCLOSURE 1, SHIFTING KC TRAINS			
	BOP	(Step 1) Limit KC flow to 4000 GPM per operating KC pump in subsequent steps.	
	BOP	(Step 2) Check the following:	
		<ul style="list-style-type: none"> 1RN-40A (Train A To Non Ess Hdr Isol) - OPEN 	
		<ul style="list-style-type: none"> 1RN-41B (Train B To Non Ess Hdr Isol) - OPEN 	
		<ul style="list-style-type: none"> 1RN-43A (Train B To Non Ess Hdr Isol) - OPEN 	
		<ul style="list-style-type: none"> Any KC pump – RUNNING. 	NOTE: The B Train KC Pumps are operating.
	CRS	(Step 3) GO TO Step 5.	
	BOP	(Step 5) Check both ND pumps – OFF.	
	CRS	(Step 6) Perform the following:	
		<ul style="list-style-type: none"> IF shifting from 1A KC Train to 1B KC Train,... 	NOTE: The crew will be shifting from 1B KC Train to 1A KC Train.
		OR	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 32 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF shifting from 1B KC Train to 1A KC Train, THEN GO TO Step 22. 	
	BOP	(Step 22) THROTTLE OPEN 1RN-89A (RN to A KC Hx Control) to establish desired flow to 1A KC Hx, while maintaining 1A RN pump discharge pressure greater than 50 psig.	
	BOP	(Step 23) Place control switch for 1KC-51A (Train A Recirc Isol) in the "AUTO" position.	
	BOP	(Step 24) Ensure 1KC-51A OPENS.	
	BOP	(Step 25) Start 1A1 KC pump.	NOTE: The CRS may contact the AO to start the pumps. If so, Booth Instructor acknowledge as the AO.
	BOP	(Step 26) Start 1A2 KC pump.	
	BOP	(Step 27) Align Reactor Bldg header to 1A Train as follows:	
		<ul style="list-style-type: none"> OPEN the following valves: 	
		<ul style="list-style-type: none"> 1KC-3A (Trn A Rx Bldg Non Ess Ret Isol) 	
		<ul style="list-style-type: none"> 1KC-230A (Trn A Rx Bldg Non Ess Sup Isol). 	
		<ul style="list-style-type: none"> CLOSE the following valves: 	
		<ul style="list-style-type: none"> 1KC-228B (Trn B Rx Bldg non Ess Sup Isol) 	
		<ul style="list-style-type: none"> 1KC-18B (Trn B Rx Bldg Non Ess Ret Isol). 	
	BOP	(Step 28) Check both ND pumps – OFF.	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 33 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 29) Place 1RN-187B "MODE SELECT" switch to auto.	
	BOP	(Step 30) Check 1RN-187B (B KC Hx Inlet Isol) – CLOSED.	
	BOP	(Step 31) WHEN RN flow through the 1B KC Hx begins to go down, THEN THROTTLE OPEN 1RN-89A (RN to A KC Hx Control) to achieve desired flow rate while maintaining the following:	
		<ul style="list-style-type: none"> 1A RN pump discharge pressure - GREATER THAN 50 PSIG 	
		<ul style="list-style-type: none"> 1A RN pump flow - LESS THAN 14,000 GPM. 	
	BOP	(Step 32) Place 1KC-54B (Train B Recirc Isol) in "CLOSE".	
	BOP	(Step 33) Ensure 1KC-54B is CLOSED.	
	BOP	(Step 34) Stop the following pumps:	
		<ul style="list-style-type: none"> 1B1 KC pump 	
		<ul style="list-style-type: none"> 1B2 KC pump. 	
	BOP	(Step 35) Ensure NC pump thermal barrier isolation valves are OPEN.	
	BOP	(Step 36) RETURN TO step in effect in body of this procedure.	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 34 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior		Comments
				NOTE: The CRS will return to the main body of AP-20. Examiner NOTE: Because there are still AP-related actions to take with this procedure, the CRS may NOT address the TS at the time. Consequently, it may be necessary to move to next event, and address the TS after the scenario.
TECHNICAL SPECIFICATION 3.7.7, NUCLEAR SERVICE WATER SYSTEM				
	CRS	LCO 3.7.7 Two NSWS trains shall be OPERABLE.		
	CRS	APPLICABILITY: MODES 1, 2, 3, and 4.		
	CRS	ACTIONS		
CONDITION		REQUIRED ACTION		COMPLETION TIME
A.One NSWS train inoperable.		A.1 Restore NSWS train to OPERABLE status.		72 hours
				NOTE: The CRS will determine that condition A is required and ACTION A.1 must be taken.
TECHNICAL SPECIFICATION 3.8.1, AC SOURCES - OPERATING				
	CRS	LCO 3.8.1 The following AC electrical sources shall be OPERABLE:		

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 35 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Two qualified circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System; and Two diesel generators (DGs) capable of supplying the Onsite Essential Auxiliary Power Systems; and The qualified circuit(s) between the offsite transmission network and the opposite unit's Onsite Essential Auxiliary Power System necessary to supply power to the Nuclear Service Water System (NSWS), Control Room Area Ventilation System (CRAVS), Control Room Area Chilled Water System (CRACWS) and Auxiliary Building Filtered Ventilation Exhaust System (ABFVES); and The DG(s) from the opposite unit necessary to supply power to the NSWS, CRAVS, CRACWS and ABFVES; 	
		AND	
		The automatic load sequencers for Train A and Train B shall be OPERABLE.	
	CRS	APPLICABILITY: MODES 1, 2, 3, and 4.	
		NOTE: The opposite unit electrical power sources in LCO 3.8.1.c and LCO 3.8.1.d are not required to be OPERABLE when the associated shared systems are inoperable.	
	CRS	ACTIONS	
		NOTE: LCO 3.0.4.b is not applicable to DGs.	

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 36 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
CONDITION		REQUIRED ACTION	COMPLETION TIME
B. One LCO 3.8.1.b DG inoperable.		B.1 Verify LCO 3.8.1.d DG(s) OPERABLE.	1 hour <u>AND</u> Once per 12 hours thereafter
		<u>AND</u>	
		B.2 Perform SR 3.8.1.1 for the offsite circuit(s).	1 hour <u>AND</u> Once per 8 hours thereafter
		<u>AND</u>	
		B.3 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
		<u>AND</u>	
		B.4.1 Determine OPERABLE DG is not inoperable due to common cause failure.	24 hours
		<u>OR</u>	
		B.4.2 Perform SR 3.8.1.2 for OPERABLE DG.	24 hours
		<u>AND</u>	
		B.5 Evaluate availability of Emergency Supplemental Power Source (ESPS)	1 hour <u>AND</u> Once per 12 hours thereafter
		<u>AND</u>	
		B.6 Restore DG to OPERABLE status.	72 hours from discovery of unavailable ESPS ** <u>AND</u> 24 hours from discovery of Condition B entry ≥ 48 hours concurrent with unavailability of ESPS <u>AND</u> 14 days <u>AND</u> 17 days from discovery of failure to meet LCO 3.8.1.a or LCO 3.8.1.b

Op Test No.: N20-1 Scenario # 2 Event # 4 Page 37 of 72Event Description: **1B RN Pump Suction Valve inadvertently CLOSES**

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The CRS will determine that condition B is required and ACTION B.1, B.2, B3.1 or B.3.2, B.4, B.5 and B.6 must be taken.
At the discretion of the Lead Examiner, move to Event #5.			

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 38 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Subsequently, the 1B CF Pump will trip causing the turbine to automatically runback to 55%. Simultaneously, a 40 gpm Steam Generator Tube Leak (SGTL) will occur in the 1C Steam Generator. The operator will implement AP/1/A/5500/03, "Load Rejection." During the runback the operator will need to drive rods in manually.

Booth Operator Instructions:

Insert MAL_LF003B = TRUE
Insert MAL_IRE009 = FAIL_OF_AUTO
Insert MAL_SG001C = 40

Indications Available:

- 1B CF Pump Trips.
- MCB Annunciator 1AD-1, D6, DEH TURBINE RUNBACK, alarms.
- Turbine Generator MWe lowering.
- MCB Annunciator 1RAD-1, C-1, 1EMF 71 S/G A LEAKAGE HI RAD
- MCB Annunciator 1RAD-1, D-1, 1EMF 72 S/G B LEAKAGE HI RAD
- MCB Annunciator 1RAD-1, D-2, 1EMF 73 S/G C LEAKAGE HI RAD
- MCB Annunciator 1RAD-1, D-3, 1EMF 74 S/G D LEAKAGE HI RAD

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/03, LOAD REJECTION			
	RO	(Step 1) Ensure control rods in auto.	Immediate Action
			NOTE: Rods are in MANUAL from a previous malfunction and will NOT work in AUTO.
	RO	(Step 2) Check Turbine Generator response as follows:	
		<ul style="list-style-type: none"> • Check Generator – TIED TO GRID. 	
		<ul style="list-style-type: none"> • Check Generator output – GOING DOWN AS REQUIRED. 	
	RO	(Step 3) Check control rod response as follows:	
		<ul style="list-style-type: none"> • Check control banks – MOVING IN AS REQUIRED. 	NOTE: Rods are in MANUAL from a previous malfunction and will NOT work in AUTO.

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 39 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3a RNO) IF no rods will move in auto; THEN perform the following:	
		<ul style="list-style-type: none"> Place Control Rods in manual. 	
		<ul style="list-style-type: none"> Insert rods to reduce T-avg equal to programmed T-Ref. 	
		<ul style="list-style-type: none"> If no rods will move, THEN..... 	NOTE: The Control Rods will move in MANUAL.
	RO	<ul style="list-style-type: none"> Check all rods – ALIGNED WITH ASSOCIATED BANK. 	
	BOP	(Step 4) Check CM system response as follows:	
		<ul style="list-style-type: none"> Standby Hotwell and Condensate Booster pumps – RUNNING. 	
		<ul style="list-style-type: none"> 1CM-420 (Unit 1 Generator Load Rejection Bypass control) – OPEN. 	
	RO	(Step 5) IF runback to 55% power in effect, THEN ensure turbine inlet pressure going down to less than or equal to 500 PSIG.	
	CRS	(Step 6) Announce: "UNIT 1 LOAD REJECTION, NON-ESSENTIAL PERSONNEL STAY OUT OF UNIT 1 TURBINE BLDG".	NOTE: CRS may ask U2 RO to make Plant Announcement that AP-3 has been entered. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 7) Check P/R meters – LESS THAN 20%.	
	CRS / RO	(Step 7 RNO) Perform the following:	

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 40 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Designate an operator to continuously monitor reactor power. 	
		<ul style="list-style-type: none"> IF AT ANY TIME reactor power is less than 20%, THEN perform Step 8 to stabilize reactor power. 	NOTE: This is a Continuous Action. The CRS will designate the RO to observe this action.
	CRS	<ul style="list-style-type: none"> GO TO Step 9. 	
	RO	(Step 9) Check condenser dump valves – MODULATING OPEN.	
	BOP	(Step 10) Check “IPB AIR FLOW TROUBLE” alarm (1AD-11, J-5) – DARK.	
	BOP	(Step 11) Check Pzr pressure control response as follows:	
		<ul style="list-style-type: none"> Ensure Pzr heaters are in auto. 	
		<ul style="list-style-type: none"> Ensure Pzr spray control valves are in auto. 	NOTE: 1NC-27C is NOT in AUTO due to a previous malfunction.
		<ul style="list-style-type: none"> Check Pzr PORVs – CLOSED. 	
		<ul style="list-style-type: none"> Check Pzr spray control valves - CLOSED 	
			Examiner NOTE: The CRS may enter AP10 to address the SGTL at any point once it is determined that the transient is over. If so, move to Events 6-7.
	RO	(Step 12) Check load rejection – DUE TO LOSS OF CF PUMP.	NOTE: The load rejection was due to a Loss of CF Pump.
	CRS	(Step 13) Dispatch operator as necessary to determine cause of CF pump trip.	NOTE: The CRS may dispatch an AO. If so, Booth Instructor acknowledge as the AO.

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 41 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
CAUTION The CF pump high discharge pressure trip setpoint is 1435 PSIG.			
	BOP	(Step 14) Ensure in service CF pump properly responds in auto as follows:	
		<ul style="list-style-type: none"> Monitor in service CF pump discharge pressure. 	
		<ul style="list-style-type: none"> "1A CF PUMP DISCHARGE PRESS" (OAC point M1A1108). 	
		OR	
		<ul style="list-style-type: none"> "1B CF PUMP DISCHARGE PRESS" (OAC point M1A1114). 	
		<ul style="list-style-type: none"> Monitor S/G N/R Levels. 	
		<ul style="list-style-type: none"> IF AT ANY TIME any of the following occurs: 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> "CF PUMP DISCHARGE HI PRESS" 1AD-8, A-4 alarms (Setpoint at 1335 PSIG), 	
		OR	
		<ul style="list-style-type: none"> S/G N/R level approaches Hi Hi level (83%), 	
		OR	
		<ul style="list-style-type: none"> S/G N/R level approaches Lo Lo level (17%). 	
		<ul style="list-style-type: none"> THEN take manual control of in service CF pump as follows: 	
		<ul style="list-style-type: none"> Place low pressure governor control in manual. 	
		<ul style="list-style-type: none"> Place high pressure governor control in manual 	
		<ul style="list-style-type: none"> Adjust CF pump speed to maintain CF header pressure 100- 120 PSIG above steam header pressure. 	
		<ul style="list-style-type: none"> Do not continue until the following are satisfied: 	
		<ul style="list-style-type: none"> In service CF pump discharge pressure is stable. 	
		<ul style="list-style-type: none"> S/G levels are at setpoint. 	

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 42 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
			Examiner NOTE: The CRS may enter AP10 to address the SGTL at any point once it is determined that the transient is over. If so, move to Events 6-7.
	RO	(Step 15) Check turbine inlet pressure – LESS THAN 340 PSIG.	
	RO	(Step 15 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF AT ANY TIME turbine inlet pressure drops to less than 340 PSIG, THEN GO TO Step 16. 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	<ul style="list-style-type: none"> GO TO Step 19. 	
	RO	(Step 19) Check Main Generator as follows:	
		<ul style="list-style-type: none"> Check Generator Breakers – EITHER GENERATOR BREAKERS CLOSED. 	
		<ul style="list-style-type: none"> Check Generator – TIED TO GRID. 	
		<ul style="list-style-type: none"> Check generator power factor – 0.9 TO 1.0 LAGGING. 	
	CRS	<ul style="list-style-type: none"> GO TO Step 20. 	
	CRS	(Step 20) Ensure the following have been implemented:	NOTE: The CRS may ask SM to address. If so, Floor Instructor acknowledge as SM.
		<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). 	
	RO/ BOP	(Step 21) WHEN transient is over, THEN perform the following:	
		<ul style="list-style-type: none"> Determine if one CF pump should be shutdown as follows: 	

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 43 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check two CF pumps - RUNNING. 	NOTE: the 1A CF is the only Main Feedwater Pump running.
		(Step 21.A RNO) GO TO Step 21.B	
			Examiner NOTE: The CRS may enter AP10 to address the SGTL at any point once it is determined that the transient is over. If so, move to Events 6-7.
		<ul style="list-style-type: none"> (Step 21.B) Check the following on in service CF pump(s): 	
		<ul style="list-style-type: none"> Low pressure governor control – IN AUTO 	
		<ul style="list-style-type: none"> High pressure governor control – IN AUTO. 	
		<ul style="list-style-type: none"> Check SM flow on all S/Gs – LESS THAN 75%. 	NOTE: SM flow is ≈ 60%.
		<ul style="list-style-type: none"> Check SM flow on all S/Gs – LESS THAN 25%. 	NOTE: SM flow is ≈ 60%.
	RO	(Step 21.D RNO) Perform the following:	
		<ul style="list-style-type: none"> Check the following CF control bypass valves – CLOSED: 	
		<ul style="list-style-type: none"> 1CF-104AB (1A S/G CF Control Bypass) - CLOSED 	
		<ul style="list-style-type: none"> 1CF-105AB (1B S/G CF Control Bypass) - CLOSED 	
		<ul style="list-style-type: none"> 1CF-106AB (1C S/G CF Control Bypass) - CLOSED 	
		<ul style="list-style-type: none"> 1CF-107AB (1D S/G CF Control Bypass) - CLOSED 	

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 44 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	<ul style="list-style-type: none"> IF any CF control bypass valve is open or throttled... 	NOTE: All CF control bypass valves are closed.
	CRS	<ul style="list-style-type: none"> GO TO Step 21.F. 	
	BOP	<ul style="list-style-type: none"> Slowly CLOSE 1CM-420 (Unit 1 Generator Load Rejection Bypass Control) while monitoring Condensate Booster pump suction pressure. 	NOTE: The BOP will close 1CM-420.
		<ul style="list-style-type: none"> WHEN 1CM-420 is closed, THEN check load rejection signal reset (OAC turn on code "CM"). 	
	BOP	<ul style="list-style-type: none"> Place 1CM-420 in auto. 	
		<ul style="list-style-type: none"> IF thermal power is greater than 15%, THEN within 4 hours of reaching stable conditions, ensure each power range channel is within 2% of heat balance. 	
		<ul style="list-style-type: none"> Check T-Avg – GREATER THAN 561°F. 	
		<ul style="list-style-type: none"> Check "CONTROL ROD BANK LO LO LIMIT" alarm (1AD-2, B-9) – DARK. 	
		<ul style="list-style-type: none"> Check "CONTROL ROD BANK LO LIMIT" alarm (1AD-2, A-9) – DARK. 	NOTE: 1AD-2, A-9 may be LIT. If so, the operator will perform Step 21.I RNO.
	RO	(Step 21.I RNO) Ensure the "CONTROL ROD BANK LO LIMIT" alarm clears as Xenon builds in.	
	RO	(Step 22) Check load rejection – DUE TO LOSS OF CF PUMP.	NOTE: The load rejection was due to a Loss of CF Pump.
	RO/ BOP	(Step 23) Reset CF pump recirc valves as follows:	
		<ul style="list-style-type: none"> CLOSE recirc valve manual loader for CF pump that is tripped: 	
		<ul style="list-style-type: none"> 1CF-76 (1A CF Pump Recirc Control) 	
		OR	

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 45 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1CF-81 (1B CF Pump Recirc Control). 	
		<ul style="list-style-type: none"> Depress "1A OR 1B CF PUMP RECIRC VALVE CLOSURE CIRCUIT" "RESET" pushbutton and ensure red "ACTIVE" light goes out and yellow "RESET" light is lit. 	
		<ul style="list-style-type: none"> Check the following valves - OPEN: 	
		<ul style="list-style-type: none"> 1CM-266 (1A CF Pump Suction Isol) 	
		<ul style="list-style-type: none"> 1CM-272 (1B CF Pump Suction Isol). 	
		<ul style="list-style-type: none"> Check main oil pump on tripped CF pump - RUNNING. 	
		<ul style="list-style-type: none"> Check if CF pump – TRIPPED AUTOMATICALLY. 	
	RO/ BOP	<ul style="list-style-type: none"> Slowly OPEN recirc valve on tripped CF pump while monitoring suction pressure on in service CF pump. 	
			Examiner NOTE: The CRS may enter AP10 to address the SGTL at any point once it is determined that the transient is over. If so, move to Events 6-7.
	BOP	(Step 24) Shutdown unnecessary running plant equipment as follows:	
	BOP	<ul style="list-style-type: none"> Excess Condensate Booster pumps and place in auto. 	NOTE: The BOP may stop one Condensate Booster Pump.
		<ul style="list-style-type: none"> Excess Hotwell pumps and place in auto. 	NOTE: The BOP may stop one Hotwell Pump.
<p align="center">NOTE</p> <p>During normal load reductions, OP/1/A/6100/003 (Controlling Procedure For Unit Operation) secures G Heater Drain Tank pumps at 60% power and C Heater Drain Tank pumps at 50% power.</p>			

Op Test No.: N20-1 Scenario # 2 Event # 5 Page 46 of 72Event Description: **1B CF Pump Trip/SGTL/Turbine Runback w/rods in Manual**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF desired to secure, THEN dispatch operator to shutdown PER OP/1/B/6250/004 (Feedwater Heater Vents, Drains and Bleed System) Enclosure 4.2 (System Shutdown) the following: 	NOTE: The CRS may dispatch an AO. If so, Booth Instructor acknowledge as the AO.
		<ul style="list-style-type: none"> Unit 1 C Heater Drain Tank pumps 	
		<ul style="list-style-type: none"> Unit 1 G Heater Drain Tank pumps. 	
	CRS	(Step 25) IF power change greater than 15% in one hour, THEN notify Primary Chemistry to perform required Tech Spec sampling.	NOTE: The CRS may call Chemistry to address the power decrease. If so, Booth Instructor acknowledge as Chemistry.
	RO	(Step 26) WHEN condenser dump valves closed AND no longer required for temperature control, THEN reset C-7A using "STEAM DUMP SELECT" switch.	
Upon Entry into AP-10, or at the discretion of the Lead Examiner, move to Events #6-7.			

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 47 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

When the plant is stabilized or AP/1/A/5500/10 is entered to mitigate the SGTL, the 1C MSIV will inadvertently CLOSE, and the Reactor will fail to trip automatically and manually. Additionally, the low set Safety Valve on the 1C Steam Generator will lift and stick fully OPEN. Additionally, the TD CA Pump will trip on overspeed on auto start, and both MDCA Pumps will fail to start automatically. The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and then transition to EP/1/A/5000/FR-S.1, "Response to Nuclear Power Generation/ATWS." During the performance of FR-S.1, the operator will continuously drive rods in manually, successfully trip the Reactor locally, and manually start the MDCA Pumps and establish 450 gpm of flow the Steam Generators. The SGTL will degrade to a tube rupture in the 1C Steam Generator when the reactor is locally tripped. After completion of FR-S.1, the operator will transition back to E-0, and then to EP/1/A/5000/E-2, "Faulted Steam Generator Isolation." After the 1C Steam Generator is isolated, the operator will transition to EP/1/A/5000/E-3, "Steam Generator Tube Rupture." The scenario will terminate at Step 6 of E-3 after the operator has transitioned to EP/1/A/5000/ECA-3.1, "SGTR with Subcooled Recovery Desired," or at Step 9 of E-3 upon initiating an NCS cooldown.

Booth Operator Instructions:

Insert REM_SM003AB (1C MSIV Closure)
Insert MAL_SM004C1 = 100 cd='H_X02_078_3
EQ 1' delay=0 (Safety Valve on 1C SG sticks
OPEN on C MSIV CLOSE Indicating Light)

Insert MAL_SG001C = 300 cd='H_X01_094_2
EQ 1' delay=0 (300 gpm SGTR occurs on 1C
SG on Reactor Trip Breaker Open Indicating
Light)

Indications Available:

- 1SM3AB Green status light is LIT (MSIV Closed).
- 1C SG Steam Flow lowering.
- 1C SG Feedflow lowering.
- 1C SG Narrow Range Level is lowering.
- MCB Annunciator 1AD3, A-5, MAIN STEAM ISOLATION VLV CLOSED

Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 48 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: At any time the CRS may dispatch an AO to close the steam supply valves to the TDCA Pump from the 1C S/G. If so, Booth Instructor: Insert REM_SA0001 = 0 Insert REM_SA0077 = 0 Within 3 minutes, as AO report that steam has been isolated to the TD CA Pump from the 1C SG.
			NOTE: Crew will carry out Immediate Actions of E-0, prior to the CRS addressing the EP.
	RO/BOP	(Step 1) Monitor Foldout page.	
		NC Pump Trip Criteria (Not Expected)	
		CA Suction Sources (CA storage tank (water tower) goes below 1.5 ft – Not expected)	
		Position Criteria for 1NV-150B and 1NV-151A (U1 NV Pump Recird Isol)	
		<ul style="list-style-type: none"> IF NV S/I flowpath aligned AND NC pressure is less than 1500 PSIG, THEN CLOSE 1NV-150B and 1NV-151A. 	
		<ul style="list-style-type: none"> IF NC pressure is greater than 2000 PSIG, THEN OPEN 1NV-150B and 1NV-151A. 	
		Ruptured S/G Aux Feedwater Isolation Criteria (IF both of the following conditions met, THEN stop CA flow to affected S/G(s): (1) Level going up in an uncontrolled manner or radiation level in that S/G is abnormal and (2) N/R level - GREATER THAN 11% (32% ACC).)	NOTE: The Crew may meet this criterion.

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 49 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		Faulted S/G Aux Feedwater Isolation Criteria (IF all of the following conditions met, THEN stop CA flow to affected S/G: (1) S/G pressure going down in an uncontrolled manner or completely depressurized, (2) Only one S/G is diagnosed as faulted, and (3) Secondary heat sink: is available [NR level in one SG > 11% or > 450 gpm CA flow].)	NOTE: The Crew is expected to meet this criterion.
	RO	(Step 2) Check Reactor Trip:	Immediate Action
		<ul style="list-style-type: none"> All rod bottom lights – LIT 	
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R power – GOING DOWN. 	
	RO	(Step 2 RNO) Perform the following:	Immediate Action
		<ul style="list-style-type: none"> Trip reactor. 	
	RO	<ul style="list-style-type: none"> IF reactor will not trip, THEN perform the following: 	<p>NOTE: The CRS may dispatch an AO to locally trip the reactor.</p> <p>If so, Booth Instructor After 30 seconds insert:</p> <p>LOA_IPE011=TRIP (Rx Trip Bkr 1A)</p> <p>LOA_IPE012=TRIP (Rx Trip Bkr 1B)</p> <p>As an Alternate Insert:</p> <p>LOA_IRE001A = OPEN (MG Set 1A Gen Output Bkr)</p> <p>LOA_IRE002A = OPEN (MG Set 1B Gen Output Bkr)</p>
		<ul style="list-style-type: none"> Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees). 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 50 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	<ul style="list-style-type: none"> GO TO EP/1/A/5000/FR-S.1 (Response To Nuclear Power Generation/ATWS). 	NOTE: The CRS will transition to FR-S.1.
EP/1/A/5000/FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS			
CAUTION NC pumps should not be tripped with Reactor power greater than 5%.			
	RO	(Step 1) Check Reactor Trip:	Immediate Action
		<ul style="list-style-type: none"> All rod bottom lights - LIT 	
		<ul style="list-style-type: none"> Reactor trip and bypass breakers - OPEN 	
		<ul style="list-style-type: none"> I/R power – GOING DOWN. 	
	RO	(Step 1 RNO) Perform the following:	Immediate Action
		<ul style="list-style-type: none"> Trip the reactor. 	
		<ul style="list-style-type: none"> IF reactor will not trip, THEN ensure rod insertion in auto or manual. 	NOTE: The RO will manually drive Rods inward.
	BOP	(Step 2) Check Turbine Trip:	
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	RO/ BOP	(Step 3) Monitor Foldout page.	
		Cold Leg Recirc Switchover Criteria	
		CA Suction Sources	
		Position Criteria for 1NV-150B and 1NV-151A (U1 NV Pump Recirc Isol)	
		IF NV S/I flowpath aligned AND NC pressure is less than 1500 PSIG, THEN CLOSE 1NV-150B and 1NV-151A.	
		IF NC pressure is greater than 2000 PSIG, THEN OPEN 1NV-150B and 1NV-151A.	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 51 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 4) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	NOTE: Both MDCA Pumps have failed to AUTO start.
	BOP	(Step 4.A RNO) Start pumps.	NOTE: The BOP will start one or both MDCA Pump.
	BOP	<ul style="list-style-type: none"> Check N/R Level in at least 3 S/Gs – GREATER THAN 17%. 	
<u>Critical Task:</u> Start one or more MD CA Pumps before entry into FR-H.1 is required. Safety Significance: Failure to establish a Secondary Heat Sink through the initiation of CA flow unnecessarily challenges both the HEAT SINK and the CORE COOLING Critical Safety Functions. Additionally, the FSAR Safety Analysis results are predicated on the assumption that at least one train of safeguards actuates and delivers a minimum amount of AFW flow to the Steam Generators. Failure to perform this task, when the ability to do so exists, results in a violation of the Facility License Condition and places the plant in an unanalyzed condition.			
	BOP	(Step 5) Initiate emergency boration of NC System as follows:	
		<ul style="list-style-type: none"> Ensure one NV pump - ON 	
		<ul style="list-style-type: none"> Align boration flowpath as follows: 	
		<ul style="list-style-type: none"> Open 1NV-265B (Boric Acid To NV Pumps). 	
		<ul style="list-style-type: none"> Start both boric acid transfer pumps. 	
		<ul style="list-style-type: none"> Check emergency boration flow – GREATER THAN 30 GPM. 	
		<ul style="list-style-type: none"> Check if NV flowpath aligned to NC System: 	
		<ul style="list-style-type: none"> 1NV-244A (Charging Line Cont Outside Isol) – OPEN. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 52 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NV-245B (Charging Line Cont Outside Isol) – OPEN. 	
		<ul style="list-style-type: none"> Ensure charging flow is greater than emergency Boration flow. 	
		<ul style="list-style-type: none"> Check Pzr pressure – LESS THAN 2335 PSIG. 	
	BOP	(Step 6) Close the following VQ valves:	
		<ul style="list-style-type: none"> CLOSE 1VQ-1A (U1 Cont Air Release Inside Isol) 	
		<ul style="list-style-type: none"> CLOSE 1VQ-6A (U1 Cont Air Addition Inside Isol) 	
		<ul style="list-style-type: none"> CLOSE 1VQ-2B (U1 Cont Air Release Outside Isol) 	
		<ul style="list-style-type: none"> CLOSE 1VQ-5B (U1 Cont Air Addition Outside Isol) 	
	BOP	(Step 7) IF AT ANY TIME while in this procedure an S/I signal exists or occurs, THEN perform the following:	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> Have another Licensed Operator check S/I equipment PER Enclosure 3 (Subsequent S/I Actions). 	
	CRS	<ul style="list-style-type: none"> Continue with this procedure. 	
	RO	(Step 8) Check if the following trips have occurred:	
		<ul style="list-style-type: none"> Reactor trip. 	
		<ul style="list-style-type: none"> Turbine trip. 	
	RO	(Step 9) Check reactor subcritical:	
		<ul style="list-style-type: none"> P/R channels – LESS THAN 5% 	
		<ul style="list-style-type: none"> I/R channels – LESS THAN 5% 	
		<ul style="list-style-type: none"> W/R Neutron Flux – LESS THAN 5% 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 53 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> I/R SUR – NEGATIVE. 	
	CRS	(Step 10) GO TO Step 17.	
	RO	(Step 17) Ensure adequate shutdown margin as follows:	
		<ul style="list-style-type: none"> Obtain current NC boron concentration from Primary Chemistry. 	NOTE: The CRS/RO may call Chemistry. If so, Booth Instructor acknowledge as Chemistry.
		<ul style="list-style-type: none"> WHEN current NC boron concentration is obtained, THEN perform shutdown margin calculation PER OP/0/A/6100/006 (Reactivity Balance Calculation). 	NOTE: The CRS may ask the U2 RO to perform this action. If so, Floor Instructor acknowledge as U2 RO.
		<ul style="list-style-type: none"> WHEN following conditions satisfied, THEN NC System boration may be stopped: 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> Adequate shutdown margin is obtained. 	
		<ul style="list-style-type: none"> Uncontrolled cooldown has been stopped. 	
	CRS	(Step 18) Ensure the following have been implemented:	NOTE: The CRS may ask SM to address. If so, Floor Instructor acknowledge as SM.
		<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). 	
	CRS	(Step 19) RETURN TO procedure and step in effect.	NOTE: The CRS will transition back to E-0.

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 54 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	RO/ BOP	(Step 1) Monitor Foldout page.	
		NC Pump Trip Criteria (Not Expected)	
		CA Suction Sources (CA storage tank (water tower) goes below 1.5 ft – Not expected)	
		Position Criteria for 1NV-150B and 1NV-151A (U1 NV Pump Recird Isol)	
		<ul style="list-style-type: none"> IF NV S/I flowpath aligned AND NC pressure is less than 1500 PSIG, THEN CLOSE 1NV-150B and 1NV-151A. 	
		<ul style="list-style-type: none"> IF NC pressure is greater than 2000 PSIG, THEN OPEN 1NV-150B and 1NV-151A. 	
		Ruptured S/G Aux Feedwater Isolation Criteria (IF both of the following conditions met, THEN stop CA flow to affected S/G(s): (1) Level going up in an uncontrolled manner or radiation level in that S/G is abnormal and (2) N/R level - GREATER THAN 11% (32% ACC).)	NOTE: The Crew may meet this criterion.
		Faulted S/G Aux Feedwater Isolation Criteria (IF all of the following conditions met, THEN stop CA flow to affected S/G: (1) S/G pressure going down in an uncontrolled manner or completely depressurized, (2) Only one S/G is diagnosed as faulted, and (3) Secondary heat sink: is available [NR level in one SG > 11% or > 450 gpm CA flow].)	NOTE: The Crew is expected to meet this criterion.
	RO	(Step 2) Check Reactor Trip:	Immediate Action
		<ul style="list-style-type: none"> All rod bottom lights – LIT 	
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R power – GOING DOWN. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 55 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 3) Check Turbine Trip:	Immediate Action
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	Immediate Action
	RO/ BOP	(Step 5) Check if S/I is actuated:	Immediate Action
		<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. 	<p>Examiner NOTE: SI will most likely NOT be actuated at this time, however, plant conditions will not permit SI to be avoided.</p> <p>If the crew transitions to ES-0.1, observe crew activities and continue with the script when SI is actuated.</p> <p>NOTE that upon return to E-0 from ES-0.1 the CRS will start at Step 1.</p>
	CRS	(Step 6) Announce “Unit 1 Safety Injection”.	<p>NOTE: The CRS may ask U2 RO to make Plant Announcement.</p> <p>If so, Floor Instructor acknowledge as U2 RO.</p>
	BOP	(Step 7) Check all Feedwater Isolation status lights (1SI-4) – LIT.	
	BOP	(Step 8) Check Phase A “RESET” lights – DARK.	
	BOP	(Step 9) Check ESF Monitor Light Panel on Energized train(s):	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 56 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<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"> Group 4 – LIT AS REQUIRED. 	
		<ul style="list-style-type: none"> Group 6 – LIT. 	NOTE: Group 6 lights may NOT be LIT due to the previously failed RN Pump Suction Valve.
	CRS	(Step 9.d RNO) GO TO Step 9.f.	
	RO/ BOP	(Step 9.f) Check the following:	
		<ul style="list-style-type: none"> OAC - IN SERVICE 	
		<ul style="list-style-type: none"> LOCA Sequencer Actuated status light (1SI-14) on energized train(s) - LIT. 	
		<ul style="list-style-type: none"> Perform the following on energized train(s): 	
		<ul style="list-style-type: none"> Check OAC Monitor Light Program ("MONL") for Group 6 windows that are dark. 	
		<ul style="list-style-type: none"> Align valves as required, while continuing in this EP. 	
	RO	(Step 10) Check proper CA pump status:	
		<ul style="list-style-type: none"> MD CA pumps – ON. 	NOTE: Although both MDCA Pumps failed to auto start they should be running by now.
		<ul style="list-style-type: none"> N/R level in at least 3 S/Gs – GREATER THAN 17%. 	NOTE: Although NR level in 3 S/Gs may not exist the TDCA Pump has failed and cannot be started.
	BOP	(Step 11) Check all KC pumps – ON.	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 57 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 12) Check both RN pumps – ON.	NOTE: The 1B RN Pump may have been rendered inoperable due to a previous malfunction. If not, the CRS may contact the WCCS/dispatch an AO to stop the pump by opening the breaker. If so, Booth Instructor acknowledge as WCC , and indicate that the 1B RN Pump Breaker will be Racked Out . Use: LOA-RN006 = Racked_Out (1B RN Pump BKR) LOA-RN006A = Racked_Out (1B RN Pump Cntrl Pwr)
	BOP	(Step 12 RNO) Perform the following:	
		<ul style="list-style-type: none"> Start pump(s). 	NOTE: the 1B RN Pump cannot be started.
		<ul style="list-style-type: none"> IF 1A RN pump is off, THEN.... 	
		<ul style="list-style-type: none"> IF affected train is deenergized, AND it's D/G is off, THEN..... 	NOTE: the 1B D/G is running.
		<ul style="list-style-type: none"> Reset the following on affected train: 	
		<ul style="list-style-type: none"> S/I. 	
		<ul style="list-style-type: none"> Sequencer. 	
		<ul style="list-style-type: none"> Dispatch operator to stop affected D/G using emergency stop pushbutton. 	NOTE: The CRS may dispatch an AO. If so, Booth Instructor acknowledge as the AO , and use LOA_DG004 = STOP_DG to stop the 1B D/G.
		<ul style="list-style-type: none"> Monitor affected RN cooled components and shut down as necessary. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 58 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 13) Notify Unit 2 to perform the following:	Floor Instructor: As U2 RO report "2A RN Pump is running."
		<ul style="list-style-type: none"> Start 2A RN pump. 	
		<ul style="list-style-type: none"> THROTTLE Unit 2 RN flow to minimum for existing plant condition. 	Booth Instructor: insert LOA_RN087 (Start 2A RN Pump) insert LOA_RN083 8050.000000 delay=0 ramp=10 (Unit 2 Train A Demand Flow)
	RO	(Step 14) Check all S/G pressures – GREATER THAN 775 PSIG.	NOTE: 1C S/G is faulted and may be less than 775 psig (Crew may perform RNO. If NOT, proceed to Step 15).
	RO	(Step 14 RNO) Perform the following:	
		<ul style="list-style-type: none"> Check the following valves closed: 	
		<ul style="list-style-type: none"> All MSIVs 	
		<ul style="list-style-type: none"> All MSIV Bypass Valves 	
		<ul style="list-style-type: none"> All SM PORVs. 	
		<ul style="list-style-type: none"> IF any valve open, THEN..... 	
	BOP	(Step 15) Check Containment Pressure – HAS REMAINED LESS THAN 3 PSIG.	NOTE: Containment Pressure is normal.
	BOP	(Step 16) Check S/I flow:	
		<ul style="list-style-type: none"> Check "NV PMPS TO COLD LEG FLOW" gauge – INDICATING FLOW. 	
		<ul style="list-style-type: none"> Check NC pressure – LESS THAN 1600 PSIG. 	
	BOP	(Step 16b RNO) Perform the following:	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 59 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<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). 	
	CRS	<ul style="list-style-type: none"> IF valve(s) open on all running ND pumps, THEN GO TO Step 17. 	
	CRS	(Step 17) Notify Shift Manager or other SRO to perform EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 22 (Shift Manager Actions Following an S/I) within 10 minutes.	NOTE: The CRS may ask SM to address. If so, Floor Instructor acknowledge as SM.
	RO/BOP	(Step 18) Check CA flow:	NOTE: The CA flow to the 1C S/G should be isolated. E-0 Foldout Page item 5 is expected to be met by this time.
		<ul style="list-style-type: none"> Total CA flow – GREATER THAN 450 GPM. 	
	RO/BOP	(Step 18.a RNO) Perform the following:	
		<ul style="list-style-type: none"> IF N/R level in all S/Gs is less than 11% (32% ACC), THEN..... 	
		<ul style="list-style-type: none"> IF N/R level in all S/Gs is less than 11% (32% ACC) AND feed flow greater than 450 GPM cannot be established, THEN.... 	
	BOP	<ul style="list-style-type: none"> Check VI header pressure – GREATER THAN 60 PSIG. 	
	RO/BOP	<ul style="list-style-type: none"> WHEN each S/G N/R level is greater than 11% (32% ACC), THEN control CA flow to maintain that S/G N/R level between 11% (32% ACC) and 50%. 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 60 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 19) Check NC temperatures:	
		<ul style="list-style-type: none"> IF any NC pumps on... 	
		OR	
		<ul style="list-style-type: none"> IF all NC pumps off, THEN check NC T-Colds – STABLE OR TRENDING TO 557°F. 	
		(Step 19 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). 	NOTE: The CRS may assign the RO (BOP) to perform this action. If so, RO (BOP) Examiner follow actions of Enclosure 3. Other Examiners follow E-0 Actions, Step 20, on Page 61.
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION ENCLOSURE 3, UNCONTROLLED NC SYSTEM COOLDOWN			
	RO/ (BOP)	(Step 1) Check steam dump valves – CLOSED.	
	RO/ (BOP)	(Step 2) Check all SM PORVs – CLOSED.	
	RO/ (BOP)	(Step 3) Check MSR “RESET” light - LIT	
	RO/ (BOP)	(Step 4) Check any NC pump – ON.	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 61 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO/ (BOP)	(Step 5) Check NC T-Avg - GOING DOWN.	
	RO/ (BOP)	(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... 	
		<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/ (BOP)	(Step 7) Check MSIVs – ANY OPEN.	NOTE: All MSIVs are expected to be CLOSED.
	RO/ (BOP)	(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 	
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	BOP (RO)	(Step 20) Check Pzr PORV and spray valves:	Examiner NOTE: Examiners following the CRS/RO(BOP) continue HERE .
		<ul style="list-style-type: none"> All Pzr PORVs – CLOSED. 	
		<ul style="list-style-type: none"> Normal Pzr spray valves – CLOSED. 	NOTE: 1NC-27 is most likely closed using the Emergency CLOSE Switch.
		<ul style="list-style-type: none"> At least one Pzr PORV isolation valve- OPEN. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 62 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP (RO)	(Step 21) Check NC subcooling based on core exit T/Cs – GREATER THAN 0°F.	
	BOP (RO)	(Step 22) 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. 	
	CRS	(Step 22 RNO) IF any S/G is faulted, THEN perform the following:	NOTE: The 1C S/G is faulted.
		<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 CRS will transition to E-2.
EP/1/A/5000/E-2, FAULTED STEAM GENERATOR ISOLATION			
	RO/BOP	(Step 1) Monitor Foldout page.	
		Cold Leg Recirc Switchover Criteria	
		CA Suction Sources	
		Position Criteria for 1NV-150B and 1NV-151A (U1 NV Pump Recirc Isol)	
		<ul style="list-style-type: none"> IF NV S/I flowpath aligned AND NC pressure is less than 1500 PSIG, THEN CLOSE 1NV-150B and 1NV-151A. 	
		<ul style="list-style-type: none"> IF NC pressure is greater than 2000 PSIG, THEN OPEN 1NV-150B and 1NV-151A. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 63 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 2) Maintain any faulted S/G or secondary break isolated during subsequent recovery actions unless needed for NC System cooldown.	
	RO	(Step 3) Check the following – CLOSED:	
		<ul style="list-style-type: none"> All MSIVs 	
		<ul style="list-style-type: none"> All MSIV bypass valves. 	
	RO	(Step 4) Check at least one S/G pressure – STABLE OR GOING UP.	NOTE: Although all SG pressures may be decreasing slowly, the operator will report stable based on plant conditions (i.e. faulted SG). Otherwise a transition to ECA-2.1 will be made.
	RO/ BOP	(Step 5) Identify faulted S/G(s):	NOTE: The 1C SG is Faulted.
		<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. 	
	RO	(Step 6) Maintain at least one S/G available for NC System cooldown in subsequent steps.	
	RO	(Step 7) Check faulted S/G(s) SM PORV – CLOSED.	
	BOP	(Step 8) Reset CA modulating valves.	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 64 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO/ BOP	(Step 9) Isolate faulted S/G(s) as follows:	
	RO/ BOP	<ul style="list-style-type: none"> For 1C S/G: 	
		<ul style="list-style-type: none"> Check "S/G 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"> Check at least one MD CA pump - RUNNING 	
		<ul style="list-style-type: none"> Dispatch operator to unlock and CLOSE the following valves: 	<p>NOTE: If not already done, the CRS will dispatch an AO to close these valves.</p> <p>If so, Booth Instructor: Insert REM_SA0001 = 0 Insert REM_SA0077 = 0 Within 3 minutes, as AO report that steam has been isolated to the TD CA Pump from the 1C SG.</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) 	
		<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). 	
		<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). 	
	BOP	<ul style="list-style-type: none"> Close 1SM-95 (C SM Line Drain Isol). 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 65 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 10) Close 1AS-12 (U1 SM To AS Hdr Control Inlet Isol).	
	RO/ BOP	(Step 11) Check S/G tubes intact as follows:	
		<ul style="list-style-type: none"> Check the following EMF's – NORMAL: 	NOTE: 1EMF-26 is likely in TRIP 1 or 2.
		<ul style="list-style-type: none"> 1EMF-33 (Condenser Air Ejector Exhaust) 	
		<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). 	
	CRS	(Step 11.a RNO) GO TO EP/1/A/5000/E-3 (Steam Generator Tube Rupture)	
			NOTE: The CRS will transition to E-3.
EP/1/A/5000/E-3, STEAM GENERATOR TUBE RUPTURE			
	RO/ BOP	(Step 1) Monitor Foldout page.	
		NC Pump Trip Criteria	
		S/I Reinitiation Criteria	
		Secondary Integrity Criteria	
		Cold Leg Switchover Criteria	
		CA Suction Sources	
		Multiple Tube Rupture Criteria:	
	BOP	(Step 2) Identify ruptured S/G(s):	
		<ul style="list-style-type: none"> Any S/G N/R level – GOING UP IN AN UNCONTROLLED MANNER 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 66 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		OR	
		<ul style="list-style-type: none"> Chemistry or RP has determined ruptured S/G. 	NOTE: The CRS may contact Chemistry for sampling. Booth Instructor: Acknowledge as appropriate.
		OR	
		<ul style="list-style-type: none"> Any of the following EMFs – ABOVE NORMAL: 	NOTE: 1EMF-26 is likely in TRIP 1 or 2.
		<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	(Step 3) Check at least one S/G – AVAILABLE FOR NC SYSTEM COOLDOWN.	
	RO	(Step 4) Isolate flow from ruptured S/G(s) as follows:	
		<ul style="list-style-type: none"> Check ruptured S/G(s) PORV – CLOSED. 	
		<ul style="list-style-type: none"> Check S/Gs 1B and 1C – INTACT. 	NOTE: The 1C SG is NOT Intact.
	RO/ BOP	(Step 4.B RNO) Isolate TD CA pump steam supply from ruptured S/G as follows:	
		<ul style="list-style-type: none"> IF TD CA pump is the only source of feedwater, THEN..... 	
		<ul style="list-style-type: none"> Ensure operators dispatched in next step immediately notify Control Room Supervisor when valves are closed. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 67 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		For 1C S/G:	NOTE: If not already done, the CRS will dispatch an AO to close these valves. If so, Booth Instructor: Insert REM_SA0001 = 0 Insert REM_SA0077 = 0 Within 3 minutes, as AO report that steam has been isolated to the TD CA Pump from the 1C SG.
		<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) 	
		<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). 	
		IF AT ANY TIME local closure of SA valves takes over 8 minutes, THEN isolate TD CA pump steam supply PER Enclosure 2 (Tripping TD CA Pump Stop Valve or Alternate Steam Isolation).	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	RO	<ul style="list-style-type: none"> Check blowdown isolation valves on ruptured S/G(s) – CLOSED. 	
		<ul style="list-style-type: none"> For 1C S/G: 	
		<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). 	
	BOP	<ul style="list-style-type: none"> CLOSE steam drain on ruptured S/G(s) 	
		<ul style="list-style-type: none"> 1SM-95 (C SM Line Drain Isol) 	
	RO	<ul style="list-style-type: none"> CLOSE the following valves on ruptured S/G(s): 	
		<ul style="list-style-type: none"> MSIV 	
		<ul style="list-style-type: none"> MSIV bypass valve. 	
	RO	(Step 5) Control ruptured S/G(s) level as follows:	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 68 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check ruptured S/G(s) N/R level – GREATER THAN 11% (32% ACC). 	
	BOP	(Step 5 RNO A) Perform the following:	
		<ul style="list-style-type: none"> IF any ruptured S/G is also faulted, THEN do not establish feed flow to the ruptured S/G unless needed for NC System cooldown. 	NOTE: The 1C S/G is NOT needed for cooldown.
		<ul style="list-style-type: none"> IF any ruptured S/G is non-faulted OR is required for cooldown, THEN.... 	
	CRS	<ul style="list-style-type: none"> GO TO Step 6. 	
	RO	(Step 6) Check ruptured S/G(s) pressure – GREATER THAN 350 PSIG.	Examiner NOTE: The 1C S/G may be less than 350 psig. IF so, the crew will transition to ECA-3.1, at which time the Exam should be terminated. If not, continue in E-3 until the NCS cooldown is started.
	BOP	(Step 7) Check any NC pump – RUNNING.	
	BOP	(Step 8) Check Pzr pressure – GREATER THAN 1955 PSIG.	NOTE: Pzr pressure may be <1955. If so, the crew will perform the RNO. If not, proceed to Step 9.
	BOP	(Step 8 RNO) IF "P-11 PRESSURIZER S/I BLOCK PERMISSIVE" status light (1SI-18) is lit, THEN block Low Pressure Steamline Isolation as follows:	
		<ul style="list-style-type: none"> Depress "BLOCK" on Low Pressure Steamline Isolation block switches. 	
		<ul style="list-style-type: none"> Maintain NC pressure less than 1955 PSIG. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 69 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 9) Initiate NC System cooldown as follows:	
	CRS	<ul style="list-style-type: none"> Determine required core exit temperature based on lowest ruptured S/G pressure: 	NOTE: The CRS will determine the target temperature ruptured S/G pressure based on the 1C SG pressure.
	RO	<ul style="list-style-type: none"> Check the following valves on ruptured S/G(s) – 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 ruptured S/G(s) SM PORV – CLOSED. 	
	RO	<ul style="list-style-type: none"> Check S/G(s) 1B and 1C – INTACT. 	NOTE: The 1C SG is ruptured.
	RO/ BOP	(Step 9.D RNO) IF 1B OR 1C S/G is ruptured, THEN perform the following:	NOTE: If not already done, the CRS will dispatch an AO to close these valves. If so, Booth Instructor: Insert REM_SA0001 = 0 Insert REM_SA0077 = 0 Within 3 minutes, as AO report that steam has been isolated to the TD CA Pump from the 1C SG.
		<ul style="list-style-type: none"> Ensure steam to TDCA pump is isolated from ruptured S/G per one of the following: 	
		<ul style="list-style-type: none"> Local isolation of SA line (per Step 4.B) 	
		OR	
		<ul style="list-style-type: none"> Tripping TD CA pump stop valve (per Step 4.B). 	
		<ul style="list-style-type: none"> Do not continue until affected TDCA pump steam supply is either: 	
		<ul style="list-style-type: none"> Isolated 	
		OR	
		<ul style="list-style-type: none"> Determined to be unisolable. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 70 of 72Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
<p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> NC pump trip criteria based on subcooling does not apply after starting a controlled cooldown. After the Low Pressure Steamline Isolation signal is blocked, maintaining steam pressure negative rate less than 2 PSIG per second will prevent a Main Steam Isolation. 			
	RO	(Step 9.E) Check condenser available:	
		<ul style="list-style-type: none"> "C-9 COND AVAILABLE FOR STEAM DUMP" status light (1SI-18) – LIT 	
		<ul style="list-style-type: none"> MSIV on intact S/G(s) - OPEN. 	
	RO	(Step 9.E RNO) GO TO RNO for Step 9.H.	
<p style="text-align: center;">CAUTION</p> <p>After initiating cooldown in next step, continue with subsequent steps without delay.</p>			
	CRS	(Step 9.H RNO) Perform the following:	
	RO/ BOP	<ul style="list-style-type: none"> Ensure at least one Pzr PORV isolation valve is OPEN 	
		<ul style="list-style-type: none"> IF VI is lost, OR a Phase B Isolation has occurred, THEN..... 	NOTE: VI is NOT lost.
		<ul style="list-style-type: none"> IF Pzr pressure is greater than 1955 PSIG, THEN depressurize to 1900 PSIG using Pzr PORV. 	NOTE: Pzr pressure may be greater than 1955 psig. If NOT, no depressurization will be made.
		<ul style="list-style-type: none"> Depress "BLOCK" on Low Pressure Steamline Isolation block switches. 	
		<ul style="list-style-type: none"> Maintain NC pressure less than 1955 PSIG. 	
		<ul style="list-style-type: none"> Ensure Main Steam Isolation reset. 	
		<ul style="list-style-type: none"> Ensure SM PORVs reset. 	

Op Test No.: N20-1 Scenario # 2 Event # 6-7 Page 71 of 72

Event Description: **1C MSIV fails CLOSED/ 1C SG SV fails OPEN/ATWS/SGTR/ TD CA Pump Overspeed Trip/1A & B MD CA Pumps fail to start in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF any intact S/G SM PORV isolation valve is closed, AND associated SM PORV is operable, THEN perform the following: 	NOTE: The Cooldown will be conducted using the 1A and 1B S/Gs.
		<ul style="list-style-type: none"> OPEN SM PORV isolation valve. 	
		<ul style="list-style-type: none"> IF isolation valve will not open,..... 	
		<ul style="list-style-type: none"> Dump steam using all intact S/G(s) SM PORVs at maximum rate as follows: 	
	RO/BOP	<ul style="list-style-type: none"> CLOSE SM PORV manual loader on ruptured S/G(s). 	
		<ul style="list-style-type: none"> Place intact S/G SM PORV manual loaders at 50%. 	
		<ul style="list-style-type: none"> Select "MANUAL" on "SM PORV MODE SELECT". 	
		<ul style="list-style-type: none"> Adjust manual loaders on intact S/G SM PORVs as required to control intact S/G depressurization rate at approximately 2 PSIG per second. 	
At the discretion of the Lead Examiner terminate the exam.			

UNIT 1 STATUS:

Power Level: 75% NCS [B] 1065 ppm Pzr [B]: 1068 ppm Xe: Per OAC

Power History: At this power level for 14 days Core Burnup: 250.1 EFPDs

UNIT 2 STATUS:

Power Level: 100%

CONTROLLING PROCEDURE:

- OP/1/A/6100/003 (Controlling Procedure for Unit Operation)

OTHER INFORMATION NEEDED TO ASSUME THE SHIFT:

- The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.

The following equipment is Out-Of-Service:

- The 1D S/G PORV is isolated and its actuator is currently removed for maintenance.
- 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating).
- MCB Annunciator 1AD-11, L-1, "ETA DEGRADED VOLTAGE," has alarmed spuriously several times over the last hour and has currently failed ON (IAE has verified that the issue is limited to an annunciator card issue).

Crew Directions:

- The crew will raise power to 100% after taking the shift, starting from Step 3.37.11 of Enclosure 4.1 of OP/1/A/6100/003.
- The fuel is conditioned for 100% power.
- Raise power at 3 MWe/minute.
- The RE recommends 100% Control Rod position of 216 steps on Control Bank D.
- The RE recommends that the BOP perform a 400 gallon Simple Dilute to initiate the power increase.
- RMWST Dissolved O₂ is greater than 1000 ppb.
- Blender content is Reactor Makeup Water.

Work Control SRO**Jim****Field SRO****Joe (FB)****AO's AVAILABLE****Unit 1****Aux Bldg. John****Turb Bldg. Bob (FB)****Extra(s) Bill (FB) Ed (FB) Gus (RW) Carol****Unit 2****Aux Bldg. Chris****Turb Bldg. Mike (FB)**

Facility:	McGuire	Scenario No.:	3	Op Test No.:	N20-1
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	
Initial Conditions:	The plant is at 36% power (BOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.				
Turnover:	The following equipment is Out-Of-Service: The 1B EDG is OOS for bearing replacement. ACTION has been taken in accordance with Technical Specification LCO 3.8.1 ACTION B. The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-9, A-7, "NF SYSTEM TRACE HEATING LOSS OF POWER," has alarmed spuriously several times over the last hour (IAE is investigating). The crew will raise power to 100% after taking the shift.				
Critical Tasks:	See Below				
Event No.	Malf. No.	Event Type*	Event Description		
1	NA	R-RO N-BOP N-SRO	Power Increase w/Alternate Dilute		
2	^{MAL} SM001C	C-RO C(TS)-SRO	SG 1C PORV fails OPEN		
3	^{REM} NV0461	C-BOP C-SRO	1B NCP Standpipe Low Level Alarm		
4	^{MAL} NCP008B	C(TS)-SRO	#1 Seal Leak on 1B NCP		
5	^{MAL} DEH001 IRE009	C-RO C-SRO	Inadvertent Turbine Trip/Failure of Control Rods to Move in AUTO		
6	^{MAL} NCP008B NCP016C NCP015C	C-BOP	#1 Seal Leak on 1B NCP Fails		
7	^{MAL} IRE010	C-BOP C-SRO	4 Control Rods fail to Fully Insert on Rx Trip		
8	^{MAL} EP002A EP002B DG001A	M-RO M-BOP M-SRO	Loss of Switchyard to Unit 1/1A EDG fails to START		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

McGuire 2020 NRC Scenario #3

The plant is at 36% power (BOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.

The following equipment is Out-Of-Service: The 1B EDG is OOS for bearing replacement. ACTION has been taken in accordance with Technical Specification LCO 3.8.1 ACTION B. The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-9, A-7, "NF SYSTEM TRACE HEATING LOSS OF POWER," has alarmed spuriously several times over the last hour (IAE is investigating). The crew will raise power to 100% after taking the shift.

Shortly after taking the watch, the operator will commence a load increase to 100% starting with Step 3.35.12 of Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." The operator will dilute the NC System Boron concentration in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control," and raise Turbine load in accordance with OP/1/A/6300/001 A, "Turbine-Generator Load Change."

Shortly after starting the power increase, the 1C Steam Generator PORV will fail OPEN. The operator will respond in accordance with AP/1/A/5500/01, "Steam Leak," and isolate the PORV. The operator will address Technical Specification LCO 3.7.4, "Steam Generator Power Operated Relief Valves (SG PORVs)," and may enter LCO 3.4.1, "RCS Pressure, Temperature and Flow Departure from Nucleate Boiling (DNB) Limits."

After this, AD-7/B-2, "NC PUMP B NO. 2 SEAL S-PIPE LO LEVEL," will alarm. The operator will address the Annunciator Response Procedure, and then use Enclosure 4.3, "Filling and Draining NC Pump Standpipe," of OP/1/A/6150/002A, "Reactor Coolant Pump Operation," to refill the standpipe.

Subsequently, a #1 seal leak will develop on the 1B NCP such that #1 Seal leakoff flow is 5.0-5.5 gpm. The operator will respond in accordance with AP/1/A/5500/08, "Malfunction of NC Pump," and address Selected Licensee Commitment 16.9.7, "Standby Shutdown System." The control operators will be directed on the action to take should the #1 Seal Leakoff flow degrade to > 6 gpm (which will occur subsequently).

Shortly afterwards, the Main Turbine will inadvertently trip. The operator will respond in accordance with AP/1/A/5500/02, "Turbine Generator Trip." The operator will discover that the Control Rods will not respond in AUTO and the RO will need to operate the control rods manually. The crew will stabilize the plant in accordance with AP-2 and subsequently enter AP/1/A/5500/14, "Rod Control Malfunction."

While the crew is in AP-2, the 1B NC Pump Hi Vibration alarm will occur and the #1 seal leak flow on the 1B NCP will rise to 6 gpm. The operator will return to Step 8 of AP-8 (Continuous Action Step), and close the 1B NCP Pzr Spray Valve, manually trip the reactor and stop the 1B NCP when reactor power is < 5%. The crew will perform Enclosure 2, "NC Pump Post Trip Actions For #1 Seal Failure," of AP8, while subsequently performing E-0.

The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and verify reactor trip. On the reactor trip four control rods will fail to fully insert. The operator will transition to EP/1/A/5000/ES-0.1, "Reactor Trip Response," and emergency borate per AP/1/A/5500/38, "Emergency Boration And Response To Inadvertent Dilution."

Immediately following the initiation of Emergency Boration, a loss of the Unit 1 Switchyard will occur, and the 1A Emergency Diesel Generator will fail to start. The operator will immediately transition to EP/1/A/5000/ECA-0.0, "Loss of All AC Power." The operator will restore power to 1ETA per Unit 2 6900V busses through SATA or SATB per Enclosure 13 "Energizing Unit 1 4160V Bus From Unit 2 – SATA or SATB."

The scenario will terminate when one ESF Bus has been re-energized.

Critical Tasks:

Trip the Reactor prior to stopping the 1B NCP during a seal failure/high vibration condition and trip the NCP only after Reactor power level has dropped to less than 5% but before the CRS starts to read the Immediate Actions of EP/1/A/5000/E-0, Reactor Trip or Safety Injection to the Control Board Operators to verify that a Reactor Trip has occurred.

Safety Significance: The transient placed on the unit when an NCP is secured at power can challenge both reactor protection and control systems. Station management has decided that the conservative approach to dealing with this transient is to trip the reactor anytime a NCP malfunction warrants stopping a pump in Mode 1. Guidance is given to wait until reactor power is less than 5% before stopping the NC pump to ensure that the NC pump will provide adequate flow/core cooling until reactor power is sufficiently low enough to preclude a challenge to fuel integrity. If the action can be taken, and is not taken, this demonstrates "mis-operation" or incorrect operation that could unnecessarily challenge a fission product barrier (NCS).

Control Steam Generator Water Levels during the Station Blackout such that no Steam Generator Overfill Condition occurs (≤ 0.8 on Void Fraction SGINFO.cts) and causes Water to Enter the Steam Lines.

Safety Significance: During the Station Blackout the only source of CA flow is the TDCA Pump. If the critical task is not performed and one or more SG's are allowed to overfill, water will enter the steam line and potentially damage the only available source for CA flow (i.e. the TDCA Pump).

PROGRAM: McGuire Operations Training

MODULE: Initial License Operator Training Class ILT 20-1

TOPIC: NRC Simulator Exam

Scenario N20-1-3

REFERENCES:

1. Technical Specification LCO 3.8.1, "AC Sources - Operating" (Amendment 314/293)
2. OP/1/A/6100/003, "Controlling Procedure for Unit Operation" (Rev 212)
3. OP/1/A/6150/009, "Boron Concentration Control" (Rev 138)
4. OP/1/A/6300/001 A, "Turbine-Generator Load Change" (Rev 13)
5. AP/1/A/5500/01, "Steam Leak" (Rev 19)
6. Technical Specification LCO 3.4.1, "RCS Pressure, Temperature and Flow Departure From Nucleate Boiling (DNB) Limits" (Amendment 219/201)
7. MCEI -0400-379, "McGuire 1 Cycle 27 Core Operating Limits Report" (Rev 1)
8. Technical Specification LCO 3.7.4, "Steam Generator Power Operated Relief Valves (SG PORVs)" (Amendment 302/281)
9. OP/1/A/6100/010 H, "Annunciator Response for Panel 1AD-7" (Rev 68)
10. OP/1/A/6150/002 A, "Reactor Coolant Pump Operation" (Rev 71)
11. AP/1/A/5500/08, "Malfunction of NC Pump" (Rev 17)
12. SLC 16.9.7, "Standby Shutdown System" (Rev 180)
13. AP/1/A/5500/02, "Turbine Generator Trip" (Rev 30)
14. AP/1/A/5500/14, Rod Control Malfunction (Rev 16)
15. AP/1/A/5500/38, "Emergency Boration and Response to Inadvertent Dilution" (Rev 11)
16. EP/1/A/5000/E-0, "Reactor Trip or Safety Injection" (Rev 36)
17. EP/1/A/5000/ES-0.1, "Reactor Trip Response" (Rev 47)
18. EP/1/A/5000/ECA-0.0, "Loss of All AC Power" (Rev 44)

Validation Time: 115 minutes

Author: David Lazarony, Essential Training & Consulting, LLC

Facility Review: _____

Rev. 011420

McGuire 2020 NRC Scenario #3 Objectives:

Given the simulator at an initial condition of 36% power with a normal power increase planned evaluate:

1. the SRO's ability to supervise the control room team during the normal, abnormal, and emergency situations that arise, including compliance with all facility procedures, Technical Specifications, and other commitments.
2. each crew member's ability to effectively communicate as part of a control room team during the normal, abnormal, and emergency situations that arise.
3. the RO and BOP's ability to effectively raise power in accordance with Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation," and the Alternate Dilution process.
4. each crew member's ability to effectively diagnose a failed open Steam Generator PORV and the RO and BOP's ability to respond to such an event in accordance with AP/1/A/5500/01, "Steam Leak."
5. each crew member's ability to effectively diagnose a low-level condition on an NC Pump #2 Seal Pipe, and the BOP's ability to respond to such a condition in accordance with OP/1/A/6150/002A, "Reactor Coolant Pump Operation."
6. each crew member's ability to effectively diagnose a degradation of a #1 Seal on an NC Pump and the RO and BOP's ability to respond to such an event in accordance with AP/1/A/5500/08, "Malfunction of NC Pump."
7. each crew member's ability to effectively diagnose an inadvertent Turbine Trip while < P-8 and a failure of the control rods to move in AUTO when required; and the RO's ability to respond to such an event in accordance with AP/1/A/5500/02, "Turbine Generator Trip," including manual rod control during the transient.
8. each crew member's ability to effectively diagnose a failure of the #1 NC Pump Seal and the RO and BOP's ability to respond to such an event in accordance with AP/1/A/5500/08, "Malfunction of NC Pump, EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," EP/1/A/5000/ES-0.1, "Reactor Trip Response," and emergency borate per AP/1/A/5500/38, "Emergency Boration And Response To Inadvertent Dilution."
9. each crew member's ability to effectively diagnose a loss of the Unit 1 Switchyard and the RO and BOP's ability to respond to such an event in accordance with EP/1/A/5000/ECA-0.0, "Loss of All AC Power."

Scenario Event Description
NRC Scenario 3

Facility: McGuire		Scenario No.: 3		Op Test No.: N20-1	
Examiners: _____		Operators: _____		(SRO)	
_____		_____		(RO)	
_____		_____		(BOP)	
Initial Conditions:		The plant is at 36% power (BOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.			
Turnover:		The following equipment is Out-Of-Service: The 1B EDG is OOS for bearing replacement. ACTION has been taken in accordance with Technical Specification LCO 3.8.1 ACTION B. The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-9, A-7, "NF SYSTEM TRACE HEATING LOSS OF POWER," has alarmed spuriously several times over the last hour (IAE is investigating). The crew will raise power to 100% after taking the shift.			
Critical Tasks:		See Below			
Event No.	Malf. No.	Event Type*	Event Description		
1	NA	R-RO N-BOP N-SRO	Power Increase w/Alternate Dilute		
2	MAL SM001C	C-RO C(TS)-SRO	SG 1C PORV fails OPEN		
3	REM NV0461	C-BOP C-SRO	1B NCP Standpipe Low Level Alarm		
4	MAL NCP008B	C(TS)-SRO	#1 Seal Leak on 1B NCP		
5	MAL DEH001 IRE009	C-RO C-SRO	Inadvertent Turbine Trip/Failure of Control Rods to Move in AUTO		
6	MAL NCP008B NCP016C NCP015C	C-BOP	#1 Seal Leak on 1B NCP Fails		
7	MAL IRE010	C-BOP C-SRO	4 Control Rods fail to Fully Insert on Rx Trip		
8	MAL EP002A EP002B DG001A	M-RO M-BOP M-SRO	Loss of Switchyard to Unit 1/1A EDG fails to START		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Scenario Event Description
NRC Scenario 3

McGuire 2020 NRC Scenario #3

The plant is at 36% power (BOL). The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.

The following equipment is Out-Of-Service: The 1B EDG is OOS for bearing replacement. ACTION has been taken in accordance with Technical Specification LCO 3.8.1 ACTION B. The 1D S/G PORV is isolated and its actuator is currently removed for maintenance. 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating) and MCB Annunciator 1AD-9, A-7, "NF SYSTEM TRACE HEATING LOSS OF POWER," has alarmed spuriously several times over the last hour (IAE is investigating). The crew will raise power to 100% after taking the shift.

Shortly after taking the watch, the operator will commence a load increase to 100% starting with Step 3.35.12 of Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." The operator will dilute the NC System Boron concentration in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control," and raise Turbine load in accordance with OP/1/A/6300/001 A, "Turbine-Generator Load Change."

Shortly after starting the power increase, the 1C Steam Generator PORV will fail OPEN. The operator will respond in accordance with AP/1/A/5500/01, "Steam Leak," and isolate the PORV. The operator will address Technical Specification LCO 3.7.4, "Steam Generator Power Operated Relief Valves (SG PORVs)," and may enter LCO 3.4.1, "RCS Pressure, Temperature and Flow Departure from Nucleate Boiling (DNB) Limits."

After this, AD-7/B-2, "NC PUMP B NO. 2 SEAL S-PIPE LO LEVEL," will alarm. The operator will address the Annunciator Response Procedure, and then use Enclosure 4.3, "Filling and Draining NC Pump Standpipe," of OP/1/A/6150/002A, "Reactor Coolant Pump Operation," to refill the standpipe.

Subsequently, a #1 seal leak will develop on the 1B NCP such that #1 Seal leakoff flow is 5.0-5.5 gpm. The operator will respond in accordance with AP/1/A/5500/08, "Malfunction of NC Pump," and address Selected Licensee Commitment 16.9.7, "Standby Shutdown System." The control operators will be directed on the action to take should the #1 Seal Leakoff flow degrade to > 6 gpm (which will occur subsequently).

Shortly afterwards, the Main Turbine will inadvertently trip. The operator will respond in accordance with AP/1/A/5500/02, "Turbine Generator Trip." The operator will discover that the Control Rods will not respond in AUTO and the RO will need to operate the control rods manually. The crew will stabilize the plant in accordance with AP-2 and subsequently enter AP/1/A/5500/14, "Rod Control Malfunction."

While the crew is in AP-2, the 1B NC Pump Hi Vibration alarm will occur and the #1 seal leak flow on the 1B NCP will rise to 6 gpm. The operator will return to Step 8 of AP-8 (Continuous Action Step), and close the 1B NCP Pzr Spray Valve, manually trip the reactor and stop the 1B NCP when reactor power is < 5%. The crew will perform Enclosure 2, "NC Pump Post Trip Actions For #1 Seal Failure," of AP8, while subsequently performing E-0.

The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and verify reactor trip. On the reactor trip four control rods will fail to fully insert. The operator will transition to EP/1/A/5000/ES-0.1, "Reactor Trip Response," and emergency borate per AP/1/A/5500/38, "Emergency Boration And Response To Inadvertent Dilution."

Scenario Event Description
NRC Scenario 3

Immediately following the initiation of Emergency Boration, a loss of the Unit 1 Switchyard will occur, and the 1A Emergency Diesel Generator will fail to start. The operator will immediately transition to EP/1/A/5000/ECA-0.0, "Loss of All AC Power." The operator will restore power to 1ETA per Unit 2 6900V busses through SATA or SATB per Enclosure 13 "Energizing Unit 1 4160V Bus From Unit 2 – SATA or SATB."

The scenario will terminate when one ESF Bus has been re-energized.

Critical Tasks:

Trip the Reactor prior to stopping the 1B NCP during a seal failure/high vibration condition and trip the NCP only after Reactor power level has dropped to less than 5% but before the CRS starts to read the Immediate Actions of EP/1/A/5000/E-0, Reactor Trip or Safety Injection to the Control Board Operators to verify that a Reactor Trip has occurred.

Safety Significance: The transient placed on the unit when an NCP is secured at power can challenge both reactor protection and control systems. Station management has decided that the conservative approach to dealing with this transient is to trip the reactor anytime a NCP malfunction warrants stopping a pump in Mode 1. Guidance is given to wait until reactor power is less than 5% before stopping the NC pump to ensure that the NC pump will provide adequate flow/core cooling until reactor power is sufficiently low enough to preclude a challenge to fuel integrity. If the action can be taken, and is not taken, this demonstrates "mis-operation" or incorrect operation that could unnecessarily challenge a fission product barrier (NCS).

Control Steam Generator Water Levels during the Station Blackout such that no Steam Generator Overfill Condition occurs (≤ 0.8 on Void Fraction SGINF0.cts) and causes Water to Enter the Steam Lines.

Safety Significance: During the Station Blackout the only source of CA flow is the TDCA Pump. If the critical task is not performed and one or more SG's are allowed to overfill, water will enter the steam line and potentially damage the only available source for CA flow (i.e. the TDCA Pump).

Scenario Event Description
NRC Scenario 3

SIMULATOR OPERATOR INSTRUCTIONS

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>		Reset to Temp IC 232 (Base IC-18 [42% BOL])	T = 0 Malfunctions: insert MAL_EPQ001B ACTIVE (Loss of D/G B Control Power) insert LOA_DG021 RACKED_OUT (1B D/G Output Breaker Control Power Fuses) insert LOA_DG012 RACKED_OUT (1B D/G Output Breaker Racked Out) Insert REM_SV0025 = 0 (Close 1SV-25 [1D S/G PORV Isolation]) Insert LOA_SV004 = Racked_Out (SG PORV Breaker Racked Out) H_X02_098_3 = 0 (1D PORV Controller LEFT lamp) H_X02_098_4 = 0 (1D PORV Controller RIGHT lamp) Insert LOA_SV020 = 0 (SM PORV D LOCAL OPERATION) insert XMT_KFTT5130 = 0 (Spent Fuel Pool Temperature Failure) insert MAL_IRE010N9 (Shutdown Bank B-3 Stuck at original position) insert MAL_IRE010N11 (Shutdown Bank D-3 Stuck at original position) insert MAL_IRE010P10 Control Bank B-3 Stuck at original position) insert MAL_IRE010P12 Shutdown Bank A-3 Stuck at original position)
<input type="checkbox"/>		RUN Reset all SLIMs	Place Tagout/O-Stick on: <ul style="list-style-type: none"> • 1B EDG (Tagout) • 1SV-25 (Tagout) • 1KFP-5130 (O-Stick) • MCB Annunciator 1AD-9, A-7 (O-stick)
<input type="checkbox"/>		Update Status Board, Setup OAC	NOTE: RMWST DO = <1000 ppb.
<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"/>		Fill out the AO'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 as required. 4. Provide the crew with OP/1/A/6150/009 (Boron Concentration Control) and OP/1/A/6300/1 A (Turbine-Generator Load Change). 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	Execute Simulator Scenario N20-1-3.	
<input type="checkbox"/>	At direction of examiner	Event 1 NA	Power Increase w/Alternate Dilute
<input type="checkbox"/>	After adequate power increase/ direction of examiner	Event 2 insert MAL_SM001C = 100, ramp=10	SG 1C PORV fails OPEN

Scenario Event Description
NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	When AD-7/B-2, "NC PUMP B NO. 2 SEAL S-PIPE LO LEVEL," is LIT	Event 3 insertREM_NV0461 = 1.0 (Open Standpipe Drain Valve) della REM_NV0461 = 0.0 cd 'cd 'x10_152_5 =1 delay = 60 seconds (Closed Standpipe Drain Valve when MCB Annunciator 1AD-7 B-2 is LIT)	1B NCP Standpipe Low Level Alarm NOTE: The Malfunction for this event will be inserted in Event 2.
<input type="checkbox"/>	When crew determines 1B NC Pump #1 Seal leakoff flow is rising or at the discretion of the Lead Examiner	Event 4 Insert MAL_NCP008B=12, Ramp = 10 minutes	#1 Seal Leak on 1B NCP NOTE: The Malfunction for this event will be inserted in Event 3.
<input type="checkbox"/>	When the CRS enters AP-14 for the failure of Auto Rod Motion or at direction of examiner	Event 5 Insert MAL_DEH001 Insert MAL_IRE009	Inadvertent Turbine Trip/Failure of Control Rods to Move in AUTO
<input type="checkbox"/>	At direction of examiner	Event 6 Change Severity MAL_NCP008B=15 Ramp = 120 seconds insertMAL_NCP016C = 16 Ramp = 120 seconds (1B NCP Hi Vibration) insert MAL_NCP015C = 11 Ramp = 120 seconds (1B NCP Hi Vibration) H_X10_171_3 EQ1 (NCP 1B Breaker Green Status light ON), della MAL-NCP016C and 015C	#1 Seal Leak on 1B NCP Fails

Scenario Event Description
NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	Post-Rx Trip	Event 7 Insert MAL_IRE010N9 MAL_IRE010N11 MAL_IRE010P10 MAL_IRE010P12	4 Control Rods fail to Fully Insert on Rx Trip
<input type="checkbox"/>	Post-Immediate Boration	Event 8 Insert MAL_EP002 AND EP002B = TRIP Insert MAL_DG001A = TRUE	Loss of Switchyard to Unit 1/1A EDG fails to START
<input type="checkbox"/>	Terminate the scenario upon direction of Lead Examiner		

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 10 of 71Event Description: **Power Increase w/Alternate Dilute**

Shortly after taking the watch, the operator will commence a load increase to 100% starting with Step 3.35.12 of Enclosure 4.1, Power Increase, of OP/1/A/6100/003, "Controlling Procedure for Unit Operation." The operator will dilute the NC System Boron concentration in accordance with Enclosure 4.4, "Alternate Dilute," of OP/1/A/6150/009, "Boron Concentration Control," and raise Turbine load in accordance with OP/1/A/6300/001 A, "Turbine-Generator Load Change."

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

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: Per Limit and Precaution 1.4 of Enclosure 4.1 of OP/1/A/6100/003 the operator will control Tavg-Tref at $\pm 2^{\circ}\text{F}$.
OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATIONS ENCLOSURE 4.1, POWER INCREASE			
			NOTE: The power increase will be at 3 MWe/minute.
	BOP	(Step 3.35.12) WHEN Turbine load greater than 40% (370 psig Turbine Inlet Pressure), THEN begin aligning MSRs per OP/1/B/6250/011 (Moisture Separator Reheater Operation).	
OP/1/A/6300/001A, TURBINE-GENERATOR STARTUP/SHUTDOWN ENCLOSURE 4.1, TURBINE-GENERATOR LOAD CHANGE			
NOTE			
If reducing power to a level greater than 50%, it is preferable to reduce power at a rate less than 12% per hour in order to minimize sodium peaks. [NCR01574291]			
	RO	(Step 3.4.1) IF Turbine in "OPERATOR AUTO", perform the following:	
		(Step 3.4.1.1) Ensure desired change within "Calculated Capability Curve".	

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 11 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 3.4.1.2) IF turbine load will increase or decrease more than 10 MWs, notify Dispatcher of expected load change.	NOTE: The BOP will contact DEC BA. Booth Operator: As DEC BA acknowledge.
	RO	(Step 3.4.1.3) IF desired to change the load rate, THEN perform the following:	
		<ul style="list-style-type: none"> Depress "LOAD RATE". 	
		<ul style="list-style-type: none"> Enter desired load rate in "VARIABLE DISPLAY". 	NOTE: the RO will select 3 MWe/Min loading rate.
		<ul style="list-style-type: none"> Depress "ENTER". 	
		(Step 3.4.1.4) IF desired to change desired load, THEN perform the following:	
		<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" 	
		(Step 3.4.1.5) IF desired to pause load change, THEN perform the following:	
		<ul style="list-style-type: none"> Depress "HOLD". 	
		<ul style="list-style-type: none"> WHEN desired to resume load change, THEN depress "GO". 	
OP/1/A/6150/009, BORON CONCENTRATION CONTROL ENCLOSURE 4.4, ALTERNATE DILUTE			
			NOTE: The BOP may repeat this task as needed during the power increase.
	BOP	(Step 3.1) Obtain RMWST Dissolved Oxygen (DO) concentration from Chemistry Daily Status Sheet.	
NOTE High Oxygen concentration within the VCT makeup process can cause an increase in iron corrosion product generation within the charging supply piping (long term Crud Burst control issue). {NCR 01604415}			

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 12 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.2) IF RMWST Dissolved Oxygen (DO) concentration is greater than 1000 ppb, THEN.....	NOTE: The RMWST Dissolved Oxygen (DO) concentration is less than 1000 ppb.
	BOP	(Step 3.3) Evaluate all outstanding Clearances that may impact performance of this procedure.	
<p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> Large additions of cold water to the VCT (from RMWST) can cause large decreases in NC pump #1 seal leakoff flow. This creates a potential for a #1 seal rub when there is a low leaking seal (less than 2 gpm). {NCR 01632117} A temperature decrease at the NC pump seals, will cause a short term increase (5 - 10 min) in seal leakoff flow before it goes to its new lower operating flow. A temperature increase at the NC pump seals, will cause a short term decrease (5 - 10 min) in seal leakoff flow before it goes to its new higher operating flow. If outside air temperature is less than 75 °F (can use OAC point M1P1484), consideration should be given to making large cold water additions to VCT in 1000 gallon increments with time between additions to restore temperature. 			
	BOP	(Step 3.4) IF the lowest NCP seal leakoff is less than 2 gpm AND VCT makeup of greater than 1000 gallons will be made, THEN.....	
	BOP	(Step 3.5) Evaluate energizing additional pressurizer heaters per OP/1/A/6100/003 (Controlling Procedure For Unit Operation) to enhance system mixing when changing NC System boron concentration. (R.M.)	
	BOP	(Step 3.6) Determine current blender contents and evaluate any potential Reactivity effects prior to performing this enclosure:	
		<ul style="list-style-type: none"> Rx Makeup Water 	
		<ul style="list-style-type: none"> Blend 	

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 13 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Boron 	
	BOP	(Step 3.7) Determine amount of reactor makeup water needed to obtain desired boron concentration using McGuire Data Book, OAC, Reactor Group Guidance, or plant parameters (T-Ave, Steam Pressure, Xenon worth, etc.). (R.M.)	
		<ul style="list-style-type: none"> Total Reactor Makeup Water: 	NOTE: The BOP will add 300 gallons of MU Water.
	BOP	(Step 3.8) Ensure the following reset to zero: (R.M.)	
		<ul style="list-style-type: none"> Total Make Up Flow Counter 	
		<ul style="list-style-type: none"> Boric Acid Flow Counter 	
	BOP	(Step 3.9) Set Total Make Up Flow Counter to value determined in Step 3.7. (R.M.)	
	BOP	(Step 3.10) Select "ALTERNATE DILUTE" on "NC Sys M/U Controller".	
	BOP	(Step 3.11) IF desired to makeup only through 1NV-175A (U1 Boric Acid Blender To VCT Outlet Control), THEN select "CLOSED" on 1NV-171A (U1 Boric Acid Blender to VCT Inlet Control).	
<p style="text-align: center;">NOTE</p> <p>Rapidly changing reactor makeup water flow can cause a Rx Makeup Flow Deviation Annunciator Alarm.</p>			
	BOP	(Step 3.12) IF AT ANY TIME it is desired to adjust reactor makeup water flow, adjust "Rx M/U Water Flow Control" setpoint to achieve desired flowrate.	NOTE: Typically, it is NOT desired to adjust reactor makeup water flow.

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 14 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.13) IF AT ANY TIME it is desired to manually adjust reactor makeup water flow, perform the following:	
		(Step 3.13.1) Place "Rx M/U Water Flow Control" in manual.	
		(Step 3.13.2) Adjust "Rx M/U Water Flow Control" output to control reactor makeup water flowrate.	
NOTE IF desired to dilute with a constant flow rate as advised by engineering to minimize VCT temperature decrease, it is preferred to allow 1NV-137A (U1 NC Filter Otlft to VCT 3-Way Diversion Cntrl) to auto divert on high level.			
	BOP	(Step 3.14) IF AT ANY TIME it is desired to lower VCT level, perform the following:	
		(Step 3.14.1) Monitor Letdown Pressure.	
NOTE An increase in Letdown Pressure greater than 20 psig during diverts may be indicative of excessive NB Feed Filter DP. {NCR 01597088}			
		(Step 3.14.2) Select "HUT" on 1NV-137A (U1 NC Filters Otlft to VCT 3-Way Diversion Cntrl).	NOTE: The BOP may do this at any time to lower VCT level.
		(Step 3.14.3) IF Letdown Pressure increases greater than 20 psig, notify CRS.	
		(Step 3.14.4) AFTER desired level achieved, select "AUTO" on 1NV-137A (U1 NC Filters Otlft to VCT 3-Way Diversion Cntrl).	
NOTE Steps 3.15 - 3.25 may be completed and then checked off as time allows.			
	BOP	(Step 3.15) IF AT ANY TIME plant parameters require termination of dilution, THEN perform the following:	

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 15 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 3.15.1) Place "NC System Make Up" to "STOP". (R.M.)	
		(Step 3.15.2) IF 1NV-137A (U1 NC Filters Otlit to VCT 3-Way Diversion Cntrl) was placed to HUT, place to "AUTO".	
	BOP	(Step 3.16) IF AT ANY TIME nuisance Reactor Makeup Flow Deviation alarms are being received AND Unit in Mode 5, 6, or NO Mode....	NOTE: The plant is in Mode 1.
	BOP	(Step 3.17) Momentarily select "START" on "NC System Make Up". (R.M.)	
	BOP	(Step 3.18) Check "NC System Make Up" red light lit.	
	BOP	(Step 3.19) Check 1NV-175A (U1 Boric Acid Blender To VCT Outlet Control) open.	
	BOP	(Step 3.20) Check 1NV-252A (Rx M/U Water Supply To U1 BA Blender Cntrl) open or throttled as required.	
	BOP	(Step 3.21) IF 1NV-171A (U1 Boric Acid Blender To VCT Inlet Control) in "AUTO", THEN check 1NV-171A (U1 Boric Acid Blender to VCT Inlet Control) open.	NOTE: 1NV-171A is NOT in AUTO.
	BOP	(Step 3.22) Check Rx M/U Water Pump starts.	
	BOP	(Step 3.23) Monitor Total Make Up Flow Counter. (R.M.)	
	BOP	(Step 3.24) HOLD until one of the following occurs:	

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 16 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Amount of reactor makeup water recorded per Step 3.7 added 	
		OR	
		<ul style="list-style-type: none"> Reactor makeup water addition manually terminated 	
	BOP	(Step 3.25) Ensure dilution terminated as follows: (R.M.)	
		(Step 3.25.1) IF in "AUTO", ensure the following off:	
		<ul style="list-style-type: none"> 1A Rx M/U Water Pump 	
		<ul style="list-style-type: none"> 1B Rx M/U Water Pump 	
	BOP	(Step 3.25.2) Ensure the following closed:	
		<ul style="list-style-type: none"> 1NV-175A (U1 Boric Acid Blender To VCT Outlet Control) 	
		<ul style="list-style-type: none"> 1NV-252A (RX M/U Water Supply To U1 BA Blender Cntrl) 	
		<ul style="list-style-type: none"> 1NV-171A (U1 Boric Acid Blender To VCT Inlet Control) 	
	BOP	(Step 3.26) Ensure 1NV-171A (U1 Boric Acid Blender to VCT Inlet Control) in "AUTO".	
	BOP	(Step 3.27) Ensure "Rx M/U Water Flow Control" in "AUTO". (R.M.)	
<p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> OAC point M1P5614 (Unit 1 Effective Boron Concentration) may be used as the desired boron concentration in the following calculations. Use of Effective Boron Concentration will account for B-10 depletion. {NCR 01641629} Results of Boron Concentration makeups have been consistently lower than desired. To compensate it may be necessary to use actual Boron Concentration (instead of Effective Boron Concentration) or adjustment of the "desired" Boron Concentration to obtain a desired resultant Boron Concentration. {NCR 01682204} 			

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 17 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3.28) IF "Rx M.U Water Flow Control" adjusted per Step 3.12 or 3.13, THEN...	NOTE: Typically, the Rx M.U Water Flow Control was NOT adjusted.
	BOP	(Step 3.29) Ensure 1NV-137A (U1 NC Filters Otlit to VCT 3-Way Diversion Cntrl) in "AUTO".	
	BOP	(Step 3.30) IF Reactor Makeup Flow Deviation alarms blocked per Step 3.16, THEN....	NOTE: These alarms are NOT blocked.
NOTE CRS concurrence required if flush of blender NOT performed.			
	BOP	(Step 3.31) IF desired to flush blender....	NOTE: The BOP will likely request that the flush NOT be performed.
	BOP	(Step 3.32) Select "AUTO" for "NC Sys M/U Controller".	
	BOP	(Step 3.33) Momentarily select "START" on "NC System Make Up".	
	BOP	(Step 3.34) Check "NC System Make Up" red light lit.	
	BOP	(Step 3.35) Ensure the following reset to zero: (R.M.)	
		• Total Make Up Flow Counter	
		• Boric Acid Flow Counter	
	BOP	(Step 3.36) Record in Auto Log that final blender content is Rx Makeup Water.	

Op Test No.: N20-1 Scenario # 3 Event # 1 Page 18 of 71Event Description: **Power Increase w/Alternate Dilute**

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/003, CONTROLLING PROCEDURE FOR UNIT OPERATIONS ENCLOSURE 4.1, POWER INCREASE			
	RO	(Step 3.35.13) WHEN Turbine Inlet Pressure 365 - 375 psig, THEN check "AMSAC ACTUATION BLOCK/UNBLOCK" as follows:	
		<ul style="list-style-type: none"> IF "UNBLOCK" dark, THEN reset as follows: 	
		<ul style="list-style-type: none"> Check all "AMSAC S/G LOW FLOW" status lights dark. 	
		<ul style="list-style-type: none"> Check "S/G PATH CLSD >30 SEC" dark. 	
		<ul style="list-style-type: none"> Depress "UNBLOCK" for "AMSAC ACTUATION BLOCK/UNBLOCK". 	
		<ul style="list-style-type: none"> Check "UNBLOCK" lit. 	
	BOP	(Step 3.35.14) WHEN 40% RTP, THEN notify RP to adjust setpoints for the following: {NCR 01717012}	
		<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) 	
		<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) 	
After adequate power increase/discretion of the Lead Examiner move to Event #2.			

Op Test No.: N20-1 Scenario # 3 Event # 2 Page 19 of 71Event Description: **SG 1C PORV fails OPEN**

Shortly after starting the power increase, the 1C Steam Generator PORV will fail OPEN. The operator will respond in accordance with AP/1/A/5500/01, "Steam Leak," and isolate the PORV. The operator will address Technical Specification LCO 3.7.4, "Steam Generator Power Operated Relief Valves (SG PORVs)," and may enter LCO 3.4.1, "RCS Pressure, Temperature and Flow Departure from Nucleate Boiling (DNB) Limits."

Booth Operator Instructions: insert MAL_SM001C 100 delay=0
ramp=10 (S/G PORV 1SV7 SGC fails OPEN)

Indications Available:

- 1SV-7ABC Red status light LIT
- 1SV-7ABC Black needle indication at 100%
- OAC Alarm: TM FREEZE – MID3497-VLVSV1C SM PORV OPEN
- OAC Alarm: U1 SV-PORV/SAFETY VLV OPEN –T/D CA PMP ON
- OAC Alarm: 1SV-7 1C SM PORV
- Core ΔT s rising
- Rx Power rising
- Steam flow on 1C steam line rising

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: It is likely that the operator will take actions to isolate the 1C SG PORV prior to being directed by the CRS. (Step 13)
AP/1/A/5500/01, STEAM LEAK			
	CRS	(Step 1) Monitor Foldout page.	
		Manual Reactor Trip Criteria: (IF any of the following occur: (1) Steam leak is jeopardizing personnel safety or plant equipment, (2) T-Avg is less than 551°F AND going down, or (3) UST level is less than 1 ft – NOT Expected).	NOTE: Manual Reactor Trip Criteria is NOT expected to be utilized.
	RO	(Step 2) Reduce turbine load to maintain the following:	
		<ul style="list-style-type: none"> • Excore NI's – LESS THAN OR EQUAL TO 100%. 	
		<ul style="list-style-type: none"> • NC Loop D/T's – LESS THAN 60°F D/T 	

Op Test No.: N20-1 Scenario # 3 Event # 2 Page 20 of 71Event Description: **SG 1C PORV fails OPEN**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> T-Avg – AT T-REF. 	
	CRS	(Step 3) Check containment entry – IN PROGRESS.	NOTE: A Containment Entry is NOT in progress.
	CRS	(Step 3 RNO) GO TO Step 5.	
	BOP	(Step 5) Check Pzr pressure prior to event – GREATER THAN P-11 (1955 PSIG).	
	BOP	(Step 6) Check Pzr level – STABLE OR GOING UP.	NOTE: The CRS may direct the RNO to be performed depending on the timeliness of the S/G PORV closure. If not, proceed to Step 7.
	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 (U1 Charging Hdr Control) OPENING. 	
		<ul style="list-style-type: none"> OPEN 1NV-241 (U1 Seal Water Inj Flow Control) while maintaining NC pump seal flow greater than 6 GPM. 	
		<ul style="list-style-type: none"> Reduce or isolate letdown. 	
		<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 	
	BOP	(Step 7) IF AT ANY TIME while in this procedure Pzr level cannot be maintained stable, THEN RETURN TO Step 6.	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	(Step 8) GO TO Step 12.	

Op Test No.: N20-1 Scenario # 3 Event # 2 Page 21 of 71Event Description: **SG 1C PORV fails OPEN**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 12) Announce occurrence on paging system.	NOTE: CRS may ask U2 RO to make Plant Announcement that AP-1 has been entered. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 13) Identify and isolate leak on Unit 1 as follows:	
		<ul style="list-style-type: none"> (Step 13.A) Check SM PORVs – CLOSED. 	NOTE: The 1C SG PORV is Open.
	RO	(Step 13.A RNO) IF S/G pressure is less than 1092 PSIG, THEN perform the following:	
		<ul style="list-style-type: none"> Close affected S/G SM PORV manual loader. 	NOTE: Closing the Manual Loader will have no effect.
		<ul style="list-style-type: none"> IF SM PORV is still open, THEN perform the following: 	NOTE: The 1C SG PORV Isolation Valve will need to be closed.
		<ul style="list-style-type: none"> Close SM PORV isolation valve. 	
		<ul style="list-style-type: none"> IF SM PORV isolation valve still open..... 	NOTE: The PORV Isolation valve is closed.
	RO	<ul style="list-style-type: none"> (Step 13.B) Check condenser dump valves – CLOSED. 	
	BOP	<ul style="list-style-type: none"> (Step 13.C) Check containment conditions – NORMAL: 	
		<ul style="list-style-type: none"> Containment temperature 	
		<ul style="list-style-type: none"> Containment pressure 	
		<ul style="list-style-type: none"> Containment humidity 	
		<ul style="list-style-type: none"> Containment floor and equipment sump level. 	
	RO / BOP	<ul style="list-style-type: none"> (Step 13.D) Check TD CA pump – OFF. 	

Op Test No.: N20-1 Scenario # 3 Event # 2 Page 22 of 71Event Description: **SG 1C PORV fails OPEN**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> (Step 13.E) Check valves on "STEAM LINE DRAIN VALVES" board (1MC-9) – CLOSED. 	NOTE: One or more of these valves may be cycling. The RNO will direct closing the valves.
	CRS	<ul style="list-style-type: none"> (Step 13.F) Check opposite Unit (Unit 2) "STEAM HEADER PRESSURE" – GREATER THAN 200 PSIG. 	NOTE: CRS may ask U2 RO for AS Header pressure. If so, Floor Instructor report as U2 RO that U2 Steam Header pressure is ≈1000 psig.
	CRS	<ul style="list-style-type: none"> (Step 13.G) Dispatch operator to check for leaks. 	NOTE: The CRS may dispatch an AO to look for leaks. If so, Floor Instructor: acknowledge. Booth Instructor: Report back in 3-5 minutes that there are no leaks.
			NOTE: The CRS may NOT dispatch AOs to look for leaks because it is understood that the SM PORV opening was the reason that AP-1 was entered.
	BOP	(Step 14) Check UST level – STABLE OR GOING UP.	
	CRS	(Step 15) Evaluate unit shutdown as follows:	
		<ul style="list-style-type: none"> Check unit status – IN MODE 1 OR 2. 	
		<ul style="list-style-type: none"> Determine if unit shutdown or load reduction is warranted based on the following criteria: 	NOTE: CRS may call WCC/Management to address the startup. If so, Booth Instructor acknowledge as WCC.
		<ul style="list-style-type: none"> Size of leak 	
		<ul style="list-style-type: none"> Location of leak 	
		<ul style="list-style-type: none"> Rate of depletion of secondary inventory 	
		<ul style="list-style-type: none"> IF steam is leaking from a secondary heater relief OR MSR relief valve... 	

Op Test No.: N20-1 Scenario # 3 Event # 2 Page 23 of 71Event Description: **SG 1C PORV fails OPEN**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF turbine trip will isolate steam leak (such as feedwater heater leak or MSR leak... 	
		<ul style="list-style-type: none"> Check unit shutdown or load reduction – REQUIRED. 	NOTE: Shutdown/Load Reduction will NOT be required.
	CRS	(Step 15.C RNO) Perform the following:	
		<ul style="list-style-type: none"> Maintain present plant conditions until leak can be isolated or repaired. 	
		<ul style="list-style-type: none"> Exit this procedure. 	
			NOTE: The CRS may call WCC/IAE to address the Valve failure. If so, Booth Instructor acknowledge as WCC, and using Time Compression report that 1SV7ABC is stuck fully open (and cannot be moved even using the Manual handwheel).
			NOTE: The CRS will likely conduct a Focus Brief.
			NOTE: The CRS will address Tech Specs based on plant response.
Booth Operator Instructions: While the CRS is checking Tech Specs, insert REM_NV0461 = 1.0 (Open Standpipe Drain Valve) (will take ≈ 3-4 min, to alarm) delIA REM_NV0461 = 0.0 cd 'x05_002B02_1 =1 Delay = 60 Seconds (Closed Standpipe Drain Valve when MCB Annunciator 1AD-7 B-2 is LIT)			
TECHNICAL SPECIFICATION 3.7.4, STEAM GENERATOR POWER OPERATED RELIEF VALVES (SG PORVs)			

Op Test No.: N20-1 Scenario # 3 Event # 2 Page 24 of 71Event Description: **SG 1C PORV fails OPEN**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	LCO 3.7.4 Three SG PORV lines shall be OPERABLE.	
	CRS	APPLICABILITY: MODES 1, 2, and 3, MODE 4 when steam generator is relied upon for heat removal.	
	CRS	ACTIONS	
CONDITION		REQUIRED ACTION	COMPLETION TIME
A. One required SG PORV line inoperable.		A.1 Restore required SG PORV line to OPERABLE status.	7 days
			NOTE: The CRS will determine that Condition A is required and that ACTION A.1 must be taken.
TECHNICAL SPECIFICATION 3.4.1, RCS PRESSURE, TEMPERATURE, AND FLOW DEPARTURE FROM NUCLEATE BOILING (DNB) LIMITS			
	CRS	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.	NOTE: According to Table 3.4.1-1, Parameter 2, indicated Pressurizer Pressure will be \geq The limit specified in the COLR.
	CRS	APPLICABILITY: MODE 1.	NOTE: According to Table 4 of the COLR, indicated Pressurizer Pressure (with four channels available) must be \geq 2212.3 psig via the meter indication and \geq 2209.1 psig via the OAC. During this failure Pressurizer Pressure will lower below these values.
	CRS	ACTIONS	

Op Test No.: N20-1 Scenario # 3 Event # 2 Page 25 of 71Event Description: **SG 1C PORV fails OPEN**

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
			NOTE: When Pressurizer Pressure drops to < 2209.1 psig (OAC) on the failure, the CRS will determine that Condition A is required and that ACTION A.1 must be taken.
			NOTE: Floor Instructor if the crew attempts to continue the power increase as Shift Manager direct that the crew await further direction to raise power.
When AD-7/B-2, "NC PUMP B NO. 2 SEAL S-PIPE LO LEVEL," move to Event 3.			

Op Test No.: N20-1 Scenario # 3 Event # 3 Page 26 of 71Event Description: **1B NCP Standpipe Low Level Alarm**

After this, AD-7/B-2, "NC PUMP B NO. 2 SEAL S-PIPE LO LEVEL," will alarm. The operator will address the Annunciator Response Procedure, and then use Enclosure 4.3, "Filling and Draining NC Pump Standpipe," of OP/1/A/6150/002A, "Reactor Coolant Pump Operation," to refill the standpipe.

Booth Operator Instructions:

insertREM_NV0461 = 1.0 (Open Standpipe Drain Valve) (will take ≈ 3-4 min, to alarm)

delIA REM_NV0461 = 0.0 cd
'x05_002B02_1 =1 delay = 60 seconds
(Closed Standpipe Drain Valve when MCB Annunciator 1AD-7 B-2 is LIT)

Indications Available:

- OAC Alarm M1D1496: 1B NC Pump Standpipe Level Low
- MCB Annunciator 1AD-7/B-2 NC PUMP B NO.2 SEAL S-PIPE LOW LEVEL

Time	Pos.	Expected Actions/Behavior	Comments
OP/1/A/6100/010 H, ANNUNCIATOR RESPONSE FOR PANEL 1AD-7 B2, NC PUMP B NO. 2 SEAL S-PIPE LO LVL			
	BOP	(Step 1) IF drain was inadvertently opened, ensure it is closed.	
	BOP	(Step 2) Check the following NC pump parameters stable:	
		<ul style="list-style-type: none"> • Lower bearing Temperature 	
		<ul style="list-style-type: none"> • Number 1 seal outlet temperature 	
		<ul style="list-style-type: none"> • Number 1 seal leakoff flow 	
	BOP	(Step 3) IF any NC pump parameter listed in Step 2 abnormal,...	NOTE: All listed parameters are normal.
	BOP	(Step 4) Make up to standpipe as necessary per OP/1/A/6150/002A (Reactor Coolant Pump Operation).	NOTE: The CRS will transition to the OP to refill the standpipe.

Op Test No.: N20-1 Scenario # 3 Event # 3 Page 27 of 71Event Description: **1B NCP Standpipe Low Level Alarm**

Time	Pos.	Expected Actions/Behavior	Comments
When BOP addresses OP/1/A/6150/002 A to refill the 1B NC Pump Standpipe: Booth Operator Instructions: insert MAL_NCP008B=12 Ramp = 10 minutes (Event 4) (NOTE: This malfunction will require several minutes to diagnose).			
OP/1/A/6150/002 A, REACTOR COOLANT PUMP OPERATION ATTACHMENT 3, FILLING AND DRAINING NC PUMP STANDPIPE			
	BOP	(Step 3.1.1) Evaluate all outstanding CLEARANCES that may impact performance of this procedure.	
	BOP	(Step 3.1.2) IF Containment Closure in effect, THEN.....	NOTE: Containment Closure is NOT in effect.
	BOP	(Step 3.1.3) Perform the following sections, as applicable:	
		<ul style="list-style-type: none"> Section 3.2, Filling NC Pump Standpipes 	
	BOP	(Step 3.2) Filling NC Pump Standpipes	
		<ul style="list-style-type: none"> Check Reactor Makeup Water System aligned per OP/1/A/6200/012 (Reactor Makeup Water System). 	
		<ul style="list-style-type: none"> Check 1NC-56B (PRT Spray Cont Outside Isol) OPEN. 	
NOTE <ul style="list-style-type: none"> NC Pump Standpipe volume needed to clear applicable "NC Pump No. 2 Seal S-pipe Lo Lvl" alarm is approximately seven gallons. The preferred method to clear the alarm is to allow RMWST gravity feed to fill the affected NC Pump Standpipe. [8.7.9]□ Only one NC Pump Standpipe fill valve should be opened at a time and closed immediately when the low standpipe alarm clears. [8.7.9] Minimal NC Pump Standpipe volume is required to reduce flow through the standpipe and reduce debris entering No. 2 and No. 3 seals. [8.7.9] 			

Op Test No.: N20-1 Scenario # 3 Event # 3 Page 28 of 71Event Description: **1B NCP Standpipe Low Level Alarm**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Open Applicable valve(s): 	
		<ul style="list-style-type: none"> 1NV-55B (B NC Pump Standpipe Fill) 	
		<ul style="list-style-type: none"> IF required, THEN start one of the following: 	NOTE: It is likely that the BOP will need to start a Rx M/U Water Pump.
		<ul style="list-style-type: none"> 1A Rx M/U Water Pump 	
		OR	
		<ul style="list-style-type: none"> 1B Rx M/U Water Pump 	
		<ul style="list-style-type: none"> WHEN applicable "NC Pump No. 2 Seal S-pipe Lo Lvl" alarm clears, THEN perform the following: 	
		<ul style="list-style-type: none"> IF pump started in Step 4, stop applicable pump: 	
		<ul style="list-style-type: none"> 1A Rx M/U Water Pump 	
		OR	
		<ul style="list-style-type: none"> 1B Rx M/U Water Pump 	
		<ul style="list-style-type: none"> Close applicable valve. 	
		<ul style="list-style-type: none"> 1NV-55B (B NC Pump Standpipe Fill) 	
			NOTE: The CRS may call WCC to address the failure. If so, Booth Instructor acknowledge as WCC.
			NOTE: The CRS will likely conduct a Focus Brief.

When the crew has determined that the 1B NC Pump #1 Seal Leakoff flow is rising or at the discretion of the Lead Examiner, move to Event #4.

Op Test No.: N20-1 Scenario # 3 Event # 4 Page 29 of 71Event Description: **#1 Seal Leak on 1B NCP**

Subsequently, a #1 seal leak will develop on the 1B NCP such that #1 Seal leakoff flow is 5.0-5.5 gpm. The operator will respond in accordance with AP/1/A/5500/08, "Malfunction of NC Pump," and address Selected Licensee Commitment 16.9.7, "Standby Shutdown System." The control operators will be directed on the action to take should the #1 Seal Leakoff flow degrade to > 6 gpm (which will occur subsequently).

Booth Operator Instructions: insert MAL_NCP008B=12 Ramp = 10 minutes
(NOTE: This malfunction was mostly likely inserted during the completion of Event 3).

Indications Available:

- 1B NC Pump #1 Seal leakoff flow is rising on the OAC.
- OAC Alarm: 1B NCP Seal Flow > SSF Limit.
- MCB Annunciator 1AD-7/E3, NCP PMP CNTRL LEKAGE HI FLOW

Time	Pos.	Expected Actions/Behavior	Comments
AP/1/A/5500/08, MALFUNCTION OF NC PUMP			
CASE I, NC PUMP SEAL OR PUMP LOWER BEARING MALFUNCTION			
NOTE			
Step 1 RNO should be used to validate the abnormal parameter unless it has been previously validated or is clearly known to be valid.			
	BOP	(Step 1) Check abnormal NC pump parameter – KNOWN TO BE VALID.	NOTE: The operator may address Enclosure 1 per the RNO (Not Scripted).
	BOP	(Step 2) Check NC pump parameters within operating limits:	
		<ul style="list-style-type: none"> • All NC pump lower radial bearing temperatures – LESS THAN 225°F 	
		<ul style="list-style-type: none"> • All NC pump number 1 seal outlet temperatures – LESS THAN 235°F 	
		<ul style="list-style-type: none"> • All NC pump number 1 seal D/Ps – GREATER THAN 200 PSID. 	

Op Test No.: N20-1 Scenario # 3 Event # 4 Page 30 of 71Event Description: **#1 Seal Leak on 1B NCP**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 3) IF AT ANY TIME, any operating limit in Step 2 is exceeded, THEN GO TO Step 5.	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	(Step 4) GO TO Step 6.	
	BOP	(Step 6) Check if seal cooling available to affected NC pump as follows:	
		<ul style="list-style-type: none"> Seal injection (normal or SSF Supply) – ESTABLISHED 	
		OR	
		<ul style="list-style-type: none"> KC to Thermal Barrier - ESTABLISHED. 	
<p align="center">NOTE</p> <p>Up to 24 hours of NC Pump operation may be required before seals seat and operate normally after seal maintenance or startup.</p>			
	BOP	(Step 7) Check any NC pump number one seal leakoff – GREATER THAN OR EQUAL TO 6 GPM.	NOTE: It is likely that by the time the crew arrives at this step the leakoff flow will be rising but will NOT have exceeded 6 GPM.
	BOP	(Step 7 RNO) Perform the following:	
<p align="center">NOTE</p> <p>OP/1/A/6200/001 B (Chemical and Volume Control System Charging), Enclosure 4.10 (Maintaining NC Pump Seal Leakoff) gives guidance on actions used to change seal leakoff flow.</p>			
		<ul style="list-style-type: none"> IF seal leakoff slowly going up, THEN contact station management for further guidance. 	<p>NOTE: The CRS may call WCC/SM to address the seal failure with station management.</p> <p>If so, Booth Instructor acknowledge as WCC/SM.</p>

Op Test No.: N20-1 Scenario # 3 Event # 4 Page 31 of 71Event Description: **#1 Seal Leak on 1B NCP**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Continue to monitor NC pump seal leakoff flow. 	
	CRS	<ul style="list-style-type: none"> IF AT ANY TIME seal leakoff flow goes up to 6 GPM, THEN GO TO Step 8. 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	<ul style="list-style-type: none"> GO TO Step 9. 	
	BOP	(Step 9) Check affected NC pump(s) Seal Return Valve – OPEN:	
		<ul style="list-style-type: none"> 1NV-50B (1B NC Pump Seal Return Isol) 	
	BOP	(Step 10) Check NC pressure – GREATER THAN 2000 PSIG.	
	BOP	(Step 11) Check any NC Pump number one seal leakoff - LESS THAN 0.8 GPM.	
	CRS	(Step 11 RNO) Perform the following:	
<p align="center">NOTE</p> <p>OP/1/A/6200/001 B (Chemical and Volume Control System Charging), Enclosure 4.10 (Maintaining NC Pump Seal Leakoff) gives guidance on actions used to change seal leakoff flow.</p>			
	BOP	<ul style="list-style-type: none"> IF seal leakoff slowly going down, THEN.... 	
		<ul style="list-style-type: none"> Continue to monitor NC Pump seal leakoff flow. 	
		<ul style="list-style-type: none"> IF AT ANY TIME seal leakoff flow goes below 0.8 GPM, THEN RETURN TO Step 10. 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	<ul style="list-style-type: none"> GO TO Step 17. 	
	BOP	(Step 17) Check for number two seal failure without a number one seal failure as follows:	

Op Test No.: N20-1 Scenario # 3 Event # 4 Page 32 of 71Event Description: **#1 Seal Leak on 1B NCP**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Number one seal leakoff - LESS THAN NORMAL OR GOING DOWN. 	NOTE: #1 Seal Leak off Flow is higher than Normal.
	CRS	(Step 17 RNO) GO TO Step 18.	
	CRS	(Step 18) Check for number three seal failure as follows:	
		<ul style="list-style-type: none"> Frequent filling of seal standpipe with standpipe drains closed – HAS OCCURRED. 	
	CRS	(Step 18 RNO) GO TO Step 19.	
	CRS	(Step 19) Announce occurrence on paging system.	NOTE: CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	BOP	(Step 20) Check NC Pumps - ANY RUNNING.	NOTE: All NCPs are running.
	BOP	(Step 21) Check the following NC Pump temperatures - STABLE OR GOING DOWN:	
		<ul style="list-style-type: none"> All NC Pump lower radial bearing temperatures 	
		<ul style="list-style-type: none"> All NC Pump number one seal outlet temperatures. 	
	CRS	(Step 22) Have another SRO evaluate if leakage exceeds SLC 16.9.7 Condition C limit and immediately notify security if SSF is inoperable.	NOTE: The CRS may ask the SM to evaluate SLC 16.9.7. If so, Floor Instructor , indicate that another SRO is NOT available.

Op Test No.: N20-1 Scenario # 3 Event # 4 Page 33 of 71Event Description: **#1 Seal Leak on 1B NCP**

Time	Pos.	Expected Actions/Behavior	Comments
SELECTED LICENSEE COMMITMENT 16.9.7, STANDBY SHUTDOWN SYSTEM			
	CRS	COMMITMENT The Standby Shutdown System (SSS) shall be operable.	
	CRS	APPLICABILITY: MODES 1, 2, and 3.	
	CRS	REMEDIAL ACTIONS	
		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 discovery.	NOTE: The CRS may call WCC/Security to implement compensatory measures within 10 minutes of discovery. If so, Booth Instructor acknowledge as WCC/Security.

Op Test No.: N20-1 Scenario # 3 Event # 4 Page 34 of 71Event Description: **#1 Seal Leak on 1B NCP**

Time	Pos.	Expected Actions/Behavior	Comments
CONDITION		REQUIRED ACTION	COMPLETION TIME
C. Total Unidentified LEAKAGE, Identified LEAKAGE, and reactor coolant pump seal leakoff > 20 gpm. OR Total reactor coolant pump seal leakoff > 16.3 gpm. OR Any reactor coolant pump No. 1 seal leakoff > 4.0 gpm.		C.1 Declare the Standby Makeup Pump inoperable. AND C.2 Enter Condition A.	Immediately
A. One or more required SSS components identified in Table 16.9.7-1.		A.1 Verify the FUNCTIONALITY of fire detection and suppression systems in the associated areas identified in Table 16.9.7-1 AND A.2 Restore the component to FUNCTIONAL status.	1 hour 7 days
			The CRS will identify that Condition C is required and that Actions C.1 and C.2 must be taken immediately; and that C.2 requires Condition A and Actions A.1 and A.2 must be taken.
At the discretion of the Lead Examiner, move to Event #5.			

Op Test No.: N20-1 Scenario # 3 Event # 5 Page 35 of 71Event Description: **Inadvertent Turbine Trip/Failure of Control Rods to Move in AUTO**

Shortly afterwards, the Main Turbine will inadvertently trip. The operator will respond in accordance with AP/1/A/5500/02, "Turbine Generator Trip." The operator will discover that the Control Rods will not respond in AUTO and the RO will need to operate the control rods manually. The crew will stabilize the plant in accordance with AP-2 and subsequently enter AP/1/A/5500/14, "Rod Control Malfunction."

Booth Operator Instructions: **insert MAL_DEH001/IRE009**

Indications Available:

- Turbine Trip Valves closed
- Turbine Governor Valves closed
- Rx does NOT trip (Rx Trip Breakers closed)
- Steam Dump Valves open
- No Automatic Rod Motion

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The CRS will enter AP-02.
AP/1/A/5000/02, 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: PR indication is > 20%.
	RO	(Step 2 RNO) Perform the following:	
		<ul style="list-style-type: none"> • Ensure control rods moving in to reduce T-Avg. 	NOTE: The rods must be moved in MANUAL.
		<ul style="list-style-type: none"> • Designate an operator to continuously monitor reactor power. 	NOTE: The CRS will designate the RO.
		<ul style="list-style-type: none"> • WHEN reactor power is less than 20%, THEN perform the following: 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> • Place control rods in manual. 	
		<ul style="list-style-type: none"> • Perform Step 3 to stabilize reactor power. 	NOTE: The RO will stabilize reactor power at about 12-15%.

Op Test No.: N20-1 Scenario # 3 Event # 5 Page 36 of 71Event Description: **Inadvertent Turbine Trip/Failure of Control Rods to Move in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	<ul style="list-style-type: none"> GO TO Step 4. 	
	RO	(Step 4) IF AT ANY TIME reactor power goes below 5%, THEN perform the following:	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	RO	<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. 	
	RO	(Step 5) Check "C-9 COND AVAILABLE FOR STEAM DUMP" status light (1SI-18) – LIT.	
	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.	
	RO	(Step 8) Check "EXCITATION" – OFF.	
	RO	(Step 9) IF AT ANY TIME T-Avg is less than 551°F AND going down, THEN perform the following:	NOTE: This is a Continuous Action. The CRS will make one or more 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	(Step 10) Check all control rods – ALIGNED WITH ASSOCIATED BANK.	
	RO	(Step 11) Check MSR "RESET" light – LIT.	

Op Test No.: N20-1 Scenario # 3 Event # 5 Page 37 of 71Event Description: **Inadvertent Turbine Trip/Failure of Control Rods to Move in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 12) Announce the following: "Unit 1 Turbine trip, non-essential personnel stay out of Unit 1 turbine bldg".	NOTE: CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 13) Check "UNBLOCK" light for "AMSAC ACTUATION BLOCK/UNBLOCK" switch (1MC-2) – DARK.	
	RO	(Step 14) Check condenser dump valves – MODULATING OPEN.	
	BOP	(Step 15) Check Pzr pressure control response as follows:	
		<ul style="list-style-type: none"> Ensure Pzr heaters are in auto. 	
		<ul style="list-style-type: none"> Ensure Pzr spray control valves are in auto. 	
		<ul style="list-style-type: none"> Check Pzr PORVs – CLOSED. 	
		<ul style="list-style-type: none"> Check Pzr spray control valves – CLOSED. 	
	BOP	(Step 16) Check Pzr level –TRENDING TO PROGRAM.	
	RO	(Step 17) Ensure Bearing Lift pump in "AUTO".	
	RO	(Step 18) WHEN bearing oil pressure goes down to 11-12 PSIG, THEN ensure AC Bearing Oil pump starts.	

Op Test No.: N20-1 Scenario # 3 Event # 5 Page 38 of 71Event Description: **Inadvertent Turbine Trip/Failure of Control Rods to Move in AUTO**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 19) Perform applicable steps of OP/1/A/6300/001 (Turbine Generator Startup/Shutdown), Enclosure 4.3 (Shutdown).	
When the CRS enters AP-14 for the failure of Automatic Rod Motion or at the discretion of the Lead Examiner move to Events #6-8.			

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 39 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

While the crew is in AP-2, the 1B NC Pump Hi Vibration alarm will occur and the #1 seal leak flow on the 1B NCP will rise to 6 gpm. The operator will return to Step 8 of AP-8 (Continuous Action Step), and close the 1B NCP Pzr Spray Valve, manually trip the reactor and stop the 1B NCP when reactor power is < 5%. The crew will perform Enclosure 2, "NC Pump Post Trip Actions For #1 Seal Failure," of AP8, while subsequently performing E-0. The operator will enter EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and verify reactor trip. On the reactor trip four control rods will fail to fully insert. The operator will transition to EP/1/A/5000/ES-0.1, "Reactor Trip Response," and emergency borate per AP/1/A/5500/38, "Emergency Boration And Response To Inadvertent Dilution." Immediately following the initiation of Emergency Boration, a loss of the Unit 1 Switchyard will occur, and the 1A Emergency Diesel Generator will fail to start. The operator will immediately transition to EP/1/A/5000/ECA-0.0, "Loss of All AC Power." The operator will restore power to 1ETA per Unit 2 6900V busses through SATA or SATB per Enclosure 13 "Energizing Unit 1 4160V Bus From Unit 2 – SATA or SATB." The scenario will terminate when one ESF Bus has been re-energized.

Booth Operator Instructions: Change Severity MAL_NCP008B=15 Ramp = 120 seconds
 insert MAL_NCP016C = 16 Ramp = 120 seconds (1B NCP Hi Vibration)
 insert MAL_NCP015C = 11 Ramp = 120 seconds (1B NCP Hi Vibration)
 H_X10_171_3 EQ1 (NCP 1B Breaker Green Status light ON), della MAL_NCP016C and 015C

Indications Available:

- MCB Annunciator 1AD6/E-11, NC PUMP HI VIBRATION
- 1B NC Pump #1 Seal leakoff flow is rising on the OAC to 6 gpm.

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The CRS will go back and implement Step 8 of AP-8.
AP/1/A/5500/08, MALFUNCTION OF NC PUMP			
CASE I, NC PUMP SEAL OR PUMP LOWER BEARING MALFUNCTION			
	CRS	(Step 8) Stop affected NC pump as follows:	
		<ul style="list-style-type: none"> • IF A or B NC pump is the affected pump, Then CLOSE associated spray valve: 	
	BOP	<ul style="list-style-type: none"> • 1NC-29C (B NC Loop PZR Spray Control). 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 40 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
CAUTION Enclosure 2 (NC Pump Post Trip Actions For #1 Seal Failure) contains actions that must be performed 3 to 5 minutes after stopping the NC Pump. This enclosure must be performed even after transition to EPs.			
	CRS	<ul style="list-style-type: none"> Have any available RO perform Enclosure 2 (NC Post Trip Actions for #1 Seal Failure as crew performs the following steps. 	NOTE: The CRS may direct the Unit 2 BOP to perform this action. If so, Floor Instructor: report that the U2 BOP (or any other RO) is NOT available.
		<ul style="list-style-type: none"> Check unit status – IN MODE 1 OR 2. 	
	RO	<ul style="list-style-type: none"> Trip reactor 	
	BOP	<ul style="list-style-type: none"> WHEN reactor power less than 5%, THEN stop affected NC pump. 	

Critical Task:

Trip the Reactor prior to stopping the 1B NCP during a seal failure/high vibration condition and trip the NCP only after Reactor power level has dropped to less than 5% but before the CRS starts to read the Immediate Actions of EP/1/A/5000/E-0, Reactor Trip or Safety Injection to the Control Board Operators to verify that a Reactor Trip has occurred.

Safety Significance: The transient placed on the unit when an NCP is secured at power can challenge both reactor protection and control systems. Station management has decided that the conservative approach to dealing with this transient is to trip the reactor anytime a NCP malfunction warrants stopping a pump in Mode 1. Guidance is given to wait until reactor power is less than 5% before stopping the NC pump to ensure that the NC pump will provide adequate flow/core cooling until reactor power is sufficiently low enough to preclude a challenge to fuel integrity. If the action can be taken, and is not taken, this demonstrates “mis-operation” or incorrect operation that could unnecessarily challenge a fission product barrier (NCS).

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 41 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The CRS will direct the BOP to perform Enclosure 2, and continue in AP-8 with the RO. If so, BOP Examiner follow actions of Enclosure 2. Other Examiners follow AP-8 Actions on Page 42 .
AP/1/A/5500/08, MALFUNCTION OF NC PUMP ENCLOSURE 2, NC PUMP POST TRIP ACTIONS FOR #1 SEAL FAILURE			
			Examiner NOTE: Follow the actions associated with Enclosure 2 if BOP is assigned by CRS to perform.
CAUTION Failure of number two and three seals may occur unless the affected NC Pump Seal Return Valve is closed immediately after the pump has coasted down to zero speed (3-5 min). This enclosure must be completed even after transition to EPs.			
	BOP	(Step 1) Record time of NC pump shutdown.	
	BOP	(Step 2) Check if seal cooling available to affected pump as follows:	
		<ul style="list-style-type: none"> Seal injection from normal charging (NV pump or PD Pump) - ESTABLISHED 	
		<ul style="list-style-type: none"> KC to Thermal Barrier - ESTABLISHED. 	
	BOP	(Step 3) Check if any NC Pump number one seal leakoff flow – GREATER THAN OR EQUAL TO 6 GPM.	
	BOP	(Step 4) Maintain seal injection flow greater than 9 GPM to affected pump(s).	NOTE: The BOP will need to adjust Sealwater Injection flow.

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 42 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 5) Check all NC Pumps - OFF.	NOTE: All NC Pumps are running.
	BOP	(Step 5 RNO) IF any NC Pump continues to run, THEN perform the following:	
		<ul style="list-style-type: none"> WHEN affected NC pump has been off 3 minutes, THEN immediately perform the following: 	
		<ul style="list-style-type: none"> CLOSE affected NC pump seal return valve: 	
		<ul style="list-style-type: none"> 1NV-50B (B NC Pump Seal Return Isol) 	NOTE: The BOP will close this valve approximately three minutes after stopping the 1B NC Pump.
		<ul style="list-style-type: none"> OPEN all of the following valves: 	
		<ul style="list-style-type: none"> OPEN 1KC-394A (A NC Pump Therm Bar Otlt) 	
		<ul style="list-style-type: none"> OPEN 1KC-345A (C NC Pump Therm Bar Otlt) 	
		<ul style="list-style-type: none"> OPEN 1KC-364B (B NC Pump Therm Bar Otlt) 	
		<ul style="list-style-type: none"> OPEN 1KC-413B (D NC Pump Therm Bar Otlt) 	
		<ul style="list-style-type: none"> Exit this enclosure 	
AP/1/A/5500/08, MALFUNCTION OF NC PUMP CASE I, NC PUMP SEAL OR PUMP LOWER BEARING MALFUNCTION			
			Examiner NOTE: Examiners following the CRS/RO continue HERE .
	CRS	<ul style="list-style-type: none"> Continue with this AP as time allows. 	
	CRS	<ul style="list-style-type: none"> GO TO EP/1/A/5000/E-0 (Reactor Trip or Safety Injection). 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 43 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/E-0, REACTOR TRIP OR SAFETY INJECTION			
	RO/ BOP	(Step 1) Monitor Foldout page.	
		NC Pump Trip Criteria (Not Expected)	
		CA Suction Sources (CA storage tank (water tower) goes below 1.5 ft – Not expected)	
		Position Criteria for 1NV-150B and 1NV-151A (U1 NV Pump Recirc Isol)	
		<ul style="list-style-type: none"> IF NV S/I flowpath aligned AND NC pressure is less than 1500 PSIG, THEN CLOSE 1NV-150B and 1NV-151A. 	NOTE: The BOP will monitor these conditions.
		<ul style="list-style-type: none"> IF NC pressure is greater than 2000 PSIG, THEN OPEN 1NV-150B and 1NV-151A. 	
		Ruptured S/G Aux Feedwater Isolation Criteria (Not expected)	
		Faulted S/G Aux Feedwater Isolation Criteria (Not expected)	
	RO	(Step 2) Check Reactor Trip:	Immediate Action
		<ul style="list-style-type: none"> All rod bottom lights – LIT 	NOTE: There will be four rods that failed to fully insert on the Rx Trip.
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R power – GOING DOWN. 	
	RO	(Step 2 RNO) Perform the following:	
		<ul style="list-style-type: none"> Trip reactor. 	
		<ul style="list-style-type: none"> IF reactor will not trip... 	
	RO	(Step 3) Check Turbine Trip:	Immediate Action

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 44 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	BOP	(Step 4) Check 1ETA and 1ETB – ENERGIZED.	Immediate Action
	RO/ BOP	(Step 5) Check if S/I is actuated:	Immediate Action
		<ul style="list-style-type: none"> “SAFETY INJECTION ACTUATED” status light (1SI-18) – LIT. 	NOTE: SI will NOT be actuated.
	RO/ BOP	(Step 5 RNO) Perform the following:	Immediate Action
		Check if S/I is required:	
		<ul style="list-style-type: none"> Pzr pressure less than 1845 PSIG 	
		OR	
		<ul style="list-style-type: none"> Containment pressure greater than 1 PSIG. 	
		IF S/I is required,.....	NOTE: SI will NOT be required.
	RO/ BOP	IF S/I is not required, THEN perform the following:	
		Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees).	
	CRS	GO TO EP/1/A/5000/ES-0.1 (Reactor Trip Response).	
			NOTE: The CRS will transition to ES-0.1.
EP/1/A/5000/ES-0.1, REACTOR TRIP RESPONSE			
	RO/ BOP	(Step 1) Monitor Foldout page.	
		S/I Actuation Criteria	
		CA Suction Sources	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 45 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 2) Check the following:	
		<ul style="list-style-type: none"> VI pressure - GREATER THAN 85 PSIG. 	
		<ul style="list-style-type: none"> Any Unit 1 6900V bus - ENERGIZED. 	
	CRS	(Step 3) Announce: "Unit 1 Reactor trip, non-essential personnel stay out of Unit 1 turbine bldg".	NOTE: The CRS may ask U2 RO to make Plant Announcement. If so, Floor Instructor acknowledge as U2 RO.
	RO	(Step 4) Check any NC Pump - ON.	NOTE: The 1A, 1C and 1D NCPs will be ON.
	RO	(Step 5) 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 557°F. 	
	RO	(Step 6) Continue to monitor NC temperature as follows:	
		<ul style="list-style-type: none"> Check any NC Pump - ON. 	NOTE: The 1A, 1C and 1D NCPs will be ON.
		<ul style="list-style-type: none"> IF AT ANY TIME while in this procedure either of the following occurs, THEN perform Step 5: 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> NC T-Avg is less than 557°F and going down 	
		OR	
		<ul style="list-style-type: none"> NC T-Avg is greater than 557°F and going up. 	
	CRS	(Step 7) REFER TO the following:	NOTE: The CRS may ask SM to address. If so, Floor Instructor acknowledge as SM.

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 46 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<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). 	
	RO	(Step 8) Check Main Generator as follows:	
		<ul style="list-style-type: none"> Check both generator breakers - OPEN. 	
		<ul style="list-style-type: none"> Check "EXCITATION" - OFF. 	
	RO	(Step 9) Check MSR "RESET" light - LIT.	
	RO	(Step 10) Check NC T-Avg - GREATER THAN 553°F.	
	RO/BOP	(Step 11) Check feedwater status:	
		<ul style="list-style-type: none"> Check any CA Pump - ON. 	
		<ul style="list-style-type: none"> Check total feed flow to S/Gs - GREATER THAN 450 GPM. 	
	CRS	(Step 12) WHEN time and manpower allow, THEN dispatch operator to perform Enclosure 5 (MSR Second Stage Drain Tank Isolation).	NOTE: The CRS may dispatch an AO to look for leaks. If so, Floor Instructor: acknowledge.
	RO	(Step 13) Check if shutdown margin adequate:	
		<ul style="list-style-type: none"> All control rods - FULLY INSERTED. 	NOTE: There will be four rods that failed to fully insert on the Rx Trip.
	BOP	(Step 13 RNO) Perform the following:	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 47 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> IF all rod position indication is lost, OR greater than 2 rods not fully inserted, THEN emergency borate total of 8,000 gallons of 7000 PPM boron solution PER AP/1/A/5500/38 (Emergency Boration And Response To Inadvertent Dilution). 	NOTE: The BOP will borate 8000 gallons of Boric Acid per AP/1/A/5500/38, while the crew continues with ES-0.1.
		<ul style="list-style-type: none"> IF 2 rods not fully inserted, THEN..... 	
			NOTE: The CRS may assign the BOP to perform this action. If so, BOP Examiner follow actions of Enclosure AP38. Other Examiners follow ES-0.1 Actions, Step 13.B, on Page 50. NOTE: The CRS may these actions to the BOP.
AP/1/A/5500/38, EMERGENCY BORATION AND RESPONSE TO INADVERTENT DILUTION			
			Examiner NOTE: Follow the actions associated with AP38 if BOP is assigned by CRS to perform.
	BOP	(Step 1) Check if boron dilution - SUSPECTED.	
	BOP	(Step 1 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF unit in Mode 1 or 2, THEN..... 	
		<ul style="list-style-type: none"> GO TO Step 12. 	
	BOP	(Step 12) Initiate emergency boration as follows:	
		<ul style="list-style-type: none"> Check 1A or 1B NV pump - AVAILABLE. 	
		<ul style="list-style-type: none"> Check any NV pump - ON. 	
		<ul style="list-style-type: none"> Check the following boric acid system components - AVAILABLE. 	
		<ul style="list-style-type: none"> Boric Acid Storage Tank 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 48 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	<ul style="list-style-type: none"> Boric Acid Transfer pump. 	
		<ul style="list-style-type: none"> OPEN 1NV-265B (U1 NV Pump Boric Acid Sup Isol). 	
		<ul style="list-style-type: none"> Ensure a boric acid transfer pump is running. 	
		<ul style="list-style-type: none"> Check boration flow using one of the following methods: 	
		<ul style="list-style-type: none"> IF 1NV-265B is open, THEN check "EMERGENCY BORATION FLOW" - ESTABLISHED. 	
		OR	
		<ul style="list-style-type: none"> IF 1NV-269 is open, THEN..... 	
<p style="text-align: center;">NOTE</p> <p>If 1NV-265B opened for emergency boration, OAC point M1P0785 provides the gallons of boric acid added.</p>			
	BOP	(Step 13) IF AT ANY TIME boration no longer required, THEN GO TO Step 20.	NOTE: This is a Continuous Action.
	BOP	(Step 14) IF AT ANY TIME a higher boration flowrate is desired, THEN evaluate performing the following as required:	NOTE: This is a Continuous Action.
		<ul style="list-style-type: none"> Start a second boric acid transfer pump. 	
		<ul style="list-style-type: none"> Align NV pump suction to FWST as follows: 	
		<ul style="list-style-type: none"> OPEN the following valves: 	
		<ul style="list-style-type: none"> 1NV-221A (U1 NV Pump Suct From FWST Isol) 	
		<ul style="list-style-type: none"> 1NV-222B (U1 NV Pump Suct From FWST Isol). 	
		<ul style="list-style-type: none"> CLOSE the following valves: 	
		<ul style="list-style-type: none"> 1NV-141A (U1 VCT Outlet Isol) 	
		<ul style="list-style-type: none"> 1NV-142B (U1 VCT Outlet Isol). 	
	BOP	(Step 15) Align Normal Charging flowpath as follows:	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 49 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Ensure one of the following NC loop isolation valves is OPEN: 	
		<ul style="list-style-type: none"> 1NV-13B (U1 NV Supply To 1A NC Loop Isol) 	
		OR	
		<ul style="list-style-type: none"> 1NV-16A (U1 NV Supply To 1D NC Loop Isol). 	
		<ul style="list-style-type: none"> Check both of the following valves - OPEN: 	
		<ul style="list-style-type: none"> 1NV-244A (U1 Charging Hdr Cont Outside Isol) 	
		<ul style="list-style-type: none"> 1NV-245B (U1 Charging Hdr Cont Outside Isol). 	
	BOP	(Step 16) Establish desired charging flowrate to the NC System as follows:	
		<ul style="list-style-type: none"> THROTTLE OPEN 1NV-238 (U1 Charging Hdr Control) and 1NV-241 (U1 Seal Water Inj Flow Control) to establish desired charging flow, not to exceed 200 GPM. 	
		<ul style="list-style-type: none"> IF required to compensate for higher charging flowrate, THEN raise letdown to a maximum of 120 GPM. 	
NOTE A time delay of up to 3-5 minutes can be expected before indication of negative reactivity insertion is obtained on excore instrumentation.			
	BOP	(Step 17) Check if boric acid flow to NC System is adequate:	
		<ul style="list-style-type: none"> Reactor power - STABLE OR GOING DOWN 	
		<ul style="list-style-type: none"> NC temperature - STABLE OR GOING DOWN 	
		<ul style="list-style-type: none"> Control Rods - STABLE OR STEPPING OUT. 	
	BOP	(Step 18) Check NV pump suction - ALIGNED TO VCT.	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 50 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 19) IF AT ANY TIME VCT level approaches water solid, THEN evaluate performing the following:	
		<ul style="list-style-type: none"> Raise charging flow. 	
		<ul style="list-style-type: none"> Raise letdown flow as required to compensate for higher charging flow. 	
		<ul style="list-style-type: none"> Ensure 1NV-137A (U1 NC Filter Otlt To VCT 3-Way Diversion Cntrl) diverts to the RHT as required. 	
	BOP	(Step 20) WHEN emergency boration no longer required, THEN.....	
EP/1/A/5000/ES-0.1, REACTOR TRIP RESPONSE			
			Examiner NOTE: Examiners following the CRS/RO continue HERE .
	RO	(Step 13.B-D) Stop any dilutions in progress.	
		<ul style="list-style-type: none"> Check all NC T-Colds - GREATER THAN 540°F. 	
		<ul style="list-style-type: none"> IF AT ANY TIME any NC T-Cold goes below 540°F, THEN perform Step 13.C. 	NOTE: This is a Continuous Action. The CRS will make the RO aware.
	RO/ BOP	(Step 14) Check Pzr level control:	
		<ul style="list-style-type: none"> Check VI pressure - GREATER THAN 60 PSIG. 	
		<ul style="list-style-type: none"> Pzr level - GREATER THAN 17%. 	
		<ul style="list-style-type: none"> Check charging and letdown - IN SERVICE. 	
		<ul style="list-style-type: none"> Check Pzr level trending to program "PZR LEVEL SETPOINT". 	NOTE: The RO or BOP may adjust Letdown flow as needed.
	RO/ BOP	(Step 15) Check Pzr pressure - GREATER THAN 1845 PSIG.	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 51 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	RO	(Step 16) Check NC loop flow instruments on 1MC-5 - ALL LOOPS INDICATING GREATER THAN 90% FLOW.	NOTE: The 1B NC Pump is OFF.
	RO/ BOP	(Step 16 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF 1A OR 1B NC pump is off, THEN place Pzr spray valve in manual and CLOSE for stopped NC Pump. 	
		<ul style="list-style-type: none"> IF loss of offsite power has occurred, THEN.... 	
<p align="center">NOTE</p> <p>The following enclosure will place Outside Air Pressure Filter train in service to pressurize the Control Room. This is a 30 minute time critical action to minimize Control Room dose if NC pump locked rotor event has occurred.</p>			
		<ul style="list-style-type: none"> Place Outside Air Pressure Filter train in service PER Enclosure 7 (Control Room Pressurization). 	NOTE: The BOP may go to perform Enclosure 7 but will return when the LOP occurs and ECA-0.0 is entered.
	RO/ BOP	(Step 17) Check Pzr pressure - STABLE AT OR TRENDING TO 2235 PSIG.	
	RO	(Step 18) Control S/G levels as follows:	
		<ul style="list-style-type: none"> Check N/R level in any S/G - GREATER THAN 11%. 	
		<ul style="list-style-type: none"> THROTTLE feed flow to maintain S/G N/R levels between 11% and 50%. 	
<p>Booth Operator Instructions: Insert MAL_EP002A AND EP002B =</p> <p style="text-align: right;">Insert MAL_DG001A = TRUE</p>			
<p>Indications Available:</p> <ul style="list-style-type: none"> Control Room lights dim. 1A EDG does NOT start as required. 			

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 52 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
			NOTE: The CRS will transition to ECA-0.0.
EP/1/A/5000/ECA-0.0, LOSS OF ALL AC POWER			
			NOTE: Crew will carry out Immediate Actions of ECA-0.0, prior to the CRS addressing the EP.
	CRS	(Step 1) CSF Status trees should be monitored for information only. EPs referenced by them should not be implemented.	
	RO	(Step 2) Check Reactor Trip:	IMMEDIATE ACTION
		<ul style="list-style-type: none"> All rod bottom lights – LIT 	NOTE: DRPI is NOT available on the LOOP.
		<ul style="list-style-type: none"> Reactor trip and bypass breakers – OPEN 	
		<ul style="list-style-type: none"> I/R power – GOING DOWN. 	
	RO	(Step 3) Check Turbine Trip:	IMMEDIATE ACTION
		<ul style="list-style-type: none"> All throttle valves – CLOSED. 	
	CRS	(Step 4) Establish NC pump seal injection from the SSF as follows:	
	CRS	<ul style="list-style-type: none"> Immediately dispatch operator to SSF to perform the following: 	NOTE: The CRS will dispatch an AO to complete Enclosure 2. Floor/Booth Instructor acknowledge as appropriate, after ten minutes insert ECA-0.0 (Enclosure 2 SSF Actions) and report that Enclosure 2 is complete.

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 53 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Obtain Brown Folder at SSF and complete Enclosure 2 (Unit 1 SSF - ECA-0.0 Actions). 	
<p align="center">NOTE</p> <p>The fastest pathway to 1ETA room is to emergency egress into the aux bldg from the Unit 1 MG set room.</p>			
	CRS	<ul style="list-style-type: none"> Dispatch operator to 1ETA room as follows: 	
		<ul style="list-style-type: none"> Check if operator will enter aux bldg – FROM MG SET ROOM. 	
		<ul style="list-style-type: none"> Give operator dosimeter from Unit 2 SRO desk. 	
	CRS	<ul style="list-style-type: none"> Dispatch operator to perform Enclosure 3 (Unit 1 ETA And ETB Rooms – ECA-0.0 Actions). 	<p>NOTE: The CRS will dispatch an AO to complete Enclosure 3.</p> <p>If so, Floor/Booth Instructor acknowledge as appropriate.</p> <p>Booth Instructor: wait 3 minutes, then insert ECA-0.0 ENCLOSURE 3, then report that Enclosure 3 is complete.</p>
	CRS	<ul style="list-style-type: none"> Use any of the following to notify security to immediately dispatch officer with key to SSF to ensure operator can access SSF: 	<p>NOTE: The CRS will dispatch a Security Officer to the SSF.</p> <p>Booth Instructor: Acknowledge as Security.</p>
		<ul style="list-style-type: none"> Security ringdown phone (located on Unit 2 SRO desk) 	
		<ul style="list-style-type: none"> 1941 (Same line as ringdown phone) 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 54 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 4900. 	Floor Instructor: If asked, U2 does NOT have normal power, and both DGs are running.
	RO/ BOP	(Step 5) Monitor Foldout Page	
		Alternate Low Pressure Feedwater (applies after Step 8 in body of the procedure)	
		Loss of Vital Instrumentation or Control Power	
		Low Decay Heat Temperature Control	
		CA Suction Sources (applies after Step 15 in body of the procedure)	
	BOP	(Step 6) Check NC System – ISOLATED:	
	BOP	<ul style="list-style-type: none"> Check the following letdown orifice isolation valves – CLOSED. 	
		<ul style="list-style-type: none"> 1NV-458A (U1 75 GPM L/D Orifice Outlet Cont Isol). 	
		<ul style="list-style-type: none"> 1NV-457A (U1 45 GPM L/D Orifice Outlet Cont Isol). 	
		<ul style="list-style-type: none"> 1NV-35A (U1 Variable L/D Orifice Outlet Cont Isol). 	
	BOP	<ul style="list-style-type: none"> CLOSE the following valves: 	
		<ul style="list-style-type: none"> 1NV-1A (U1 NC L/D Isol To Regenerative Hx) 	
		<ul style="list-style-type: none"> 1NV-2A (U1 NC L/D Isol To Regenerative Hx). 	
	BOP	<ul style="list-style-type: none"> Check Pzr PORVs – CLOSED. 	
	BOP	<ul style="list-style-type: none"> Check the following excess letdown isolation valves – CLOSED: 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 55 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> 1NV-24B (1C NC Loop To Excess L/D Hx Isol) 	
		<ul style="list-style-type: none"> 1NV-25B (1C NC Loop To Excess L/D Hx Isol). 	
	BOP	<ul style="list-style-type: none"> Check 1NV-121 (U1 ND Letdown Control) – CLOSED. 	
	RO	(Step 7) Check total CA flow – GREATER THAN 450 GPM.	
	RO	(Step 7 RNO) Perform the following:	
		<ul style="list-style-type: none"> Ensure TD CA pump on. 	
	CRS	<ul style="list-style-type: none"> IF flow is less than 450 GPM due to operator action to control CA flow, THEN GO TO Step 8. 	
Control Steam Generator Water Levels during the Station Blackout such that no Steam Generator Overfill Condition occurs (≤ 0.8 on Void Fraction SGINFO.cts) and causes Water to Enter the Steam Lines.			
Safety Significance: During the Station Blackout the only source of CA flow is the TDCA Pump. If the critical task is not performed and one or more SG's are allowed to overfill, water will enter the steam line and potentially damage the only available source for CA flow (i.e. the TDCA Pump).			
	BOP	(Step 8) Try to restore power to 1ETA or 1ETB as follows:	
		<ul style="list-style-type: none"> Check both D/Gs - RUNNING. 	
	BOP	(Step 8.A RNO) Perform the following:	
		<ul style="list-style-type: none"> Initiate S/I 	
		<ul style="list-style-type: none"> Notify Unit 2 to immediately perform Enclosure 5 (Unit 2 Actions) (enclosure ensures 2B RN pump has suction flowpath, which may have isolated on S/I signal). 	NOTE: The CRS will notify U2. Floor Instructor: Acknowledge as U2 RO.

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 56 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	<ul style="list-style-type: none"> IF at least one D/G starts, THEN ... 	NOTE: The 1B D/G is OOS, and the 1A D/G will NOT start.
	CRS	<ul style="list-style-type: none"> GO TO Step 9 	
	RO/ BOP	(Step 9) Stabilize S/G pressures using SM PORVs as follows:	NOTE: The 1C S/G PORV has previously failed and is isolated; while the 1D S/G PORV is OOS.
		<ul style="list-style-type: none"> Reset Main Steam Isolation. 	
		<ul style="list-style-type: none"> Reset SM PORVs. 	
		<ul style="list-style-type: none"> CLOSE all SM PORV manual loaders. 	
		<ul style="list-style-type: none"> Place SM PORVs in manual. 	
		<ul style="list-style-type: none"> Control S/G pressures at 1000 PSIG. 	
	CRS	(Step 10) Ensure the following have been implemented:	NOTE: The CRS may ask SM to address. If so, Floor Instructor acknowledge as SM.
		<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). 	
	RO/ BOP	(Step 11) Control intact S/G levels as follows:	
		<ul style="list-style-type: none"> Check N/R level in any intact S/G - GREATER THAN 11% (32% ACC). 	
		<ul style="list-style-type: none"> THROTTLE CA control valves to maintain all intact S/G N/R levels between 11% (32% ACC) and 50%. 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 57 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
NOTE			
If normal VI supply is lost, the Blackout Header FLEX Air Tank should automatically maintain normal control of CA flow. 1EVDA and 1EVDD are also required for TD CA control valves to work, unless TD CA solenoid valves are bypassed.			
		<ul style="list-style-type: none"> IF AT ANY TIME CA flow control is lost, THEN perform RNO for Step 11.B. 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
	CRS	(Step 12) Ensure Unit 2 performs Enclosure 5 (Unit 2 Actions).	NOTE: The CRS will ask U2 to address. If so, Floor Instructor acknowledge as U2 BOP.
	RO	(Step 13) Check Unit 1 status - IN MODE 3.	
NOTE			
If operating train of VC/YC has failed, it is time critical to swap operating VC/YC trains.			
	BOP	(Step 14) Ensure VC/YC cooling available as follows:	
		<ul style="list-style-type: none"> Check VC/YC alignment using Unit 1 status board - AT LEAST ONE OPERABLE VC/YC TRAIN ALIGNED TO AN ENERGIZED UNIT 2 4160V BUS. 	
		<ul style="list-style-type: none"> Notify an available operator to initiate EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 13 (VC and VA System Operation) within 30 minutes of loss of power. 	NOTE: The CRS may assign the BOP to perform this action. If so, BOP Examiner follow actions of Enclosure 13. Other Examiners follow ECA-0.0 Actions, Step 15 , on Page 63 .

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 58 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
EP/1/A/5000/G-1, GENERIC ENCLOSURES ENCLOSURE 13, VC AND VA OPERATION			
			Examiner NOTE: Follow the actions associated with Enclosure 13 if BOP is assigned by CRS to perform.
	BOP	(Step 1) Check the following HVAC annunciator alarms - LIT:	NOTE: The B Train alarm is LIT.
		<ul style="list-style-type: none"> "VC/YC TRAIN A SAFETY ACTUATION" (0AD-11, G-1) 	
		<ul style="list-style-type: none"> "VC/YC TRAIN B SAFETY ACTUATION" (0AD-11, G-2). 	
	BOP	(Step 1 RNO) Depress VC/YC Safety Actuation "INITIATE" pushbutton(s).	
	BOP	(Step 2) Check the following VC equipment - ON:	
		<ul style="list-style-type: none"> "B CONTROL ROOM AHU" 	NOTE: The B Train equipment is ON.
		<ul style="list-style-type: none"> "A CONTROL ROOM AHU" 	
		<ul style="list-style-type: none"> Train selected YC pump. 	
	BOP	(Step 2 RNO) Start equipment.	
	BOP	(Step 3) Check train selected Control Room Area Chiller - ON.	NOTE: The selected Train is NOT ON.
	BOP	(Step 3 RNO) Perform the following:	
		<ul style="list-style-type: none"> IF the "STOP" pushbutton is depressed on selected train, THEN..... 	NOTE: The STOP pushbutton on the selected Train is NOT depressed.
		<ul style="list-style-type: none"> IF train selected chiller is off, THEN start opposite train chiller as follows: 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 59 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Ensure RN pump aligned to desired chiller is running. 	NOTE: The BOP will direct the Unit 2 BOP to start the 2B RN Pump. Floor Instructor: Acknowledge as U2 RO.
		<ul style="list-style-type: none"> Perform one of the following: 	
		<ul style="list-style-type: none"> IF desired to start A VC/YC chiller, THEN.... 	
		OR	
		<ul style="list-style-type: none"> IF desired to start B VC/YC chiller, THEN place the "VC/YC TRN B MODE SELECT" switch to "TRN B". 	
		<ul style="list-style-type: none"> Depress "START" on chiller to be started. 	
		<ul style="list-style-type: none"> Check chiller starts within 2 minutes. 	
		<ul style="list-style-type: none"> IF neither chiller can be started, THEN.... 	
		<ul style="list-style-type: none"> Stop undesired train by performing the following: 	
		<ul style="list-style-type: none"> Depress "STOP" on chiller to be stopped. 	
		<ul style="list-style-type: none"> WHEN chiller "ON" indication dark, THEN select "OFF" on associated VC/YC mode select switch. 	
	BOP	(Step 4) Check the following VC fans - ON:	
		<ul style="list-style-type: none"> "B TRAIN CR OUTSIDE AIR PRESS FAN" 	
		<ul style="list-style-type: none"> "A TRAIN CR OUTSIDE AIR PRESS FAN". 	NOTE: The A Train Fan is NOT running.
		(Step 4 RNO) Start equipment	NOTE: The A Train Fan will NOT start.
	BOP	(Step 5) Check "OPEN" lights on the following dampers - DARK:	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 60 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> CRA-OAD-4 (CR Area Otsd Air Fans Damper) 	
		<ul style="list-style-type: none"> CRA-OAD-3 (CR Area Otsd Air Fans Damper). 	NOTE: The CRA-OAD-3 light is LIT.
	BOP	(Step 5 RNO) CLOSE dampers.	
	BOP	(Step 6) Check the following fans - OFF.	
		<ul style="list-style-type: none"> "#1 CRA OTSD AIR FAN" 	
		<ul style="list-style-type: none"> "#2 CRA OTSD AIR FAN". 	
	BOP	(Step 7) Check the following VC equipment for train selected - ON:	
		<ul style="list-style-type: none"> A Train: 	NOTE: The A Train is NOT selected.
		<ul style="list-style-type: none"> 1A SWGR AHU (1ETA Supply) 	
		<ul style="list-style-type: none"> 2A SWGR AHU (2ETA Supply) 	
		<ul style="list-style-type: none"> 1C SWGR AHU (1ETB Supply) 	
		<ul style="list-style-type: none"> 2C SWGR AHU (2ETB Supply) 	
		<ul style="list-style-type: none"> "A CR AREA AHU" 	
		<ul style="list-style-type: none"> "BATT ROOM A EXH FAN". 	
		OR	
		<ul style="list-style-type: none"> B Train: 	NOTE: The B Train is selected.
		<ul style="list-style-type: none"> 1B SWGR AHU (1ETA Supply) 	NOTE: The AHU is NOT ON.
		<ul style="list-style-type: none"> 2B SWGR AHU (2ETA Supply) 	
		<ul style="list-style-type: none"> 1D SWGR AHU (1ETB Supply) 	NOTE: The AHU is NOT ON.
		<ul style="list-style-type: none"> 2D SWGR AHU (2ETB Supply) 	
		<ul style="list-style-type: none"> "B CR AREA AHU" 	
		<ul style="list-style-type: none"> "BATT ROOM B EXH FAN". 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 61 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 7 RNO) Perform the following:	
		<ul style="list-style-type: none"> Start equipment on train selected. 	
		<ul style="list-style-type: none"> IF SWGR AHU or CR Area AHU is not available on selected train, THEN evaluate swapping VC trains PER OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System), Enclosure 4.2 (Operational Alignment Change of VC/YC System) (copy of procedure located in satellite file in VC/YC chiller area). 	
		<ul style="list-style-type: none"> IF battery room exhaust fan is off on selected train, THEN..... 	
		<ul style="list-style-type: none"> IF switchgear room cooling is not available, THEN contact station management to evaluate opening the following essential 4160 V switchgear room doors to establish cooling: 	NOTE: The BOP will contact Station Management. Floor Instructor: Acknowledge as Station Management and indicate that they will evaluate .
		<ul style="list-style-type: none"> Auxiliary Bldg Doors 	
		<ul style="list-style-type: none"> Turbine Bldg Doors. 	
	BOP	(Step 8) Check the following AHUs - ON:	NOTE: All AHUs are OFF.
		<ul style="list-style-type: none"> 1B NS AHU 	
		<ul style="list-style-type: none"> 1B ND AHU 	
		<ul style="list-style-type: none"> 1B KF AHU 	
		<ul style="list-style-type: none"> 1A NS AHU 	
		<ul style="list-style-type: none"> 1A ND AHU 	
		<ul style="list-style-type: none"> 1A KF AHU. 	
	BOP	(Step 8 RNO) IF S/I has occurred, THEN start AHUs.	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 62 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 9) Ensure VA filter units remain in filter mode as follows:	
		<ul style="list-style-type: none"> Place the following switches in "TEST": 	
		<ul style="list-style-type: none"> "1B VA FILTER UNITS TEST" 	
		<ul style="list-style-type: none"> "1A VA FILTER UNITS TEST" 	
		<ul style="list-style-type: none"> "2B VA FILTER UNITS TEST" 	
		<ul style="list-style-type: none"> "2A VA FILTER UNITS TEST". 	
		<ul style="list-style-type: none"> Check the following - CLOSED: 	
		<ul style="list-style-type: none"> 1ABF-D-3 (1B VA Filter Exh Bypass Damper) - CLOSED 	
		<ul style="list-style-type: none"> 1ABF-D-3 (1A VA Filter Exh Bypass Damper) - CLOSED 	
		<ul style="list-style-type: none"> 2ABF-D-3 (2B VA Filter Exh Bypass Damper) - CLOSED 	
		<ul style="list-style-type: none"> 2ABF-D-3 (2A VA Filter Exh Bypass Damper) - CLOSED. 	
	BOP	(Step 9.b RNO) Notify station management to evaluate PER "Evaluations by Station Management in the TSC, Volume 1" (section titled "Generic Enclosure (G-1) Specified Actions").	NOTE: The BOP will contact Station Management. Floor Instructor: Acknowledge as Station Management and indicate that they will evaluate .
	BOP	(Step 10) Restart the following EMF Sample Blowers as required:	
		<ul style="list-style-type: none"> EMF 41 (Aux Bldg Ventilation) EMF-43A (Control Room Air Intake Loc A) 	
		<ul style="list-style-type: none"> 1EMF-35, 36, 37 (Unit Vent Particulate, Gas, Iodine) 	
		<ul style="list-style-type: none"> 1EMF-42 (Fuel Bldg Ventilation) 	
		<ul style="list-style-type: none"> EMF-43B (Control Room Air Intake Loc B). 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 63 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	BOP	(Step 11) WHEN time and manpower allow, THEN dispatch operator to ensure VA System remains in proper alignment....	NOTE: The BOP will inform the CRS of this step.
EP/1/A/5000/ECA-0.0, LOSS OF ALL AC POWER			
			Examiner NOTE: Examiners following the CRS/RO continue HERE .
	RO	(Step 15) Monitor CA Storage Tank (water tower) level and ensure CA suction source as follows:	
		<ul style="list-style-type: none"> Check if external event that has the potential to damage CA Storage Tank (water tower) (such as seismic or tornado) – HAS OCCURRED. 	NOTE: The CRS may ask the OSM to evaluate. If so, Floor Instructor: Acknowledge and indicate that no such event has occurred.
	CRS	(Step 15.A RNO) Observe Note prior to Step 15.C and GO TO Step 15.C.	
NOTE Control Room indication of CA Storage Tank (water tower) level should be used if available. It will be lost when aux control power is lost or if instrument damaged by external event. If operator is dispatched for periodic local monitoring, he can be used for other tasks.			
		(Step 15.C-E) Monitor CA Storage Tank (water tower) level using available Control Room indication.	
		<ul style="list-style-type: none"> IF AT ANY TIME CA Storage Tank (water tower) level indication is lost (invalid reading), THEN dispatch operator to locally monitor level PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 31 (Local CA Storage Tank (Water Tower) Level Monitoring). 	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> Ensure CA Suction Sources is monitored on Foldout Page. 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 64 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 16) Check for plant damage as follows:	
		<ul style="list-style-type: none"> Check if event that could have caused damage to mechanical systems internal to plant (seismic, tornado, etc) - HAS OCCURRED. 	NOTE: No such event has occurred.
	CRS	(Step 16 RNO) GO TO Step 17.	
	RO	(Step 17) Check if S/I is actuated as follows:	NOTE: SI was actuated in an attempt to start the 1A D/G.
		<ul style="list-style-type: none"> "SAFETY INJECTION ACTUATED" status light (1SI-18) - LIT. 	
		<ul style="list-style-type: none"> Reset S/I. 	
	CRS	(Step 18) Dispatch operator to open the following breakers to sequencer DC control power:	NOTE: The CRS will dispatch an AO. Booth Instructor acknowledge as appropriate, after three minutes insert MAL_EQB002A and EQB002B = FAILURE and report that the Sequencer DC Control Breakers have been opened.
		<ul style="list-style-type: none"> A Train - 1EVDA Breaker 6 	
		<ul style="list-style-type: none"> B Train - 1EVDD Breaker 8. 	
	CRS	(Step 19) IF AT ANY TIME operator dispatched to perform Enclosure 3 (Unit 1 ETA And ETB Rooms - ECA-0.0 Actions) determines that lockout exists, THEN perform the following:	NOTE: This is a Continuous Action. The CRS will make one or more board operators aware.
		<ul style="list-style-type: none"> Have IAE clear or isolate fault from bus. 	
		<ul style="list-style-type: none"> WHEN fault cleared or isolated from bus, THEN reset lockout. 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 65 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
<p align="center">NOTE</p> <p>Consider the following when selecting power restoration options:</p> <ul style="list-style-type: none"> If problem with D/G is easily correctable, Enclosure 12 (Energizing Unit 1 4160V Bus With 1A OR 1B D/G) may restore power the quickest. If Unit 2 6900V busses are energized, Enclosure 13 (Energizing Unit 1 4160V Bus From Unit 2 - SATA or SATB) can be performed within an hour and should be the preferred option. If cause of loss of Unit 1 offsite power is known, and grid available, Enclosure 14 (Energizing Unit 1 4160V Bus From Unit 1) may be preferred, but could take 2-3 hours. EPSP can restore one essential bus within an hour, but complicates restoration of offsite power later in the event. If ESPS is being used on Unit 2, it shall not be used on Unit 1. 			
	CRS	(Step 20) Restore power to 1ETA or 1ETB using any of the following while continuing with this procedure:	<p>NOTE: The CRS may dispatch an AO to evaluate lockouts on 1ETA and 1ETB.</p> <p>Booth Instructor acknowledge as appropriate, after two minutes report that there are no Lockouts on 1ETA but that Lockouts do exist on 1ETB.</p>
		<ul style="list-style-type: none"> Local reset and start of 1A or 1B D/G PER Enclosure 12 (Energizing Unit 1 4160V Bus With 1A or 1B D/G) 	
		OR	
		<ul style="list-style-type: none"> Unit 2 6900V busses through SATA or SATB PER Enclosure 13 (Energizing Unit 1 4160V Bus From Unit 2 - SATA or SATB). 	<p>NOTE: This is the only option for re-powering either 1ETA or 1ETB.</p>
		OR	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 66 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Unit 1 offsite power PER Enclosure 14 (Energizing Unit 1 4160V Bus From Unit 1) 	
		OR	
		<ul style="list-style-type: none"> ESPS PER Enclosure 65 (Energizing Unit 1 4160V Bus With ESPS). 	
			NOTE: The CRS will address Enclosure 13.
EP/1/A/5000/ECA-0.0, LOSS OF ALL AC POWER ENCLOSURE 13, ENERGIZING UNIT 1 4160V BUS FROM UNIT 2 – SATA OR SATB			
NOTE <ul style="list-style-type: none"> Unit 2 6900V bus 2TB must already be energized for this enclosure to restore power to 1ETB. Unit 2 6900V bus 2TC must already be energized for this enclosure to restore power to 1ETA. Available equipment on 1ETA or 1ETB bus should be considered when choosing bus to energize. 			
	CRS	(Step 1) Perform one of the following:	NOTE: The CRS may dispatch an AO to evaluate lockouts on 1ETA and 1ETB. Booth Instructor acknowledge as appropriate, after two minutes report that there are no Lockouts on 1ETA but that Lockouts do exist on 1ETB.
		<ul style="list-style-type: none"> IF 1ETA is to be energized from Unit 2, THEN observe Note prior to Step 18 and GO TO Step 18. 	
		OR	
		<ul style="list-style-type: none"> IF 1ETB is to be energized from Unit 2, THEN observe Note prior to Step 2 and GO TO Step 2. 	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 67 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
NOTE			
Steps 18 through 32 will align power from Unit 2 2TC through SATA to Unit 1 1ETA.			
		(Step 18) Have Unit 2 RO check 2ETA Standby Breaker control switch - DARK.	NOTE: The CRS/BOP will ask U2 to address. If so, Floor Instructor acknowledge as U2 BOP, and report that 2ETA Standby Breaker control switch - DARK.
NOTE			
Either the 1ETA Normal or 1ETA Standby Breaker control switch will be dark, indicating that it is racked out and open.			
	RO/ BOP	(Step 19) Check the following 4160V breakers - OPEN.	
		<ul style="list-style-type: none"> 1ETA Normal Breaker 	
		<ul style="list-style-type: none"> 1ETA Standby Breaker 	
		<ul style="list-style-type: none"> 1ETA Emergency Breaker. 	
	RO/ BOP	(Step 20) Ensure breakers are racked in as required to power 1ETA from Unit 2 2TC (via SATA) as follows:	
		<ul style="list-style-type: none"> Check 1ETA Normal Breaker control switch - LIT (indicates that breaker is racked in). 	
		<ul style="list-style-type: none"> Dispatch operator to perform Enclosure 68 (Shifting 1ETA from Normal (1ATC) to Standby (SATA)). 	NOTE: The CRS will dispatch an AO to complete Enclosure 68. Booth Instructor acknowledge as appropriate, after two minutes insert LOA_EP134=RACKOUT and LOA_EP136=RACKIN and report that Enclosure 68 is complete.

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 68 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
		<ul style="list-style-type: none"> Check Unit 1 SATA Feeder Breaker control switch - LIT (indicates that breaker is racked in). 	
		<ul style="list-style-type: none"> OPEN Unit 1 SATA Feeder Breaker. 	
NOTE If enclosure was initiated in Step 20.B, then enclosures in Steps 20.B and 20.E can be performed concurrently.			
		<ul style="list-style-type: none"> Dispatch operator to perform Enclosure 72 (Shifting SATA from 1TC to Unit 2 2TC). 	NOTE: The CRS will dispatch an AO to complete Enclosure 72. Booth Instructor acknowledge as appropriate, after two minutes report that Enclosure 72 is complete (No Field Action is required).
	CRS	(Step 21) Do not continue until the following is performed:	
		<ul style="list-style-type: none"> Ensure Steps 18 through 20 are completed. 	
		<ul style="list-style-type: none"> Ensure operators are away from breakers. 	
	CRS	(Step 22) Have Unit 2 RO check Unit 2 SATA Feeder Breaker - CLOSED.	NOTE: The CRS will ask U2 to address. If so, Floor Instructor acknowledge as U2 BOP, and report that Unit 2 SATA Feeder Breaker is CLOSED.
	RO/ BOP	(Step 23) Check if S/I is actuated as follows:	
		<ul style="list-style-type: none"> "SAFETY INJECTION ACTUATED" status light (1SI-18) - LIT. 	NOTE: SI was previously reset.

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 69 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	CRS	(Step 23.A RNO) GO TO Step 24.	
	CRS	(Step 24) Check "SEQ A LOSS OF CONTROL PWR" alarm (1AD-11, B-2) - LIT.	
	RO/ BOP	(Step 25) Open 1A CA pump breaker.	
	RO/ BOP	(Step 25 RNO) Open breaker by depressing 1A CA pump "START" and "STOP" at same time.	
	RO/ BOP	(Step 26) Open the remaining pump breakers:	
		• 1A NV pump	
		• 1A ND pump	
		• 1A NI pump	
		• 1A1 KC pump	
		• 1A2 KC pump	
		• 1A RN pump	
		• 1A KF pump	
		• 1A NS pump	
	RO/ BOP	(Step 27) Open the following 600 V essential load center feeder breakers:	
		• 1ELXA	
		• 1ELXC	
		• 1ELXE	
	RO/ BOP	(Step 28) Check 1A D/G Mode Select switch - IN CONTROL ROOM POSITION.	

Op Test No.: N20-1 Scenario # 3 Event # 6, 7 & 8 Page 70 of 71Event Description: **#1 Seal Leak on 1B NCP Degrades/4 Control Rods fail to Fully Insert on Rx Trip/ Loss of Switchyard to Unit 1/1A EDG fails to START**

Time	Pos.	Expected Actions/Behavior	Comments
	RO/ BOP	(Step 28 RNO) Place 1A D/G Mode Select switch to Control Room position.	
	RO/ BOP	(Step 29) Close 1ETA Standby Breaker.	
	RO/ BOP	(Step 30) Place 1A D/G Mode Select switch to "AUTO" position.	
	RO/ BOP	(Step 31) Check 1ETA bus - ENERGIZED.	
	RO/ BOP	(Step 32) Notify Control Room Supervisor to GO TO Step 47 in body of this procedure.	
Control Steam Generator Water Levels during the Station Blackout such that no Steam Generator Overfill Condition occurs (≤ 0.8 on Void Fraction SGINFO.cts) and causes Water to Enter the Steam Lines.			
Safety Significance: During the Station Blackout the only source of CA flow is the TDCA Pump. If the critical task is not performed and one or more SG's are allowed to overfill, water will enter the steam line and potentially damage the only available source for CA flow (i.e. the TDCA Pump).			
At the discretion of the Lead Examiner terminate the exam.			

UNIT 1 STATUS:

Power Level: 36% NCS [B] 1888 ppm Pzr [B]: 1884 ppm Xe: Per OAC

Power History: At this power level for 20 days Core Burnup: 25.1 EFPDs

UNIT 2 STATUS:

Power Level: 100%

CONTROLLING PROCEDURE:

- OP/1/A/6100/003 (Controlling Procedure for Unit Operation)

OTHER INFORMATION NEEDED TO ASSUME THE SHIFT:

- The area has experienced snow and freezing rain for the last 2 hours, and this is expected to continue for the next 6 hours.

The following equipment is Out-Of-Service:

- The 1B EDG is OOS for bearing replacement. ACTION has been taken in accordance with Technical Specification LCO 3.8.1 ACTION B.
- The 1D S/G PORV is isolated and its actuator is currently removed for maintenance.
- 1KFP-5130, Spent Fuel Pool Temperature, failed last shift (IAE is investigating).
- MCB Annunciator 1AD-9, A-7, "NF SYSTEM TRACE HEATING LOSS OF POWER," has alarmed spuriously several times over the last hour (IAE is investigating).

Crew Directions:

- The crew will raise power to 100% on this shift, starting with Step 3.35.12 of Enclosure 4.1 of OP/1/A/6100/003 Controlling Procedure for Unit Operation.
- The loading rate will be 3 MWe/minute.
- The RE recommends 100% Control Rod position of 215 steps on Control Bank D.
- RE has recommended a 300-gallon initial dilution using Enclosure 4.4 (Alternate Dilute) of OP/1/A/6150/009 (Boron Concentration Control).
- RMWST Dissolved O₂ is less than 1000 ppb.
- Blender content is Reactor Makeup Water.

Work Control SRO

Jim

Field SRO

Joe (FB)

AO's AVAILABLE**Unit 1**

Aux Bldg. John

Turb Bldg. Bob (FB)

Extra(s) Bill (FB) Ed (FB) Gus (RW) Carol

Unit 2

Aux Bldg. Chris

Turb Bldg. Mike (FB)

SIM JPM A

NUREG 1021, Revision 11

Job Performance Measure Worksheet

Initiating Cue:	The CRS has directed you to perform Enclosure 4 (Restoring Charging Flow With Hot NC Pump Seals) of AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection," and establish approximately 50 gpm charging flow.
Task Standard:	The operator will isolate the NC Pumps seals, attempt to start the 1B NV Pump to re-establish Charging Flow, then start the PD Pump when the 1B NV Pump fails to start and complete the restoration of approximately 50 gpm charging flow per Enclosure 4 of AP/1/A/5500/12.
Required Materials:	None
General References:	EP/1/A/5000/E-0 (Reactor Trip or Safety Injection), Rev 36 EP/1/A/5000/ES-0.1 (Reactor Trip Response), Rev 47 AP/1/A/5500/12 (Loss of Letdown, Charging or Seal Injection), Rev 24 OMP 4-3 (Use of Emergency and Abnormal Procedures and FLEX Support Guidelines), Rev 48
Handouts:	Handout 1: Blank copy of Enclosure 4 (Restoring Charging Flow With Hot NC Pump Seals) of AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection."
Time Critical Task:	NO
Validation Time:	15 minutes

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 1	This step is critical because initially isolating sealwater flow to the NC Pumps is necessary to complete the restoration of charging flow per Enclosure 4 of AP/1/A/5500/12.
Step 2	This step is critical because sealwater flow to the NC Pumps must be isolated before action is taken to re-establish charging flow to the NC Pumps per Enclosure 4 of AP/1/A/5500/12.
Step 3	This step is critical because pressing the 1B NV Lube Oil Pump MAN pushbutton (White PB) and then pressing the START pushbutton is necessary to start the 1B NV Pump to re-establish Charging Flow.
Step 4	This step is critical because depressing the 1B NV Start pushbutton is necessary to start the 1B NV Pump to re-establish Charging Flow.
<u>Alternate Path Critical Step Justification</u>	
Step 7	This step is critical because depressing the 1RN-64A OPEN pushbutton is necessary to start the PD Pump to complete the restoration of charging flow per Enclosure 4 of AP/1/A/5500/12.
Step 8	This step is critical because selecting the SLIMS output to be displayed on the PD Pump SLIMS and using the DOWN arrow to adjust the SLIMS Output to 0% is necessary to start the PD Pump to complete the restoration of charging flow per Enclosure 4 of AP/1/A/5500/12.
Step 10	This step is critical because depresses the PD Pump START pushbutton is necessary to start the PD Pump to complete the restoration of charging flow per Enclosure 4 of AP/1/A/5500/12.
Step 14	This step is critical because using the UP arrow on the PD Pump SLIMs, over at least a 45 second period is necessary to complete the restoration of 50 gpm charging flow per Enclosure 4 of AP/1/A/5500/12.

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-21 (100% Power, Any Time in Life).
2. Place in RUN.
3. INSERT MAL_NV029A (NV Pump A Trips Due To Overcurrent).
4. INSERT MAL_NV006B (NV Pump fails to START)
5. Respond in accordance with AP-12 (The goal is to have all four NC Pumps Lower Bearing temperatures rise above 225°F which will require a plant trip. It may be necessary to close the KC flow to the thermal barrier while doing this, but flow should be restored with bearing temperature above setpoint and stable when the IC is snapped.).
6. Ensure that Simulator reflects that AP-12 was performed to some point, E-0 was entered the when the NC Pumps high bearing temperatures occur and the NC Pumps are stopped, ES-0.1 was entered and performed to step 14.c, and AP-12 is now complete through the Step 23 RNO.
7. Insert the following LOAs:
 - REM_NV0028 EQ 0 (NC Pump 1A Seal Water Manual Control)
 - REM_NV0044 EQ 0 (NC Pump 1B Seal Water Manual Control)
 - REM_NV0060 EQ 0 (NC Pump 1C Seal Water Manual Control)
 - REM_NV0076 EQ 0 (NC Pump 1D Seal Water Manual Control)
8. Freeze the Simulator

OR

1. Reset to IC-239 (August, 2019)
2. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
3. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: During the performance of this JPM, the simulator operator may need to control CF flow to the SGs.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
*1	(Step 1) Dispatch operator to CLOSE the following valves on the NC pump(s) with hot seals: <ul style="list-style-type: none"> • 1NV-28 (1A NC Pump Seal Water Injection Throttle) (aux bldg, 733, VCT hallway at reactor bldg wall) • 1NV-44 (1B NC Pump Seal Water Injection Throttle) (aux bldg, 733+2, HH-52, VCT hallway at reactor bldg wall) • 1NV-60 (1C NC Pump Seal Water Injection Throttle) (aux bldg, 733+2, JJ-51, VCT hallway 15 ft southwest of BIT) • 1NV-76 (1D NC Pump Seal Water Injection Throttle) (aux bldg, 716+14, JJ-51, room 603, 4 ft from reactor building wall). 	The operator contacts AO and directs that they CLOSE 1NV-28. The operator contacts AO and directs that they CLOSE 1NV-44. The operator contacts AO and directs that they CLOSE 1NV-60. The operator contacts AO and directs that they CLOSE 1NV-76. BOOTH OPERATOR: As AO acknowledge direction and state "Using Time Compression, all NC Pump Sealwater Injection Throttle Valves are CLOSED."		
*2	(Step 2) Do not continue until Step 1 complete.	The operator ensure that Step 1 is complete and proceeds to Step 3.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 3) Start 1A or 1B NV pump as follows: (Step 3.a) Start associated NV Lube Oil pump.	The operator presses the 1B NV Lube Oil Pump MAN pushbutton (White PB) and then presses the START pushbutton observing the Red status light is LIT and the Green status light is OFF.		
*4	(Step 3.b) Start 1A or 1B NV pump.	The operator depresses the 1B NV Pump Start pushbutton and observed Red status remains OFF, and the Green status light is LIT. (Alternate Path) The operator proceeds to the Step 3RNO.		
5	(Step 3RNO a) IF PD pump is available, THEN start PD pump as follows: IF SI has occurred OR 1ETA is deenergized, THEN....	The operator observes the 1SI-18 SAFETY INJECTION ACTUATED status light is OFF (Or Equivalent) and recognizes that SI has not occurred or observes that the 1SI-14 LOSS/UNDERVOLTAGE Phase A, B, and C status lights are OFF and recognizes that 1ETA is energized; and proceeds to Step 3RNO b.		
6	(Step 3RNO b) Ensure 1RN-42A (AB Non Ess Supply Isol) is OPEN.	The operator observes the 1RN-42A Red status light LIT, Green status light OFF.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*7	(Step 3RNO c) OPEN the following valves: <ul style="list-style-type: none"> • 1RN-64A (AB Non Ess Return Isol) • 1RN-63B (AB Non Ess Return Isol). 	The operator depresses the 1RN-64A OPEN pushbutton and observes Red status light LIT, Green status light OFF. The operator observes the 1RN-63B Red status light LIT, Green status light OFF.		
*8	(Step 3RNO d) Ensure PD pump speed controller output set to 0%.	The operator selects the SLIMS output to be displayed on the PD Pump SLIMS and uses the DOWN arrow to adjust the SLIMS Output to 0%.		
9	(Step 3RNO e) OPEN 1NV-1047A (U1 NV PD Pump Recirc Isol).	The operator depresses the 1NV-1047A OPEN pushbutton and observes Red status light LIT, Green status light OFF.		
*10	(Step 3RNO f) Start the PD pump.	The operator depresses the PD Pump START pushbutton and observes the Red status light LIT, Green status light OFF.		
11	(Step 3RNO g) Ensure 1NV-1047A CLOSES after 2 minutes.	After two minutes, the operator observes that the 1NV-1047A Green status light is LIT, Red status light is OFF.		
12	(Step 4) Check any of the following charging pumps - ON. <ul style="list-style-type: none"> • 1A NV pump OR <ul style="list-style-type: none"> • 1B NV pump OR <ul style="list-style-type: none"> • PD pump 	The operator observes the PD Pump Red status light is LIT, Green status light is OFF and concludes that the PD Pump is running.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	(Step 5) Check all four NC pump seals - ISOLATED PER STEP 1.	The operator recognizes that all four valves were closed and proceeds to Step 6.		
*14	(Step 6) Slowly establish desired charging flow by performing one of the following: <ul style="list-style-type: none"> • THROTTLE OPEN 1NV-238 (U1 Charging Hdr Control) OR <ul style="list-style-type: none"> • WHEN 1NV-1047A (U1 NV PD Pump Recirc Isol) is closed, THEN raise PD pump speed, taking at least 45 seconds to reach desired flow. 	The operator uses the UP arrow on the PD Pump SLIMs, over at least a 45 second period, and observes Charging flow (1NVP5630) is rising to ≈50 gpm.		
15	(Step 7) GO TO Step 37 in the body of this procedure.	The operator informs the CRS of required AP12 action. Cue: Another operator will continue with this procedure.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM A

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 was at 100% power when the 1A NV Pump tripped on overcurrent.
- The 1B NV Pump was Out-Of-Service for maintenance.
- The crew entered AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection," and tripped the reactor on high bearing temperatures on the 1A NC Pump.
- The crew entered EP/1/A/5000/E-0, "Reactor Trip or Safety Injection," and transitioned to EP/1/A/5000/ES-0.1, "Reactor Trip Response."
- Maintenance has returned 1B NV pump to Operations and all clearances have been restored.
- The crew has returned to AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection," to restore charging flow.
- All NC Pump lower bearing temperature are greater than 225°F.

INITIATING CUE:

The CRS has directed you to perform Enclosure 4 (Restoring Charging Flow With Hot NC Pump Seals) of AP/1/A/5500/12, "Loss of Letdown, Charging or Seal Injection," and establish approximately 50 gpm charging flow.

SIM JPM B

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Auxiliary Feedwater Flow Control
with a Loss of Instrument AirJPM No.: 2020 Systems - Control
Room JPM B
(Alternate Path)

K/A Reference: APE 065 AA2.07 (2.8/3.2)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: X Classroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

- Initial Conditions:
- With Unit 1 at 100% power, a seismic event results in a loss of VI and a reactor trip.
 - The crew is in EP/1/A/5000/ES-0.1, "Reactor Trip Response," and continuing with AP/1/A/5500/22, "Loss of VI," as time allows.
 - The crew has just determined that VI Header pressure is less than 85 psig at Step 2 of ES-0.1.

Initiating Cue: The CRS has directed you to perform the ES-0.1 Step 2 RNO to control NC System Cooldown.

Task Standard: The operator will initiate the Step 2 RNO of ES-0.1, determine that all S/G levels are greater than 11% and rising in an uncontrolled manner, then implement Generic Enclosure 16 (CA Flow Control with a Loss of VI) to minimize cooldown and stabilize all Steam Generator levels prior to Steam Generator Narrow Range level in any Steam Generator rising to greater than 92%.

Job Performance Measure Worksheet

Required Materials: None

General References: EP/1/A/5000/E-0 (Reactor Trip or Safety Injection), Rev 36
 EP/1/A/5000/ES-0.1 (Reactor Trip Response), Rev 47
 AP/1/A/5500/22 (Loss of VI), Rev 39
 EP/1/A/500/G-1 (Generic Enclosures), Rev 41
 OMP 4-3 (Use of Emergency and Abnormal Procedures and FLEX Support Guidelines), Rev 48

Handouts: Handout 1: Pages 2-3 of 79 of EP/1/A/5000/ES-0.1 (Reactor Trip Response) marked up for place-keeping through Step 2.
 Handout 2: EP/1/A/500/G-1 (Generic Enclosures); Generic Enclosure 16 (CA Flow Control With Loss Of VI).

Time Critical Task: NO

Validation Time: 15 minutes

<u>Critical Step Justification</u>	
Step 5	This step is critical because resetting and attempting to control CA flow to the Steam Generators using the CA throttle Valves for both the TDCA and the MDCA Pumps is necessary to determine that SG levels are rising uncontrollably and that Generic Enclosure 16 (CA Flow Control with a Loss of VI) must be implemented.
Step 9	This step is critical because controlling flow from the TDCA Pump into all four Steam Generators is necessary to stabilize all Steam Generator levels prior to Steam Generator Narrow Range level in any Steam Generator rising to greater than 92%.
Step 13	This step is critical because controlling flow from the MD CA Pumps into three of the four Steam Generators is necessary to stabilize all Steam Generator levels prior to Steam Generator Narrow Range level in any Steam Generator rising to greater than 92%.
<u>Alternate Path Critical Step Justification</u>	
Step 16	This step is critical because dispatching an AO to control flow from the MD CA Pump into 1D Steam Generator is necessary to stabilize the 1D Steam Generator level prior to Narrow Range level rising to greater than 92%.

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39 (100% power, Any Time In Life).
2. Place in RUN.
3. Insert MAL-VI001B (INSTR AIR SYS LEAK:AUX-A ESS HDR) and VI001C (INSTR AIR SYS LEAK:AUX-B ESS HDR) [The goal is to have a loss of VI such that a reactor trip is required by AP-22].
4. Create a Scenario Manager File N20 JPM B.sce as follows:
 - Insert LOA_VI108 0.0 Ramp = 0, Delay = 5 Seconds
 - Insert LOA_VI109 0.0 Ramp = 8, Delay = 5 Seconds
 - Label CPJEM1A0001INP 0 (OAC Point)
 - Insert REM-CA0042B = 1 (1CA-42B [1B CA Pump Disch To 1D S/G Isol] will not move from position from the Control Room)
5. RUN Scenario Manager File N20 JPM B.sce
6. Perform AP-22 through Step 14 RNO.
7. Perform E-0 and ES-0.1 such that all CA Control valves are open delivering flow to all four Steam Generators such that Narrow Range Level for all S/Gs are greater than 11% and rising uncontrollably.
8. Freeze the Simulator

OR

1. Reset to IC-240 (August, 2019)
2. RUN Scenario Manager File N20 JPM B.sce
3. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
4. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: During the performance of this JPM, the simulator operator may need to control all plant alarms and processes not associated with the control of CA flow and Steam Generator Narrow Range Levels.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(ES-0.1, Step 2RNO) Perform the following: (ES-0.1, Step 2RNO A) IF loss of offsite power has occurred, THEN.....	The operator observes voltage on the 6900V Busses (Or Equivalent) and determines that a loss of offsite power has NOT occurred, and proceeds.		
2	(ES-0.1, Step 2RNO B) IF AT ANY TIME VI pressure is less than 60 PSIG, THEN CLOSE the following valves: <ul style="list-style-type: none"> • All MSIVs • All MSIV Bypass Valves. 	The operator observes VI pressure on 1MC13 to be less than 60 psig (≈35 psig). The operator observes Green status lights are LIT Red status lights are OFF for all four MSIVs. The operator observes all four MSIVs Bypass valves are closed using the OAC.		
3	(ES-0.1, Step 2RNO C) IF CA control valves cannot be throttled in subsequent steps, THEN control flow PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 16 (CA Flow Control With Loss Of VI).	The operator reads the Continuous Action Step and proceeds.		
4	(ES-0.1, Step 2RNO D) IF S/G N/R level is less than 11% in all S/Gs, THEN.....	The operator observes all four S/G Narrow Range levels and determines that all levels are NOT less than 11% and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	<p>(ES-0.1, Step 2RNO E) WHEN N/R level is greater than 11% in at least one S/G, THEN THROTTLE feed flow further to achieve the following:</p> <ul style="list-style-type: none"> Minimize cooldown Maintain at least one S/G N/R level greater than 11%. 	<p>The operator observes all four S/G Narrow Range levels and determines that level is greater than 11% in at least one S/G.</p> <p>The operator will reset and attempt to control CA flow to the Steam Generators using the CA throttle Valves for both the TDCA and the MDCA Pumps and determine that these valves have failed OPEN.</p> <p>NOTE:</p> <p>The operator may attempt to regain control of these valves throughout the JPM.</p> <p>The operator addresses Generic Enclosure 16.</p> <p>NOTE:</p> <p>When the operator locates Generic Enclosure 16, PROVIDE the operator with Handout 2.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	(Generic Enclosure 16, NOTE prior to Step 1) This enclosure may be required if the Unit 1 VI Blackout Header FLEX Air Tank is not providing adequate air supply or if control of CA valves is lost for any other reason such as loss of vital DC control power (1EVDA or 1EVDD). The Unit 1 VI Blackout Header FLEX Air Tank should provide air for CA control valves for 16 hours if normal VI supply is lost.	The operator reads the Note and proceeds.		
7	(Step 1) Continue to use any normal CA flow control valve that works instead of associated S/G motor operator isolation valve.	The operator reads the Continuous Action Step and proceeds.		
8	(Step 2) Check TD CA pump - ON.	The operator observes flow from the TDCA Pump into all four Steam Generators (Or Equivalent) and determines that the TD CA Pump is ON.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	<p>(Step 3) Control TD CA pump flow by operating the following TD CA pump to S/G motor operated isolation valves as required:</p> <ul style="list-style-type: none"> • 1CA-66AC (U1 TD CA Pump Disch To 1A S/G Isol) • 1CA-54AC (U1 TD CA Pump Disch To 1B S/G Isol) • 1CA-50B (U1 TD CA Pump Disch To 1C S/G Isol) • 1CA-38B (U1 TD CA Pump Disch To 1D S/G Isol). 	<p>The operator presses the 1CA-66AC CLOSE pushbutton and observes the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator presses the 1CA-54AC CLOSE pushbutton and observes the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator presses the 1CA-50B CLOSE pushbutton and observes the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator presses the 1CA-38B CLOSE pushbutton and observes the Green status light is LIT, and the Red status light is OFF.</p>		
10	(Step 4) Check 1A or 1B CA pump - ON.	The operator observes flow from the 1A and 1B MD CA Pump into all four Steam Generators (Or Equivalent) and determines that both MD CA Pumps are ON.		
11	(Note prior to Step 5) At S/G pressures less than 600 PSIG, only one S/G is fed at a time from each MD CA pump through an unthrottled discharge path, to ensure adequate margin to pump runout and overcurrent trip setpoint.	The operator reads the Note and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	<p>(Step 5) IF AT ANY TIME S/G pressure is less than 600 PSIG, THEN perform the following:</p> <ul style="list-style-type: none">• Only feed one S/G at a time from each MD CA pump until flow is throttled in subsequent steps.• Ensure each MD CA pump flow is maintained less than 600 GPM.	<p>The operator observes S/G pressure to be greater than 600 psig.</p> <p>The operator reads the Continuous Action Step and proceeds.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*13	<p>(Step 6) Control MD CA pump flow by operating the following CA to S/G motor operated isolation valves as required:</p> <p>1A CA pump:</p> <ul style="list-style-type: none"> • 1CA-62A (1A CA Pump Disch To 1A S/G Isol) • 1CA-58A (1A CA Pump Disch To 1B S/G Isol). <p>1B CA pump:</p> <ul style="list-style-type: none"> • 1CA-46B (1B CA Pump Disch To 1C S/G Isol) • 1CA-42B (1B CA Pump Disch To 1D S/G Isol). 	<p>The operator presses the 1CA-62A CLOSE pushbutton and observes the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator presses the 1CA-58A CLOSE pushbutton and observes the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator presses the 1CA-46B CLOSE pushbutton and observes the Green status light is LIT, and the Red status light is OFF.</p> <p>The operator presses the 1CA-42B CLOSE pushbutton and observes the Red status light remains LIT, and the Green status light remains OFF.</p> <p>NOTE:</p> <p>When the operator attempts to close 1CA-42B the valve will not move from position. (Alternate Path)</p> <p>The operator will recognize that 1CA-42B cannot be controlled from the MCB and proceed to the RNO.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	(Step 6 RNO A) Control MD CA pump flow as follows: IF any of the CA to S/G motor operator isolation valves OR air operated control valves work, THEN continue to control that S/G level from the Control Room.	The operator recognizes that the motor operator isolation valves for all CA flow loops with the exception of the MD CA Pump to the 1D Steam Generator are operating and proceeds with the RNO.		
15	(Note prior to Step 6 RNO B) Valves take 20-22 turns to stroke. Most of the throttling occurs in the first 4 turns from closed seat.	The operator reads the Note and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*16	<p>(Step 6 RNO B) Dispatch operator to unlock and THROTTLE the following valve(s) on just the S/G(s) that flow cannot be controlled from the Control Room:</p> <p>1D S/G: 1CA-39 (1B CA Pump Disch To 1D S/G Control Inlet Isol) (Unit 1 CA pump rm, 716+12, CC-50, 6 ft north of 1B CA Pump near reactor bldg wall).</p>	<p>The operator contacts an AO to unlock and THROTTLE 1CA-39</p> <p>BOOTH OPERATOR:</p> <p>Close 1CA-39 using REM-CA0039 and report that the valve has been closed.</p> <p>The operator determines that all four Steam Generator Narrow Range levels are under control between 11-92%.</p> <p>NOTE:</p> <p>The operator will continue with Enclosure 16 until feedback is provided from the AO.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM B

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- With Unit 1 at 100% power, a seismic event results in a loss of VI and a reactor trip.
- The crew is in EP/1/A/5000/ES-0.1, "Reactor Trip Response," and continuing with AP/1/A/5500/22, "Loss of VI," as time allows.
- The crew has just determined that VI Header pressure is less than 85 psig at Step 2 of ES-0.1.

INITIATING CUE:

The CRS has directed you to perform the ES-0.1 Step 2 RNO to control NC System Cooldown.

SIM JPM C

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: CA Suction Source RealignmentJPM No.: 2020 Systems - Control Room JPM C (Alternate Path)

K/A Reference: 061 A2.07 (3.4/3.5)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

Initial Conditions:

- Unit 1 has just tripped from 100% power, due to seismic activity.
- The crew is now implementing EP/1/A/5000/ES-0.1 (Reactor Trip Response).
- The CA Storage Tank has developed a leak, and level has lowered to 1.5 feet.

Initiating Cue: The CRS has directed you to perform EP/1/A/5000/G-1, Generic Enclosure 20 (CA Suction Source Realignment), while the crew continues with ES-0.1.

Task Standard: The operator will realign the suction of the CA Pumps from the non-safety related to the safety-related source (RN). During this action, the operator will recognize that RN Supply to the 1B MDCA Pump cannot be established and stop the pump.

Required Materials: None

Job Performance Measure Worksheet

General References: EP/1/A/5000/E-0 (Reactor Trip or Safety Injection), Rev 36
EP/1/A/5000/ES-0.1 (Reactor Trip Response), Rev 47
EP/1/A/5000/G-1 (Generic Enclosures), Rev 41
OMP 4-3 (Use of Emergency and Abnormal Procedures and FLEX
Support Guidelines Procedures), Rev 48

Handouts: Handout 1: Blank copy of Enclosure 20 (CA Suction Source
Realignment) of EP/1/A/5000/G-1 (Generic Enclosures).

Time Critical Task: NO

Validation Time: 8 minutes

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 4	This step is critical because pressing the 1RN-69A OPEN pushbutton is necessary to realign the suction of the CA Pumps from the non-safety related to the safety-related source.
Step 5	This step is critical because pressing the 1CA-15A OPEN pushbutton is necessary to realign the suction of the CA Pumps from the non-safety related to the safety-related source.
Step 6	This step is critical because pressing the 1CA-86A OPEN pushbutton is necessary to realign the suction of the CA Pumps from the non-safety related to the safety-related source.
<u>Alternate Path Critical Step Justification</u>	
Step 12	This step is critical because pressing the STOP pushbutton for the 1B MDCA Pump is necessary to stop the 1B MDCA pump.
Step 15	This step is critical because pressing the 1CA-11A CLOSE pushbutton is necessary to realign the suction of the CA Pumps from the non-safety related to the safety-related source.
Step 19	This step is critical because pressing the 1CA-7AC CLOSE is necessary to realign the suction of the CA Pumps from the non-safety related to the safety-related source.

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39 (100%).
2. Place Simulator in RUN.
3. Ensure that the B Train of RN is in operation.
4. Insert REM_CA0018B=0 to ensure that 1CA-18B (1B CA Pump Suction from 1B RN Isol) will not OPEN.
5. Insert (CA) PLP_078 = 1.00 – (Simulates Leak in CAST).
6. Override ON OBE Exceeded Annunciator (1AD-13 E-7). (1AD13_E07 = ON)
7. Manually trip the reactor and perform the actions of EP/1/A/5000/E-0, and transition to EP/1/A/5000/ES-01.
8. Ensure both MDCA Pumps are running, acknowledge and silence all annunciators, and Freeze the Simulator.

OR

1. Reset to IC-241 (August, 2019)
2. Run Scenario Manager file N20 JPM C.sce.
3. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
4. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: **The Booth/Floor Instructor will need to control BOP during the performance of this JPM and ENSURE that SI Actuation is NOT needed.**

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Enclosure 20, Step 1/1.A) Check if RN assured CA suction should be immediately aligned as follows: Check if failure (causing leak) of CA Storage Tank (water tower) or associated CA suction piping - KNOWN TO EXIST.	The operator recognizes from the Initial Conditions that a CAST leak exists, and proceeds.		
2	(Step 1.B) GO TO Step 4.	The operator proceeds to Step 4.		
3	(Step 4) Align A train RN to CA suction as follows: (Step 4.A) Start 1A RN pump.	The operator observes the 1A RN Pump Red status light LIT, Green status light OFF; and motor amps at \approx 88 amps and determines the 1A RN Pump is running.		
*4	(Step 4.B) OPEN 1RN-69A (1A RN Assured Supply To Unit 1 CA Isol).	The operator presses the 1RN-69A OPEN pushbutton and observes the Red status light LIT, Green status light OFF. The operator will acknowledge alarm on 1AD-5.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	(Step 4.C) OPEN 1CA-15A (1A CA Pump Suction From 1A RN Isol)	The operator presses the 1CA-15A OPEN pushbutton and observes the Red status light LIT, Green status light OFF. The operator will acknowledge alarm on 1AD-5.		
*6	(Step 4.D) OPEN 1CA-86A (U1 TD CA Pump Suction From 1A RN Isol).	The operator presses the 1CA-86A OPEN pushbutton and observes the Red status light LIT, Green status light OFF. The operator will acknowledge alarm on 1AD-5.		
7	(Step 5) Align B train RN to CA suction as follows: (Step 5.A) Start 1B RN pump.	The operator observes the 1B RN Pump Red status light LIT, Green status light OFF; and motor amps at \approx 88 amps and determines the 1B RN Pump is running.		
8	(Step 5.B) OPEN 1RN- 162B (1B RN Assured Supply To Unit 1 CA Isol).	The operator presses the 1RN-162B OPEN pushbutton and observes the Red status light LIT, Green status light OFF. The operator will acknowledge alarm on 1AD-5.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
9	(Step 5.C) OPEN 1CA-18B (1B CA Pump Suction From 1B RN Isol).	The operator presses the 1CA-18B OPEN pushbutton and observes the Green status light remains LIT, Red status light OFF (Alternate Path) . The operator proceeds to the RNO.		
10	(Step 5.C RNO) IF 1B CA pump is on, THEN stop 1B MD CA pump as follows: (Step 5.C RNO 1) Reset S/I.	The operator may press the RESET Pushbuttons and observes RESET status lights LIT for both Train A and B SI. (Already RESET)		
11	(Step 5.C RNO 2) Reset 1B Sequencer.	The operator may press the Sequencer RESET and observes RESET status lights LIT Pushbuttons for both Train A and B. (Already RESET)		
*12	(Step 5.C RNO 3) Stop 1B CA pump.	The operator presses the STOP pushbutton for the 1B MDCA Pump and observes the Green status light LIT, Red status light OFF; and that motor amps drop to 0. The operator will acknowledge alarm on 1AD-5.		
13	(Step 5.C RNO 4) IF 1B CA pump still on,....	The operator observes that the 1B MDCA Pump is OFF, and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	(Step 5.D) OPEN 1CA-116B (U1 TD CA Pump Suction From 1B RN Isol).	The operator presses the 1CA-116B OPEN pushbutton and observes the Red status light LIT, Green status light OFF. The operator will acknowledge alarm on 1AD-5.		
*15	(Step 6) Isolate non-safety CA suction sources from MD CA pumps as follows: (Step 6.A) CLOSE 1CA-11A (1A CA Pump Suction Isol).	The operator presses the 1CA-11A CLOSE pushbutton and observes the Green status light LIT, Red status light OFF.		
16	(Step 6.B) CLOSE 1CA-9B (1B CA Pump Suction Isol).	The operator presses the 1CA-9B CLOSE pushbutton and observes the Green status light LIT, Red status light OFF.		
17	(Step 7) Isolate non-safety CA suction sources from TD CA pump as follows: (Step 7.A) Check the following valves - OPEN: 1RN-69A (1A RN Assured Supply To Unit 1 CA Isol) 1CA-86A (U1 TD CA Pump Suction From 1A RN Isol).	The operator observes the 1RN-69A Red status light LIT, Green status light OFF. The operator observes the 1CA-86A Red status light LIT, Green status light OFF.		
18	(Step 7.B) GO TO Step 7.D.	The operator proceeds to Step 7.D.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*19	(Step 7.D) CLOSE 1CA-7AC (U1 TD CA Pump Suction Isol).	The operator presses the 1CA-7AC CLOSE pushbutton and observes the Green status light LIT, Red status light OFF.		
20	(Step 8) WHEN time allows, THEN....	<div>Cue:</div> <div>Another operator will complete the remaining steps.</div>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM C

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 has just tripped from 100% power, due to seismic activity.
- The crew is now implementing EP/1/A/5000/ES-0.1 (Reactor Trip Response).
- The CA Storage Tank has developed a leak, and level has lowered to 1.5 feet.

INITIATING CUE:

The CRS has directed you to perform EP/1/A/5000/G-1, Generic Enclosure 20 (CA Suction Source Realignment), while the crew continues with ES-0.1.

SIM JPM D

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Place LTOP in Service and
Respond to a Failed PORVJPM No.: 2020 Systems - Control
Room JPM D
(Alternate Path)

K/A Reference: 010 A4.03 (4.0/3.8)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

Initial Conditions:

- A Unit 1 NC cooldown and depressurization is in progress in accordance with OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F).
- Attachment 2 (Cooldown to 240°F (Control Room Activities)) is in progress.
- The 1A and 1B NCPs are operating.
- NC System pressure is ≈320 psig and NC System temperature is 310-320°F.
- NC Pressure control via normal spray and PZR heaters.
- NC pressure is being controlled using 1NC-29C, 1B NC Loop Pzr Spray Control, in MANUAL.
- Attachment 1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) has been completed through Step 3.13.a.
- LTOP vent requirements are to be satisfied by Pzr PORVs 1NC-32B and 1NC-34A.

Job Performance Measure Worksheet

Initiating Cue: The CRS has directed you to place the LTOP System in operation beginning with Step 3.13.b - of Attachment 1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) and monitor for proper operation.

Task Standard: The operator will place LTOP in service by first placing 1NC-32B in service per procedure; and then respond to a failed open Pzr PORV (1NC-34A) by closing the failed open Pzr PORV Block Valve.

Required Materials: None

General References: OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F), Rev 73
OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation), Rev 43
AP/1/A/5500/11 (Pressurizer Pressure Anomalies), Rev 12
AD-OP-ALL-1001 (Conduct of Abnormal Operations), Rev 3
OMP 4-3 (Use of Emergency And Abnormal Procedures And FLEX Support Guidelines), Rev 48

Handouts: Handout 1: Enclosure 4.1 (Placing LTOP System in Service per OP/1/A/6100/SO-10 (Cooldown to 240 Degrees F)) marked up for place-keeping through Step 3.13.a.

Time Critical Task: NO

Validation Time: 10 minutes

NOTE: This JPM should be pre-briefed in the Briefing Room.

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 7	This step is critical because placing the PORV Overpress Protection Select Switch in LOW PRESS is necessary to change the Pzr PORV mode of operation from Normal mode to the Low Temperature Overpressure Protection (LTOP) mode.
Step 13	This step is critical because placing the PORV Overpress Protection Select Switch in LOW PRESS is necessary to change the Pzr PORV mode of operation from Normal mode to the Low Temperature Overpressure Protection (LTOP) mode.
<u>Alternate Path Critical Step Justification</u>	
Step 17	This step is critical because placing the 1NC-33A Control Switch in the CLSD position is necessary to respond to a failed open Pzr PORV (1NC-34A) by closing the failed open Pzr PORV Block Valve.

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-45.
2. Place in RUN
3. Adjust NCS Temperature to 300-320°F, and NCS Pressure to 320-330 psig.
4. Place LTOP PORV switches in NORMAL
5. When NCS Temperature/Pressure in range place Steam Dump System in AUTO (SG Pressure ≈70 psig)
6. Ensure that Simulator reflects that Attachment 2 of OP/1/A/6100/SD-4 is complete through Step 3.19 and Attachment 1 of OP/1/A/6100/SO-10 is completed through Step 3.13.a.
7. Insert **REM_NC0034A=1 cd X10_162_1EQ1 (Conditional on the LOW PRESS position of the PORV Overpress Protection Select 1NC-34A)**
8. Freeze the Simulator

OR

1. Reset to IC-242 (August, 2019)
2. Run Scenario Manager file N20 JPM D.sce.
3. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
4. Ensure that the “AFD” Computer screen displays the “C/D Tab” panel and that the “BOP” screen displays the “NCLTOP” panel.
5. Place Info Stickers on PORV Controls.
6. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: **During the performance of this JPM, the simulator operator may need to control CF flow to the SGs (Monitor Wide Range Levels).**

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Step 3.13.b) Ensure in service: M1A1359 (NC NR Pressure for 1NC-32B actuation). M1A1365 (NC NR Pressure for 1NC-34A actuation).	The operator calls up both points on OAC.		
2	(Step 3.13.c) Monitor: M1A1359 (NC NR pressure for 1NC-32B actuation). M1A1365 (NC NR pressure for 1NC-34A actuation).	The operator monitors both points and observes NC NR Pressure to be between 320-330 psig.		
3	(Step 3.13.d) Ensure the following for A Cold Leg Accumulator: Pressure greater than 200 psig. Level less than 38.7% (7342 gallons maximum).	The operator observes 1NIP-5050 and 1NIP-5040 and determines A CLA pressure to be ≈610 psig. The operator observes 1NIP-5051 and 1NIP-5041 and determines A CLA Level to be ≈30%.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<p>(Step 3.13.e) Ensure the following for B Cold Leg Accumulator:</p> <p>Pressure greater than 200 psig.</p> <p>Level less than 38.7% (7342 gallons maximum).</p>	<p>The operator observes 1NIP-5070 and 1NIP-5060 and determines B CLA pressure to be \approx610 psig.</p> <p>The operator observes 1NIP-5071 and 1NIP-5061 and determines B CLA Level to be \approx25%.</p>		
5	<p>(Step 3.13.f) Ensure OPEN:</p> <p>1NC-31B (Pzr PORV Isol).</p> <p>1NC-33A (Pzr PORV Isol).</p>	<p>The operator observes Red status light LIT, Green status light OFF for 1NC-31B.</p> <p>The operator observes Red status light LIT, Green status light OFF for 1NC-33A.</p>		
6	<p>(Note prior to Step 3.13.g) For NC Loop in which an NC Pump is operating, NR pressure may indicate up to 30 psig lower than NR pressure for NC Loop in which an NC Pump is NOT operating.</p>	<p>The operator reads the Note, and proceeds to Step 3.13.g.</p>		
*7	<p>(Step 3.13.g) When M1A1359 indicates 320-330 psig, perform the following:</p> <p>(Step 3.13.g.1) Select "LOW PRESS" on "PORV Overpress Protection Select 1NC-32B."</p>	<p>The operator observes M1A1359 is between 320-330 psig and selects LOW PRESS on PORV Overpress Protection Select 1NC-32B.</p> <p>NOTE: 1AD-6/F-10 will alarm.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	(Step 3.13.g.2) Ensure 1NI-431B (Emerg N2 from CLA to 1NC-32B & 36B) OPEN.	<p>The operator observes that Red status light is LIT, Green status light OFF for 1NI-431B.</p> <p>NOTE: If CLOSED, the operator presses the OPEN Pushbutton and Observes Red status light is LIT, Green status light OFF for 1NI-431B.</p>		
9	(Step 3.13.g.3) Check lit 1AD-6, F10 (PORV NC-32B Emerg CLA N ₂ Enabled)	The operator observes that 1AD-6, F-10 is LIT.		
10	(Note prior to Step 3.13.g.4) Continue with the rest of the procedure while performing Step 3.13.g.4.	The operator reads the Note, and proceeds to Step 3.13.g.4.		
11	(Step 3.13.g.4) Place Info Sticker on control switch for 1NI-431B stating: "Do <u>NOT</u> operate, N ₂ aligned to 1NC-32B for LTOP."	<div> <p>Cue:</p> <p>Another operator has filled out and placed an Info Sticker for 1NI-431B</p> </div> <p>The operator acknowledges and proceeds to Step 3.13.g.5.</p>		
12	(Step 3.13.g.5) Ensure 1NC-32B (Pzr PORV) in "AUTO."	The operator observes that Control Switch for 1NC-32B is in AUTO.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*13	<p>(Step 3.13.h) WHEN M1A1365 indicates 320-330 psig, THEN perform the following:</p> <p>(Step 3.13.h.1) Select "LOW PRESS" on "PORV Overpress Protection Select 1NC-34A."</p>	<p>The operator observes M1A1365 is between 320-330 psig and selects LOW PRESS on PORV Overpress Protection Select 1NC-34A (Alternate Path).</p> <p>NOTE:</p> <p>When this occurs 1NC-34A will fail full open, causing NCS pressure to lower, and creating the plant conditions need to enter AP/1/A/500/11, Pressurizer Pressure Anomalies.</p> <p>The operator will carry out the Immediate Actions of AP11.</p> <p>NOTE:</p> <p>The operator may take the immediate actions without addressing AP11 first. (Section 5.2.5 of OMP 4-3 and Section 3.12, 5.1.4.1, and 5.7.3 of AD-OP-ALL-1001).</p>		
14	<p>(AP11 Immediate Action Step 1) Check Pzr pressure - HAS GONE DOWN.</p>	<p>The operator observes NCS pressure to be lowering rapidly.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	(Immediate Action Step 2) Check Pzr PORVs - CLOSED.	The operator observes the 1NC-34A Red status light is LIT and determines that the valve is OPEN.		
16	(Immediate Action Step 2 RNO) Perform the following: (Immediate Action Step 2 RNO A) CLOSE PORVs.	The operator rotates the 1NC-34A control Switch to CLOSE.		
17 *	(Immediate Action Step 2 RNO) Perform the following: (Immediate Action Step 2 RNO B) IF PORV will not close, THEN CLOSE PORV isolation valve.	The operator observes that 1NC-34A is still OPEN and places the 1NC-33A Control Switch in the CLSD position; and observes the 1NC-33A Green status light is LIT, and the Red status light is OFF.		
18	(Immediate Action Step 3) Check Pzr spray valves - CLOSED.	The operator observes that only the 1NC-27C SLIM CLOSED window light is LIT. The operator observes that only the 1NC-29C SLIM CLOSED window light is LIT.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM D

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A Unit 1 NC cooldown and depressurization is in progress in accordance with OP/1/A/6100/SD-4 (Cooldown to 240 Degrees F).
- Attachment 2 (Cooldown to 240°F (Control Room Activities)) is in progress.
- The 1A and 1B NCPs are operating.
- NC System pressure is ≈ 320 psig and NC System temperature is 310-320°F.
- NC Pressure control via normal spray and PZR heaters.
- NC pressure is being controlled using 1NC-29C, 1B NC Loop Pzr Spray Control, in MANUAL.
- Attachment 1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) has been completed through Step 3.13.a.
- LTOP vent requirements are to be satisfied by Pzr PORVs 1NC-32B and 1NC-34A.

INITIATING CUE:

The CRS has directed you to place the LTOP System in operation beginning with Step 3.13.b - of Attachment 1 of OP/1/A/6100/SO-10 (Controlling Procedure for LTOP Operation) and monitor for proper operation.

SIM JPM E

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Restore Normal Power to 1ETB and
Unload the 1B EDG/Respond to
1ETB LockoutJPM No.: 2020 Systems - Control
Room JPM E
(Alternate Path)

K/A Reference: 056 AA1.02 (4.0/3.9)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom _____ Simulator X Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

Initial Conditions:

- Unit 1 was operating at 100% power when the normal power breaker to 1ETB was inadvertently opened.
- The 1B EDG started and re-energized the bus and sequenced loads onto 1ETB as expected.
- The crew entered AP/1/A/5500/07, Loss of Electrical Power, Case II, Loss of Normal Power to Either 1ETA or 1ETB; and are currently at Step 86.
- An investigation has revealed that the breaker was inadvertently opened, and that the breaker is ready to be re-closed.
- The crew is attempting to return 1ETB to normal power and shutdown the 1B D/G.
- AO John is standing by in the field to support this activity.

Initiating Cue:

The CRS has directed you to restore 1ETB to normal power and separate the 1B D/G from the Grid from the Control Room per OP/1/A/6350/002 (Diesel Generator), Enclosure 4.4 (1B D/G Shutdown).

Job Performance Measure Worksheet

Task Standard: While 1ETB is being powered by the 1B D/G, the operator will parallel 1ETB, with 1ATD, and then unload the 1B D/G. Once the 1ETB Emergency Breaker is opened, Bus 1ETA will experience an overcurrent lockout, and the operator will carry out the immediate actions of AP/1/A/5500/07 by starting the 1B NV Pump and the 1B KC Pumps manually.

Required Materials: None

General References: EP/1/A/5000/E-0 (Reactor Trip or Safety Injection), Rev 36
EP/1/A/5000/ES-0.1 (Reactor Trip Response), Rev 47
AP/1/A/5500/07 (Loss of Electrical Power), Rev 40
OP/1/A/6350/002 (Diesel Generator), Rev 130
OMP 4-3 (Use of Emergency And Abnormal Procedures And FLEX Support Guidelines), Rev 48
AD-OP-ALL-1001 (Conduct of Abnormal Operations), Rev 3

Handouts: Handout 1: Enclosure 4.4 of OP/1/A/6350/002 (Diesel Generator) marked up through Step 3.1.

Time Critical Task: NO

Validation Time: 15 minutes

NOTE: The JPM should be pre-briefed in the Briefing Room.

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 1	This step is critical because rotating the "1B D/G Mode Select" switch counter-clockwise to the C/R position is necessary for the Control Room operator to control the 1B D/G.
Step 4	This step is critical because rotating "1B D/G Volt Adjust" switch clockwise and/or counterclockwise as necessary to match voltages is necessary to parallel 1ETB (powered by the 1B D/G), with 1ATD.
Step 5	This step is critical because rotating the 1B D/G Sync Scope Switch to ON is necessary to parallel 1ETB (powered by the 1B D/G), with 1ATD.
Step 7	This step is critical because depressing the RAISE/LOWER pushbutton causing the synchroscope to move slowly in the FAST direction is necessary to parallel 1ETB (powered by the 1B D/G), with 1ATD.
Step 8	This step is critical because depressing the 1ETB Normal Breaker CLOSE pushbutton with the synchroscope pointer is 3 minutes before vertical is necessary to parallel 1ETB (powered by the 1B D/G), with 1ATD.
Step 9	This step is critical because pressing the Raise pushbutton to raise DG load after paralleling and rotating the Voltage Adjust handle to raise power factor within band are necessary to parallel 1ETB (powered by the 1B D/G), with 1ATD.
Step 14	This step is critical because depressing the 1B D/G Gov Control LOWER pushbutton until load meter indicates < 200 KW is necessary to unload the 1B D/G.
Step 15	This step is critical because depressing the 1ETB Emergency Breaker OPEN pushbutton is necessary to unload the 1B D/G.
<u>Alternate Path Critical Step Justification</u>	
Step 19	This step is critical because pressing the 1B NV Pump, 1B1 KC Pump and 1B2 KC Pump START Pushbutton is necessary to carry out the immediate actions of AP/1/A/5500/07.

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-21, 100% Power (or equivalent at power IC).
2. Ensure that Train A Pumps are in service.
3. Place Simulator in RUN and allow time to stabilize.
4. Open the 1ETB Normal Power Breaker (Simulating an inadvertent opening of the breaker).
5. Insert MAL_EP008A on Trigger #1 and establish a condition such that when the 1ETB Emergency Breaker is opened the malfunction will go active (H_X11_229_3_1 [Emergency Breaker OPEN light is LIT]).
6. Perform the actions of Case II AP/1/A/5500/07 up through step 86.B.
7. Freeze the Simulator

OR

1. Reset to IC-243 (August, 2019)

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
*1	(Step 3.2) Place Control Room "1B D/G Mode Select" switch to the applicable position: "LOCAL" to operate D/G from local panel. OR "C/R" to operate D/G from Control Room.	The operator rotates the "1B D/G Mode Select" switch counter-clockwise to C/R for the 1B D/G.		
2	(Step 3.3) If D/G is operating Unloaded,.....	The operator observes Emergency Breaker status (Red light LIT) and determines that the D/G is not running unloaded (Or Equivalent).		
3	(Step 3.4) IF D/G is carrying 1ETB separated from the Duke Grid, THEN parallel D/G to Grid as follows: (Step 3.4.1) Check "Line Volts" 3960-4360 V.	The operator observes Normal and Emergency Breaker status and determines that the D/G is separated from the Duke Grid. The operator observes Line Volts Meter at ≈4175V.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(Step 3.4.2) Match D/G voltage with line voltage using "1B D/G Voltage Adjust."	The operator rotates "1B D/G Voltage Adjust" switch clockwise and/or counterclockwise as necessary and observes voltage meters are matched.		
*5	(Step 3.4.3) Place the "1B D/G Sync Switch" to "ON."	<p>The operator rotates the 1B D/G Sync Scope Switch to ON.</p> <p>The operator observes synch scope meter dial is NOT moving or moving slowly in the SLOW direction.</p>		
6	(Note prior to Step 3.4.4) As a guide, have synchroscope traveling no faster than one revolution in 20 seconds.	The operator reads the NOTE and proceeds.		
*7	(Step 3.4.4) Using "1B D/G Gov Control," adjust D/G speed to allow synchroscope to move slowly and smoothly in "FAST" direction.	The operator depresses the RAISE/LOWER pushbutton causing the synchroscope to move slowly in the FAST direction.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	<p>(Step 3.4.5) IF desired to align 1ETB to normal supply (1ATD), perform the following:</p> <p>(Notes prior to Step 3.4.5.1):</p> <ul style="list-style-type: none"> • D/G load will drop to 0 amps when bus is paralleled to Duke Grid. • D/G load shall be quickly raised after breaker closed to prevent reverse power condition. IF a reverse power condition occurs, the D/G Emergency Breaker will trip after a short time delay. • Steps 3.4.5.1 and 3.4.5.2 may be completed and then signed off as time allows. <p>(Step 3.4.5.1) HOLD until synchroscope pointer is within 3 minutes before the 12 o'clock position, THEN firmly depress AND release "CLOSE" on "1ETB Normal Breaker."</p>	<p>The operator determines from initial conditions that it is desired to align 1ETB to 1ATD.</p> <p>The operator reads the NOTES and proceeds.</p> <p>The operator observes pointer is 3 minutes before vertical, then depresses the 1ETB Normal Breaker CLOSE pushbutton and observes Red Status light is LIT.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	<p>(Step 3.4.5.2) Perform concurrently:</p> <p>Quickly raise D/G load to 800 - 1000 KW using "1B D/G Gov Control."</p> <p>Adjust power factor to 0.90 – 0.92 lagging using "1B D/G Voltage Adjust."</p>	<p>The operator presses Raise pushbutton and observes KW meter indicates 800-1000KW.</p> <p>The operator rotates Voltage Adjust handle and observes meter indication reads 0.9 Lagging.</p>		
10	(Step 3.4.5.3) Place "1B D/G Sync Switch" to "OFF."	The operator turns the 1B D/G Sync scope to OFF.		
11	(Step 3.4.5.4) Evaluate Offsite Power OPERABILITY.	The operator has the CRS sign for offsite power operability.		
		<p>Cue:</p> <p>As CRS, initial Step 3.4.5.4.</p>		
12	(Step 3.4.5.5) Go to Step 3.5.9.	The operator proceeds to Step 3.5.9.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	(Step 3.5.9) HOLD for 10 minutes	The operator waits for 10 minutes.		
		Cue: Using TIME COMPRESSION, the 1B D/G has been at the current load for 10 minutes.		
*14	(Step 3.5.10) Perform the following: (Step 3.5.10.1) Lower D/G load to less than 200 kW using "1B D/G Gov Control."	The operator depresses the 1B D/G Gov Control LOWER pushbutton until load meter indicates < 200 KW. The operator observes that meter indicates < 200KW.		
*15	(Step 3.5.10.2) Open "1ETB Emergency Breaker."	The operator depresses the 1ETB Emergency Breaker OPEN pushbutton and observes the Green Status light is LIT.		
Simulator Instructor NOTE: Trigger #1 is set up to cause an Overcurrent Lockout on Bus 1ETA when the 1ETB Emergency Breaker is OPEN. (Alternate Path)				

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
16	(Note prior to Step 3.6) IF D/G has been loaded less than full load (3600 - 4000 kW) for an extended event, performing a full load run for 1 hour essentially reconfirms McGuire Tech Spec SR 3.8.1.3 AND conforms to industry practices.	The operator will recognize that an Overcurrent Lockout has occurred on 1ETA and perform the Immediate Actions of Case II of AP/1/A/5500/07.		
		NOTE: The operator may take the immediate actions without addressing AP7 first. (Section 5.2.5 of OMP 4-3 and Section 3.12, 5.1.4.1, and 5.7.3 of AD-OP-ALL-1001).		
17	(AP/1/A/5500/07 IA Step 1) Check affected bus(s) - ENERGIZED AND SEQUENCER APPLYING LOADS.	The operator observes 1ETA remains de-energized, and proceeds to the RNO.		
18	(AP/1/A/5500/07 IA Step 1RNO.A) Perform the following: IF both busses deenergized, THEN....	The operator observes that 1ETB is energized, and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*19	<p>(AP/1/A/5500/07 IA Step 1RNO.B) Perform the following:</p> <p>Ensure the following pumps running on energized bus:</p> <ul style="list-style-type: none"> NV pump KC pumps RN pump. 	<p>The operator presses the 1B NV Pump START Pushbutton and observes the Red status light is LIT, and the Green status light is OFF.</p> <p>The operator presses the 1B1 KC Pump START Pushbutton and observes the Red status light is LIT, and the Green status light is OFF.</p> <p>The operator presses the 1B2 KC Pump START Pushbutton and observes the Red status light is LIT, and the Green status light is OFF.</p> <p>The operator observes the 1B RN Pump Red status light is LIT, and the Green status light is OFF.</p>		
		<p>Cue:</p> <p>Another operator will continue with this procedure.</p>		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM E

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 was operating at 100% power when the normal power breaker to 1ETB was inadvertently opened.
- The 1B EDG started and re-energized the bus and sequenced loads onto 1ETB as expected.
- The crew entered AP/1/A/5500/07, Loss of Electrical Power, Case II, Loss of Normal Power to Either 1ETA or 1ETB; and are currently at Step 86.
- An investigation has revealed that the breaker was inadvertently opened, and that the breaker is ready to be re-closed.
- The crew is attempting to return 1ETB to normal power and shutdown the 1B D/G.
- AO John is standing by in the field to support this activity.

INITIATING CUE:

The CRS has directed you to restore 1ETB to normal power and separate the 1B D/G from the Grid from the Control Room per OP/1/A/6350/002 (Diesel Generator), Enclosure 4.4 (1B D/G Shutdown).

SIM JPM F

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Control Room Air Intake High
Radiation AlarmsJPM No.: 2020 Systems - Control
Room JPM F

K/A Reference: 061 AA2.01 (3.5/3.7)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

Initial Conditions:

- Units 1 and 2 are operating at 100% power.
- Annunciator 1RAD-2 B2, EMF 43B CR AIR INTAKE B HI RAD, alarmed 45 seconds ago.
- Annunciator 1RAD-1 B2, EMF 43A CR AIR INTAKE A HI RAD, alarmed 15 seconds ago.

Initiating Cue: The CRS has directed you to perform the Annunciator Response Procedures for both alarms.

Task Standard: The operator will determine that the Unit 2 intake presents a greater threat than Unit 1 and align the VC inlet to take suction on Unit 1 only; and then pressurize the Control Room from the B Train Outside Air Pressure Fan.

Required Materials: None

General References: OP/1/A/6100/010 Q (Annunciator Response for Panel 1RAD-1), Rev 68
OP/1/A/6100/010 R (Annunciator Response for Panel 1RAD-2), Rev 42

Job Performance Measure Worksheet

OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System), Rev 107

AD-HU-ALL-004 (Procedure And Work Instruction Use and Adherence), Rev 10

Handouts: Handout 1: OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System)

Time Critical Task: NO

Validation Time: 10 minutes

<u>Critical Step Justification</u>	
Step 8	This step is critical because observing EMF 43A and EMF 43B and determining that EMF 43B has the highest reading is necessary to determine that the operator must align the VC inlet to take suction on Unit 1 only.
Step 13	This step is critical because pressing the 1VC-9A, 10A, 11B and 12B CLOSE pushbutton is necessary to align the VC inlet to take suction on Unit 1 only.
Step 14	This step is critical because determining that both EMF 43A and EMF 43B are valid alarms is necessary to pressurize the Control Room from the B Train Outside Air Pressure Fan.
Step 21	This step is critical because rotating the B Train CR Outside Air Press Fan Control Switch to the ON position is necessary to pressurize the Control Room from the B Train Outside Air Pressure Fan.
Step 22	This step is critical because pressing the MAN pushbutton for #1 & #2 CRA Otsd Air Fan is necessary to pressurize the Control Room from the B Train Outside Air Pressure Fan.
Step 23	This step is critical because pressing the OFF pushbutton for CRA-OAD-3 and 4 is necessary to pressurize the Control Room from the B Train Outside Air Pressure Fan.

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39 (100%).
2. Place in RUN
3. Adjust the output of EMF 43B to greater than the Trip II setpoint (Insert MAL_EMF-43B = 5400).
4. Adjust the output of EMF 43A to greater than the Trip II setpoint, but less than the value of EMF 43B (Insert MAL_EMF-43A = 4100).
5. Ensure 1RAD-1 B2 and 1RAD-2 B2 are both LIT.
6. Ensure Air Intake Valves from BOTH Units are OPEN.
7. Ensure that the B Train of VC/YC is operating.
8. Acknowledge all alarms.
9. Freeze the Simulator

OR

1. Reset to IC-244 (August, 2019)
2. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
3. Leave Simulator in FREEZE until operator is ready to begin.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(OP/1/A/6100/010 Q, 1RAD-1 B2 IA) Perform OP/0/A/6450/011 (Control Area Ventilation / Chilled Water System) Enclosure 4.14 (Response When EMF 43A and/or EMF 43B In Trip 2 or Non-Functional).	<p>After checking the other ARP, the operator proceeds to OP/0/A/6450/011 Enclosure 4.14.</p> <p>Examiner Note:</p> <p>The Immediate Actions for both ARPs are the same. The operator can address in either order (Step 1 and 2 can be done in any order).</p> <p>When operator seeks Enclosure 4.14, provide Handout 1.</p>		
2	(OP/1/A/6100/010 R, 1RAD-2 B2 IA) Perform OP/0/A/6450/011 (Control Area Ventilation / Chilled Water System) Enclosure 4.14 (Response When EMF 43A and/or EMF 43B In Trip 2 or Non-Functional).	After checking the other ARP, the operator proceeds to OP/0/A/6450/011 Enclosure 4.14.		
3	(OP/0/A/6450/011 Enclosure 4.14, Step 2.1) EMF43A or EMF43B in Trip 2 Alarm or Non-Functional.	<p>The operator observes that EMF-43A is in TRIP II.</p> <p>The operator observes that EMF-43B is in TRIP II.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 3.1) Evaluate all outstanding Clearances that may impact performance of this procedure.	The operator requests this information from the CRS.		
		Cue: There are no outstanding Clearances on this equipment.		
5	(Step 3.2) Perform the following sections, as applicable: <ul style="list-style-type: none"> Section 3.3, Response for EMF43A or EMF43B Non Functional Section 3.4, Response for Trip 2 on EMF43A (Control Rm Air Intake Loc A) Section 3.5, Response for Trip 2 on EMF43B (Control Rm Air Intake Loc B) Section 3.6, Response for Trip 2 on EMF43A (Control Rm Air Intake Loc A) AND EMF43B (Control Rm Air Intake Loc B) 	The operator observes that EMF-43A is in TRIP II. The operator observes that EMF-43B is in TRIP II. The operator proceeds to Section 3.6.		
		Examiner Note: The operator may go to Section 3.4 or 3.5. If so, the first step of both sections will direct the use of Section 3.6.		
6	(Step 3.6) Response for Trip 2 on EMF43A (Control Rm Air Intake Loc A) AND EMF43B (Control Rm Air Intake Loc B) (Step 3.6.1) Notify RP of Trip 2 on both EMF43A and EMF43B.	The operator calls and notifies RP of the situation, and records.		
		Cue: RP Technician Don Smith acknowledges.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	(Note prior to Step 3.6.2) Both sets of air intakes should never be closed at same time.	The operator reads the Note and proceeds.		
*8	(Step 3.6.2) IF both Unit 1 and Unit 2 intake valves open, perform the following: (Step 3.6.2.1) Determine location with highest radiation hazard per one or both of the following: (Step 3.6.2.1.A) Check EMF readings in Control Room and determine location with highest radiation hazard. Record Location:	The operator observes that both Unit 1 and Unit 2 intake valves are OPEN. The operator observes EMF 43A and EMF 43B and determines that EMF 43B has the highest reading and records EMF 43B in the space provided.		
9	(Note prior to Step 3.6.2.1.B) Each unit's intake can be accessed from associated unit's D/G building roof. The intake is 2 candy cane shaped 18" pipes on Aux building roof, next to Reactor building.	The operator reads the Note and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	(Step 3.6.2.1.B) Notify RP to check VC intake radiation and determine location with highest radiation hazard. Record Location:	The operator calls requests RP to survey the areas.		
		Cue: The CRS directs you to continue with your task.		
11	(Step 3.6.2.2) IF both intake radiation hazards are the same,.....	The operator recognizes that the threat at Unit 2 is higher and that this step is NA.		
12	(Step 3.6.2.3) IF Unit 1 intake (monitored by EMF43A) is intake with highest radiation hazard....	The operator recognizes that the threat at Unit 2 is higher and that this step is NA.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*13	<p>(Step 3.6.2.4) IF Unit 2 intake (monitored by EMF43B) is intake with highest radiation hazard ensure the following closed:</p> <ul style="list-style-type: none"> • 1VC-9A (VC Outside Air Intake From Unit 2 Isol) • 1VC-10A (VC Outside Air Intake From Unit 2 Isol) • 1VC-11B (VC Outside Air Intake From Unit 2 Isol) • 1VC-12B (VC Outside Air Intake From Unit 2 Isol) 	<p>The operator presses the 1VC-9A CLOSE pushbutton, and observes the Green status light LIT, Red status light OFF.</p> <p>The operator presses the 1VC-10A CLOSE pushbutton, and observes the Green status light LIT, Red status light OFF.</p> <p>The operator presses the 1VC-11B CLOSE pushbutton, and observes the Green status light LIT, Red status light OFF.</p> <p>The operator presses the 1VC-12B CLOSE pushbutton, and observes the Green status light LIT, Red status light OFF.</p> <p>Cue:</p> <p>If asked, indicate that a Concurrent Verification (CV) has been completed.</p> <p>Examiner NOTE:</p> <p>HVAC OAD-11 H-8 and H-9 are expected alarms.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*14	(Step 3.6.3) IF EMF43A (Control Rm Air Intake Loc A) AND EMF43B (Control Rm Air Intake Loc B) Trip 2 alarm valid (no loss of power), perform the following:	The operator observes both instruments and determines that both EMF 43A and EMF 43B are valid alarms; and proceeds to Enclosure 4.4.		
	(Step 3.6.3.1) Pressurize Control Room per Enclosure 4.4 (Control Room Atmosphere Pressurization During Abnormal Conditions).	Examiner Note: Handout 1 also contains Enclosure 4.4.		
15	(OP/0/A/6450/011 Enclosure 4.4, Step 2.1) Control Room atmosphere has been determined to be in need of pressurization to protect Control Room personnel.	The operator recognizes that this Initial Condition has been satisfied during the performance of the Immediate Actions.		
16	(Step 2.2) VC / YC Train A OR B is selected and is in operation per this procedure.	The operator observes that the VC/YC Train B Mode Select Switch is in "B," and that the VC/YC Train A Mode Select Switch is in "OFF," and determines that the Train B is selected and in operation.		
17	(Step 3.1) Evaluate all outstanding Clearances that may impact performance of this procedure.	The operator requests this information from the CRS.		
		Cue: There are no outstanding Clearances on this equipment.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
18	(Step 3.2) Perform the following sections as applicable: <ul style="list-style-type: none"> Section 3.3, Pressurize Control Room Using Outside Air Pressure Fans Section 3.4, Securing Pressurization Of Control Room 	The operator recognizes that Section 3.3 is required and proceeds.		
19	(Step 3.3) Pressurize Control Room using Outside Air Pressure Fans (Step 3.3.1) Ensure at least one the following groups of intake valves open: <ul style="list-style-type: none"> 1VC-1A (VC Outside Air Intake From Unit 1 Isol) 1VC-2A (VC Outside Air Intake From Unit 1 Isol) 1VC-3B (VC Outside Air Intake From Unit 1 Isol) 1VC-4B (VC Outside Air Intake From Unit 1 Isol) OR <ul style="list-style-type: none"> 1VC-9A (VC Outside Air Intake From Unit 2 Isol) 1VC-10A (VC Outside Air Intake From Unit 2 Isol) 1VC-11B (VC Outside Air Intake From Unit 2 Isol) 1VC-12B (VC Outside Air Intake From Unit 2 Isol) 	The operator observes the Red status lights LIT for the Unit 1 valves. Cue: If asked, indicate that a Concurrent Verification (CV) has been completed.		
20	(Step 3.3.2) IF A Train VC/ YC operating,	The operator observes that the A Train of VC/YC is OFF.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*21	(Step 3.3.3) IF B Train VC / YC operating, place "B" Train CR Outside Air Press Fan" to "ON".	<p>The operator rotates the B Train CR Outside Air Press Fan Control Switch to the ON position.</p> <p>The operator will observe the Red B Train CR Outside Air Press Fan status light is LIT. (Not Critical)</p> <p>The operator will observe the White B Train CR Filter Preheat Enabled status light is LIT. (Not Critical)</p> <p>The operator observes the CRA-OAPFT-2 Dampers Red status light is LIT, and the Green status light is OFF. (Not Critical)</p> <p>Cue:</p> <p>If asked, indicate that a Concurrent Verification (CV) has been completed.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
22	(Step 3.3.4) Depress "MAN" for the following (to ensure fans off): <ul style="list-style-type: none"> #1 CRA Otsd Air Fan #2 CRA Otsd Air Fan 	<p>The operator presses the MAN pushbutton for #1 CRA Otsd Air Fan, and observes the Green status light is LIT, Red status light is OFF.</p> <p>The operator presses the MAN pushbutton for #2 CRA Otsd Air Fan, and observes the Green status light is LIT, Red status light is OFF.</p>		
*		<p>Cue:</p> <p>If asked, indicate that a Concurrent Verification (CV) has been completed.</p>		
*23	(Step 3.3.5) Depress "OFF" for the following: <ul style="list-style-type: none"> CRA-OAD-4 (CR Area Otsd Air Fans Damper) CRA-OAD-3 (CR Area Otsd Air Fans Damper) 	<p>The operator presses the OFF pushbutton for CRA-OAD-4 and observes the Red status light is OFF.</p> <p>The operator presses the OFF pushbutton for CRA-OAD-3 and observes the Red status light is OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
24	(Step 3.3.6) Check the following dark: <ul style="list-style-type: none"> CRA-OAD-4 (CR Area Otsd Air Fans Damper) "OPEN" light CRA-OAD-3 (CR Area Otsd Air Fans Damper) "OPEN" light 	<p>The operator observes CRA-OAD-4 light is OFF.</p> <p>The operator observes CRA-OAD-3 light is OFF.</p>		
25	(Note prior to Step 3.4) CR Outside Air Press Fan is credited to minimize Control Room dose for events such as:	<p>The operator starts to read the Note.</p> <p>Cue:</p> <p>Another operator will complete this task.</p>		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM F

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Units 1 and 2 are operating at 100% power.
- Annunciator 1RAD-2 B2, EMF 43B CR AIR INTAKE B HI RAD, alarmed 45 seconds ago.
- Annunciator 1RAD-1 B2, EMF 43A CR AIR INTAKE A HI RAD, alarmed 15 seconds ago.

INITIATING CUE:

The CRS has directed you to perform the Annunciator Response Procedures for both alarms.

SIM JPM G

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Control Pressurizer Relief Tank
ParametersJPM No.: 2020 Systems - Control
Room JPM G

K/A Reference: 007 A1.03 (2.6/2.7)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

- Initial Conditions:
- Unit 1 is operating at power.
 - A transient has resulted in a discharge to the Pressurizer Relief Tank from the Pressurizer PORVs.
 - The plant has stabilized and all Pressurizer PORVs are closed.
 - Previous PRT cooling operations have lowered PRT Temperature, however, MCB Annunciator 1AD-6, C9, PRT HI TEMP, is still LIT.
 - The following PRT parameters are observed:
 - PRT Level is \approx 76%.
 - PRT Pressure is \approx 4 psig.
 - PRT Temperature \approx 112°F.
 - Steps 3.1 through 3.5 of Enclosure 4.3 (PRT Cooling) of OP/1/A/6150/004 (Pressurizer Relief Tank), have been completed.

Initiating Cue: The CRS has directed you to perform Enclosure 4.3 (PRT Cooling) of OP/1/A/6150/004 (Pressurizer Relief Tank), starting with Step 3.6, to lower PRT Temperature to clear 1AD-6, C9, PRT HI TEMP.

Job Performance Measure Worksheet

Task Standard: The operator will complete Enclosure 4.3 (PRT Cooling) of OP/1/A/6150/004 (Pressurizer Relief Tank) such that PRT Temperature is less than 110°F, and 1AD-6, C9, PRT HI TEMP, is EXTINGUISHED.

Required Materials: None

General References: OP/1/A/6150/004 (Pressurizer Relief Tank), Rev 60
OP/1/A/6100/010G (Annunciator Response for Panel 1AD-6) Rev 77
AD-HU-ALL-004 (Procedure And Work Instruction Use and Adherence), Rev 10

Handouts: Handout 1: Enclosure 4.3 (PRT Cooling) of OP/1/A/6150/004 (Pressurizer Relief Tank) marked up for place-keeping through Step 3.5.

Time Critical Task: NO

Validation Time: 12 minutes

NOTE: The JPM should be pre-briefed in the Briefing Room.

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 4	This step is critical because pressing the 1NC-107A OPEN pushbutton is necessary to cool the PRT per Enclosure 4.3 of OP/1/A/6150/004 (Pressurizer Relief Tank).
Step 5	This step is critical because pressing the 1WL-33 OPEN pushbutton is necessary to cool the PRT per Enclosure 4.3 of OP/1/A/6150/004 (Pressurizer Relief Tank).
Step 6	This step is critical because pressing the 1WL-3 and 1WL-36 CLOSE pushbutton is necessary to cool the PRT per Enclosure 4.3 of OP/1/A/6150/004 (Pressurizer Relief Tank).
Step 7	This step is critical because rotating the 1WL-23 Control Switch clockwise to MAN is necessary to cool the PRT per Enclosure 4.3 of OP/1/A/6150/004 (Pressurizer Relief Tank).
Step 11	This step is critical because pressing the 1WL-3 and 1WL-36 OPEN pushbutton is necessary to cool the PRT per Enclosure 4.3 of OP/1/A/6150/004 (Pressurizer Relief Tank).
Step 12	This step is critical because pressing 1WL-33 and the 1NC-107A CLS pushbutton is necessary to cool the PRT per Enclosure 4.3 of OP/1/A/6150/004 (Pressurizer Relief Tank).
Step 16	This step is critical because rotating the 1WL-23 Control Switch counter-clockwise to AUTO is necessary to restore NCDT Level Control per Enclosure 4.3 of OP/1/A/6150/004 (Pressurizer Relief Tank).

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-39 (100%).
2. Place Simulator in RUN.
3. Lower reactor power to $\approx 97\%$ by manually adjusting Turbine load, or some other convenient means.
4. Open one Pressurizer PORV until PRT Temperature is $\approx 114^{\circ}\text{F}$, and THEN Close.
5. Ensure that PRT Level is $< 88\%$ and that PRT Rupture Disc does NOT fail.
6. Ensure 1WL-41B is Open.
7. Ensure that PRT and NCDT pressures are approximately equal.
8. If necessary, use NCPLP90 = 4, to raise PRT pressure to 4 psig.
9. Ensure 1AD-6, C-9, PRT HI TEMP, is LIT.
10. Since 1AD-6, C-9, PRT HI TEMP, alarms at 114°F and does NOT clear until 110°F , cool the PRT to 112°F to lower the time commitment of the JPM.

OR

1. Reset to IC-245 (August, 2019)
2. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
3. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: **The Booth/Floor Instructor will need to control BOP during the performance of this JPM.**

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Caution prior to Step 3.6) NCDT pressure will rise rapidly to PRT pressure. IF NCDT pressure goes above VCT pressure, NC Pump #2 and #3 seals will be adversely affected.	The operator reads the Caution and proceeds.		
2	(Step 3.6) IF 1NV-94AC (U1 NC Pumps Seal Water Return Cont Inside Isol) AND 1NV-95B (U1 NC Pump Seal Water Return Cont Outside Isol) open, check VCT pressure is greater than PRT pressure.	The operator observes the 1NV-94AC and 1NV-95B Red status lights are LIT, and Green status lights are OFF. The operator observes 1NVP5500 (VCT pressure) and 1NCP-5130 (PRT pressure) and determines that VCT pressure is greater than PRT pressure.		
3	(Note prior to Step 3.7) IF 1WL-41B (NCDT Vent Cont Outside Isol) open, Steps 3.7 - 3.9 should be performed without delay.	The operator reads the Note and proceeds.		
*4	(Step 3.7) Open 1NC-107A (Unit 1 PRT To NCDT Pump Drn Isol).	The operator presses the 1NC-107A OPEN pushbutton and observes the Red status light LIT, Green status light is OFF.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	(Step 3.8) Open 1WL-33 (NCDT Pumps to PRT).	The operator presses the 1WL-33 OPEN pushbutton and observes the Red status light LIT, Green status light is OFF.		
*6	(Step 3.9) Close: <ul style="list-style-type: none"> 1WL-3 (Unit 1 NCDT Outlet Isol) 1WL-36 (NCDT Pumps Recirc) 	<p>The operator presses the 1WL-3 CLOSE pushbutton and observes the Green status light LIT, Red status light is OFF.</p> <p>The operator presses the 1WL-36 CLOSE pushbutton and observes the Green status light LIT, Red status light is OFF.</p>		
*7	(Step 3.10) Align 1WL-23 (NCDT Pumps Disch Control) as follows: (Step 3.10.1) Select "MAN" on "1WL-23 Mode Select".	The operator rotates the 1WL-23 Control Switch clockwise to MAN.		
8	(Step 3.10.2) Close 1WL-23 (NCDT Pumps Disch Control).	The operator observes the 1WLM0230 controller output to be "0."		
9	(Step 3.11) IF 1WL-41B (NCDT Vent Cont Outside Isol) open, perform the following: (Step 3.11.1) Monitor NCDT level.	<p>The operator observes the 1WL-41B Red status light is LIT, Green status light is OFF.</p> <p>The operator observes 1WLP-5153 (NCDT Level) to be 48%.</p>		
10	(Step 3.11.2) IF NCDT level approaches 90%, close 1WL-41B (NCDT Vent Cont Outside Isol).	The operator reads the Step and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*11	<p>(Step 3.12) WHEN PRT at desired temperature OR necessary to stop and lower NCDT level, perform the following:</p> <p>(Step 3.12.1) Open:</p> <ul style="list-style-type: none"> 1WL-3 (Unit 1 NCDT Outlet Isol) 1WL-36 (NCDT Pumps Recirc) 	<p>The operator observes 1NCP-5350 (PRT Temperature) to be lowering.</p> <p>The operator observes that 1AD-6, C9, is DARK.</p> <p>The operator presses the 1WL-3 OPEN pushbutton and observes the Red status light LIT, Green status light is OFF.</p> <p>The operator presses the 1WL-36 OPEN pushbutton and observes the Red status light LIT, Green status light is OFF.</p> <p>NOTE:</p> <p>MCB Annunciator 1AD-6, C9 will clear at 110°F.</p>		
*12	<p>(Step 3.12.2): Close:</p> <ul style="list-style-type: none"> 1WL-33 (NCDT Pumps to PRT) 1NC-107A (Unit 1 PRT To NCDT Pump Dm Isol) 	<p>The operator presses the 1WL-33 CLS pushbutton and observes the Green status light LIT, Red status light is OFF.</p> <p>The operator presses the 1NC-107A CLS pushbutton and observes the Green status light LIT, Red status light is OFF.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	(Step 3.12.3) IF PRT over pressure initiated, THEN notify Radwaste to isolate PRT over pressure per OP/0/A/6200/518 (Waste Gas Operation).	The operator recognizes that the PRT is not overpressurized, and proceeds.		
14	(Step 3.12.4) Align 1WL-23 (NCDT Pumps Disch Control) as follows: (Step 3.12.4.1) IF NCDT level greater than 48%, lower NCDT level to 48% using 1WL-23 (NCDT Pumps Disch Control).	The operator observes 1WLP-5153 (NCDT Level) is lowering to $\approx 42-46\%$.		
15	(Step 3.12.4.2) Ensure 1WL-23 (NCDT Pumps Disch Control) closed.	The operator observes the 1WLM0230 controller output to be "0."		
*16	(Step 3.12.4.3) Select "AUTO" on "1WL-23 Mode Select".	The operator rotates the 1WL-23 Control Switch counter-clockwise to AUTO.		
17	(Step 3.12.5) WHEN NCDT level AND pressure normal, ensure 1WL-41B (NCDT Vent Cont Outside Isol) open.	The operator observes the 1WL-41B the Red status light is LIT, Green status light is OFF.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM G

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is operating at power.
- A transient has resulted in a discharge to the Pressurizer Relief Tank from the Pressurizer PORVs.
- The plant has stabilized and all Pressurizer PORVs are closed.
- Previous PRT cooling operations have lowered PRT Temperature, however, MCB Annunciator 1AD-6, C9, PRT HI TEMP, is still LIT.
- The following PRT parameters are observed:
 - PRT Level is $\approx 76\%$.
 - PRT Pressure is ≈ 4 psig.
 - PRT Temperature $\approx 112^{\circ}\text{F}$.
- Steps 3.1 through 3.5 of Enclosure 4.3 (PRT Cooling) of OP/1/A/6150/004 (Pressurizer Relief Tank), have been completed.

INITIATING CUE:

The CRS has directed you to perform Enclosure 4.3 (PRT Cooling) of OP/1/A/6150/004 (Pressurizer Relief Tank), starting with Step 3.6, to lower PRT Temperature to clear 1AD-6, C9, PRT HI TEMP.

SIM JPM H

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Start and Stop the 1B NCP for NCS VentingJPM No.: 2020 Systems - Control Room JPM H

K/A Reference: 003 A4.01 (3.3/3.2)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

- Initial Conditions:
- A plant startup is in progress per OP/1/A/6100/001 (Controlling Procedure For Unit Startup).
 - The crew is implementing Attachment 2 (Venting the NC System (Control Room Activities)) of OP/1/A/6100/SU-6 (Venting the NC System).
 - The NC System is water solid.
 - NC System pressure is being maintained between 320-350 psig.
 - During the NC System pressure increase to the current system pressure, it was noted that the 1B NCP Seal Leakoff flow increased 0.2 gpm.
 - The crew is ready to conduct an initial 60 second run of the 1B NC Pump.
 - Attachment 1 (Startup and Operation) of OP/1/A/6150/002 A (Reactor Coolant Pump Operation) has been completed through step 3.1.3 to support NC Pump operation.
 - Another operator has been assigned to control and maintain NCS pressure during the NCP run.
 - AO's are standing by in the field to assist.

Job Performance Measure Worksheet

Initiating Cue: The CRS has directed you to start the 1B NCP per Section 3.3 of Attachment 1 (Startup and Operation) of OP/1/A/6150/002 A (Reactor Coolant Pump Operation); and then stop the 1B NCP under either of the following conditions:

- The LOWEST NC Tcold lowers to 74°F.
- The 1B NCP has operated for 60 seconds.

Task Standard: The operator will conduct a 60 second run of the 1B NC Pump in accordance with Attachment 1 of OP/1/A/6150/002 A. **The pump should be immediately stopped if the applicant notices the bearing temperature spike (simulator issue).**

Required Materials: None

General References: OP/1/A/6100/001 (Controlling Procedure For Unit Startup), Rev 186
 OP/1/A/6100/SU-6 (Venting the NC System), Rev 38
 OP/1/A/6150/002 A (Reactor Coolant Pump Operation), Rev 71
 OP/1/A/6100/022 (Unit 1 Data Book), Rev 481
 AD-HU-ALL-004 (Procedure And Work Instruction Use and Adherence), Rev 10

Handouts: Handout 1: Attachment 1 (Startup and Operation) of OP/1/A/6150/002 A (Reactor Coolant Pump Operation) marked up for place-keeping.

Time Critical Task: NO

Validation Time: 15 minutes

NOTE: The JPM should be pre-briefed in the Briefing Room.

<u>Critical Step Justification</u>	
Step 16	This step is critical because pressing the START pushbutton for either 1B1 or 1B2 Oil Lift Pumps is necessary to conduct a 60 second run of the 1B NC Pump in accordance with Attachment 1 of OP/1/A/6150/002 A.
Step 19	This step is critical because pressing the 1B NC Pump START pushbutton is necessary to conduct a 60 second run of the 1B NC Pump in accordance with Attachment 1 of OP/1/A/6150/002 A.
Step 22	This step is critical because pressing the 1B NC Pump STOP pushbutton is necessary to conduct a 60 second run of the 1B NC Pump in accordance with Attachment 1 of OP/1/A/6150/002 A.

Job Performance Measure Worksheet

Job Performance Measure Worksheet

SIMULATOR OPERATIONAL GUIDELINES

1. Reset simulator to IC-5 (Mode 5, water solid).
2. Place Simulator in RUN.
3. Take actions through Step 3.3.9 of Attachment 2 (Venting the NC System (Control Room Activities)) of OP/1/A/6100/SU-6 (Venting the NC System)
4. Ensure NC System pressure adjusted between 320-350 psig.
5. Ensure that Seal Water Injection flow to each NCP is 8-12 gpm.
6. Ensure that 1NV-127A is aligned to the VCT.
7. Ensure that plant conditions permit the startup of the 1B NC Pump per Attachment 1 of OP/1/A/6150/002 A (Reactor Coolant Pump Operation).
8. Allow plant conditions to stabilize.
9. Freeze the Simulator.

OR

1. Reset to IC-246 (August, 2019) [It may be necessary to run the CTS file to defeat the NCP overcurrent relay: CTS-SET_NCP_51_RELAYDISABLED.CTS]
2. Ensure that Seal Water Injection flow to each NCP is 8-12 gpm.
3. Momentarily go to RUN to acknowledge Alarms then place Simulator in FREEZE.
4. Leave Simulator in FREEZE until operator is ready to begin.

NOTE: **During the performance of this JPM, the Simulator Instructor will need to control NCS pressure between 325-350 psig and monitor unrelated alarms and silence as needed.**

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
Simulator Instructor NOTE: Leave Simulator in FREEZE until operator is ready to begin.				
1	(Step 3.3.1) Check the associated 6900 V supply breaker closed.	The operator observes the 1B NC Pump supply breaker Red status light lit, Green status light OFF.		
2	(Step 3.3.2) Check reactor power less than 25%.	The operator observes that the Reactor Trip Breakers are OPEN (or equivalent).		
3	(Step 3.3.3) Check 1B NC Pump No. 1 Seal D/P is greater than 200 psid.	The operator observes 1B NC Seal ΔP , 1NVP-5220, and notes ΔP is 300 psid.		
4	(Step 3.3.4) Check VCT pressure equal to OR greater than 15 psig.	The operator observes VCT Pressure, 1NVP-5500, and notes pressure is approximately 30 psig.		
5	(Step 3.3.5) Check 8 gpm seal injection flow established to 1B NC Pump.	The operator observes 1B NC Pump Seal Flow, 1NVP-5320, and notes flow is approximately 9.0 gpm.		
6	(Notes prior to Step 3.3.6) NORMAL is described as ZERO static level. The preferred method to check NC Pump oil level is by visual inspection.	The operator reads the Notes and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	(Caution prior to Step 3.3.6) Starting an NC motor with LOW oil has the risk of an immediate bearing wipe.	The operator reads the Caution and proceeds.		
8	(Step 3.3.6) Check the following Normal via OAC OR by visual inspection of 1B NC Pump. Upper oil pot level Lower oil pot level	<div>The operator uses OAC, NCPMPALL (or equivalent), and notes that lower and upper oil levels – all green.</div> <div>Cue: IF asked, AO reports that all lower and upper oil pot levels are satisfactory.</div>		
9	(Step 3.3.7) Check 1NC-29 (B Loop Pzr Spray Control) CLOSED.	The operator observes the B Loop Pzr Spray SLIMS Red closed light (or equivalent) is LIT.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	<p>(Notes prior to Step 3.3.8) Effective spray flow can be achieved with any of the following:</p> <ul style="list-style-type: none"> • 1B NC Pump using 1NC-29 (B Loop Spray Control) • 1A, 1C and 1D NC Pumps using 1NC-27 (A Loop Pzr Spray Control) • ND System in RHR Mode using 1NV-840A (ND to Pzr Aux Spray Control) • ND System not in RHR Mode using 1NV-21A (NV Spray to Pzr Isol) 	The operator reads the Notes and proceeds.		
11	<p>(Caution prior to Step 3.3.8) Starting an NC Pump with either Pressurizer Spray Valve open will increase spray flow and affect NC System pressure.</p>	The operator reads the Caution and proceeds.		
12	<p>(Step 3.3.8) IF 1A NC Pump OFF, THEN ensure 1NC-27 (A Loop Pzr Spray Control) CLOSED.</p>	The operator observes the A Loop Pzr Spray SLIMS Red closed light (or equivalent) is LIT.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	<p>(Step 3.3.9) IF 1B NC Pump No. 1 seal leakoff NOT greater than or equal to the minimum leakoff required per Unit 1 Data Book, perform one of the following:</p> <p>(Step 3.3.9.a) Check that a 0.2 gpm increase occurred during pressurization. OR (Step 3.3.9.b) Perform Attachment 4 (Operator Action for Low No.1 Seal Leakoff Flow) to locally measure flow.</p>	The operator recognizes that a 0.2 gpm increase on the 1B NC Pump seal leakoff flow occurred during pressurization; and continues.		
14	(Step 3.3.10) IF either 1B NC Pump Standpipe alarm lit,.....	The operator observes that AD-7/A-2, NC Pump B No. 2 Seal S-Pipe Hi Level, and AD-7/B-2, NC Pump B No. 2 Seal S-Pipe Lo Level, annunciators are EXTINGUISHED.		
15	(Step 3.3.11) Ensure all personnel are clear of 1B NCP Safety Breaker by at least 10 feet.	<p>The operator contacts AO and directs that they ensure that all personnel are clear of the 1B NC Pump Safety Breaker by at least 10 feet.</p> <p>Cue:</p> <p>AO reports that all personnel are clear of the 1B NC Pump Safety Breaker by at least 10 feet.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*16	(Step 3.3.12) Two minutes prior to starting 1B NC Pump, start one of the associated oil lift pumps.	The operator presses the START pushbutton for either 1B1 or 1B2 Oil Lift Pumps, and observes Red status light LIT, Green status light OFF.		
17	(Step 3.3.13) Announce starting of 1B NC Pump.	The operator announces that the 1B NC Pump will be started.		
18	(Caution prior Step 3.3.14) In Low Pressure Mode, PORVs will open on NC Narrow Range Pressure of 378 - 382 psig.	The operator reads the Caution and proceeds.		
*19	(Step 3.3.14) Start 1B NC Pump.	<p>The operator presses the 1B NC Pump START pushbutton and observes Red status light LIT, Green status light OFF.</p> <p>The operator observes Motor amps increase, spike high, and then stabilize lower.</p> <p>The operator observes NC System flow for the 1B NC Loop increases to 100%.</p> <p>If the operator notices that bearing temperatures have spiked, it is acceptable to trip the NCP immediately.</p>		
20	(Step 3.3.15) Record time 1B NC Pump started:	The operator records the time the pump is started in the space provided.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	(Step 3.3.16) IF desired to stop 1B NC Pump in less than one minute after start,...	The operator recognizes that the CRS direction is to run the 1B NC Pump until either the LOWEST NC Tcold lowers to 74°F, (Not Expected) or the 1B NCP has operated for 60 seconds; and proceeds.		
*22	(CRS Directed Action) The CRS has directed you to start the 1B NCP per Section 3.3 of Attachment 1 (Startup and Operation) of OP/1/A/6150/002 A (Reactor Coolant Pump Operation); and then stop the 1B NCP under either of the following conditions: <ul style="list-style-type: none"> • The LOWEST NC Tcold lowers to 74°F. • The 1B NCP has operated for 60 seconds. 	≥60 seconds after pump start, the operator presses the 1B NC Pump STOP pushbutton and observes Green status light LIT, Red status light OFF. The operator observes Motor amps lower to 0. The operator observes NC System flow for the 1B NC Loop decrease to 0%.		
23	(Step 3.3.17) WHEN two minutes have elapsed from 1B NC Pump start, THEN check the oil lift pump that was started has stopped.	The operator observes the running Oil Lift Pump Green status light is LIT Red status light is OFF.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems - Control Room JPM H

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A plant startup is in progress per OP/1/A/6100/001 (Controlling Procedure For Unit Startup).
- The crew is implementing Attachment 2 (Venting the NC System (Control Room Activities)) of OP/1/A/6100/SU-6 (Venting the NC System).
- The NC System is water solid.
- NC System pressure is being maintained between 320-350 psig.
- During the NC System pressure increase to the current system pressure, it was noted that the 1B NCP Seal Leakoff flow increased 0.2 gpm.
- The crew is ready to conduct an initial 60 second run of the 1B NC Pump.
- Attachment 1 (Startup and Operation) of OP/1/A/6150/002 A (Reactor Coolant Pump Operation) has been completed through step 3.1.3 to support NC Pump operation.
- Another operator has been assigned to control and maintain NCS pressure during the NCP run.
- AO's are standing by in the field to assist.

INITIATING CUE:

The CRS has directed you to start the 1B NCP per Section 3.3 of Attachment 1 (Startup and Operation) of OP/1/A/6150/002 A (Reactor Coolant Pump Operation); and then stop the 1B NCP under either of the following conditions:

- The LOWEST NC Tcold lowers to 74°F.
- The 1B NCP has operated for 60 seconds.

IN-PLANT JPM I

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Emergency Borate the Reactor
Coolant System Locally Using 2NV-
269JPM No.: 2020 Systems – In-
Plant JPM I

K/A Reference: APE 024 AA1.04 (3.6/3.7)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:Simulated Performance: X Actual Performance: Classroom Simulator Plant X **READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

- Initial Conditions:
- Unit 2 was at 100% power when a Boron dilution event occurred.
 - AP/2/A/5500/38 (Emergency Boration and Response to Inadvertent Dilution) was entered.
 - While attempting to open 2NV-265B (Boric Acid To NV Pumps), the BOP discovered that 2NV-265B was de-energized.

Initiating Cue: The CRS has directed you to emergency borate the NC System by performing Step 12.d RNO of AP/2/A/5500/38 (Emergency Boration and Response to Inadvertent Dilution).

A Portion of this JPM is TIME CRITICAL

Task Standard: The operator will attempt to open 2NV-265B, and then open 2NV-269 within ten (10) minutes of dispatch minus transit time from the Control Room to the RCA Entry Point.

Job Performance Measure Worksheet

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)
Dosimetry

General References: AP/2/A/5500/38 (Emergency Boration and Response to Inadvertent Dilution), Rev 10
OMP 4-3 (Use of Emergency and Abnormal Procedures and FLEX Guidelines), Rev 48
PT/0/A/4600/113 (McGuire Time Critical Actions/Time Sensitive Actions), Enclosure 13.3 (Stop Dilution and Borate During a Dilution Event), Rev 28

Handouts: Handout 1: Step 12.d RNO (Page 8 of 19) of AP/2/A/5500/38 (Emergency Boration and Response to Inadvertent Dilution) marked up for place-keeping.

Time Critical Task: YES – Enclosure 13.3 of PT/0/A/4600/113

Modes 1 and 2: Operators will stop dilution and initiate boration within 15 minutes. This may involve time critical local actions to open NV-265 or NV-269 (10 minutes from dispatch) per AP-38. Time starts when rods reach insertion limit (automatic rod control), or when reactor trips (manual rod control). (If you stop the dilution prior to going below rod insertion limit or reactor trip, emergency boration is not required.)

Only securing dilution within times above is required by the safety analysis, but UFSAR 15.4.6 states that operators can also initiate boration in these stated times. Operators will therefore be required to meet times for both securing dilution and initiating boration. The stated times are long enough for operators to perform actions. Note that UFSAR Section 15.4.6 states that operators have "at least 15 minutes" (Modes 1 and 2). The actual limiting times per UFSAR Table 15-19 are 16.6 minutes when rods are in manual (after trip), and 25.9 minutes when rods are in auto (after reaching rod insertion limit).

Validation Time: 8 minutes

NOTE: Start this JPM from the RCA Control Point. Record the Time Critical Completion Time (in JPM step number 2) when 2NV-269 is open.

<u>Critical Step Justification</u>	
Step 1	This step is critical because locating 2NV-265B, pressing downward on the Motor handwheel clutch, and rotating the handwheel in the counter-clockwise direction is necessary to attempt to open 2NV-265B.
Step 2	This step is critical because locating 2NV-269, removing the locking device, and rotating the handwheel in the counter-clockwise direction is necessary to manually open 2NV-269.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	<p>(Step 12.d RNO) Perform the following:</p> <p>(Step 12.d RNO 1) Dispatch operator to OPEN 2NV-265B (aux bldg, 733+3, JJ-57, near chemical addition tank).</p>	<p>The operator locates 2NV-265B, presses downward on the Motor handwheel clutch, and rotates the handwheel in the counter-clockwise direction.</p> <p>Cue:</p> <p>Handwheel clutch engaged</p> <p>Force applied in the counter-clockwise direction</p> <p>Handwheel is <u>NOT</u> moving</p> <p>The operator recognizes that valve cannot be opened and continues.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2 *	(Step 12.d RNO 2) IF 2NV-265B cannot be opened, THEN perform the following: (Step 12.d RNO 2.a) Dispatch operator to unlock and OPEN 2NV-269 (Unit 2 NV Pump Boric Acid Supply Isol (Emergency Boration Valve)) (aux bldg, 733+4, JJ-58, near chemical addition tank).	<p>The operator locates 2NV-269, removes the locking device, and rotates the handwheel in the counter-clockwise direction within ten minutes of dispatch.</p> <p>Cue:</p> <p>Lock removed, Handwheel rotated fully counter-clockwise.</p> <p>Stop Time for Time Critical Task:</p> <p>_____</p>		
3	(Step 12.d RNO 2.b) OPEN 2NV-267A (Boric Acid To Blender Control).	<p>The operator calls the Control Room to report 2NV-269 Open and requests that the BOP Open 2NV-267A.</p> <p>Cue:</p> <p>The Control Room operator acknowledges that 2NV-269 and 2NV-267A is open.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	(Step 12.d RNO 3) Do not continue until 2NV-265B or 2NV-269 flowpath above is aligned.	The operator recognizes that 2NV-269 is OPEN and indicates that the task is complete.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems – In-Plant JPM I

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 2 was at 100% power when a Boron dilution event occurred.
- AP/2/A/5500/38 (Emergency Boration and Response to Inadvertent Dilution) was entered.
- While attempting to open 2NV-265B (Boric Acid To NV Pumps), the BOP discovered that 2NV-265B was de-energized.

INITIATING CUE:

The CRS has directed you to emergency borate the NC System by performing Step 12.d RNO of AP/2/A/5500/38 (Emergency Boration and Response to Inadvertent Dilution).

A Portion of this JPM is TIME CRITICAL

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

IN-PLANT JPM J

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Start the Hydrogen AnalyzersJPM No.: 2020 Systems – In-Plant JPM J

K/A Reference: 069 AA1.03 (2.8/3.0)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:Simulated Performance: X Actual Performance: Classroom Simulator Plant X **READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

Initial Conditions:

- Unit 1 has tripped from 100% power due to an accident.
- The crew is in EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure).
- The crew is checking Containment Hydrogen Concentration.

Initiating Cue: The CRS has directed you to place the Hydrogen Analyzers in service in accordance with Enclosure 5 (Placing H₂ Analyzers In Service) of EP/1/A/5000/G-1 (Generic Enclosures).

Task Standard: The operator will place the 1A Hydrogen Analyzer in service.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)
Dosimetry
KEY #172 (Key 178 will be Simulated)

General References: EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure), Rev 19
EP/1/A/5000/G-1 (Generic Enclosures), Rev 41

Job Performance Measure Worksheet

OMP 4-3 (Use of Emergency and Abnormal Procedures and FLEX Support Guidelines), Rev 48

Handouts: Handout 1: Enclosure 5 (Placing H₂ Analyzers In Service) of EP/1/A/5000/G-1 (Generic Enclosures).

Time Critical Task: NO

Validation Time: 20 minutes

NOTE: The Examiner will need to sign out Key 172 from the WCC before using this JPM.

<u>Critical Step Justification</u>	
Step 2	This step is critical because going to the 1MICA6851 1A VX HYDROGEN ANALYZER REMOTE CABINET is necessary to place the 1A Hydrogen Analyzer in service.
Step 3	This step is critical because using Key 172 to Open the 1MICA6851 1A VX HYDROGEN ANALYZER REMOTE CABINET is necessary to place the 1A Hydrogen Analyzer in service.
Step 4	This step is critical because is placing Key 178 in the "ISOLATION VALVES OPEN" switch, and rotating the switch clockwise is necessary to place the 1A Hydrogen Analyzer in service.
Step 6	This step is critical because rotating the "HYDROGEN ANALYZER SAMPLE ENABLE SWITCH" clockwise is necessary to place the 1A Hydrogen Analyzer in service.
Step 7	This step is critical because rotating the "HYDROGEN ANALYZER SAMPLE SELECT" switch counter-clockwise is necessary to place the 1A Hydrogen Analyzer in service.
Step 8	This step is critical because pressing the "OFF" pushbutton for "SAMPLE ROUTED TO PAMS PANEL" switch is necessary to place the 1A Hydrogen Analyzer in service.
Step 9	This step is critical because rotating the "OFF-STANDBY /ANALYZE" switch clockwise is necessary to place the 1A Hydrogen Analyzer in service.
Step 10	This step is critical because pressing the "LOCAL/REMOTE SELECTOR" pushbutton is necessary to place the 1A Hydrogen Analyzer in service.
Step 12	This step is critical because rotating the "FUNCTION SELECTOR" counterclockwise is necessary to place the 1A Hydrogen Analyzer in service.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 1) Obtain one key 172 and two keys 178 from "Unit 1 EP/AP Keys" on Unit 1 SRO desk.	The operator seeks to find the Keys.		
		Cue: Hand Key 172 to Operator. The Use of the 178 Key will be <u>simulated</u> during this JPM.		
		The operator proceeds.		
*2	(Step 2) Start 1A H ₂ Analyzer as follows: (Step 2.A) Proceed to "1MICA6851 1A VX HYDROGEN ANALYZER REMOTE CABINET (750' elevation in cable spreading room).	The operator proceeds to cabinet.		
*3	(Step 2.B) Use key 172 to access remote panel.	The operator uses Key 172 to Open Cabinet.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(Step 2.C) Inside remote panel, use key 178 to place "ISOLATION VALVES OPEN" switch to "ON".	The operator places Key 178 in the "ISOLATION VALVES OPEN" switch and rotates the switch clockwise.		
		Cue: The Switch is in the ON position.		
5	(Step 2.D) Check "POWER ON" light above "ISOLATION VALVES OPEN" switch – LIT.	The operator observes the "POWER ON" light.		
		Cue: The POWER ON light is LIT.		
*6	(Step 2.E) Place "HYDROGEN ANALYZER SAMPLE ENABLE SWITCH" to "SAMPLE".	The operator rotates the "HYDROGEN ANALYZER SAMPLE ENABLE SWITCH" clockwise.		
		Cue: The Switch is in SAMPLE.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*7	(Step 2.F) Select sample location as follows: (Step 2.F.1) Place "HYDROGEN ANALYZER SAMPLE SELECT" switch to "UPPER CONT" (Step 2.F.2) Check "POWER ON" light for selected location - OFF	The operator rotates the "HYDROGEN ANALYZER SAMPLE SELECT" switch counter-clockwise.		
		Cue: The Switch is in UPPER CONT.		
		The operator observes the "POWER ON" light.		
		Cue: The POWER ON light is OFF.		
*8	(Step 2.G) Depress "OFF" pushbutton on "SAMPLE ROUTED TO PAMS PANEL" switch.	The operator presses the "OFF" pushbutton for "SAMPLE ROUTED TO PAMS PANEL" switch.		
*9	(Step 2.H) Place "OFF-STANDBY/ANALYZE" switch to "ANALYZE"	The operator rotates the "OFF-STANDBY/ANALYZE" switch clockwise.		
		Cue: The Switch is in Analyze.		
*10	(Step 2.I) Depress "LOCAL/REMOTE SELECTOR" pushbutton.	The operator presses the "LOCAL/REMOTE SELECTOR" pushbutton.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 2.J) Ensure "H2 DUAL RANGE SW" is in 0-30% range.	The operator observes the position of the "H2 DUAL RANGE SW".		
		Cue: The Switch is in the 0-30% range.		
*12	(Step 2.K) Place "FUNCTION SELECTOR" to "SAMPLE".	The operator rotates the "FUNCTION SELECTOR" counterclockwise.		
		Cue: The Function Selector is in the SAMPLE position.		
13	(Step 2.L) Do not continue until 5 minutes have elapsed.	The operator waits for five minutes.		
		Cue: Using Time Compression, five minutes have elapsed.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	(Step 2.M) IF "COMMON ALARM" lit, THEN	The operator observes the COMMON ALARM.		
		Cue: The COMMON ALARM light is NOT LIT.		
15	(Step 2.N) Notify Control Room that 1A H2 Analyzer is in service.	The operator calls the control room and reports.		
		Cue: As the BOP, acknowledge report.		
16	(Step 3) Start 1B H2 Analyzer as follows.....	The operator starts to place the 1B Hydrogen Analyzer in service.		
		Cue: Another Operator will start 1B H2 Analyzer and complete the Enclosure.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems – In-Plant JPM J

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 has tripped from 100% power due to an accident.
- The crew is in EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure).
- The crew is checking Containment Hydrogen Concentration.

INITIATING CUE:

The CRS has directed you to place the Hydrogen Analyzers in service in accordance with Enclosure 5 (Placing H₂ Analyzers In Service) of EP/1/A/5000/G-1 (Generic Enclosures).

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

IN-PLANT JPM K

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Establish NC Pump Seal Injection
From the SSFJPM No.: 2020 Systems – In-
Plant JPM K

K/A Reference: EPE 055 EK3.02 (4.3/4.6)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:Simulated Performance: X Actual Performance: Classroom Simulator Plant X **READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and WHEN the operator locates the Brown Folder at the SSF, provide Handout 1.

Initial Conditions:

- A Loss of All AC has occurred on Unit 1.
- EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented.
- The CRS has dispatched an operator to complete Enclosure 3 (Unit 1 ETA And ETB Rooms - ECA-0.0 Actions).

Initiating Cue:

The CRS has directed you to obtain the Brown Folder at SSF and complete Enclosure 2 (Unit 1 SSF-ECA-0.0 Actions).

~~A Portion of the JPM is TIME CRITICAL.~~

Task Standard:

The operator will place the SSF Diesel in operation and supply power to 1SLXG, start the Standby Makeup Pump and ensure that it is supplying NCP seal injection ~~within seven (7) minutes~~ of dispatch, ensure that 1SLXG is supplying power to SMXG and SMXG-1, and that Battery Chargers SDSP-1 and SDSP-2 supply breakers are closed.

Job Performance Measure Worksheet

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)

General References: EP/1/A/5000/ECA-0.0 (Loss of All AC Power), Rev 44
OMP 4-3 (Use of Emergency And Abnormal Procedures And FLEX Support Guidelines), Rev 48
PT/0/A/4600/113 (McGuire Time Critical Actions/Time Sensitive Actions), Enclosure 13.9 (Initiate SSF NCP Seal Injection and Swap to the SSF), Rev 28

Handouts: Handout 1: Blank copy of Enclosure 2 (Unit 1 SSF – ECA-0.0 Actions) of EP/1/A/5000/ECA-0.0 (Loss of All AC Power)

Time Critical Task: ~~YES: According to PT/0/A/4600/113 (Operator Time Critical Task Verification), Enclosure 13.9 (Initiate SSF NCP Seal Injection and Swap to the SSF):~~ **NO**

Expectation: Seal injection from standby makeup pump can be initiated within 10 minutes of a loss of all AC power event or an NFPA 805 fire event. This requires completion of actions at SSF to start SBMUP within 7 minutes of dispatch, and completion of actions in ETA room to swap EMXA-4 within 4 minutes of dispatch. To support the local actions, the following dispatches must be initiated:
~~Operator dispatched to SSF within 3 minutes of loss of all NCP seal cooling. (Total time = 7 min + 3 min = 10 min to initiate NCP seal injection from SBMUP).~~

~~Consequently, the operator must place the SSF Diesel in operation and supply power to 1SLXG, start the Standby Makeup Pump and ensure that it is supplying NCP seal injection within 7 minutes of dispatch.~~

~~This JPM should be timed starting from the OPS Kitchen. Once flow from the standby makeup pump is verified, the "critical time" stops.~~

Validation Time: 15 minutes

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 4	This step is critical because rotating the "SSF DIESEL TEST/EMERG" switch clockwise to "EMER" is necessary to place the SSF Diesel in operation and supply power to 1SLXG.
Step 6	This step is critical because placing the "SSF DIESEL START CONTROL" switch to ON is necessary to place the SSF Diesel in operation and supply power to 1SLXG.
Step 8	This step is critical because pressing "TRIP" for "NORMAL INCOMING BREAKER CONTROL" and for the two breaker control switches on far right of bottom row holding for two seconds is necessary to place the SSF Diesel in operation and supply power to 1SLXG.
Step 9	This step is critical because pressing "CLOSE" for GENERATOR BREAKER CONTROL is necessary to place the SSF Diesel in operation and supply power to 1SLXG.
Step 10	This step is critical because pressing "CLOSE" for "1SLXG-5C CTRL SW" is necessary to place the SSF Diesel in operation and supply power to the SBMUP.
Step 12	This step is critical because pressing "CLOSE" for "1SLXG-4C CTRL SW" is necessary to place the SSF Diesel in operation and supply power to the SBMUP.
Step 13	This step is critical because pressing the 1NV-842AC OPEN pushbutton and 1NV-849 AC is necessary to start the Standby Makeup Pump and ensure that it is supplying NCP seal injection within 7 minutes.
Step 15	This step is critical because pressing the 1NV-94AC CLOSE pushbutton is necessary to start the Standby Makeup Pump and ensure that it is supplying NCP seal injection within 7 minutes.
Step 16	This step is critical because pressing the SBMUP START pushbutton is necessary to start the Standby Makeup Pump and ensure that it is supplying NCP seal injection within 7 minutes.
Step 25	This step is critical because resetting the shunt trip and closing breaker SMXG1-FAE is necessary to ensure that 1SLXG is supplying power to SMXG.
Step 28	This step is critical because resetting the shunt trip and closing breaker SMXG1-RAD is necessary to ensure that 1SLXG is supplying power to SMXG-1, and that Battery Chargers SDSP-1 and SDSP-2 supply breakers are closed.
Step 30	This step is critical because pressing the "CLOSE" pushbutton on "1SLXG-5D CTRL SW" is necessary to ensure that Battery Chargers SDSP-1 and SDSP-2 supply breakers are closed.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and WHEN the operator locates the Brown Folder at the SSF, provide Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Note prior to Step 1) The following steps are performed at SSF Control Panel until stated otherwise.	The operator reads the NOTE and proceeds.		
2	(Step 1) Check "LINE VOLTAGE" – APPROXIMATELY 600V.	The operator observes the line voltage meter.		
		Cue: Meter reads "0" Volts.		
3	(Step 1 RNO) GO TO Step 3.	Operator goes to Step 3.		
*4	(Step 3) Place "SSF DIESEL TEST/EMERGENCY" switch to "EMER"	The operator rotates "SSF DIESEL TEST/EMERG" switch clockwise to "EMER"		
		Cue: Switch rotated clockwise to EMER position.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(Step 4) Check "SSF DIESEL START CONTROL" switch - "OFF"	The operator observes the "SSF DIESEL START CONTROL".		
		Cue: Switch is in "OFF" position.		
*6	(Step 5) Place "SSF DIESEL START CONTROL" switch to "ON"	The operator places "SSF DIESEL START CONTROL" switch to ON.		
		Cue: Switch is rotated clockwise to "ON" position.		
7	(Step 6) Check D/G – STARTS WITHIN 30 SECONDS	The operator observes Diesel condition.		
		Cue: Background noise level has increased, various gage indications are up.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*8	<p>(Step 7) Open the following breakers:</p> <p>(Step 7.A) Depress "TRIP" on all nine breaker control switches inside yellow time critical border.</p> <p>(Step 7.B) Ensure two breaker control switches on far right of bottom row were depressed for 2 seconds.</p>	For all nine breakers inside the yellow time critical border the operator presses "TRIP". For the two breaker control switches on the far right of the bottom row they will hold for 2 seconds.		
		Cue: Pushbuttons depressed, Green lights are LIT.		
		If the operator did not already perform on previous bullet they will depress "TRIP" and hold for two seconds for the two breaker control switches on the far right of bottom row. There are no lights for these pushbuttons.		
		Cue: Pushbuttons depressed.		
*9	(Step 8) Depress "CLOSE" on "GENERATOR BREAKER CONTROL".	The operator presses "CLOSE" for GENERATOR BREAKER CONTROL."		
		Cue: Pushbutton depressed, Red light is LIT.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*10	(Step 9) Depress "CLOSE" on "1SLXG-5C CTRL SW".	The operator presses "CLOSE" for "1SLXG-5C CTRL SW."		
		Cue: Pushbutton depressed, Red light is LIT.		
11	(Step 10) Wait 10 seconds.	The operator waits 10 seconds.		
*12	(Step 11) Depress "CLOSE" on "1SLXG-4C CTRL SW".	The operator presses "CLOSE" for "1SLXG-4C CTRL SW."		
		Cue: Pushbutton depressed, Red light is LIT.		
*13	(Step 12) Open the following valves: 1NV-842AC (U1 Standby Makeup Pump Suction Isol) 1NV-849AC (U1 Standby Makeup Pump Cont Outside Isol)	The operator presses the 1NV-842AC OPEN pushbutton, observes Red status light LIT. The operator presses the 1NV-849AC OPEN pushbutton, observes Red status light LIT.		
		Cue: As each valve is repositioned, pushbutton depressed, red light is LIT.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	(Step 13) Check 1NV-1013C (Standby M/U Pump to NC Pmp Seals Isol) – OPEN	The operator observes Red status light LIT.		
		Cue: Red light is LIT.		
*15	(Step 14) CLOSE 1NV-94AC (U1 NC Pumps Seal Water Return Cont Inside Isol)	The operator presses the 1NV-94AC CLOSE pushbutton, and observes Green status light LIT.		
		Cue: Pushbutton depressed, Green light is LIT.		
*16	(Step 15) Start Unit 1 Standby Makeup pump.	The operator presses the SBMUP START pushbutton, observes Red status light LIT.		
		Cue: Pushbutton depressed, Red light is LIT.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
17	(Step 16) Check Unit 1 Standby Makeup pump flow (1NVP6420) - GREATER THAN OR EQUAL TO 26 GPM.	The operator observes meter		
		Cue: Meter indicates 28 gpm.		
		Stop Time for Time Critical Task: -----		
		NOTE: This time must be ≤ 7 minutes.		
18	(Note prior to Step 17) Remaining steps in this enclosure are not time critical, but must be completed in a timely manner.	The operator reads the NOTE and proceeds.		
19	(Step 17) Check 1NV-1012C (Standby M/U Pump Disch to Cont Sump) - CLOSED	The operator observes Green status light LIT.		
		Cue: Green light is LIT.		
20	(Step 18) Check SSF D/G - RUNNING	The operator observes Diesel condition.		
		Cue: Background noise level is heard, various gage indications are up.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	(Step 19) Check SSF D/G "FREQUENCY" - AT 60 Hz.	The operator observes frequency meter.		
		Cue: Meter indicates 60 Hz.		
22	(Step 20) Check SSF D/G "VOLTAGE" – AT 600V.	The operator observes meter.		
		Cue: Meter indicates 600 Volts.		
23	(Note prior to Step 21) If SMXG1-FAE and SMXG1- RAD were previously shunt tripped from the SSF Control Panel, they will be in their intermediate position.	The operator reads the NOTE and proceeds.		
24	(Step 21) At SMXG1: (Step 21.A) Check breaker SMXG1-FAE (SDSP1 BATTERY CHARGER) – IN INTERMEDIATE POSITION.	The operator observes breaker SMXG1-FAE.		
		Cue: Breaker is in the Tripped/Intermediate position.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*25	(Step 21.B) Reset shunt trip and close breaker SMXG1-FAE as follows: (Step 21.B.1) Slide breaker fully to OPEN position. (Step 21.B.2) CLOSE breaker.	The operator resets the shunt trip by sliding the breaker down to the fully Open position.		
		Cue: Breaker is down in Open position.		
		The operator closes the breaker by pushing the breaker up into the Closed position.		
		Cue: Breaker is up in the Closed position.		
26	(Step 21.C) Wait 10 seconds.	The operator waits 10 seconds.		
27	(Step 21.D) Check breaker SMXG1-RAD (SDSP2 BATTERY CHARGER) - IN INTERMEDIATE POSITION.	The operator observes breaker SMXG-1 RAD.		
		Cue: Breaker is in the Tripped/Intermediate position.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*28	(Step 21.E) Reset shunt trip and close breaker SMXG1-RAD (SDSP2 BATTERY CHARGER) as follows: (Step 21.E.1) Slide breaker fully to OPEN position. (Step 21.E.2) CLOSE breaker.	The operator resets the shunt trip by sliding the breaker down to the fully Open position.		
		Cue: Breaker is down in Open position.		
		The operator closes the breaker by pushing the breaker up into the Closed position.		
		Cue: Breaker is up in the Closed position.		
29	(Step 22) At SMXG: (Step 22.A) Ensure SMXG-F5A (UNIT 1 PRESSURIZER HEATERS 28/55/56 FEEDER) is CLOSED.	The operator observes breaker position.		
		Cue: Breaker is closed.		
*30	(Step 23) At SSF Control Panel: (Step 23.A) Depress "CLOSE" on "1SLXG-5D CTRL SW (SDSS BATTERY CHARGER FDR BKR CONTROL)".	The operator presses the CLOSE pushbutton and observes the Red status light.		
		Cue: Pushbutton depressed, Red light is LIT.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
31	(Step 23.B) Check SSF D/G "FREQUENCY" - AT 60 HZ	The operator observes SSF D/G Frequency Meter.		
		Cue: Meter indicates 60 Hz.		
32	(Step 23.C) Check SSF D/G "VOLTAGE" – AT 600V.	The operator observes SSF D/G Voltage Meter.		
		Cue: Meter indicates 600 volts.		
33	(Step 23.D) Check SSF Generator Load - LESS THAN OR EQUAL TO 700 KW.	The operator observes SSF Generator Load Meter.		
		Cue: Meter indicates 500 KW.		
34	(Step 24) Check proper operation of SSF battery chargers in upper level of SSF as follows:	The operator moves toward SDSP1 Battery Charger.		
		Cue: Another operator will continue with this procedure.		

Terminating Cue:

Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Systems – In-Plant JPM K

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A Loss of All AC has occurred on Unit 1.
- EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented.
- The CRS has dispatched an operator to complete Enclosure 3 (Unit 1 ETA And ETB Rooms - ECA-0.0 Actions).

INITIATING CUE:

The CRS has directed you to obtain the Brown Folder at SSF and complete Enclosure 2 (Unit 1 SSF-ECA-0.0 Actions).

~~A Portion of the JPM is TIME CRITICAL.~~

NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.

JPM A1a RO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Complete a Surveillance for Mode ChangeJPM No.: 2020 Admin – JPM A1a RO

K/A Reference: 2.1.20 (4.6)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

Initial Conditions:

- Unit 1 is in Mode 4 during a plant startup.
- Current EFPD is 348.
- NC System pressure has stabilized at 1600 psig.
- Chemistry has reported that the CLA Boron Concentrations are as follows:
 - CLA 1A – 2485 ppm
 - CLA 1B – 2482 ppm
 - CLA 1C – 2491 ppm
 - CLA 1D – 2349 ppm
- It has become necessary to perform Enclosure 13.4, NC Boron Concentration Checklist, of PT/1/A/4600/003D, Monthly Surveillance Items, in order to continue with the plant startup.

Initiating Cue:

- The CRS has directed you to complete Enclosure 13.4, NC Boron Concentration Checklist, of PT/1/A/4600/003D, Monthly Surveillance Items.
- Identify Flex Strategy Administrative Limits and/or Technical Specification LCO's that are not met (if any).

Job Performance Measure Worksheet

Task Standard: The operator will complete Enclosure 13.4 of PT/1/A/4600/003D in accordance with the attached KEY, determine that all Flex Strategy Administrative Limits are met, and determine that LCO 3.5.1 is not currently met.

Required Materials: Calculator

General References: PT/1/A/4600/003D (Monthly Surveillance Items), Rev 95
MCEI-0400-379 (McGuire Unit 1 Cycle 27 Core Operating Limits Report), Rev 1
McGuire Technical Specification LCO 3.5.1 (Accumulators), Amendment 218/200

Handouts: Handout 1: PT/1/A/4600/003D, Monthly Surveillance Items and Enclosure 13.4, Boron Concentration Checklist marked up for JPM.

Time Critical Task: NO

Validation Time: 15 minutes

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 3	This step is critical because recording Mode 3 on Enclosure 13.4 is necessary to complete Enclosure 13.4 of PT/1/A/4600/003D in accordance with the attached KEY.
Step 5	This step is critical because using the COLR to determine the minimum required and maximum permitted Accumulator Boron Concentration is necessary to complete Enclosure 13.4 of PT/1/A/4600/003D in accordance with the attached KEY.
Step 8	This step is critical because identifying that CLA 1D is <2400ppm Boron is necessary to complete Enclosure 13.4 of PT/1/A/4600/003D in accordance with the attached KEY.
Step 9	This step is critical because identifying that CLA 1D is <2400ppm Boron is necessary to complete Enclosure 13.4 of PT/1/A/4600/003D in accordance with the attached KEY.
Step 10	This step is critical because determining the average boron concentration of the three CLAs >2400 ppm boron is necessary to complete Enclosure 13.4 of PT/1/A/4600/003D in accordance with the attached KEY.
Step 11	This step is critical because determining the average boron concentration of the four CLAs is necessary to complete Enclosure 13.4 of PT/1/A/4600/003D in accordance with the attached KEY.
Step 12	This step is critical because this step is necessary to determine that all Flex Strategy Administrative Limits are met.
Step 17	This step is critical because this step is necessary to determine that LCO 3.5.1 is not currently met for entry into Mode 3. Additionally, this step is critical that LCO 3.5.1 is not required in Mode 4.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 1) Prerequisites: (Step 1.1) IF performing routine monthly surveillances, THEN.....	The operator recognizes that the Surveillance is NOT being performed for the Monthly Surveillance and proceeds.		
2	(Note prior to Step 1.2) IF performing this procedure in preparation for mode change, Enclosure 13.4 may be performed prior to Mode 3 however, this surveillance shall be met in Mode 3 prior to NC System pressure increasing to greater than 1000 psig.	The operator reads the Note and proceeds.		
*3	(Step 1.2) IF performing this procedure prior to entering Mode 3 OR Unit in Mode 3 prior to NC System pressure increasing greater than 1000 psig, THEN record the following: Mode to be entered: _____ Date: _____	The operator records Mode 3 and <u>Today (or Equivalent)</u> , and proceeds. NOTE: The Date recorded is NOT critical.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<p>(Step 2) Check Boron Concentration of Cold Leg Accumulators within limits specified in COLR</p> <p>(Step 2.1) Record the following:</p> <p>Cold Leg Accumulator 1A Cold Leg Accumulator 1B Cold Leg Accumulator 1C Cold Leg Accumulator 1D</p>	<p>The operator records <u>2485</u> in the 1A CLA space provided.</p> <p>The operator records <u>2482</u> in the 1B CLA space provided.</p> <p>The operator records <u>2491</u> in the 1C CLA space provided.</p> <p>The operator records <u>2349</u> in the 1D CLA space provided.</p>		
*5	<p>(Step 2.2) Record Cold Leg Accumulator limits as specified in COLR:</p> <p>(Min) _____ ppmB (Max) _____ ppmB</p>	<p>The operator reviews the procedure and Section 2.11.1 of the Unit 1 COLR and determines that based on a current EFPD of 348, the minimum required Accumulator Boron Concentration is <u>2350</u> ppm, and records this in the space provided.</p> <p>The operator recognizes that the 1D CLA is less than that required by Tech Spec LCO 3.5.1.</p> <p>The operator reviews the procedure and Section 2.11.1 of the Unit 1 COLR and determines that the maximum allowable Accumulator Boron Concentration is <u>2875</u> ppm, and records this in the space provided.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	<p>(Notes prior to Step 3) The FLEX Strategy CLA minimum Boron Concentration limit is a Beyond Design Basis External Event administrative limit and does NOT affect Tech Spec operability.</p> <p>The FLEX Strategy Boron Concentration administrative limit for Cold Leg Accumulators is greater than 2400 ppmB.</p>	The operator reads the Notes and proceeds.		
7	<p>(Step 3) Check FLEX CLA Boron Concentration administrative limit met</p> <p>(Step 3.1) IF all Cold Leg Accumulators Boron Concentration greater than 2400 ppmB, THEN....</p>	The operator recognizes that the 1D CLA Boron Concentration is NOT greater than 2400 ppm, and proceeds.		
*8	<p>(Step 3.2) IF only one Cold Leg Accumulator below 2400 ppmB, THEN perform the following:</p> <p>(Step 3.2.1) Record affected CLA: _____</p>	The operator records <u>1D</u> in the space provided.		
*9	<p>(Step 3.2.2) Record affected CLA Boron Concentration: _____ ppmB</p>	The operator records <u>2349</u> in the space provided.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*10	(Step 3.2.3) Determine average Boron Concentration of the other three CLAs: $[(\text{_____ ppmB [1st CLA]}) + (\text{_____ ppmB [2nd CLA]}) + (\text{_____ ppmB [3rd CLA]})] \div 3 = \text{_____}$ [Avg of other CLAs]	The operator records <u>2485</u> in one space provided. The operator records <u>2482</u> in a second space provided. The operator records <u>2491</u> in the third space provided. The operator performs the calculation and determines that the Average of the Other CLAs is <u>2486</u> ppm, and this value is recorded.		
*11	(Step 3.2.4) Determine average CLA Boron Concentration: $(\text{_____ ppmB [Affected CLA]}) + \text{_____ ppmB [Average of other CLAs]} \div 2 = \text{_____ ppmB [Average CLA Boron Conc]}$	The operator records <u>2349</u> in the space provided for the Affected CLA. The operator records <u>2486</u> in the space provided for the Average of the Other CLAs. The operator performs the calculation and determines that the Average CLA Boron Concentration is <u>2417.5-2418</u> ppm, and this value is recorded.		
*12	(Step 3.2.5) IF Average CLA Boron Concentration is greater than 2400 ppmB, THEN this surveillance is met.	The operator recognizes that the Average CLA Boron Concentration is greater than 2400 ppm and concludes that the Surveillance (i.e. All Flex Strategy Administrative Limits) is met, and proceeds.		
13	(Step 3.2.6) IF above calculation is less than 2400 ppmB, THEN....	The operator recognizes that this step is NOT applicable, and proceeds.		
14	(Note prior to Step 3.3) Steps 3.3.1 and 3.3.2 may be performed concurrently.	The operator reads the Note and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	(Step 3.3) IF more than one CLA is less than 2400 ppmB, THEN....	The operator recognizes that CLA 1A, 1B and 1C are all greater than 2400 ppm, that this step is NOT applicable, and proceeds.		
16	(Step 4) Initial one of the following: <ul style="list-style-type: none"> No Discrepancy Discrepancy Sheet Attached (IF any Acceptance Criteria NOT met, THEN it is identified as a discrepancy, evaluated per Tech Spec/SLC and appropriate corrective action taken.) 	The operator leaves both bullets unsigned and hands off the Enclosure to the CRS.		
*17	(Directed Action) Complete Enclosure 13.4, NC Boron Concentration Checklist, of PT/1/A/4600/003D, Monthly Surveillance Items. Identify any Flex Strategy Administrative Limits and/or Technical Specification LCO's that are not met.	<p>The operator recognizes that the 1D CLA is less than that required by Tech Spec LCO 3.5.1 and entry into Mode 3 is not allowed.</p> <p>OR</p> <p>LCO 3.5.1 is not applicable in Mode 4.</p> <p>The operator recognizes that all Flex Strategy Administrative Limits are met.</p> <p>NOTE: See Key on Page 11 of JPM and separate document.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A1a RO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

VERIFICATION OF COMPLETION

KEY:

Are ALL Flex Strategy Administrative Limits met?

YES

Are ALL Technical Specification LCO's met?

NO

If NOT, identify requirements NOT met:

LCO 3.5.1

See also separate KEY of completed Enclosure 13.4.

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 is in Mode 4 during a plant startup.
- Current EFPD is 348.
- NC System pressure has stabilized at 1600 psig.
- Chemistry has reported that the CLA Boron Concentrations are as follows:
 - CLA 1A – 2485 ppm
 - CLA 1B – 2482 ppm
 - CLA 1C – 2491 ppm
 - CLA 1D – 2349 ppm
- It has become necessary to perform Enclosure 13.4, NC Boron Concentration Checklist, of PT/1/A/4600/003D, Monthly Surveillance Items, in order to continue with the plant startup.

INITIATING CUE:

- The CRS has directed you to complete Enclosure 13.4, NC Boron Concentration Checklist, of PT/1/A/4600/003D, Monthly Surveillance Items.
- Identify Flex Strategy Administrative Limits and/or Technical Specification LCO's that are not met (if any).

Are ALL Flex Strategy Administrative Limits met?

Are ALL Technical Specification LCO's met?

If NOT, identify requirements NOT met:

JPM A1b RO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Verification of Keff <0.99 with
Shutdown Banks WithdrawnJPM No.: 2020 Admin – JPM A1b
RO

K/A Reference: 2.1.37 (4.3)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom X Simulator _____ Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

Initial Conditions:

- Unit 1 was shutdown 16 hours ago after having run at 100% power for the previous three weeks.
- A Unit 1 startup is in progress per OP/1/A/6100/001 (Controlling Procedure for Unit Startup) and PT/0/A/4150/047 (1/M Monitoring During Startup).
- However, all control banks have just been reinserted because the extrapolated critical rod position indicated that criticality would occur below the lower ECP band.
- Criticality is now scheduled for 8 hours from now.
- The following Cycle 27 conditions exist currently:
 - EFPD = 25
 - NC Boron = 1966 PPM
 - Xenon Worth = 0 PCM
 - Differential Samarium worth = - 150 PCM
- The OAC and REACT Program are unavailable.
- It is expected that Tav_g will be maintained at its current value of 557°F

Job Performance Measure Worksheet

Initiating Cue: The CRS has directed you to perform Enclosure 4.7 (Verification of $K_{eff} < 0.99$ with Shutdown Banks Withdrawn) of OP/0/A/6100/006 (Reactivity Balance Calculation) to determine Mode 2 Boron Deficit.

Task Standard: The operator determines that under the current plant conditions there is a 2.6-2.7 ppm Mode 2 Effective Boron Deficit, and that there is sufficient NCS boron concentration to maintain Mode 2. (See attached KEY).

Required Materials: Calculator

General References: OP/1/A/6100/001 (Controlling Procedure for Unit Startup), Rev 186
PT/0/A/4150/047 (1/M Monitoring During Startup), Rev 7
OP/0/A/6100/006 (Reactivity Balance Calculation), Rev 81
MCEI-0400-380 (McGuire 1 Cycle Startup and Operational Report), Rev 0
MCEI-0400-379 (McGuire 1 Cycle 27 Core Operating Limits Report), Rev 1
AD-OP-ALL-0203 (Reactivity Management), Rev 11

Handouts: Handout 1: Blank Copy of OP/0/A/6100/006 (Reactivity Balance Calculation)

Time Critical Task: NO

Validation Time: 20 minutes

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 17	This step is critical because determining the Fission Product Correction is necessary to determine that under the current plant conditions there is a 2.6-2.7 ppm Mode 2 Effective Boron Deficit.
Step 19	This step is critical because selecting and using SOR Table 15 properly is necessary to determine that under the current plant conditions there is a 2.6-2.7 ppm Mode 2 Effective Boron Deficit.
Step 20	This step is critical because selecting and using SOR Table 1 properly is necessary to determine that under the current plant conditions there is a 2.6-2.7 ppm Mode 2 Effective Boron Deficit.
Step 21	This step is critical because completing Table 4.7.1 of Enclosure 4.7 of OP/0/A/6100/006 is necessary to determine that under the current plant conditions there is a 2.6-2.7 ppm Mode 2 Effective Boron Deficit.
Step 22	This step is critical because determining the Mode 2 Effective Boron Deficit is greater than 0 is necessary to determine that under the current plant conditions there is sufficient NCS boron concentration to maintain Mode 2.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Note prior top Step 3.1) All curves/tables used in this procedure, except for the Table referenced in Step 3.1.5, are found in the Control Room Data section of each units Startup and Operational Report (SOR).	The operator reads the NOTE and proceeds.		
2	(Step 3.1) Record the following: (Step 3.1.1) Unit ____ Cycle ____	The operator records Unit 1 and Cycle 27 , and proceeds.		
3	(Step 3.1.2) Burnup (P1457) _____ EFPD	The operator records 25 EFPD .		
4	(Step 3.1.3) Present/ Desired NC System Effective Boron Concentration: (Step 3.1.3.1) IF OAC is unavailable: (Step 3.1.3.1.A) Record Present/Desired NC Boron Concentration: (Step 3.1.3.1.B) Apply 100 ppm B-10 correction penalty: (Step 3.1.3.1A - 100 ppm) = (_____ - 100) =	 The operator recognizes that the OAC is unavailable, and records 1966 ppm as the present Boron Concentration. The operator applies the 100 ppm B-10 correction penalty and records 1866 ppm as the present Boron Concentration.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(Note prior to Step 3.1.3.2) If performing this enclosure prior to a dilution and wish to use a desired boron concentration instead of a current boron concentration, Step 3.1.3.2 shall be marked N/A.	The operator reads the NOTE and proceeds.		
6	(Step 3.1.3.2) IF desired to calculate effective boron using the OAC:.....	The operator recognizes that the OAC is unavailable, and proceeds.		
7	(Step 3.1.3.3) IF desired to calculate effective boron manually:.....	The operator recognizes that it is not desired to calculate the effective boron manually, and proceeds.		
8	(Step 3.1.3.4) Record the Effective Boron Concentration: (Step 3.1.3.1B or 3.1.3.2C or Step 3.1.3.3C) =	The operator records 1866 ppm as the Effective Boron Concentration.		
9	(Note prior to Step 3.1.4) If performing this enclosure prior to a temperature change, the limiting temperature as described in L&P 1.1.2.3 shall be used for Step 3.1.4. Otherwise, use the present temperature.	The operator reads the NOTE and proceeds.		
10	(Step 3.1.4) Present OR limiting NC system temperature:	The operator recognizes from initial conditions that Tavg is 557°F and records.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	(Step 3.1.5) IF EFPD = 0 AND boron concentration from Step 3.1.3.4 is greater than the Rod Drop boron concentration specified in the SOR Table SOR-2:.....	The operator recognizes from the initial conditions that EFPD is NOT = 0 <u>or</u> compares the Rod Drop boron concentration specified in the SOR Table SOR-2 (1963 ppm) with the Effective Boron Concentration (1866) and recognizes that this step is NA and proceeds.		
12	(Step 3.1.6) IF burnup from step 3.1.2 is > 0 EFPD, record the difference between equilibrium and present samarium worth (P1475, OAC Program Xenon Samarium-XESM, or REACT program).	The operator recognizes that burnup is > 0 EFPD and records -150 pcm from initial conditions.		
13	(Step 3.1.7) IF burnup from Step 3.1.2 is > 12 EFPD, perform Enclosure 4.8 to determine the fission product correction.	The operator recognizes that burnup is > 12 EFPD and that fission product correction is needed.		
14	(Enclosure 4.8, Notes prior to Step 3.1) <ul style="list-style-type: none"> The values in Table 4.8 (found at the end of this Enclosure) are pulled from MCEI-0400-268, Table 3. Number of hours shutdown is the difference in time between the time the reactor went subcritical and the expected time of criticality. 	The operator reads the NOTES and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	(Step 3.1) Shutdown Fission Product Correction Calculation: (Step 3.1.1) IF Unit operated > 3 EFPD from previous shutdown to current shutdown: (Step 3.1.1.1) Use Table 4.8 to determine the shutdown fission product correction:	The operator recognizes that Unit 1 operated for >3 EFPD from previous shutdown to current shutdown and addresses Table 4.8.		
16	(Step 3.1.1.2) Number of hours shutdown	The operator recognizes that the difference in time between the time the reactor went subcritical and the expected time of criticality is 24 hours.		
*17	(Step 3.1.1.3) Shutdown Fission Product Correction:	The operator records the Fission Product Correction as 10 ppmb and returns to Step 3.1.7 of Enclosure 4.7.		
18	(Enclosure 4.7, Step 3.2) IF desired, perform automated calculations using REACT (Reactivity Balance – Mode 3 Verification module).....	The operator recognizes from the initial conditions that the REACT Program is NOT available, and places NA in Step 3.2.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*19	<p>(Step 3.3) Manual Calculations:</p> <p>(Step 3.3.1) Mode 2 Boron Concentration:</p> <p>(Step 3.3.1.1) Determine Mode 2 boron concentration with shutdown banks withdrawn, control banks inserted, no xenon at the burnup recorded in Step 3.1.2 and temperature of Step 3.1.4 (Table 15 in the SOR).</p> <p>(Step 3.3.1.2) Record value in Table 4.7.1 Line A</p>	<p>The operator uses Table 15 (Handout 2) and determines Mode 2 boron concentration with shutdown banks withdrawn, control banks inserted, no xenon for 25 EFPD and 557°F is <u>1877</u> PPMB.</p> <p>The operator records <u>1877</u> on Line A of Table 4.7.1.</p>		
*20	<p>(Step 3.3.2) ARI Differential boron worth:</p> <p>(Step 3.3.2.1) Determine ARI Differential Boron Worth at burnup recorded in Step 3.1.2 and temperature of Step 3.1.4 (Table 1 in the SOR).</p> <p>(Step 3.3.2.2) Record value in Table 4.7.1 Line B</p>	<p>The operator uses Table 1 (Handout 2) and determines that the ARI Differential Boron Worth at 25 EFPD at 557°F is <u>-6.34</u> PCM/PPM.</p> <p>The operator records <u>-6.34</u> on Line B of Table 4.7.1.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*21	<p>(Step 3.3.3) Mode 2 boron deficit:</p> <p>(Step 3.3.3.1) Record values of Steps 3.1.3.4, 3.1.6 and 3.1.7 in Table 4.7.1.</p> <p>(Step 3.3.3.2) Complete Table 4.7.1, recording "0" for any reference steps N/A.</p>	<p>The operator records <u>1866 ppm</u> in Line C Table 4.7.1.</p> <p>The operator records <u>-150 pcm</u> in Line D Table 4.7.1.</p> <p>The operator records <u>10 ppmb</u> in Line E Table 4.7.1.</p> <p>The operator calculates F on Table 4.7.1 to be <u>23.66 (23.6 to 23.7) ppm</u> ($F = D/B$ or $-150 \text{ pcm} / -6.34 \text{ pcm/ppm} = 23.66 \text{ ppm [23.6 to 23.7]}$)</p> <p>The operator calculates Mode 2 Effective Boron Deficit on Table 4.7.1 to be <u>2.6-2.7 ppm</u> ($M2 \text{ EBD} = C - A - E + F$ or $1866 \text{ ppm} - 1877 \text{ ppm} - 10 + 23.66 \text{ (23.6 to 23.7)} = 2.6-2.7 \text{ ppm}$)</p>		
*22	<p>(Step 3.3.4) IF Mode 2 Effective Boron Deficit from Table 4.7.1 > 0:</p> <p>(Step 3.3.4.1) Sufficient NC boron is present in xenon free condition to prevent entering Mode 2.</p> <p>(Step 3.3.4.2) Mark remainder of Enclosure N/A.</p>	<p>The operator determines that the current NC conditions are sufficient in a xenon free condition to prevent entering Mode 2, and marks all remaining Steps NA.</p>		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A1b RO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Initial Conditions:

- Unit 1 was shutdown 16 hours ago after having run at 100% power for the previous three weeks.
- A Unit 1 startup is in progress per OP/1/A/6100/001 (Controlling Procedure for Unit Startup) and PT/0/A/4150/047 (1/M Monitoring During Startup).
- However, all control banks have just been reinserted because the extrapolated critical rod position indicated that criticality would occur below the lower ECP band.
- Criticality is now scheduled for 8 hours from now.
- The following Cycle 27 conditions exist currently:
 - EFPD = 25
 - NC Boron = 1966 PPM
 - Xenon Worth = 0 PCM
 - Differential Samarium worth = - 150 PCM
- The OAC and REACT Program are unavailable.
- It is expected that Tavg will be maintained at its current value of 557°F

INITIATING CUE:

The CRS has directed you to perform Enclosure 4.7 (Verification of $K_{eff} < 0.99$ with Shutdown Banks Withdrawn) of OP/0/A/6100/006 (Reactivity Balance Calculation) to determine Mode 2 Boron Deficit.

JPM A2 RO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Partial Loss of AnnunciatorsJPM No.: 2020 Admin – JPM A2
RO

K/A Reference: GK/A 2.2.43 (3.0)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handouts 1-2.

- Initial Conditions:
- Unit 1 is operating at 100% power.
 - Due to a lightning strike several of the Unit 1 Control Room Annunciators have failed.
 - The crew entered PT/1/A4600/033 (Loss of Control Room Annunciators) and has completed Attachment 2 (Partial Loss of Annunciator Panels) through Step 3.8.
 - Several Operators are reviewing the Annunciator Response Procedures for each failed annunciator.
 - All other annunciators have been tested satisfactorily.
 - The IAE Supervisor has been notified and is investigating.

Initiating Cue: The CRS has directed you to perform step 3.9 of Attachment 2 for the failed Annunciators on 1AD-13 (Marked in YELLOW on Attached Handout).

Job Performance Measure Worksheet

- The CRS has directed you to determine:
 - IF any AP or EP that has a Time Critical Task has been affected
 - IF any Technical Specification or Selected Licensee Commitment surveillance has been affected
 - IF any proceduralized Alternate Action must be taken

Task Standard: The operator will determine that there are Alternative Methods procedurally identified for Surveillance associated with three of these annunciators, that one failure impacts the Semi-Daily Surveillance associated with TS SR 3.6.4.1, that one failure impacts the Daily Surveillance associated with SLC 16.7.3, **that one failure impacts the Daily Surveillance associated with SLC 16.9.26**, and that one failure impacts an AP/EP Time Critical Task per the attached KEY.

Required Materials: None

General References: PT/1/A/4600/033 (Loss of Control Room Annunciators), Rev 11
PT/1/A/4600/003 A (Semi-Daily Surveillance Items), Rev 170
PT/1/A/4600/003 B (Daily Surveillance Items), Rev 172
OP/1/A/6100/010 N (Annunciator Response For Panel 1AD-13), Rev 80
PT/0/A/4600/113 (McGuire Time Critical Actions/Time Sensitive Actions), Rev 28
AP/0/A/5500/44 (Plant Flooding), Rev 21

Handouts: Handout 1: PT/1/A4600/033 (Loss of Control Room Annunciators) marked up for place-keeping.
Handout 2: Failed Annunciators

Time Critical Task: NO

Validation Time: 25 minutes

<u>Critical Step Justification</u>	
Step 1	This step is critical because determining that 1AD-13, B1 has no Alternate Method of Surveillance, that an AP/EP Time Critical Action is NOT affected, and that this alarm failure has no bearing on the surveillances of Enclosure 13.1 of PT/1/A/4600/003 A & Enclosure 13.1 of PT/1/A/4600/003 B is necessary to complete the assigned task.
Step 2	This step is critical because determining the Alternate Method of Surveillance and determining that an 1AD-13, B3 alarm failure affects Enclosure 13.1 of PT/1/A/4600/003 A (Semi-Daily Surveillance Items), specifically the surveillance associated with TS SR 3.6.4.1; and has no other impact, is necessary to complete the assigned task.
Step 3	This step is critical because determining the Alternate Method of Surveillance and determining that an 1AD-13, C1 alarm failure affects the performance of an AP/EP Time Critical Task is necessary to complete the assigned task.
Step 4	This step is critical because determining the Alternate Method of Surveillance and determining that an 1AD-13, C4 alarm failure affects Enclosure 13.1 of PT/1/A/4600/003 B (Daily Surveillance Items), specifically the surveillance associated with SLC 16.7.3; and has no other impact, is necessary to complete the assigned task.
Step 5	This step is critical because determining that 1AD-13, E7 has no Alternate Method of Surveillance, that an AP/EP Time Critical Action is NOT affected, and that this alarm failure has no bearing on the surveillances of Enclosure 13.1 of PT/1/A/4600/003 A & Enclosure 13.1 of PT/1/A/4600/003 B is necessary to complete the assigned task.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handouts 1-2.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
NOTE: The operator may desire to review the Annunciator Response Procedure for any of the five Annunciators. A copy of OP/1/A/6100/010 N (Annunciator Response For Panel 1AD-13) should be available for this review.				
*1	(PT/1/A/4600/033, Attachment 2, Step 3.9) Perform Attachment 3, Annunciator Panel Reference to evaluate the following: <ul style="list-style-type: none"> • Alternate indications available for affected alarms • Impact to Ops PTs (Semi Daily, Daily, etc.) 1AD-13, B1, FWST YARD LINE CONTENTS LO TEMP	The operator addresses Attachment 3 of PT/1/A/4600/033 and recognizes that this Annunciator has no Alternate Method of Surveillance and that an AP/EP Time Critical Action is NOT affected. The operator reviews Enclosure 13.1 of PT/1/A/4600/003 A & Enclosure 13.1 of PT/1/A/4600/003 B and determines that this alarm failure has no bearing on these surveillances.		
		NOTE: The evaluation of the Annunciators may be performed in ANY order.		
		NOTE: See KEY on Page 11.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*2	(PT/1/A/4600/033, Attachment 2, Step 3.9) Perform Attachment 3, Annunciator Panel Reference to evaluate the following: <ul style="list-style-type: none"> • Alternate indications available for affected alarms • Impact to Ops PTs (Semi Daily, Daily, etc.) 1AD-13, B3, CONT PRESS ALERT HI	<p>The operator addresses Attachment 3 of PT/1/A/4600/033 and determines that the Alternate Method of Surveillance requires that OAC alarm for M1P4295 be set at +0.2 psig.</p> <p>The operator addresses Attachment 3 of PT/1/A/4600/033 and determines that an AP/EP Time Critical Action is NOT affected.</p> <p>The operator reviews Enclosure 13.1 of PT/1/A/4600/003 A and determines that this alarm failure affects Enclosure 13.1, specifically the surveillance associated with TS SR 3.6.4.1.</p> <p>The operator reviews Enclosure 13.1 of PT/1/A/4600/003 B and determines that this alarm failure has no bearing on these surveillances.</p> <p>NOTE:</p> <p>See KEY on Page 11.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(PT/1/A/4600/033, Attachment 2, Step 3.9) Perform Attachment 3, Annunciator Panel Reference to evaluate the following: <ul style="list-style-type: none"> • Alternate indications available for affected alarms • Impact to Ops PTs (Semi Daily, Daily, etc.) 1AD-13, C1, ND & NS ROOM SUMP HI-HI LVL	<p>The operator addresses Attachment 3 of PT/1/A/4600/033 and determines that the Alternate Method of Surveillance requires that the operator monitor the ND/NS sump levels locally.</p> <p>The operator addresses Attachment 3 of PT/1/A/4600/033 and determines that the failure of this alarm will affect the performance of a Time Critical Task in an AP or EP.</p> <p>The operator reviews Enclosure 13.1 of PT/1/A/4600/003 A & Enclosure 13.1 of PT/1/A/4600/003 B and determines that this alarm failure impacts the performance of Enclosure 13.1, specifically the surveillance associated with SLC 16.9.26.</p> <p>NOTE: See KEY on Page 11.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(PT/1/A/4600/033, Attachment 2, Step 3.9) Perform Attachment 3, Annunciator Panel Reference to evaluate the following: <ul style="list-style-type: none"> • Alternate indications available for affected alarms • Impact to Ops PTs (Semi Daily, Daily, etc.) 1AD-13, C4, ENVIRONMENT SYSTEM TROUBLE	<p>The operator addresses Attachment 3 of PT/1/A/4600/033 and determines that the Alternate Method of Surveillance requires that the operator verify that the chart recorders readout is updating.</p> <p>The operator addresses Attachment 3 of PT/1/A/4600/033 and determines that an AP/EP Time Critical Action is NOT affected.</p> <p>The operator reviews Enclosure 13.1 of PT/1/A/4600/003 and determines that this alarm failure has no bearing on these surveillances.</p> <p>The operator reviews Enclosure 13.1 of PT/1/A/4600/003 B and determines that this alarm failure impacts the performance of Enclosure 13.1, specifically the surveillance associated with SLC 16.7.3.</p> <p>NOTE:</p> <p>See KEY on Page 11.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	(PT/1/A/4600/033, Attachment 2, Step 3.9) Perform Attachment 3, Annunciator Panel Reference to evaluate the following: <ul style="list-style-type: none"> • Alternate indications available for affected alarms • Impact to Ops PTs (Semi Daily, Daily, etc.) 1AD-13, E7, O.B.E. EXCEEDED	The operator addresses Attachment 3 of PT/1/A/4600/033 and recognizes that this Annunciator has no Alternate Method of Surveillance and that an AP/EP Time Critical Action is NOT affected.		
		The operator reviews Enclosure 13.1 of PT/1/A/4600/003 A & Enclosure 13.1 of PT/1/A/4600/003 B and determines that this alarm failure has no bearing on these surveillances.		
		NOTE: See KEY on Page 11.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A2 RO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

VERIFICATION OF COMPLETION

KEY:

<u>Failed Annunciator</u>	<u>AP/EP w/TC Task</u>	<u>TS/SLC Affected</u>	<u>Alternate Action</u>
1AD-13, B1, FWST YARD LINE CONTENTS LO TEMP	NO	None	None
1AD-13, B3, CONT PRESS ALERT HI	NO	TS SR 3.6.4.1	OAC alarm for M1P4295 be set at +0.2 psig
1AD-13, C1, ND & NS ROOM SUMP HI- HI LVL	YES	SLC 16.9.26 (New critical Task)	The operator will monitor the ND/NS sump levels locally
1AD-13, C4, ENVIRONMENT SYSTEM TROUBLE	NO	SLC 16.7.3	The operator verify that the chart recorders readout is updating.
1AD-13, E7, O.B.E. EXCEEDED	NO	None	None

RED = Critical

NOTE: Annunciators may be listed in ANY order.

JPM CUE SHEET

Initial Conditions:

- Unit 1 is operating at 100% power.
- Due to a lightning strike several of the Unit 1 Control Room Annunciators have failed.
- The crew entered PT/1/A4600/033 (Loss of Control Room Annunciators) and has completed Attachment 2 (Partial Loss of Annunciator Panels) through Step 3.8.
- Several Operators are reviewing the Annunciator Response Procedures for each failed annunciator.
- All other annunciators have been tested satisfactorily.
- The IAE Supervisor has been notified and is investigating.

INITIATING CUE:

- The CRS has directed you to perform step 3.9 of Attachment 2 for the failed Annunciators on 1AD-13 (Marked in YELLOW on Attached Handout).
- The CRS has directed you to determine:
 - IF any AP or EP that has a Time Critical Task has been affected
 - IF any Technical Specification or Selected Licensee Commitment surveillance has been affected
 - IF any proceduralized Alternate Action must be taken

<u>Failed Annunciator</u>	<u>AP/EP w/TC Task</u>	<u>TS/SLC Affected</u>	<u>Alternate Action</u>
	YES / NO		
	YES / NO		
	YES / NO		
	YES / NO		
	YES / NO		

(Use Back if More Space Needed)

JPM A3 RO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Evaluate Stay Time with Lowered SFP LevelJPM No.: 2020 Admin – JPM A3 RO

K/A Reference: 2.3.7 (3.5)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom X Simulator _____ Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

Initial Conditions:

- A station wide accident has occurred due to an Earthquake.
- Unit 1 is in Mode 6 with a complete core off-load.
- The Unit 1 Spent Fuel Pool level has lowered to 10 feet above the top of the fuel and has stabilized at this level.
- The crew is implementing AP/1/A/5500/41 (Loss of Spent Fuel Cooling or Level) and EP/1/A/5000/G-1 Generic Enclosures), Enclosure 32 (Monitoring Unit 1 SFP Level and Temperature).
- No installed radiation monitors are operable in the Unit 1 Spent Fuel Building.
- A dose limit of 500 mrem has been placed on all personnel performing emergency tasks within the building.
- You have been assigned a repetitive task within Generic Enclosure 32 which will require you to enter the Unit 1 Spent Fuel Building and proceed to the area around the Spent Fuel Pool, and remain there for 8 minutes, before exiting the building.
- The exposure traveling to and from the Unit 1 Spent Fuel Pool area results in no appreciable exposure.

Job Performance Measure Worksheet

Initiating Cue: The CRS has directed you to use Enclosure 13 (Spent Fuel Pool Radiation Level Vs. Water Level Above Fuel) of AP/1/A/5500/41 (Loss of Spent Fuel Cooling or Level), and determine the number of times you will be able to perform this repetitive task before you must be replaced by another operator.

Task Standard: The operator will use Enclosure 13 of AP/1/A/5500/41 to determine that the dose rate around the Spent Fuel Pool area is 649 mrem/hour and based on this the operator will determine that the repetitive task can be performed 5 times before another operator will need to perform the task.

Required Materials: Calculator

General References: AP/1/A/5500/41 (Loss of Spent Fuel Pool Cooling or Level), Rev 15
EP/1/A/5000/G-1 (Generic Enclosures), Rev 41
MNS SLC 16.9.21 (Water Level – Spent Fuel Storage Pool), Rev 155
PD-RP-ALL-0001 (Radiation Worker Responsibilities), Rev 11

Handouts: Handout 1: Enclosure 13 (Spent Fuel Pool Radiation Level Vs. Water Level Above Fuel) of AP/1/A/5500/41 (Loss of Spent Fuel Cooling or Level)

Time Critical Task: NO

Validation Time: 7 minutes

<u>Critical Step Justification</u>	
Step 1	This step is critical because using Enclosure 13 and determining that the dose rate around the pool area is 649 mrem/hour is necessary to complete the assigned task.
Step 2	This step is critical because determining the dose received for one performance of the task is necessary to complete the assigned task.
Step 3	This step is critical because determining the number of times the operator will be able to perform this repetitive task before they must be replaced by another operator is necessary to complete the assigned task.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk)*

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	(AP/1/A/5500/41, Enclosure 13) Determine the Dose Rate around the Spent Fuel Pool area with water level at 10 feet.	The operator uses Enclosure 13 and determines that the dose rate around the pool area is 649 mrem/hour . 6.49E-01R/hr OR $(6.49 \times 10^{-1} \text{ R/hr}) \times 10^3$ mrem/R = 649 mrem/hr		
*2	Determine Dose received each time task is performed	The operator recognizes that the task requires eight minutes. The operator determines that the dose received in that eight-minute period is 86.53 mrem (86-87 mrem) . Dose = 649 mrem/hr x 1hr/60 minutes x 8 minutes		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	Determine the number of times that the repetitive task can be performed while remaining within allowable RWP dose limit.	<p>The operator recognizes that the maximum allowable dose received is 500 mrem, and that 86.53 (86-87 mrem) mrem will be received on each occasion the task is performed.</p> <p>The operator identifies that the task can be performed <u>5 times</u>, before another operator will be required to perform the task.</p> <p># Task performances = $500 \text{ mrem} / 86.53 \text{ (86-87 mrem) mrem/task} = 5.78$ tasks, or 5 tasks.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A3 RO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A station wide accident has occurred due to an Earthquake.
- Unit 1 is in Mode 6 with a complete core off-load.
- The Unit 1 Spent Fuel Pool level has lowered to 10 feet above the top of the fuel and has stabilized at this level.
- The crew is implementing AP/1/A/5500/41 (Loss of Spent Fuel Cooling or Level) and EP/1/A/5000/G-1 Generic Enclosures), Enclosure 32 (Monitoring Unit 1 SFP Level and Temperature).
- No installed radiation monitors are operable in the Unit 1 Spent Fuel Building.
- A dose limit of 500 mrem has been placed on all personnel performing emergency tasks within the building.
- You have been assigned a repetitive task within Generic Enclosure 32 which will require you to enter the Unit 1 Spent Fuel Building and proceed to the area around the Spent Fuel Pool, and remain there for 8 minutes, before exiting the building.
- The exposure traveling to and from the Unit 1 Spent Fuel Pool area results in no appreciable exposure.

INITIATING CUE:

The CRS has directed you to use Enclosure 13 (Spent Fuel Pool Radiation Level Vs. Water Level Above Fuel) of AP/1/A/5500/41 (Loss of Spent Fuel Cooling or Level), and determine the number of times you will be able to perform this repetitive task before you must be replaced by another operator.

JPM A1a SRO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Determine Reportability RequirementsJPM No.: 2020 Admin – JPM A1a SRO

K/A Reference: 2.1.18 (3.8)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom X Simulator _____ Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

- Initial Conditions:
- With Unit 1 at 100% power, the following event occurred at 0400 today:
 - The crew was removing Pzr Heater Groups A, B and D from service when an automatic plant trip on low pressurizer pressure occurred due to an operational error.
 - The crew entered EP/1/A/5000/E-0, Reactor Trip or Safety Injection, and quickly stabilized pressurizer pressure before transitioning to EP/1/A/5000/ES-0.1, Reactor Trip Response, where the plant was stabilized.
 - The SM has verified that this event has NOT exceeded an Emergency Action Level (EAL).
 - The SM and the STA believe that this event is reportable to the NRC.
 - No external persons and/or agencies have been notified of this event, nor have any actions other than those identified been taken.

Initiating Cue: Ten minutes after the event the SM directs you to determine reportability requirements per RP/0/A/5700/010 (NRC Immediate Notification Requirements), including completion of any necessary paperwork (Provide to Examiner when ready to Transmit).

Job Performance Measure Worksheet

Task Standard: The operator will identify that this condition requires a 4-hour notification to the NRC in accordance with RP/0/A/5700/010 (NRC Immediate Notification Requirements), and complete Attachment 2 (NRC Event Notification Worksheet) in accordance with the attached Key.

Required Materials: None

General References: RP/0/A/5700/010 (NRC Immediate Notification Requirements), Rev. 31
RP/0/A/5700/014 (Emergency Telephone Directory), Rev. 39
AD-OP-ALL-0101 (Event Response and Notifications), Rev. 11

Handouts: Handout 1: Blank copy of RP/0/A/5700/010.

Time Critical Task: NO

Validation Time: 20 minutes

<u>Critical Step Justification</u>	
Step 3	This step is critical because determining that Event Condition 4.1.3.3 is applicable and that this event must be reported as soon as practical and within 4 hours of the occurrence is necessary to complete the assigned task.
Step 6	This step is critical because Completing Attachment 2 of RP/0/A/5700/010 (NRC Immediate Notification Requirements) is necessary to complete the assigned task in accordance with the attached Key.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Step 6.1) Notify the NRC Operations Center in accordance with this procedure.	The operator places initials in block and proceeds.		
2	(Step 6.2) Ensure the Shift Technical Advisor is aware of the pending NRC notification.	The operator recognizes that the STA is aware of the pending NRC notification (Initial Conditions), checks the block and proceeds.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Step 6.3) Determine appropriate notification AND time requirements using Attachment 1, Events Requiring NRC Notification.	<p>The operator addresses Attachment 1.</p> <p>The operator recognizes that Event Condition 4.1.3.3 is applicable and that this event must be reported as soon as practical and within 4 hours of the occurrence.</p> <p>4.1.3.3: "Any event OR condition that results in actuation of the reactor protection system (RPS) when the reactor is critical except when the actuation results from AND is part of a pre-planned sequence during testing OR reactor operation."</p> <p>The operator may check "[50.72(b)(3)(IV)(A)] Valid Actuation of System listed in Attachment 3" Block (8-hour report) – Not Critical.</p>		
4	(Note prior to Step 6.4) Sections of Attachment 2 that are not applicable should be marked (N/A).	The operator reads the Note, checks the block and proceeds.		
5	(Step 6.4) IF Attachment 2, NRC Event Notification Worksheet being completed for a drill, THEN write: "This is a Drill" on the first line of event description.	<p>The operator records that this is a drill, and proceeds.</p> <p>OR</p> <p>The operator does not record that this is a drill, and proceeds.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6 * (As shown on KEY)	(Step 6.5) Complete applicable portions of Attachment 2 using information from Attachment 1.	The operator completes Attachment 2 in accordance with the Attached Key.		
		Cue: After the Attachment 2 is presented for transmittal, indicate that another operator will complete the required actions.		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A1a SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

VERIFICATION OF COMPLETION

KEY:

Attachment 2 NRC Event Notification Worksheet Page 1 of 3

All blocks left blank except as follows:

Notification Time/Date:	(Left Blank)
Unit	1
Caller's Name	Operator's Name
NRC Operations Officer Contacted	(Left Blank)
Event Time and Zone	0400 (time)
Event Date	Present Date
Power/Mode Before	100%/Mode 1
Power/Mode After	0%/Mode 3
4-Hr Non-Emergency	Check Mark in "[50.72(b)(2)(IV)(B)] RPS Actuation – Critical Scram" Block. The operator may check "[50.72(b)(3)(IV)(A)] Valid Actuation of System listed in Attachment 3" Block (8-hour report) – Not Critical.

Attachment 2 NRC Event Notification Worksheet Page 2 of 3

All blocks left blank except as follows:

Event Description	The crew was removing Pzr Heater Groups A, B and D from service when an automatic plant trip on low pressurizer pressure occurred due to an operational error. The crew entered EP/1/A/5000/E-0, Reactor Trip or Safety Injection, and quickly stabilized pressurizer pressure before transitioning to EP/1/A/5000/ES-0.1, Reactor Trip Response, where the plant was stabilized (Or Equivalent).
Notifications: NRC Resident	Will Be is checked
Notifications: State	NO or Will Be is checked
Notifications: Local	NO or Will Be is checked
Notifications: Other Gov Agencies	NO or Will Be is checked
Notifications: Media/Press Release	NO or Will Be is checked
Anything Unusual or NOT understood?	NO is checked
Did all Systems Function as required	YES is checked.
Approved By:	Operator's Name
Time/Date:	Estimated Time and Date

Attachment 2 NRC Event Notification Worksheet Page 3 of 3 - All blocks lined out with NA and Initials.

CRITICAL Information is in BOLD

JPM CUE SHEET

Initial Conditions:

- With Unit 1 at 100% power, the following event occurred at 0400 today:
 - The crew was removing Pzr Heater Groups A, B and D from service when an automatic plant trip on low pressurizer pressure occurred due to an operational error.
 - The crew entered EP/1/A/5000/E-0, Reactor Trip or Safety Injection, and quickly stabilized pressurizer pressure before transitioning to EP/1/A/5000/ES-0.1, Reactor Trip Response, where the plant was stabilized.
- The SM has verified that this event has NOT exceeded an Emergency Action Level (EAL).
- The SM and the STA believe that this event is reportable to the NRC.
- No external persons and/or agencies have been notified of this event, nor have any actions other than those identified been taken.

INITIATING CUE:

Ten minutes after the event the SM directs you to determine reportability requirements per RP/0/A/5700/010 (NRC Immediate Notification Requirements), including completion of any necessary paperwork (Provide to Examiner when ready to Transmit).

JPM A1b SRO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Perform Daily Surveillance Items ChecklistJPM No.: 2020 Admin – JPM A1b SRO

K/A Reference: 2.1.1 (4.2)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom X Simulator _____ Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

Initial Conditions:

- Unit 1 is in Mode 1 at 100% power.
- Fire Hydrant 10 (W of Main Shop) is OOS and all other equipment is operable and/or functional.
- Enclosure 13.1, Daily Surveillance Items Checklist, of PT/1/A/4600/003B, "Daily Surveillance Items," has been completed.
- Enclosure 13.3, "Cask Monitoring," is still in progress and will be provided when complete.
- The Unit 1 VA System is undergoing scheduled maintenance (i.e. "VA Down Day")

Initiating Cue:

- Evaluate the completed Enclosure 13.1 of PT/1/A/4600/003B (Daily Surveillance Items Checklist) per Step 12.
- Identify all Technical Specification/SLC required ACTION, as well as all other actions that must be taken so that an ESOMS entry can be prepared.

Job Performance Measure Worksheet

Task Standard: The operator will review the completed Enclosure 13.1, Daily Surveillance Items Checklist and associated Equipment Problem Identification Form and verify that the applicable surveillance items meet specified acceptance criteria. For surveillance items NOT meeting Acceptance Criteria, all required action will be identified per the attached KEY.

Required Materials: None

General References: PT/1/A/4600/003B, (Daily Surveillance Items), Rev 172
AD-HU-ALL-0004, (Procedure and Work Instruction Use and Adherence), Rev 10
McGuire Technical Specifications LCO 3.5.4 (Refueling Water Storage Tank (RWST)), Amendment 184/166
McGuire Selected Licensee Commitments (SLC) 16.9.11 (Borated Water Sources (Operating)) Rev 22
McGuire Selected Licensee Commitments (SLC) 16.9.14 (Borated Water Sources (Shutdown)) Rev 177
McGuire Selected Licensee Commitments (SLC) 16.11.2 (Radioactive Liquid Effluent Monitoring Instrumentation) Rev 134
McGuire Selected Licensee Commitments (SLC) 16.11.7 (Radioactive Gaseous Effluent Monitoring Instrumentation) Rev 134

Handouts: Handout 1: Enclosure 13.1 (Daily Surveillance Items Checklist) of PT/1/A/4600/003 B (Daily Surveillance Items) and an associated Equipment Problem Evaluation Form, marked up for this JPM.

Time Critical Task: NO

Validation Time: 25 minutes

Job Performance Measure Worksheet

<u>Critical Step Justification</u>	
Step 1	This step is critical because assessing the difference between the two VCT level instruments is necessary to ensure that all required action is identified per the attached KEY for surveillance items NOT meeting Acceptance Criteria.
Step 2	This step is critical because assessing the low FWST temperature is necessary to ensure that all required action is identified per the attached KEY for surveillance items NOT meeting Acceptance Criteria.
Step 3	This step is critical because assessing the unsuccessful source check on 1EMF31 is necessary to ensure that all required action is identified per the attached KEY for surveillance items NOT meeting Acceptance Criteria.
Step 4	This step is critical because assessing the low reading on the Unit Vent Flowrate Monitor is necessary to ensure that all required action is identified per the attached KEY for surveillance items NOT meeting Acceptance Criteria.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
NOTE: Equipment problems may be evaluated in ANY order.				
*1	<p>(Step 12.2.2) IF performing Enclosure 13.1 (Daily Surveillance Items Checklist), THEN check each applicable surveillance item in Enclosure 13.1 meets its Acceptance Criteria.</p> <p>(Step 12.2.5) IF a surveillance item was NOT completed due to Unit "Applicable Mode", THEN identify surveillance item by writing "NA" in appropriate initial blank.</p> <p>(Step 12.2.6) IF a surveillance item Acceptance Criteria NOT met, perform the following:</p> <p>(Step 12.2.6.1) Identify surveillance item as a discrepancy in appropriate initials blank.</p> <p>(Step 12.2.6.2) Note surveillance item on a discrepancy sheet (JPM Cue Sheet).</p>	<p>The operator reviews the completed Enclosure 13.1 and Equipment Problem Evaluation Form.</p> <p>The operator recognizes that Control Room indicators 1NVP5760 and 1NVP5763 (VCT Level) are NOT within 5% of each other.</p> <p>The operator recognizes that there are no TS/SLC requirements associated with the VCT level instruments, but that they are required to be within 5% of each other based on SOER 97-1 requirements.</p> <p><u>The operator notifies the WCC or directs that a work request be created.</u></p> <p><u>(See KEY on Page 10)</u></p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*2	<p>(Step 12.2.2) IF performing Enclosure 13.1 (Daily Surveillance Items Checklist), THEN check each applicable surveillance item in Enclosure 13.1 meets its Acceptance Criteria.</p> <p>(Step 12.2.5) IF a surveillance item was NOT completed due to Unit "Applicable Mode", THEN identify surveillance item by writing "NA" in appropriate initial blank.</p> <p>(Step 12.2.6) IF a surveillance item Acceptance Criteria NOT met, perform the following:</p> <p>(Step 12.2.6.1) Identify surveillance item as a discrepancy in appropriate initials blank.</p> <p>(Step 12.2.6.2) Note surveillance item on a discrepancy sheet (JPM Cue Sheet).</p>	<p>The operator reviews the completed Enclosure 13.1 and Equipment Problem Evaluation Form.</p> <p>The operator recognizes that FWST Solution Temperature (Minimum) is $\leq 70^{\circ}\text{F}$ as read on 1FWP-5030 (which is operable).</p> <p>The operator addresses TS LCO 3.5.4, Refueling Water Storage Tank, and determines that ACTION A.1 applies.</p> <p>The operator addresses SLC 16.9.11, Borated Water Sources (Operating), and determines that ACTION D.1 applies.</p> <p>The operator addresses SLC 16.9.14, Borated Water Sources (Shutdown), and determines that this SLC does not apply under the current plant conditions.</p> <p><u>The operator identifies LCO 3.5.4 ACTION A and SLC 16.9.11 ACTION D.</u></p> <p><u>(See KEY on Page 10)</u></p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	<p>(Step 12.2.2) IF performing Enclosure 13.1 (Daily Surveillance Items Checklist), THEN check each applicable surveillance item in Enclosure 13.1 meets its Acceptance Criteria.</p> <p>(Step 12.2.5) IF a surveillance item was NOT completed due to Unit "Applicable Mode", THEN identify surveillance item by writing "NA" in appropriate initial blank.</p> <p>(Step 12.2.6) IF a surveillance item Acceptance Criteria NOT met, perform the following:</p> <p>(Step 12.2.6.1) Identify surveillance item as a discrepancy in appropriate initials blank.</p> <p>(Step 12.2.6.2) Note surveillance item on a discrepancy sheet (JPM Cue Sheet).</p>	<p>The operator reviews the completed Enclosure 13.1 and Equipment Problem Evaluation Form.</p> <p>The operator recognizes that the operate light is NOT LIT for 1EMF-31 (Turbine Bldg Sump Disch) the loss of sample flow annunciator is NOT in alarm status, and the source check was unsuccessful.</p> <p>The operator addresses SLC 16.11.2, Radioactive Liquid Effluent Monitoring Instrumentation, and enters Condition B immediately.</p> <p>The operator addresses Table 16.11.2-1, Instrument 2.a and determines that since TR 16.11.2.1 is NOT met and Instrument 2.a is NOT OPERABLE, ACTION D is required.</p> <p><u>The operator determines that SLC 16.11.2 ACTION B and D are required and notifies the WCC or directs that a work request be created.</u></p> <p><u>(See KEY on Page 10)</u></p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	<p>(Step 12.2.2) IF performing Enclosure 13.1 (Daily Surveillance Items Checklist), THEN check each applicable surveillance item in Enclosure 13.1 meets its Acceptance Criteria.</p> <p>(Step 12.2.5) IF a surveillance item was NOT completed due to Unit "Applicable Mode", THEN identify surveillance item by writing "NA" in appropriate initial blank.</p> <p>(Step 12.2.6) IF a surveillance item Acceptance Criteria NOT met, perform the following:</p> <p>(Step 12.2.6.1) Identify surveillance item as a discrepancy in appropriate initials blank.</p> <p>(Step 12.2.6.2) Note surveillance item on a discrepancy sheet (JPM Cue Sheet).</p>	<p>The operator reviews the completed Enclosure 13.1 and Equipment Problem Evaluation Form.</p> <p>The operator recognizes that Unit Vent Flow Rate Monitor(1VALP-5120) is reading < 15%.</p> <p>The operator addresses SLC 16.11.7-1 and enters Condition B immediately.</p> <p>The operator addresses Table 16.11.7-1, Instrument 3.d and determines that since TR 16.11.7.3 is NOT met Instrument 3.d is NOT OPERABLE, and that ACTION D is required.</p> <p><u>The operator determines that SLC 16.11.7 ACTION B and D are required.</u></p> <p><u>(See KEY on Page 10)</u></p>		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A1b SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

VERIFICATION OF COMPLETION

KEY:

<u>Problem</u>	<u>Identify all Technical Specification/SLC required ACTION, as well as all other actions that must be taken</u>
Control Room indicators 1NVP5760 and 1NVP5763 (VCT Level) are NOT within 5% of each other	The operator notifies the WCC or directs that a work request be created.
FWST Solution Temperature (Minimum) is \leq 70°F as read on 1FWP-5030	The operator identifies LCO 3.5.4 ACTION A and SLC 16.9.11 ACTION D are required.
Operate light is NOT LIT for 1EMF-31 (Turbine Bldg Sump Disch) the loss of sample flow annunciator is NOT in alarm status, and the source check was unsuccessful	<p>The operator determines that SLC 16.11.2 ACTION B and D are required.</p> <p>The operator notifies the WCC or directs that a work request be created.</p> <p>NOTE: The Identification of ACTION B is NOT Critical.</p>
Unit Vent Flow Rate Monitor(1VALP-5120) is reading < 15%	<p>The operator determines that SLC 16.11.7 ACTION B and D are required.</p> <p>NOTE: The Identification of ACTION B is NOT Critical.</p>

JPM CUE SHEET

Initial Conditions:

- Unit 1 is in Mode 1 at 100% power.
- Fire Hydrant 10 (W of Main Shop) is OOS and all other equipment is operable and/or functional.
- Enclosure 13.1, Daily Surveillance Items Checklist, of PT/1/A/4600/003B, "Daily Surveillance Items," has been completed.
- Enclosure 13.3, "Cask Monitoring," is still in progress and will be provided when complete.
- The Unit 1 VA System is undergoing scheduled maintenance (i.e. "VA Down Day")

INITIATING CUE:

- Evaluate the completed Enclosure 13.1 of PT/1/A/4600/003B (Daily Surveillance Items Checklist) per Step 12.
- Identify all Technical Specification/SLC required ACTION, as well as all other actions that must be taken so that an ESOMS entry can be prepared.

<u>Problem</u>	<u>Identify all Technical Specification/SLC required ACTION, as well as all other actions that must be taken</u>

(If additional space is needed use back of page)

JPM A2 SRO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Perform a Thermal Margin DeterminationJPM No.: 2020 Admin – JPM A2 SRO

K/A Reference: 2.2.18 (3.9)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
 Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

Initial Conditions:

- Unit 1 was shutdown 16 days ago for a mid-cycle outage after 200 days of operation.
- Unit 1 is currently in Mode 5.
- No Core Offload will occur.
- The NC system is 125°F with “A” Train ND in service.
- Preparations are being made to lower NC system level to 67 inches above Hot Leg Centerline per Enclosure 4.1 (Draining the NC System) of OP/1/A/6100/SD-20 (Draining the NC System).

Initiating Cue:

- Complete Attachment 12.6 of OMP 5-8 (Shift Supervision Turnovers) to determine the new thermal margin with NC system level at 67 inches above Hot Leg Centerline (Complete all required paperwork).
- Identify the individuals that must be notified and/or actions that must be taken.

Task Standard: The operator will determine the Thermal Margin and complete Attachment 12.6 (Thermal Margin Determination) and Attachment 12.7 (Shutdown Assessment Status) of OMP 5-8 (Shift Supervision Turnovers) in accordance with the provided KEY.

Job Performance Measure Worksheet

Required Materials: Calculator

General References: OP/1/A/6100/SD-20 (Draining the NC System), Rev 71
OMP 5-8 (Shift Supervision Turnovers), Rev 74
OP/1/A/6100/022 (Unit 1 Data Book), Rev 481
MCEI-0400-379 (McGuire 1 Cycle 27 Core Operating Limits Report), Rev 1

Handouts: Handout 1: Blank copy of OMP 5-8 (Shift Supervision Turnovers)

Time Critical Task: NO

Validation Time: 15 minutes

NOTE: An Answer KEY is provided on a separate document.

<u>Critical Step Justification</u>	
Step 2	This step is critical because selecting and using Curve 2.10.1 B (Or Curve 2.10.1.B(1)) is necessary to determine the Thermal Margin.
Step 3	This step is critical because documenting the thermal margin time and maximum NC Temperature allowed is necessary to complete Attachment 12.6 (Thermal Margin Determination) of OMP 5-8 (Shift Supervision Turnovers) in accordance with the provided KEY.
Step 4	This step is critical because completing Attachment 12.7 of OMP 5-8 is necessary to complete the assigned task in accordance with the provided KEY.
Step 5	This step is critical because notifying the Containment Closure Coordinator (CCC) of the thermal margin time determined is necessary to complete the assigned task in accordance with the provided KEY.
Step 6	This step is critical because notifying the Shift Technical Advisor (STA) of the thermal margin time determined is necessary to complete the assigned task in accordance with the provided KEY.
Step 7	This step is critical because writing the thermal margin time on MC-6 and updating MLOG is necessary to complete the assigned task in accordance with the provided KEY.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(Attachment 12.6) Applicable to: Unit 1 Unit 2	The operator places a check in the Unit 1 checkbox.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	<p>(Attachment 12.6, Step 1) Refer to OP/1(2)/A/6100/22, Unit 1 (2) Databook, Enclosure 4.3, Section 2.10 "Thermal Margin Curves," to determine appropriate section and/or curve to use.</p> <p>SECTION/CURVE USED _____</p> <p>INITIAL _____</p>	<p>The operator obtains the Core Data Book and locates Section 2.10.</p> <p>The operator recognizes that since the Loops will be drained and the Vessel Head has NOT been removed, the Curves of Section 2.10.1 are applicable.</p> <p>The operator determines that from the Initial Conditions given, Enclosure 4.3 Section/Curve 2.10.1 B or B (1) is to be used, and records this, placing their initial in the appropriate Block.</p> <p>Using Curve 2.10.1 B, the operator intersects the point of 16 days after shutdown and the 140°F temperature Curve and determines that the new Thermal Margin is 30-35 minutes.</p> <p>OR</p> <p>Using Curve 2.10.1 B (1), the operator intersects the point of 16 days after shutdown and the 140°F temperature Curve and determines that the new Thermal Margin is 32 minutes.</p>		
*				

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	(Attachment 12.6, Step 2) Document thermal margin time and maximum NC Temperature allowed (for curve used) in the table below and initial.	<p>The operator records the date in the chart on Attachment 12.6.</p> <p>The operator records the time in the chart on Attachment 12.6.</p> <p>The operator records <u>30- 35 minutes</u> in the “Thermal Margin MIN” block on the chart on Attachment 12.6.</p> <p>The operator records 140°F in the “Max NC Temp °F” block on the chart on Attachment 12.6.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(Attachment 12.6, Step 3) Communicate Thermal Margin as follows: (Attachment 12.6, Step 3.a) Write thermal margin time and max NC Temp on the "Shutdown Assessment/Status" (Attachment 12.7). Include any data Book 4.3 Section 2.10 support parameters (S/G Lvl, Pzr Lvl, etc.) Initial in Table below.	<p>The operator records <u>30-35 minutes</u> in the Thermal Margin Column "TM Minutes" block on Attachment 12.7.</p> <p>The operator records 140°F in the Thermal Margin Column "Max NC Temp" block on Attachment 12.7.</p> <p>The operator records 67" (60-84 is acceptable) in the Thermal Margin Column "NCS Level" block on Attachment 12.7.</p> <p>The operator places their initial in the "Thermal Margin Data Written on Shutdown Assessment/Status (Attachment 12.7)" block on the chart on Attachment 12.6.</p>		
*5	(Attachment 12.6, Step 3.b) Notify the Containment Closure Coordinator (CCC) of the thermal margin time determined. Initial in the table below.	<p>The operator contacts the CCC and notifies that TM is <u>30-35 minutes</u>.</p> <p>The operator places their initial in the "CCC Notified" block on the chart on Attachment 12.6.</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	(Attachment 12.6, Step 3.c) Notify the Shift Technical Advisor (STA) of the thermal margin time determined. Initial in the table below.	<p>The operator contacts the STA and notifies that TM is <u>30-35 minutes</u>.</p> <p>The operator places their initial in the "STA Notified" block on the chart on Attachment 12.6.</p>		
*7	(Attachment 12.6, Step 3.d) Write thermal margin time on MC-6 and update MLOG on SDS (OAC). Initial in the table below.	<p>The operator directs the OATC to write <u>30-35 minutes</u> in the TM Block on MC-6 and enter into MLOG.</p> <p>The operator places their initial in the "Thermal Margin Time Written on MC-6 and MLOG" block on the chart on Attachment 12.6.</p>		

Terminating Cue: Evaluation on this JPM is complete.

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A2 SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Initial Conditions:

- Unit 1 was shutdown 16 days ago for a mid-cycle outage after 200 days of operation.
- Unit 1 is currently in Mode 5.
- No Core Offload will occur.
- The NC system is 125°F with "A" Train ND in service.
- Preparations are being made to lower NC system level to 67 inches above Hot Leg Centerline per Enclosure 4.1 (Draining the NC System) of OP/1/A/6100/SD-20 (Draining the NC System).

INITIATING CUE:

- Complete Attachment 12.6 of OMP 5-8 (Shift Supervision Turnovers) to determine the new thermal margin with NC system level at 67 inches above Hot Leg Centerline (Complete all required paperwork).
- Identify the individuals that must be notified and/or actions that must be taken.

JPM A3 SRO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Approve a Liquid Release PermitJPM No.: 2020 Admin – JPM A3 SRO

K/A Reference: G KA 2.3.6 (3.8)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X
Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue and List of Out-of-Service Equipment (Last Two Pages of this JPM), and Handouts 1-2.

- Initial Conditions:
- Unit 1 and Unit 2 are in Mode 1 at 100% power.
 - There are no on-going liquid radiation releases.
 - Attachment 10 ('B' WMT Release Authorization) of OP/0/B/6200/607 (Liquid Waste Release – WMT 'B' with WMT Pump 'B') has been initiated.
 - Attachment 1 ('B' WMT Release Using 'B' WMT Pump) of OP/0/B/6200/607 (Liquid Waste Release – WMT 'B' with WMT Pump 'B') is in progress in preparation for release of the B Waste Monitor Tank.
 - RP has just delivered the LWR package # 2020067 to the Control Room.
 - All available RC Pumps are running.

- Initiating Cue:
- You are directed to review and approve LWR Package # 2020067 by performing Steps 9-12 of Attachment 10 ('B' WMT Release Authorization) of OP/0/B/6200/607.
 - If LWR Package # 2020067 cannot be approved, identify why not.

Job Performance Measure Worksheet

Task Standard: The operator will determine that LWR Package # 2020067 cannot be approved because the recommended Release Rate is GREATER THAN the Allowable Release Rate and 0EMF49 has NOT been source checked.

Required Materials: Calculator

General References: OP/0/B/6200/607 (Liquid Waste Release – WMT B With WMT Pump B), Rev 12
OP/1/A/6500/001 (Liquid Waste System), Rev 103

Handouts: Handout 1: Attachment 10 ('B' WMT Release Authorization) of OP/0/B/6200/607 (Liquid Waste Release – WMT 'B' With WMT Pump 'B') marked up through Step 8.
Handout 2: LWR Discharge Document (Adjusted such that Recommended Release Rate is > Allowable Release Rate (Reversed), and 0EMF49 Source Check Block is BLANK).

Key: A separate KEY is provided to show the portions of Attachment 10 ('B' WMT Release Authorization) of OP/0/B/6200/607 (Liquid Waste Release – WMT 'B' With WMT Pump 'B') completed by the applicant during the performance of the JPM.

Time Critical Task: NO

Validation Time: 15 minutes

<u>Critical Step Justification</u>	
Step 1	This step is critical because determining the operability/functionality of release instrumentation is necessary to determine whether or not LWR Package # 2020067 can be approved.
Step 3	This step is critical because evaluating LWR 2020067 is necessary to determine whether or not LWR Package # 2020067 can be approved.
Step 4	This step is critical because identifying the reasons why LWR 2020067 cannot be approved is necessary to complete the task.

PERFORMANCE INFORMATION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue and List of Out-of-Service Equipment (Last Two Pages of this JPM), and Handouts 1-2.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	(Attachment 10, Step 9) Determine functionality status of the following components: 0WMLP5140 (B WMT Pump Disch Flow) Yes <input type="checkbox"/> No <input type="checkbox"/> 1WP-35 (WMT & VUCDT to RC Cntrl) Yes <input type="checkbox"/> No <input type="checkbox"/> 1WP-37 (Liquid Waste to RC Cntrl) Yes <input type="checkbox"/> No <input type="checkbox"/> 0EMF-49 (Liquid Waste Disch Radiation Monitor) Yes <input type="checkbox"/> No <input type="checkbox"/> 0WMFS5440 (0EMF49 Outlet Flow) [8.7.4] Yes <input type="checkbox"/> No <input type="checkbox"/>	The operator reviews the equipment OOS List and determines that 0WMLP5140 is OPERABLE and checks YES. The operator reviews the equipment OOS List and determines that 1WP-35 is OPERABLE and checks YES. The operator reviews the equipment OOS List and determines that 1WP-37 is OPERABLE and checks YES. The operator reviews the equipment OOS List and determines that 0EMF49 is OPERABLE and checks YES. The operator reviews the equipment OOS List and determines that 0WMFS5440 is OPERABLE and checks YES.		
2	(Step 10) IF any component listed in Step 9 is NON- FUNCTIONAL, THEN.....	The operator recognizes that all required equipment is OPERABLE, and that this step is NA.		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	<p>(Step 11) Ensure the following items on LWR Document are complete:</p> <ul style="list-style-type: none"> • Number of "RC Pumps Running" is greater than OR equal to "RC Pumps Assigned To This Release" • Number of "RC Pumps Running" is greater than OR equal to "Total RC Pumps Required (all concurrent releases)" • "Recommended Release Rate (GPM)" is less than "Allowable Release Rate (GPM)" • OEMF-49L (Waste Liquid Low Range Radiation Monitor Module) is FUNCTIONAL AND in service. • OEMF-49 (Liquid Waste Disch Radiation Monitor) source check performed. • "Expected CPM" is less than "TRIP 1 SETPOINT" AND "TRIP 2 SETPOINT". • Review of Special Instructions provided on LWR Permit. [8.7.12] 	<p>The operator recognizes that there are 7 RC Pumps operating which is greater than the 1RC pump required by LWR Package # 2020067.</p> <p>The operator recognizes that there are NO concurrent releases.</p> <p>The operator recognizes that the "Recommended Release Rate (gpm)" is GREATER THAN "Allowable Release Rate (gpm)" and determines that this must be corrected.</p> <p>The operator reviews the equipment OOS List and determines that OEMF49 is OPERABLE.</p> <p>The operator reviews LWR Package #202067 and determines that OEMF49 is in service.</p> <p>The operator reviews LWR paperwork and determines that OEMF49 has NOT been source checked.</p> <p>The operator observes that the "Expected CPM" is less than "Trip 1 Setpoint" and "Trip 2 Setpoint".</p> <p>The operator reviews the Special Instructions provided on the LWR Permit and determines that all Special Instructions are met (None).</p>		

PERFORMANCE INFORMATION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	(Step 12) WHEN approved for release, THEN place signature, date, AND time of Control Room Supervisor authorization on LWR Document.	The operator does NOT initial Step 12 and identifies that LWR Package # 2020067 can NOT be approved until the "Recommended Release Rate (gpm)" is less than the "Allowable Release Rate (gpm)" and 0EMF49 has been source checked.		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A3 SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Out-of-Service Equipment**Common Unit Equipment:**

Fire Alarm Control Panel (FACP) – 2 (Admin Building) – Ongoing Testing
'A' NB Evaporator Feed Pump – Failed Bearing
0EMF43A (CR Air Intake A Rad Monitor) – Circuit Failure
SKSS Inverter – Ongoing Maintenance
0WMFT5130 (A Waste Monitor Tank Pump Disch Flow) – Failed transmitter
Fire Hydrant 10 (W of Main Shop) – Will Not Operate
0VSWT0001 (A VS Compressor Water Separator Water Trap) – Leaking Petcock

Unit 1:

Glycol Pump B – Ongoing Maintenance
MCB Annunciator 1AD-2, A8 (OTDT Runback / Rod Stop Alert) – Alarm does NOT function
1RNP 5360 (1A Component Cooling HX Outlet Flow) – Failed High
1B LLI Pump – Oil Level in Reduction Gear Low

Unit 2:

2RWS-13 (Raw Water Skid Coupon Rack A Influent) – Packing Leak
Fireworks FDS Zone 24 Smoke Detector (Unit 2 Seal Oil System) – Failed
2EMF44 (Cont Vent Drn Tank Rad Monitor) – Detector Failure
2C RC Pump – Motor Replacement
2TLP5010 (Stm Seal Header Press) – Failed Low

Note: All other equipment is OPERABLE/FUNCTIONAL.

JPM CUE SHEET

INITIAL CONDITIONS:

- Unit 1 and Unit 2 are in Mode 1 at 100% power.
- There are no on-going liquid radiation releases.
- Attachment 10 ('B' WMT Release Authorization) of OP/0/B/6200/607 (Liquid Waste Release – WMT 'B' with WMT Pump 'B') has been initiated.
- Attachment 1 ('B' WMT Release Using 'B' WMT Pump) of OP/0/B/6200/607 (Liquid Waste Release – WMT 'B' with WMT Pump 'B') is in progress in preparation for release of the B Waste Monitor Tank.
- RP has just delivered the LWR package # 2020067 to the Control Room.
- All available RC Pumps are running.

INITIATING CUE:

- You are directed to review and approve LWR Package # 2020067 by performing Steps 9-12 of Attachment 10 ('B' WMT Release Authorization) of OP/0/B/6200/607.
- If LWR Package # 2020067 cannot be approved, identify why not.

JPM A4 SRO

Job Performance Measure Worksheet

Facility: McGuire

Task No.:

Task Title: Classify an Emergency EventJPM No.: 2020 Admin – JPM A4 SRO

K/A Reference: G KA 2.4.41 (4.6)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: XClassroom X Simulator _____ Plant _____**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handouts 1-3.

Initial Conditions: Unit 1 was operating at 100% power and Unit 2 was in No Mode when a Loss of Offsite Power occurred to the site. The 1A EDG is OOS and unavailable to start. The following timeline of events is observed:

0800:00	Loss of Offsite Power due an electrical grid disturbance
0800:20	The 1B EDG failed to start automatically
0800:45	An AO is dispatched to manually start the 1B EDG
0801:00	The crew entered EP/1/A/5000/ECA-0.0, Loss of All AC Power.
0806:00	DEC BA reports that the switchyard is unavailable, however that power should be restored to at least the Mecklenburg line within 45 minutes.
0808:00	The AO reports that the 1B EDG has tripped on overspeed and IAE reports restoration will take about 25 minutes.

ALL Critical Safety Function Status Trees are Yellow or Green.

Job Performance Measure Worksheet

- Initiating Cue:
- Classify the Event in accordance with RP/0/A/5700/000 (Classification of Emergency).
 - If more than one Emergency Action Level (EAL) has been exceeded, identify the EAL resulting in the Highest Emergency Classification. (Raise your hand and alert the Examiner when complete)
 - Then, prepare a Nuclear Power Plant Emergency Notification Form for the event, and present to the Emergency Coordinator for approval. (Raise your hand and alert the Examiner when complete)

This is a Time Critical JPM

Task Standard: The operator will declare a SITE AREA EMERGENCY (SAE) based on SS1.1, "Loss of all offsite and all onsite AC power capability to essential 4160V buses 1(2)ETA and 1(2)ETB for ≥15 min;" and complete the Emergency Notification Form in accordance with the provided KEY within the following 15 minutes.

Required Materials: None

General References: RP/0/A/5700/000 (Classification of Emergency), Rev 30
 RP/0/A/5700/001 (Notification of Unusual Event), Rev 36
 RP/0/A/5700/002 (Alert), Rev 37
 RP/0/A/5700/003 (Site Area Emergency), Rev 37
 RP/0/A/5700/004 (General Emergency), Rev 35
 RP/0/B/5700/029 (Notifications to Offsite Agencies From the Control Room), Rev 25
 EP/1/A/5000/ECA-0.0 (Loss of All AC Power), Rev 44
 OMP 4-3 (Use of Emergency And Abnormal Procedures And FLEX Support Guidelines), Rev 48
 FAD-MC-EP-EAL-WALLCHARTS, (McGuire Nuclear Station Classification of Emergency) Rev 2
 Nuclear Power Plant Emergency Notification Form

Handouts: Handout 1: RP/0/A/5700/000 (Classification of Emergency)
 Handout 2: RP/0/B/5700/029 (Notifications to Offsite Agencies From the Control Room)
 Handout 3: EAL Wallchart, Rev 2
 Handout 4: Blank copies of Nuclear Power Plant Emergency Notification Forms or the Book of Pre-Printed Forms

Time Critical Task: YES – 15 minutes to make classification, and THEN 15 minutes to complete ENF.

Job Performance Measure Worksheet

Validation Time: 30 minutes

<u>Critical Step Justification</u>	
Step 5	This step is critical because using the EAL Wallchart is necessary to obtain the correct emergency classification.
Step 6	This step is critical because recording the classification time is necessary to establish the correct notification time.
Step 12	This step is critical because recording the correct Message Number is necessary to complete the Emergency Notification Form in accordance with the provided KEY within the 15 minutes.
Step 13	This step is critical because recording the correct Phone Number is necessary to complete the Emergency Notification Form in accordance with the provided KEY within the 15 minutes.
Step 14	This step is critical because checking the DRILL or the ACTUAL DECLARATION checkbox is necessary to complete the Emergency Notification Form in accordance with the provided KEY within the 15 minutes.
Step 16	This step is critical because checking the SAE checkbox is necessary to complete the Emergency Notification Form in accordance with the provided KEY within the 15 minutes.
Step 17	This step is critical because recording the correct EAL #, Declaration Date and Time and EAL DESCRIPTION is necessary to complete the Emergency Notification Form in accordance with the provided KEY within the 15 minutes.
Step 19	This step is critical because checking the NONE checkbox in Line 5 is necessary to complete the Emergency Notification Form in accordance with the provided KEY within the 15 minutes.
Step 20	This step is critical because checking the NONE checkbox in Line 6 is necessary to complete the Emergency Notification Form in accordance with the provided KEY within the 15 minutes.

VERIFICATION OF COMPLETION

(Denote Critical Steps with an asterisk*)

Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handouts 1-3.

START TIME: _____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	(RP/0/A/5700/000, Step 6.1.1) Determine operating MODE that existed at time event occurred AND prior to any protection system OR operator action initiated in response to event.	Using the Timeline of Events the operator determines that Unit 1 was in Mode 1 and Unit 2 is in No Mode at the start of the event.		
2	(Step 6.1.2) IF valid Security Condition OR Hostile Action, THEN.....	Using the Timeline of Events the operator determines that a valid Security Condition OR Hostile Action does NOT exist.		
3	(Notes prior to Step 6.1.3) <ul style="list-style-type: none"> EAL Wallchart created from MNS EPLAN Section D per NEI 99-01 rev. 006. Wallchart ID is FAD-MC-EP-EAL-WALLCHARTS located on bottom right corner of EAL Wallchart beside Duke Energy emblem. 	The operator reads the Notes and proceeds.		
4	(Step 6.1.3) Verify EAL Wallchart has current revision of Classification of Emergency, FAD-MC-EP-EAL-WALLCHARTS, Classification of Emergency, Rev. 002	The operator locates the Rev number located on bottom right corner of EAL Wallchart beside Duke Energy emblem and determines that the Wall Chart is Revision 2 (Handout 3) and proceeds and proceeds.		

VERIFICATION OF COMPLETION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	(Step 6.1.4) Perform Classification per EAL Wallchart.	<p>The operator reviews the EAL Wall Chart, and determines the following:</p> <p>The operator determines that an SAE exists on Unit 1, based on SS1.1, Loss of all offsite and all onsite AC power capability to essential 4160V buses 1(2) ETA and 1(2) ETB for ≥ 15 min.</p> <p>The operator applies Note 1: "The Emergency Coordinator/EOF Director should declare the event promptly upon determining that time limit has been exceeded, or will likely be exceeded," and determines that the SAE should be declared now based on projections for restoration of power.</p>		
*6	(Step 6.1.5) IF Emergency Action Level threshold has been exceeded, THEN declare the appropriate Emergency Classification. Event Declaration time:	<p>The operator determines that an SAE exists, based on based on SS1.1.</p> <p>The operator records the event declaration time in the space provided.</p>		
<p>Examiner Note: Record Time Critical Stop Time _____</p> <p>NOTE that this time is also the Start Time for the 2nd Time Critical action of completing the ENF SS1.1.</p> <p>Provide the operator with Handout 4 (BLANK ENF or the Book of Pre-Printed Forms from which the operator can select the appropriate form).</p>				

VERIFICATION OF COMPLETION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	<p>(RP/0/A/5700/000, Step 6.1.6) Implement the applicable Emergency Response Procedure (RP) for that classification and continue with subsequent steps of this procedure.</p> <ul style="list-style-type: none"> • Notification of Unusual Event RP/0/A/5700/001 • Alert RP/0/A/5700/002 • Site Area Emergency RP/0/A/5700/003 • General Emergency RP/0/A/5700/004. 	The operator proceeds to RP/0/A/5700/003.		
8	<p>(RP/0/A/5700/003, Note prior to Step 6.1.1) The following actions have been separated into position specific attachments to enhance timely completion and consistent execution.</p> <p>Site Assembly is required to be complete within 30 minutes of the declaration of Alert, Site Area Emergency or General Emergency.</p>	The operator reads the Notes and proceeds.		
9	<p>(Step 6.1.1) Assign the following actions:</p> <p>Notify the Offsite Agency Communicator to make initial notifications to the offsite agencies per RP/0/B/5700/029, Notifications to Offsite Agencies from the Control Room:</p>	The operator proceeds to RP/0/B/5700/029.		

VERIFICATION OF COMPLETION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	(RP/0/B/5700/029, Step 6.1.1) Complete ENF by using one of the following: <ul style="list-style-type: none"> • Preprinted ENF. OR <ul style="list-style-type: none"> • Blank ENF. 	The operator recognizes that an ENF has been provided, and proceeds.		
11	(Note prior to Step 6.1.2) Messages are sequentially numbered throughout the drill or event beginning with message number 1 and continues until termination of the drill or event.	The operator reads the Note and proceeds.		
*12	(Step 6.1.2) Record message number.	The operator records the Message Number as "1," per provided KEY.		
*13	(Step 6.1.3) Ensure "(704) 875-6044" recorded as confirmation telephone number.	The operator records the Phone Number as ""(704) 875-6044," or ensures that it already exists, per provided KEY.		
*14	(Step 6.1.4) Complete Line 1 by checking 'DRILL' OR 'ACTUAL DECLARATION'.	The operator checks the DRILL or the ACTUAL DECLARATION checkbox, per provided KEY.		
15	(Step 6.1.5) Complete Line 2 by verifying that MCGUIRE is printed on the form.	The operator ensures that the AFFECTED SITE states "McGuire," per provided KEY.		
*16	(Step 6.1.6) Complete Line 3 by checking correct emergency classification.	The operator checks the SAE checkbox, per provided KEY.		

VERIFICATION OF COMPLETION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*17	(Step 6.1.7) Complete Line 4 by recording the following: <ul style="list-style-type: none">• EAL #.• Declaration Date and Time.• EAL DESCRIPTION.	The operator records the EAL Number as "SS1.1," the Declaration Date and Time as the current Date and Time, and the EAL Description as "Loss of all offsite and all onsite AC power capability to essential 4160V buses 1(2)ETA and 1(2)ETB for ≥ 15 min.," (Or Equivalent) per provided KEY.		
18	(Note prior to Step 6.1.8) The "Release to the Environment" being evaluated in Step 8 must be caused by the emergency.	The operator reads the Note and proceeds.		

VERIFICATION OF COMPLETION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*19	<p>(Step 6.1.8) Complete Line 5 as follows: IF any of the following exists, THEN check 'IS OCCURRING' OR 'HAS OCCURRED' as appropriate:</p> <ul style="list-style-type: none"> • EMF 38, 39 or 40 readings indicate an increase AND containment pressure greater than 0.3 psig. • EMF 38, 39 or 40 readings indicate an increase AND a known leak path exists from containment. • EMF 35, 36 or 37 readings indicate an increase in activity. • EMF 33 or other alternate means indicate Steam Generator tube leakage. • A known release path exists. <p>Alternate methods of release determination are as follows:</p> <ul style="list-style-type: none"> • Greater than 0.3 psig containment pressure with a LOCA. • Positive field monitoring team results. • Known Steam Generator Tube Rupture. <p>IF NO emergency release exists, THEN check 'NONE'</p>	The operator checks the NONE checkbox, per provided KEY.		

VERIFICATION OF COMPLETION

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*20	(Step 6.1.9) Complete Line 6 as follows: <ul style="list-style-type: none"> • IF Notification of Unusual Event, Alert, OR Site Area Emergency, THEN check 'NONE' • Go to Step 10 	The operator checks the NONE checkbox per provided KEY and goes to Step 6.10.		
21	(Step 6.1.10) Complete Line 12 by recording any additional 'REMARKS' as directed by the Emergency Coordinator.	The operator leaves blank and proceeds, per provided KEY.		
22	(Step 6.1.11) Complete Line 13 by ensuring the Emergency Coordinator performs the following: <ul style="list-style-type: none"> • Sign 'APPROVED BY' • Enter 'TITLE' • Record date and time. 	<p>The operator completes the SAE ENF accordance with the provided KEY (Separate Document) within 15 Minutes of the SAE Declaration time.</p> <p>The operator presents the completed ENF Form to the Emergency Coordinator.</p>		

Terminating Cue: **Evaluation on this JPM is complete.**

STOP TIME: _____

Critical TIME 1: _____

Critical TIME 2: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2020 Admin – JPM A4 SRO

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

Initial Conditions: Unit 1 was operating at 100% power and Unit 2 was in No Mode when a Loss of Offsite Power occurred to the site.

The 1A EDG is OOS and unavailable to start.

The following timeline of events is observed:

0800:00 Loss of Offsite Power due an electrical grid disturbance

0800:20 The 1B EDG failed to start automatically

0800:45 An AO is dispatched to manually start the 1B EDG

0801:00 The crew entered EP/1/A/5000/ECA-0.0, Loss of All AC Power.

0806:00 DEC BA reports that the switchyard is unavailable, however that power should be restored to at least the Mecklenburg line within 45 minutes.

0808:00 The AO reports that the 1B EDG has tripped on overspeed and IAE reports restoration will take about 25 minutes.

ALL Critical Safety Function Status Trees are Yellow or Green.

- INITIATING CUE:
- Classify the Event in accordance with RP/0/A/5700/000 (Classification of Emergency).
 - If more than one Emergency Action Level (EAL) has been exceeded, identify the EAL resulting in the Highest Emergency Classification. (Raise your hand and alert the Examiner when complete)
 - Then, prepare a Nuclear Power Plant Emergency Notification Form for the event, and present to the Emergency Coordinator for approval. (Raise your hand and alert the Examiner when complete)

This is a Time Critical JPM