
Watts Bar Nuclear Plant

NRC EXAM 2019-301

Scenario 2

Facility:	Watts Bar Nuclear Plant	Scenario No.	2	Op Test No.:	2019-301
Examiners:	_____	Operators:	_____	SRO	
	_____		_____	RO	
	_____		_____	BOP	
Run Time: 115 to 135 minutes					
Initial Conditions:	Unit 1 is in MODE 1 at 100% power. <ul style="list-style-type: none"> Containment Spray Pump 1B-B tagged 6 hours ago for scheduled component outage. LCO 3.6.6 Condition A entered. 12 hours of scheduled work remain. 1-LPP-68-334, PZR Pressure, is removed from scan in ICS and bypassed in DCS to support 1-SI-68-106, 184D Channel Operational Test Pressurizer Pressure Channel II. 1-LPP-68-334 is BYPASSED in Eagle-21 (68-B LIT). LCO 3.3.1 Conditions A, W and X entered. LCO 3.3.2 Conditions A, D and L entered. 1-FT-3-48B, SG 2 Feed Flow, failed and was bypassed in DCS. Unit 2 is at 100% power.				
Turnover:	Train B Channel II Work Week. Place CCP 1A-A in service and shutdown CCP 1B-B IAW 1-SOI-62.01 Section 6.2 to support 1-SI-68-33, Measurement of RCP Seal Injection Flow.				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N/A	DELETED.		
2	N/A	N-OAC/SRO	Start CCP 1A-A and shutdown CCP 1B-B IAW 1-SOI-62.01 Section 6.2. (5 min)		
3	rx11b	I-BOP/SRO TS-SRO	1-PT-1-72 fails LOW arming the steam dumps and requiring either performance of ARI 66-E, C-7 Loss of Load Stm Dump Interlock, or entry into 1-AOI-2, Malfunction of Reactor Control System. (15 min)		
4	cv52	I-OAC/SRO	1-PT-62-81 fails LOW causing DCS to CLOSE 1-PCV-62-81 effectively isolating letdown. Manual control of 1-HIC-62-81 is required. Crew may isolate charging and letdown requiring entry into 1-AOI-20, Malfunction of Pressurizer Level Control System. (15 to 25 min)		
5	cc10c	C-BOP/SRO TS-SRO	CCS leak develops downstream of the C-S CCS Pump Discharge requiring entry into 1-AOI-15, Loss of CCS. All Train B ESF pumps will be placed in PULL TO LOCK. (20 min)		
6	cv17c	C-OAC/SRO	RCP 3 #1 seal begins failing requiring entry into 1-AOI-24, RCP Malfunctions During Pump Operations. Seal leakage will worsen requiring a rapid downpower (Event 5). Seal leakage will worsen again requiring a Reactor Trip, stop of RCP 3, and RCP 3 Seal Return valve closure. (10 min)		
*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Event No.	Malf. No.	Event Type*	Event Description
7	cv17c	R-OAC/SRO	Rapid downpower to comply with 1-AOI-24 action directing entry into 1-AOI-39, Rapid Load Reduction. (10 min)
8	th02c rp02a1 rp02b1	M-OAC/SRO M-BOP	Crew trips U1 reactor, stops RCP 3 and enters 1-E-0, Reactor Trip or Safety Injection. Upon transition to 1-ES-0.1, Reactor Trip Response, RCP 3 seal completely fails resulting in a LOCA at the RCP and requiring SI actuation. Auto and Manual SI Train A are failed. Crew returns to 1-E-0 and transitions to 1-E-1, Loss of Reactor or Secondary Coolant. Crew transitions to 1-ES-1.3, Transfer to Containment Sump, and aligns ECCS for Cold Leg Recirculation. (40 to 50 min)
9	N/A	C-BOP	Train A ECCS pumps fail to start automatically due to no SI Train A signal present.
10	N/A	C-OAC/SRO	1-FCV-63-72 fails to OPEN automatically due to no SI Train A signal present.
11	ch29b ch29a	C-BOP/SRO	Containment Air Return Fan 1B-B trips on overcurrent when starting. CARF 1A-A trips approx. 1 minute later. (CS Pump 1A-A remains running longer to deplete U1 RWST inventory.
*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario 2 - Summary

Event	Description
1	DELETED.
2	OAC starts CCP 1A-A and shuts down CCP 1B-B IAW 1-SOI-62.01 Section 6.2.
3	1-PT-1-72, Turbine Impulse Pressure, fails LOW arming steam dumps. Steam dumps do NOT open because there is no demand. 66-E, C-7 LOSS OF LOAD STM DUMP INTERLOCK, alarms. BOP may reset C-7 and bypass 1-PT-1-72 in DCS IAW ARI 66-E. US may enter 1-AOI-2, Malfunction of Reactor Control System, to direct the same. US evaluates LCO 3.3.1.
4	1-PT-62-81 fails LOW causing DCS to CLOSE 1-PCV-62-81 effectively isolating letdown. OAC can take MANUAL control of 1-HIC-62-81A without isolating charging and letdown. If this action is delayed, then OAC isolates charging and letdown, and US enters 1-AOI-20, Malfunction of Pressurizer Level Control System. 1-HIC-62-81A remains in MANUAL for the remainder of the scenario.
5	CCS leak develops downstream of the C-S CCS Pump Discharge. US enters 1-AOI-15, Loss of CCS. BOP stops C-S CCS Pump, isolates leak and places all Train B ESF pumps in PULL TO LOCK. US evaluates LCO 3.7.7, 3.5.2, 3.6.6 and TR 3.1.4.
6	RCP 3 #1 seal begins failing. US enters 1-AOI-24, RCP Malfunctions During Pump Operations. Seal leakage will worsen requiring a rapid downpower. Seal leakage will then worsen again requiring Reactor Trip, stopping of RCP 3 and closure of 1-FCV-62-35, RCP 3 Seal Return. Stopping RCP 3 and isolating RCP 3 Seal Return are the verifiable actions for Event 6 but are performed during Event 8.
7	Crew will lower power to support Reactor Trip IAW 1-AOI-24 and 1-AOI-39, Rapid Load Reduction. OAC reduces power.
8	OAC trips U1 reactor, stops RCP 3 and US enters 1-E-0, Reactor Trip or Safety Injection. Upon transition to 1-ES-0.1, Reactor Trip Response, LOCA develops at RCS Loop 3 Cold Leg related to catastrophic RCP 3 seal failure.
9	LOCA. OAC initiates SI. Auto and Manual Train A SI failed. US returns to 1-E-0, transitions to 1-E-1, Loss of Reactor or Secondary Coolant. When RWST reaches 34%, US transitions to 1-ES-1.3, Transfer to Containment Sump. Scenario can be terminated when 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT, is OPEN, or at the Lead Examiner's discretion.
10	BOP will prudently start Train A ECCS pumps or BOP will start Train A ECCS pumps IAW 1-E-0 Appendix A, Equipment Verification.
11	Due to failure of Auto and Manual SI Train A, 1-FCV-63-72 will NOT OPEN automatically. OAC will OPEN 1-FCV-63-72.
12	BOP places Containment Air Return Fan 1B-B and Containment Air Return Fan 1A-A handswitch in STOP PULL to LOCK.

Scenario 2 - Critical Tasks

Critical Task	Description
1	Manually start at least one Train of low head and high flow ECCS pump (RHR Pump 1A-A) prior to meeting ORANGE path criteria for implementation of 1-FR-C.2.
2	OPEN 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT, to allow establishing at least one Train of ECCS Recirculation flow prior to RWST level reaching 8%.

References

Number	Title	Revision
N/A	WBN U1 Technical Specifications	Amendment 123
1-SOI-62.01	CVCS - Charging and Letdown	0011
1-ARI-81-87	NIS & Rod Control	0011
1-ARI-64-70	Bypass, Intlk & Permissive	0002
1-AOI-2	Malfunction of Reactor Control System	0011
1-ARI-109-115	CVCS & RHR - RPS & ESF	0009
0-ARI-241-253	CCS	0003
1-AOI-15	Loss of CCS	0009
1-ARI-95-101	RCPs	0003
1-AOI-24	RCP Malfunctions During Pump Operation	0000
1-AOI-39	Rapid Load Reduction	0006
1-E-0	Reactor Trip or Safety Injection	0016
1-ES-0.1	Reactor Trip Response	0002
1-E-1	Loss of Reactor or Secondary Coolant	0011
1-ES-1.3	Transfer to Containment Sump	0006
1-FR-0	Status Trees	0000
1-FR-P.1	Pressurized Thermal Shock	0001

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	2		Page	6	of	122
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Event Description: Start CCP 1A-A and shut down CCP 1B-B IAW 1-SOI-62.01 Section 6.2

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC may state that starting CCP 1A-A will have a slightly negative reactivity effect.

Role Play:

If contacted as RP, repeat back information provided.

Role Play:

If contacted as Mechanical Maintenance, repeat back direction provided.

Role Play:

If contacted as AUO for pump pre-start checks, state: "CCP 1A-A suction valve is OPEN with 35 psig of suction pressure. Lube oil and cooling water in service. Room fan available."

Role Play:

If contacted as AUO for post pump start check status, state: "Good start on CCP 1A-A."

Role Play:

If contacted as AUO for post pump shutdown check status, state: "Good stop on CCP 1B-B."

RO/SRO**RO/SRO****OAC
N/A****N/A
OAC****N/A
OAC****N/A
N/A**

WBN Unit 1	CVCS - Charging and Letdown	1-SOI-62.01 Rev. 0011 Page 32 of 129
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Date _____

Initials _____

6.2 Swapping CCPs

NOTES

- 1) Radiological Protection should be notified when starting or changing CCP alignment for ALARA concerns and to revise Radiological Protection postings.
- 2) Mechanical Maintenance should be notified prior to swapping pumps to ensure required oil samples are taken.

[1] **START** selected CCP (**N/A** pump **NOT** started):

NOMENCLATURE	LOCATION	UNID	INITIALS
CCP A-A (ECCS)	1-M-5	1-HS-62-108A	
CCP B-B (ECCS)	1-M-5	1-HS-62-104A	

[2] **ENSURE** pump started is operating normally, **THEN**[2.1] **STOP** CCP to be shutdown (**N/A** pump just started):

NOMENCLATURE	LOCATION	UNID	INITIALS
CCP A-A (ECCS)	1-M-5	1-HS-62-108A	
CCP B-B (ECCS)	1-M-5	1-HS-62-104A	

[3] **ENSURE** the following for pump started (**N/A** pump STOPPED):

NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS
CCP A-A (ECCS)	1-M-5	A AUTO	1-HS-62-108A	IV
CCP B-B (ECCS)	1-M-5	A AUTO	1-HS-62-104A	IV

[4] **IF** the pump STOPPED is **NOT** required to be operable, **THEN****PERFORM** the following: (**N/A** running pump):

NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS
CCP A-A (ECCS)	1-M-5	PULL-TO-LOCK	1-HS-62-108A	IV
CCP B-B (ECCS)	1-M-5	PULL-TO-LOCK	1-HS-62-104A	IV

Op Test	301	Scenario #	2	Event #	2		Page	7	of	122
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Event Description: Start CCP 1A-A and shut down CCP 1B-B IAW 1-SOI-62.01 Section 6.2

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>When contacted as AUO, report to MCR: "CCP 1A-A closing springs are charged."</p>	OAC	<div><table><tr><td>WBN Unit 1</td><td>CVCS - Charging and Letdown</td><td>1-SOI-62.01 Rev. 0011 Page 33 of 129</td></tr></table><p>Date _____ Initials _____</p><p>6.2 Swapping CCPs (continued)</p><p>[5] IF required, THEN</p><p>ADJUST 1-HIC-62-81A, LETDOWN PRESS CONTROL, to maintain desired press/flow. _____</p><p>[6] MONITOR 1-LI-62-129A, VCT LEVEL. _____</p><p>[7] IF required, THEN</p><p>ADJUST the following to match Charging and Letdown flows:</p><p>[7.1] 1-HIC-62-89A, CHARGING HDR RCP SEALS FLOW CONTROL. _____</p><p>[7.2] 1-HIC-62-93A, CHARGING FLOW PZR LEVEL CONTROL. _____</p><p>[8] CHECK the started pumps' closing spring charged (N/A pump NOT started):</p><table><tr><td>NOMENCLATURE</td><td>LOCATION</td><td>CLOSING SPRING</td><td>UNID</td><td>INITIALS</td></tr><tr><td colspan="5">6.9KV Shutdown Board 1A-A</td></tr><tr><td>CENT CHARGING PUMP 1A-A (1-PMP-62-108)</td><td>C/18</td><td>CHARGED</td><td>1-BKR-62-108</td><td></td></tr><tr><td colspan="5">6.9KV Shutdown Board 1B-B</td></tr><tr><td>CENT CHARGING PUMP 1B-B (1-PMP-62-104)</td><td>C/18</td><td>CHARGED</td><td>1-BKR-62-104</td><td></td></tr></table></div>	WBN Unit 1	CVCS - Charging and Letdown	1-SOI-62.01 Rev. 0011 Page 33 of 129	NOMENCLATURE	LOCATION	CLOSING SPRING	UNID	INITIALS	6.9KV Shutdown Board 1A-A					CENT CHARGING PUMP 1A-A (1-PMP-62-108)	C/18	CHARGED	1-BKR-62-108		6.9KV Shutdown Board 1B-B					CENT CHARGING PUMP 1B-B (1-PMP-62-104)	C/18	CHARGED	1-BKR-62-104	
	WBN Unit 1	CVCS - Charging and Letdown	1-SOI-62.01 Rev. 0011 Page 33 of 129																											
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OAC																														
OAC																														
OAC																														
OAC																														

RO

N/A

Op Test	301	Scenario #	2	Event #	2		Page	8	of	122
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Event Description:	Start CCP 1A-A and shut down CCP 1B-B IAW 1-SOI-62.01 Section 6.2
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>When contacted as AUO, report to MCR: “CCP 1B-B closing springs are charged.”</div>	<div>N/A</div> <div>RO</div> <div>OAC</div> <div>OAC</div>	<table><tr><td>WBN Unit 1</td><td>CVCS - Charging and Letdown</td><td>1-SOI-62.01 Rev. 0011 Page 34 of 129</td></tr></table> <div>Date _____ Initials _____</div> <div>6.2 Swapping CCPs (continued)</div> <div>[9] CHECK the shutdown pump's closing spring charged (N/A pump NOT shutdown):</div> <table><tr><td>NOMENCLATURE</td><td>LOCATION</td><td>CLOSING SPRING</td><td>UNID</td><td>INITIALS</td></tr><tr><td colspan="5">6.9 KV Shutdown Board 1A-A</td></tr><tr><td>CENT CHARGING PUMP 1A-A (1-PMP-62-108)</td><td>C/18</td><td>CHARGED</td><td>1-BKR-62-108</td><td></td></tr><tr><td colspan="5">6.9 KV Shutdown Board 1B-B</td></tr><tr><td>CENT CHARGING PUMP 1B-B (1-PMP-62-104)</td><td>C/18</td><td>CHARGED</td><td>1-BKR-62-104</td><td></td></tr></table> <div>[10] IF 1-HIC-62-93A was taken to MANUAL, THEN PLACE 1-HIC-62-93A in AUTO when controller deviation is zero (PZR level on program), as directed by US/SM. _____</div> <div>[11] MONITOR Rx Power to ensure reactivity changes can be immediately identified and corrected.[c.s] _____</div> <div>End of Section</div>	WBN Unit 1	CVCS - Charging and Letdown	1-SOI-62.01 Rev. 0011 Page 34 of 129	NOMENCLATURE	LOCATION	CLOSING SPRING	UNID	INITIALS	6.9 KV Shutdown Board 1A-A					CENT CHARGING PUMP 1A-A (1-PMP-62-108)	C/18	CHARGED	1-BKR-62-108		6.9 KV Shutdown Board 1B-B					CENT CHARGING PUMP 1B-B (1-PMP-62-104)	C/18	CHARGED	1-BKR-62-104	
WBN Unit 1	CVCS - Charging and Letdown	1-SOI-62.01 Rev. 0011 Page 34 of 129																												
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	3		Page	9	of	122
Event Description:		1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.								
Sequence of Events / Examiner Notes						Position	Applicant's Actions or Behavior			

<div><div>At CHIEF EXAMINER Direction:</div><div>Insert Simulator Schedule File Event 3</div><div>(1-PT-1-72 fails rapidly to 80% and then slowly to 0%.)</div><div>INDICATIONS:</div><div><div>82-F, DCS TROUBLE</div><div>66-E, C-7 LOSS OF LOAD STM DUMP INTERLOCK</div></div><div>Operator Actions:</div><div><div>OAC will announce 82-F and refer to ARI-82-F (to the right)</div><div>BOP will announce 66-E and refer to ARI-66-E (next page)</div><div>US will announce entry to 1-AOI-2, Malfunction of Reactor Control System, Section 3.2, Instrument Failure</div></div><div>Examiner Note(s):</div><div>Failed instrument (1-PT-1-72) is used to develop Tref and Power Mismatch in Auto Rod Control. After crew diagnoses 1-PT-1-72 failing, US can go to 1-AOI-2.</div></div> <td><div>N/A</div><div>OAC/SRO</div></td> <td><div><div><div><div>WBN Unit 1</div><div>NIS & Rod Controls</div><div>1-ARI-81-87 Rev. 0011 Page 16 of 52</div></div><div><div>Source</div><div>DCS</div></div><div><div>Setpoint</div><div>VARIOUS <21 Volts HI 88°F HI-HI 92°F HI 98°F HI-HI 100°F</div></div><div><div>82-F</div><div>DCS TROUBLE</div></div></div><div>(Page 1 of 3)</div><div><div>Probable Cause:</div><div><div>A. Loss of a power supply</div><div>B. Loss of an input signal</div><div>C. Component failure</div><div>D. Hardware malfunction</div><div>E. Instrument loop placed in Bypass by DCS</div><div>F. System monitor alarms</div><div>G. Process monitor alarms</div><div>H. DCS Master Cabinet overheating</div></div></div><div><div>Corrective Action:</div><div><div>[1] IF DCS CRITICAL LOOP [81-F] is LIT, THEN RESPOND to window 81-F actions.</div><div>[2] IF failed instruments for the following:<div><div>Rod Control (1-AOI-2)</div><div>NIS (1-AOI-4)</div><div>Feedwater Control (1-AOI-16)</div><div>PZR Pressure (1-AOI-18)</div><div>PZR Level (1-AOI-20)</div></div>THEN REFER TO appropriate AOI.</div></div></div><div><div>NOTE</div><div>82-F does NOT have REFLASH capabilities for multiple alarms, but will RESET after approximately 5 minutes for future alarms.</div></div><div><div>[3] DETERMINE the source of the alarm on the DCS Operator Display:</div><div><div>Review System and Process alarms (turns red with alarm).</div><div>Review 'BYPASSED INSTRUMENTS' screen (turns yellow when in bypass).</div><div>Monitor for NEW process alarms during the 5 minute RESET period.</div></div></div><div>Continued on Next Page</div></div></td>	<div>N/A</div> <div>OAC/SRO</div>	<div><div><div><div>WBN Unit 1</div><div>NIS & Rod Controls</div><div>1-ARI-81-87 Rev. 0011 Page 16 of 52</div></div><div><div>Source</div><div>DCS</div></div><div><div>Setpoint</div><div>VARIOUS <21 Volts HI 88°F HI-HI 92°F HI 98°F HI-HI 100°F</div></div><div><div>82-F</div><div>DCS TROUBLE</div></div></div><div>(Page 1 of 3)</div><div><div>Probable Cause:</div><div><div>A. Loss of a power supply</div><div>B. Loss of an input signal</div><div>C. Component failure</div><div>D. Hardware malfunction</div><div>E. Instrument loop placed in Bypass by DCS</div><div>F. System monitor alarms</div><div>G. Process monitor alarms</div><div>H. DCS Master Cabinet overheating</div></div></div><div><div>Corrective Action:</div><div><div>[1] IF DCS CRITICAL LOOP [81-F] is LIT, THEN RESPOND to window 81-F actions.</div><div>[2] IF failed instruments for the following:<div><div>Rod Control (1-AOI-2)</div><div>NIS (1-AOI-4)</div><div>Feedwater Control (1-AOI-16)</div><div>PZR Pressure (1-AOI-18)</div><div>PZR Level (1-AOI-20)</div></div>THEN REFER TO appropriate AOI.</div></div></div><div><div>NOTE</div><div>82-F does NOT have REFLASH capabilities for multiple alarms, but will RESET after approximately 5 minutes for future alarms.</div></div><div><div>[3] DETERMINE the source of the alarm on the DCS Operator Display:</div><div><div>Review System and Process alarms (turns red with alarm).</div><div>Review 'BYPASSED INSTRUMENTS' screen (turns yellow when in bypass).</div><div>Monitor for NEW process alarms during the 5 minute RESET period.</div></div></div><div>Continued on Next Page</div></div>
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	3		Page	10	of	122
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Event Description:	1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

All required actions for the failure are addressed in 1-ARI-66-E. There is significant overlap between 1-AOI-2 and 1-ARI-66-E for a failure of 1-PT-1-72.

BOP
N/A

BOP

BOP

BOP
SRO/BOP

WBN Unit 1	Bypass, Intlk, & Permissive	1-ARI-64-70 Rev. 0002 Page 20 of 47
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Source Validated Turbine Impulse Pressure 1PS0010072E (DCS) Eagle 21 HP Turbine TR B 1-PM-1-72A	Setpoint Turbine impulse pressure decrease at a rate greater than or equal to 5%/min Failure of 1-PM-1-72A from Eagle 21
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66-E

C-7
LOSS OF LOAD
STM DUMP
INTERLOCK

(Page 1 of 1)

Probable	A. Fast Turbine load reduction or Turbine trip
Cause:	B. 1-PT-1-72 failed low

NOTE

C-7 will arm the Steam Dump System. A Tavg/Tref deviation must be present for dump valves to automatically open.

- Corrective Action:
- [1] VERIFY white light illuminated for "A & B" solenoids (1-XI-1-103A/B, STM DUMPS ARMED, on 1-M-4).

[2] IF turbine runback in progress, THEN REFER TO 1-AOI-37, TURBINE RUNBACK RESPONSE.

[3] WHEN all Steam Dump valves are closed, AND 1-XI-1-33, Steam Dump Demand, indicates zero, THEN MOMENTARILY TURN 1-HS-1-103D, Steam Dump Mode [1-M-4] to RESET.

[4] CHECK ROD CONTROL and BYPASS screens on DCS Operator Display for any failed instruments AND REFER TO 1-SOI-98.01 as needed.

[5] IF 1-PT-1-72 failed, THEN REFER TO 1-SOI-98.01 to ensure input bypassed.

[6] EVALUATE impact on the unit, AND NOTIFY Work Control to initiate corrective action.

- References:
- 1-45W600-1-1

1-45W600-57-16

1-47W611-1-2

08F734235-FD-1012 & 1202

1-AOI-37

1-SOI-98.01

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Event Description:	1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US performs a crew update and enters 1-AOI-2. US determines that the failure is an instrument failure (1-PT-1-72) and goes to Section 3.2.

SRO

WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011
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3.0 OPERATOR ACTIONS

3.1 Diagnostics

IF	GO TO SECTION	PAGE
Uncontrolled rod movement (Rod movement NOT due to actual T-ave to T-ref mismatch or change in reactor-turbine power)	3.2	6
Instrument failure (e.g. Tavgr, NIS, or Impulse Pressure)	3.2	6
Dropped RCCA (actual change in core power distribution parameters)	3.3	16
RCCA Misalignment in Modes 1 and 2	3.4	25
Rod Position Indicator (RPI) Malfunction (actual core power distribution parameters normal)	3.5	38
Failure of Control Rods to Move on Demand	3.6	41
RCCA Misalignment in Modes 3, 4, or 5	3.7	47

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Event Description:	1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

No rod motion is occurring.
If 1-RBSS is placed in MANUAL, **US** will establish Tavgtref mismatch control band.

OAC

OAC

WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011
Step	Action/Expected Response	Response Not Obtained

- 3.2 Uncontrolled Rod Bank Movement OR Instrument Failure
- NOTE Step 1 is an IMMEDIATE ACTION step
1. IF there is uncontrolled rod motion
THEN
- STOP uncontrolled rod motion:
- a. PLACE control rods in MAN.
- b. CHECK control rod movement STOPPED.
- b. (p) TRIP reactor.
**GO TO 1-E-0, Reactor Trip or Safety Injection.
2. MAINTAIN Tavgt on PROGRAM.
(Reference Attachment 1)
- (p) USE control rods.
- OR
- (p) ADJUST turbine load.

Op Test	301	Scenario #	2	Event #	3		Page	13	of	122
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Event Description: 1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	OAC	<table><tr><td>WBN Unit 1</td><td>Malfunction of Reactor Control System</td><td>1-AOI-2 Rev. 0011</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 Uncontrolled Rod Bank Movement OR Instrument Failure (continued)</p> <p>3. CHECK loop Tavg channels NORMAL using control board indications and DCS Operator Display:</p> <ul style="list-style-type: none">1-TI-68-2E LOOP 11-TI-68-25E LOOP 21-TI-68-44E LOOP 31-TI-68-67E LOOP 4 <p>ENSURE any failed channel(s) BYPASSED.</p> <p>IF failed channel(s) NOT BYPASSED, THEN:</p> <ol style="list-style-type: none">CHANGE to either NSSS Operator or BOP Operator environment. REFER TO 1-SOI-98.01, as necessary.NAVIGATE to affected input screen on DCS Operator DisplaySELECT channel to be bypassed.SELECT appropriate "MAINT BYP SIGNAL" button.CONFIRM "MAINT BYP SIGNAL" button changes from gray to red.CHECK input has yellow "BYP" displayed.REPEAT steps as necessary to place all appropriate failed DC3 inputs in Maintenance Bypass.CHANGE to INITIAL environment. <p>PLACE 1-TR-68-2A to a loop with operable $\Delta T/OT\Delta T/OP\Delta T$ channels using 1-XS-68-2B.</p> <p>NOTIFY Maintenance to implement 1-IMI-160 Series procedure for failed channel.</p>	WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	3		Page	14	of	122
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Event Description: 1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>OAC</div> <div>BOP</div> <div>OAC</div> <div>OAC</div>	<div><div><div>WBN Unit 1</div><div>Malfunction of Reactor Control System</div><div>1-AOI-2 Rev. 0011</div></div><div><div>Step</div><div>Action/Expected Response</div><div>Response Not Obtained</div></div></div> <div><div>3.2</div><div>Uncontrolled Rod Bank Movement OR Instrument Failure (continued)</div><div><div>NOTE</div><div>Last Good Value may be observed on DCS Operator Display overlay for PZR Level.</div></div><div><div>4.</div><div><div>CHECK 1-LIC-68-339 NORMAL using DCS Operator Display.</div><div>IF MANUAL control of PZR level is required, THEN CONTROL 1-FCV-62-93 and 1-FCV-62-89, as needed, USING Attachment 1.</div></div></div><div><div>5.</div><div><div>CHECK NIS power range NORMAL using the following:</div><div><div>Nuclear Monitoring [1-M-13]</div><div>Control Board [1-M-4]</div><div>DCS Operator Display</div></div><div>**GO TO 1-AOI-4, Nuclear Instrumentation Malfunction.</div></div></div></div>
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Appendix D Required Operator Actions Form ES-D-2																
Op Test	301	Scenario #	2	Event #	3		Page	15	of	122						
Event Description:		1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.														
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior										
<div>Examiner Note(s):</div> <p>Only a single Turbine pressure transmitter is affected. No impact on runback circuit.</p> <div>Examiner Note(s):</div> <p>1-PT-1-72 is NOT NORMAL, and US will exercise RNO and bypass 1-PT-1-72 in DCS</p>					<div>RO/SRO</div> <div>OAC/SRO</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div>	<table><tr><td>WBN Unit 1</td><td>Malfunction of Reactor Control System</td><td>1-AOI-2 Rev. 0011</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 Uncontrolled Rod Bank Movement OR Instrument Failure (continued)</p> <p>NOTE Failure of 2 or more pressure inputs will affect the secondary plant automatic runback circuit. If 2 or more pressure inputs fail, then output goes to a LAST GOOD VALUE (LGV). If less than 85% the runback circuit CANNOT be armed, and NO runback initiated. If greater than 85% the runback circuit will be constantly armed and any runback initiated will NOT stop.</p> <p>6. CHECK impulse pressure NORMAL using control board indications and DCS Operator Display:</p> <ul style="list-style-type: none">1-PM-1-72 (DCS)1-PM-1-73 (DCS)1-PT-1-74 (DCS)1-PT-1-81 (DCS) <p>ENSURE any failed input is BYPASSED. IF failed input(s) NOT BYPASSED, THEN:</p> <ol style="list-style-type: none">CHANGE to either NSSS Operator or BOP Operator environment. REFER TO 1-SOI-98.01, as necessary.NAVIGATE to affected input screen on DCS Operator Display.SELECT input to be bypassed.SELECT appropriate "MAINT BYP SIGNAL" button.CONFIRM "MAINT BYP SIGNAL" button changes from gray to red.CHECK input has yellow "BYP" displayed.REPEAT steps as necessary to place all appropriate failed DCS inputs in Maintenance Bypass.CHANGE to INITIAL environment. <p>Page 9 of 56</p>					WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011														
Step	Action/Expected Response	Response Not Obtained														

Op Test	301	Scenario #	2	Event #	3		Page	16	of	122
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Event Description:	1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A	<table><tr><td>WBN Unit 1</td><td>Malfunction of Reactor Control System</td><td>1-AOI-2 Rev. 0011</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 Uncontrolled Rod Bank Movement OR Instrument Failure (continued)</p> <p>Step 6 continued on next page</p> <p>Step 6 continued.</p> <p>IF two or more impulse pressure inputs failed, THEN PLACE steam dumps in STEAM PRESSURE mode as follows:</p> <p>a. PLACE steam dumps to OFF using:</p> <ul style="list-style-type: none">1-HS-1-103A, STEAM DUMP FSV "A"1-HS-1-103B, STEAM DUMP FSV "B" <p>b. PLACE mode selector handswitch to STEAM PRESS.</p> <p>c. ENSURE steam dump demand is ZERO.</p> <p>d. PLACE steam dumps to ON using:</p> <ul style="list-style-type: none">1-HS-1-103A, STEAM DUMP FSV "A"1-HS-1-103B, STEAM DUMP FSV "B" <p>e. ENSURE steam dump press controller, 1-PIC-1-33 in AUTO, AND set at 84% (1092 psig).</p> <p>Page 10 of 56</p>	WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	3		Page	17	of	122
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Event Description:	1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

66-E is NOT dark and **US** will exercise RNO.

Role Play:

If contacted as Work Control, acknowledge the report and direction.

BOP/SRO

BOP

BOP

BOP

BOP

BOP

BOP

SRO

RO/SRO

OAC/SRO

WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011
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Step	Action/Expected Response	Response Not Obtained
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- 3.2 Uncontrolled Rod Bank Movement OR Instrument Failure (continued)
7. CHECK LOSS OF LOAD STM DUMP INTERLOCK [66-E] dark
- RESET LOSS OF LOAD STM DUMP INTERLOCK.
- 1) PLACE steam dumps to OFF using:
- 1-HS-1-103A, STEAM DUMP FSV "A"
 - 1-HS-1-103B, STEAM DUMP FSV "B"
- 2) PLACE mode selector handswitch to RESET.
- 3) ENSURE steam dump demand is ZERO.
- 4) PLACE steam dumps to ON using:
- 1-HS-1-103A, STEAM DUMP FSV "A"
 - 1-HS-1-103B, STEAM DUMP FSV "B"
8. CHECK only one single instrument failed and does NOT impact AUTO control.
- GO TO step 13.
9. INITIATE repairs to failed equipment.
- CAUTION
- Allowing at least 5 minutes between any rod control input change (i.e., Tavg, Tref, or NIS) and placing rods in AUTO, will help prevent undesired control rod movement.

Op Test	301	Scenario #	2	Event #	3		Page	18	of	122
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Event Description:	1-PT-1-72 failure. 1-AOI-2. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>1-AOI-2 did NOT require placing Rod Control in MANUAL (step [1]). If crew elected to place Rod Control in MANUAL, then US will implement this step to return Rod Control to AUTO.</p> <div>US evaluates Technical Specifications.</div> <div>Tech Specs:</div> <p>LCO 3.3.1, Reactor Trip System Instrumentation, is NOT met. Conditions A and S (for Function 16.f, Turbine Impulse Pressure, P-13) apply. Condition S verifies P-13 interlock is in required state for existing unit conditions within 1 hour.</p> <div>Examiner Note(s):</div> <p>US performs crew update to exit 1-AOI-2. US may then conduct crew brief to discuss failure and LCO NOT met.</p>	<div>OAC/SRO</div> <div>OAC/SRO</div> <div>OAC</div> <div>SRO</div> <div>SRO</div>	<table><tr><td>WBN Unit 1</td><td>Malfunction of Reactor Control System</td><td>1-AOI-2 Rev. 0011</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 Uncontrolled Rod Bank Movement OR Instrument Failure (continued)</p> <p>10. WHEN AUTO rod control is desired, THEN:</p> <p>a. ENSURE Tavg and Tref within 1°F.</p> <p>b. ENSURE zero demand on control rod position indication [1-M-4].</p> <p>c. PLACE rods in AUTO.</p> <p>11. REFER TO Tech Specs:</p> <ul style="list-style-type: none">3.1.1, Shutdown Margin3.1.5, Rod Group Alignment Limits3.1.6, Shutdown Bank Insertion Limits3.1.7, Control Bank Insertion Limits3.2.1, Heat Flux Hot Channel Factor3.2.2, Nuclear Enthalpy Rise Hot Channel Factor3.2.4, Quadrant Power Tilt Ratio3.2.3, Axial Flux Difference3.3.1, Reactor Trip System (RTS) Instrumentation3.3.2, Engineered Safety Features Actuation System (ESFAS) Instrumentation3.3.3, Post Accident Monitoring (PAM) Instrumentation <p>12. RETURN TO Instruction in effect.</p> <p>Page 12 of 56</p>	WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Malfunction of Reactor Control System	1-AOI-2 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	4		Page	19	of	122
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Event Description:	1-PT-62-81 failure.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At **CHIEF EXAMINER** Direction:

Insert Simulator Schedule File Event 4

(1-PT-1-81 fails slowly to 0%.)

INDICATIONS:

- 110-C, LO PRESS LTDN RELIEF LINE TEMP HI
- 1-LI-68-339, -335 and -320, PZR LEVEL, rising
- 1-FI-62-82, LETDOWN FLOW, dropping
- 1-HIC-62-81A, LETDOWN PRESS CONTROL, output lowering

Operator Actions:

- **OAC** will announce 110-C and refer to ARI-110-C (to the right)
- **OAC** may prudently place 1-HIC-62-81 in MANUAL and raise output to restore letdown flow to approx. 75 gpm

Examiner Note(s):

Letdown pressure will be dropping or at zero due to instrument failure.

Role Play:

If contacted as AUO, wait 5 minutes.

If MCR is controlling 1-HIC-62-81A in MANUAL, then report: "1-PCV-62-81 is midposition."

If 1-HIC-62-81A remains in AUTO, then report: "1-PCV-62-81 is CLOSED with air on the diaphragm."

Examiner Note(s):

To satisfy step [3], **OAC** should take MANUAL control of 1-HIC-62-81A on step [3] and raise output to OPEN 1-PCV-62-81. 1-PI-62-81 will show no response so **OAC** should attempt to restore letdown flow to approx. 75 gpm or 1-HIC-62-81A to between 40% and 50%. (cont.)

OAC
OAC

RO

OAC
OAC
OAC
N/A

SRO

WBN Unit 1	CVCS & RHR - RPS & ESF	1-ARI-109-115 Rev. 0009 Page 13 of 49
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Source 1-TS-62-75 (DCS)	Setpoint 140°F	110-C
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LO PRESS LTDN RELIEF LINE TEMP HI
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(Page 1 of 1)

Probable Cause:	A. Letdown Relief Valve 1-RFV-62-662 (downstream of orifices) lifted or failed B. 1-PCV-62-81 Letdown Heat Exchanger pressure control valve malfunction
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Corrective Action:	[1] ENSURE 1-FCV-62-77 OPEN. [2] MONITOR letdown pressure on 1-PI-62-81 [1-M-6].
--------------------	---

NOTE If 1-PCV-62-81 has failed 1-SOI-62.01 may be referenced to bypass the valve.

- [3] **ENSURE** 1-HIC-62-81 maintaining press. 320 to 350 psig, 1-PI-62-81[1-M-6].
- [4] **MONITOR** low press letdown relief tailpipe temp on 1-TI-62-75 [1-M-6].
- [5] **MONITOR** VCT and PRT levels.
- [6] IF determined that 1-RFV-62-662 (letdown relief valve) has lifted and has **NOT** reseated, **THEN** **EVALUATE** isolating Letdown entering 1-AOI-20 to place Excess Letdown in service to allow 1-RFV-62-662 to depressurize and reseal.
- [7] **REFER TO** Tech Specs.

References:	1-47W610-62-2 1-AOI-20 1-SOI-62.01 Tech Specs 08F734235-FD-1609
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Appendix D Required Operator Actions Form ES-D-2									
Op Test	301	Scenario #	2	Event #	4		Page	20	of 122
Event Description:		1-PT-62-81 failure.							
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior			
<p>Examiner Note(s): RCS Pressure and letdown orifice isolation valve status has not changed so letdown flow should be approx. 75 gpm. All operators are trained (procedural requirement) to place controller output between 40% and 50% when restoring letdown to 75 gpm at normal RCS operating pressure.</p> <p>Examiner Note(s): 247-A, LTDN HX RET FLOW LO, and 247-B, LTDN HX RET TEMP HI, will also alarm. These are CCS alarms and are expected due to lowering letdown flow. The alarms will clear when the OAC restores letdown flow using 1-HIC-62-81A.</p> <p>Role Play: If contacted as Work Control, acknowledge the report and direction.</p> <p>Examiner Note(s): 1-PT-62-81 failure does NOT impact Technical Specifications.</p> <p>Examiner Note(s): If crew does NOT implement ARI correctly or improperly diagnoses the failure of 1-PT-62-81, US may enter 1-AOI-20, Malfunction of Pressurizer Level Control System, and direct isolation of charging and letdown. This is NOT the intent of the scenario, and 1-AOI-20 is not included in the guide.</p>									

Op Test	301	Scenario #	2	Event #	5		Page	21	of	122
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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.									
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Sequence of Events / Examiner Notes				Position	Applicant's Actions or Behavior					
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At **CHIEF EXAMINER** Direction:

Insert Simulator Schedule File Event 5

(CCS leak downstream of CCS Pump C-S.)

INDICATIONS:

- 249-B/253-B, U1/U2 SURGE TANK LEVEL LO MAKEUP
- 249-A/253-A, U1/U2 SURGE TANK LEVEL HI/LO
- 1/2-LI-70-99A, U1/U2 SURGE TANK B SIDE LEVELS, dropping
- 1/2-LI-70-63A, U1/U2 SURGE TANK A SIDE LEVELS, dropping to approx. 57% and stabilizing

Operator Actions:

- **BOP** will announce 249-A/253-A and 249-B/253-B and refer to ARI-249-A/-253-A (to the right and next page) and 249-B/253-B (following page)
- **RO** will dispatch AUOs to determine possible leak location
- **CREW** will diagnose a CCS leak on the Train B header.
- **US** will announce entry to 1-AOI-15, Loss of CCS

Examiner Note(s):

A baffle exists in both Units' CCS Surge Tanks to separate Trains. The baffle extends from the bottom of the tank to approx. 57% level. A side tank levels will drop to 57% and then remain steady (1/2-LT-70-63A). B side tank levels will continue to drop due to the CCS leak (1/2-LT-70-99A). Auto makeup is controlled by 1/2-LT-70-63A and the baffle is below the setpoint so auto makeup will continue to supply the leak over the baffle until operator takes action.

BOP

BOP
BOP
BOP
BOP
SRO

N/A
N/A

WBN Unit 0	CCS	0-ARI-241-253 Rev. 0003 Page 45 of 73
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		249-A
Source	Setpoint	U1 SURGE TANK LEVEL HI/LO
1-LS-70-99A/B	85%	
1-LS-70-99B/A	57%	

(Page 1 of 2)

Probable Cause:	A. Leak into or out of CCS B. Makeup system malfunction C. Gas bubble in system D. Valve misalignment E. Surge Tank vent closed causing positive or negative Surge Tank press; giving erroneous level indication (if level in BOTH sides of tank is less than 60%, a false level may be indicated due to interior baffle design)
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NOTE
Auto makeup should initiate at 60% lowering level.

Corrective Action:	[1] MONITOR Surge Tank level. [2] COMPARE 1-LI-70-63A, U1 SURGE TANK A SIDE LEVEL and 1-LI-70-99A, U1 SURGE TANK B SIDE LEVEL [0-M-27B] to check for level disagreement and potential instrument error. [3] IF level is low, THEN: [3.1] ENSURE 1-LCV-70-63, U1 SURGE TANK MAKEUP LCV, OPEN. [3.2] IF Surge Tank level lowers below 52%, THEN ENSURE 1-FCV-70-183, SAMPLE HX CCS OUTLET is CLOSED, AND NOTIFY Chemistry to suspend sampling. [3.3] IF Surge Tank loss imminent, THEN GO TO 1-AOI-15, LOSS OF COMPONENT COOLING WATER (CCS). [c.1] [3.4] IF level is NOT maintained due to loss of makeup, THEN CONSIDER installing ERCW spool piece for emergency source. [3.5] IF level is NOT maintained due to loss of air to makeup valve, THEN CONSIDER installing bottled gas on 1-LCV-70-63.
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Continued on Next Page

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	5		Page	22	of	122
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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>ARI-249-A and ARI-253-A contain identical actions for the respective CCS Surge Tank.</p> <div>Role Play:</div> <p>When RO contacts AUO to investigate CCS for possible leak, wait 5 minutes.</p> <p>If CCS Pump C-S is still running, state: "Large leak near 0-ISV-70-505, CCS C-S Pump Discharge."</p> <p>If CCS Pump C-S is stopped, then</p> <div>Insert Simulator Schedule File Event 21</div> <p>(0-ISV-70-505 CLOSED).</p> <p>and state: "Large leak near 0-ISV-70-505, CCS C-S Pump Discharge. I have closed 0-ISV-70-505 and there is still some water draining slowly."</p> <div>Examiner Note(s):</div> <p>167-D, TURB/AUX/RX FLOODED, will alarm due to CCS in the Aux Building.</p>	<div>N/A</div> <div>N/A</div>	<div><div><div>WBN Unit 0</div><div>CCS</div><div>0-ARI-241-253 Rev. 0003 Page 46 of 73</div></div><div>249-A</div><div><div>U1 SURGE TANK LEVEL HI/LO</div></div><div>Corrective Action: (Continued)</div><div>(Page 2 of 2)</div><div><div>[4] IF level is high, THEN: [4.1] ENSURE 1-LCV-70-63, U1 SURGE TANK MAKEUP LCV, CLOSED. [4.2] CHECK CCS Radiation Monitor for rise. [4.3] CHECK 1-TI-70-161, CCS HX A OUTLET TEMP [0-M-27B].</div><div>[5] IF Surge Tank level rising UNCONTROLLED or CCS Radiation Monitors rising, THEN GO TO 1-AOI-15, LOSS OF COMPONENT COOLING WATER (CCS).</div><div>References: 1-45W600-70 1-45W760-70-8, -10 1-47W610-70-1 1-47W859-1 1-AOI-15</div></div></div>
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Op Test	301	Scenario #	2	Event #	5		Page	23	of	122
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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

ARI-249-B and ARI-253-B contain identical actions for the respective CCS Surge Tank.

Role Play:

RO may dispatch an AUO to report Demin head Tank Level.
Use Thunderview Insight to display “ccldemtank.”
Wait 2 minutes and report to MCR: “Demin Head Tank level is approx. [value] feet.”

BOP
BOP
RO
BOP

WBN
Unit 0

CCS

0-ARI-241-253
Rev. 0003
Page 47 of 73

Source
1-LS-70-63D/A

Setpoint
60%

249-B
U1 SURGE TANK
LEVEL LO
MAKEUP
(Page 1 of 1)

Probable Cause:

A. CCS leak
B. Makeup system malfunction
C. Gas bubble in system
D. Valve misalignment
E. Surge Tank vent closed causing positive or negative Surge Tank press; giving erroneous level indication (if level in BOTH sides of tank is less than 60%, a false level may be indicated due to interior baffle design)

Corrective Action:

[1] COMPARE 1-LI-70-63A, U1 SURGE TANK A SIDE LEVEL and 1-LI-70-99A, U1 SURGE TANK B SIDE LEVEL [0-M-27B] to check for level disagreement and potential instrument error.
[2] ENSURE 1-LCV-70-63, U1 SURGE TANK MAKEUP LCV, OPEN.
[3] ENSURE Demin Water Storage Tank has level.
[4] IF Surge Tank continues to lower, THEN GO TO Window 249-A.

References:

1-45W600-70
1-47W610-70-1
1-47W859-1

Op Test	301	Scenario #	2	Event #	5		Page	24	of	122
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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US performs a crew update and enters 1-AOI-15. US determines that Surge Tank levels are less than 60% and dropping uncontrolled and goes to Section 3.3.

SRO

WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009
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3.0 OPERATOR ACTIONS

3.1 Diagnostics

IF	GO TO Subsection	PAGE
LOSS OF CCS FLOW: <ul style="list-style-type: none">Pump tripMultiple low flow alarmLow header pressure	3.2	6
Surge Tank level less than 60% and dropping uncontrolled OR Indications of out leakage.	3.3	11
Surge Tank level greater than 72% or rising uncontrolled, OR CCS Rad Monitor alarm.	3.4	24
Loss of ERCW to CCS HX A	3.5	33
Loss of ERCW to CCS HX C	3.6	37
Loss of CCS while RHR Shutdown Cooling is in service	1-AOI-14	

Op Test	301	Scenario #	2	Event #	5		Page	25	of	122
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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>If not previously dispatched,wait 5 minutes.</div> <div>If CCS Pump C-S is still running, state: “Large leak near 0-ISV-70-505, CCS C-S Pump Discharge.”</div> <div>If CCS Pump C-S is stopped, then</div> <div>Insert Simulator Schedule File Event 21 (0-ISV-70-505 CLOSED).</div> <div>and state: “Large leak near 0-ISV-70-505, CCS C-S Pump Discharge. I have closed 0-ISV-70-505 and there is still some water draining slowly.”</div>	<div>OAC</div> <div>OAC</div> <div>OAC</div> <div>RO</div> <div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.3 CCS Out Leakage</div> <div><div>CAUTIONS</div><ul style="list-style-type: none">CCP may survive for only 10 to 12 minutes after loss of CCS to lube oil cooler.RCPs can be operated for up to 10 minutes after loss of CCS flow.CCS leaking into CVCS may dilute RCS.</div> <div><div>1.</div><div>DISPATCH operators to identify leak location.</div></div> <div><div>2.</div><div>MONITOR 1A Surge Tank level greater than 10%.</div><div><div>PERFORM the following:</div><div>a. STOP and LOCKOUT 1A Train CCS pumps.</div><div>b. ENSURE CCP 1B-B running.</div><div>c. WHEN CCP 1B-B running, THEN STOP and LOCKOUT CCP 1A-A.</div><div>d. INITIATE alignment of ERCW to CCP 1A-A lube oil heat exchanger USING Attachment 1 (may use placard posted locally in CCP room 1A-A).</div></div><div>Step continued on next page</div><div>Page 11 of 48</div></div>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A	<table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 CCS Out Leakage (continued)</p> <p>Step 2 RNO continued.</p> <p>e. ISOLATE letdown and charging.</p> <p>1) CLOSE Orifice valves</p> <p>2) CLOSE 1-FCV-62-69 & 70</p> <p>3) CLOSE 1-FCV-62-90 & 91</p> <p>4) ENSURE excess letdown 1-FCV-62-54 & 55 isolated.</p> <p>f. STOP and LOCKOUT the following pumps:</p> <ul style="list-style-type: none">TBBPs 1-A & 1-B,CS pump 1A-A,RHR pump 1A-A,SI pump 1A-A,CCP 1A-A (IF ERCW not aligned and greater than 10 min has elapsed). <p>g. TRIP Reactor.</p> <p>h. STOP RCPs.</p> <p>i. **GO TO E-0, Reactor Trip or Safety Injection, WHILE CONTINUING this Instruction.</p> <p>Step continued on next page</p> <p>Page 12 of 48</p>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>N/A</div> <div>N/A</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.3 CCS Out Leakage (continued)</div> <div><div>CAUTION</div><div>Seal injection should NOT be reestablished to RCP seals on a total loss of cooling due to probable damage to the seals. Attachment 3 has guidance to isolate RCP seals.</div></div> <div>Step 2 RNO continued.</div> <div><div>j.</div><div>WHEN ERCW cooling established to CCP 1A-A, THEN</div><div>COORDINATE with Engineering to EVALUATE time thermal barrier and RCP seal injection flow lost prior to re-starting CCP 1A-A and supplying hot seals.</div></div> <div><div>k.</div><div>IF thermal barrier flow lost and RCP seal injection flow CANNOT be reestablished, THEN</div><div>REFER TO Attachment 3 to isolate RCP seals.</div></div> <div><div>l.</div><div>IDENTIFY and isolate leak on 1A Train header.</div></div> <div><div>m.</div><div>WHEN ERCW is aligned to CCP 1A-A, AND CCP 1B-B is RUNNING, THEN ENSURE CCP 1A-A hand switch in A-AUTO.</div></div> <div>Page 13 of 48</div>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div><div>Examiner Note(s):</div><p>U1 and U2 Surge Tank B Side levels will drop below 10%. This is a MONITOR step. When the condition is met, US will exercise the RNO. BOP will stop CCS Pump C-S. OAC will verify CCP 1A-A is running and place CCP 1B-B, RHR Pump 1B-B and SI Pump 1B-B in STOP PULL TO LOCK. CS Pump 1B-B is already DANGER tagged in STOP PULL TO LOCK.</p><div>Examiner Note(s):</div><p>When CCS Pump C-S is stopped, 180-C, 0-RM-90-123 INST MALF, will alarm.</p></div>	<div>BOP/OAC</div> <div>BOP</div> <div>N/A</div> <div>OAC</div> <div>OAC</div> <div>OAC</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>3.3 CCS Out Leakage (continued)</p><p>3. MONITOR Unit 1 CCS Train 1B and 2B surge tank level greater than 10%. ENSURE 1A-A CCP running.</p><p>STOP and LOCKOUT the following Train B equipment:</p><ul style="list-style-type: none">• B Train CCS pumps• CS pump 1B-B• RHR pump 1B-B• SI pump 1B-B• CCP 1B-B<p>IDENTIFY and isolate leak on B Train header.</p><p>CAUTION A closed Surge Tank vent valve may cause a positive or negative tank pressure, giving an erroneous level indication.</p><p>4. ENSURE 1-FCV-70-66, U1 Surge Tank Vent, OPEN.</p><p>5. CHECK any Surge Tank level DROPPING. IF Surge Tank level greater than 85%, THEN</p><p>**GO TO Subsection 3.4, CCS In Leakage.</p><div>Page 14 of 48</div></div>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>BOP N/A N/A BOP/OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>3.3 CCS Out Leakage (continued)</p><p>6. ENSURE 1-LCV-70-63, U1 Surge Tank Makeup LCV, OPEN for level greater than 10% and less than 60%. EVALUATE aligning ERCW makeup, USING 0-SOI-70.01.</p><p>CAUTIONS Seal injection should NOT be reestablished to RCP seals on a total loss of cooling due to probable damage to the seals. Attachment 3 has guidance to isolate RCP seals. IF all RCP seal cooling is lost, cooling down and depressurizing the RCS at a rapid rate, within established guidelines will minimize seal leakage upon seal failure.</p><p>7. CHECK thermal barrier flow OR seal injection flow established. IF thermal barrier flow lost and RCP seal injection flow CANNOT be reestablished, THEN MONITOR lower bearing AND seal water temperature less than 225F, AND IF greater than 225F, THEN 1) TRIP Reactor 2) STOP RCPs 3) **GO TO 1-E-0, Reactor Trip or Safety Injection, WHILE CONTINUING this instruction. 4) ISOLATE Seals using Attachment 3.</p></div>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

This step will stop the loss of water from the Demin Head Tank through the CCS leak.

Examiner Note(s):

The following steps attempt to diagnose and isolate various CCS leaks on both the 1A and B CCS headers. There are no verifiable actions other than step [18] to re-open the makeup valves once the leak is isolated.

This event is an LCO evaluation event.

If desired and at **CHIEF EXAMINER Direction:**

Insert Simulator Schedule File Event 6

(RCP 3 #1 Seal high leak-off) to initiate next event.

LCOs NOT met (p. 37 of this guide) can be discussed following scenario completion. Delaying LCO discussion until after the Major Event could impact the determination of LCOs as 1-AOI-15 actions (handswitches in PULL TO LOCK) will not have just been completed.

BOP**BOP
BOP****N/A****BOP
BOP**

WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009
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Step	Action/Expected Response	Response Not Obtained
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3.3 CCS Out Leakage (continued)

8. **MONITOR** Unit 2A CCS Train surge tank level greater than 10%.

PERFORM the following:

- STOP** and **LOCKOUT** CCS pumps 2A-A & 2B-B (if aligned to 2A Trn.)
- EVALUATE** placing SFP HX A in service using 0-SOI-70.01
- IDENTIFY** and isolate leak on 2A Train header.

9. **WHEN** a Surge Tank level reaches 10%, **THEN EVALUATE** closing associated makeup valve until leak is isolated.

- U-1, 1-LCV-70-63,
- U-2, 2-LCV-70-63.

CAUTION RCPs can be operated for up to 10 minutes after loss of CCS flow.

10. **CHECK** all RCP upper and lower oil cooler flows **NORMAL**:

PERFORM the following to isolate leak:

- Upper cooler flow: 150 - 220 gpm.
 - Lower cooler flow: 5 - 10 gpm.
- CLOSE** RCP oil cooler isol valves:
 - 1-FCV-70-100 or 1-FCV-70-140, RCP Oil Coolers Supply CIV.
 - 1-FCV-70-89 or 1-FCV-70-92, RCP Oil Coolers Return CIV.
 - TRIP** Reactor.
 - STOP** RCPs.

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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A	<table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 CCS Out Leakage (continued)</p> <p>Step 10 RNO continued</p> <p>d. **GO TO 1-E-0, Reactor Trip or Safety Injection.</p> <p>CAUTION Seal Injection water must be maintained to all RCPs following isolation of thermal barriers.</p> <p>11. CHECK Thermal Barrier HX flows NORMAL:</p> <ul style="list-style-type: none">Thermal Barrier flow 40 - 50 gpm <p>PERFORM the following to isolate leak:</p> <p>a. ENSURE Thermal Barrier Booster pumps STOPPED and evaluate OR-14.10.</p> <p>b. ENSURE the following isol valves CLOSED:</p> <ul style="list-style-type: none">1-FCV-70-133 or 1-FCV-70-134, Thermal Barrier Supply CIV.1-FCV-70-87 or 1-FCV-70-90, Thermal Barrier Return CIV. <p>c. IF RCP lower bearing temp rising uncontrolled (180°F max), THEN REFER TO 1-AOI-24. RCP Malfunctions During Pump Operation.</p>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						
	N/A							
	BOP							

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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 CCS Out Leakage (continued)</p> <p>12. CHECK 1A ESF Supply Header flow NORMAL, 1-FI-70-159A:</p> <ul style="list-style-type: none">Normal ~100 gpm with RHR out of service. <p>a. ENSURE CCP 1B-B in service, OR PLACE ERCW on CCP 1A-A USING Attachment 1 (may use placard posted locally in CCP room 1A-A).</p> <p>b. STOP and LOCKOUT the following pumps:</p> <ul style="list-style-type: none">CS pump 1A-A,RHR pump 1A-A,SI pump 1A-A,CCP 1A-A (IF ERCW not aligned and greater than 10 min has elapsed) <p>c. CLOSE bkr to 1-FCV-70-2 [Rx MOV Bd 1A2-A Compt 14A].</p> <p>d. CLOSE 1-FCV-70-2, 1A ESF Equipment Supply Header.</p> <p>e. CHECK flood alarm panel [6.9kV SD Bd Rm A, ei 757].</p> <p>f. DISPATCH Operators to inspect 1A ESF Supply Header and components for leaks.</p> <p>g. ISOLATE leaks.</p> <p>Page 18 of 48</p>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>ESF 1B Supply Header flow will be 0 gpm after CCS Pump C-S is stopped. RNO should NOT be exercised. Step [3] RNO mitigated the leak.</div>	<div>BOP/SRO</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>3.3 CCS Out Leakage (continued)</div><div>13. CHECK 1B ESF Supply Header flow NORMAL, 1-FI-70-165A:</div><div><div><div>• Normal 5000 - 6000 gpm with RHR in service.</div></div><div><div>a. ENSURE CCP 1A-A in service.</div><div>b. STOP and LOCKOUT the following pumps:<div><div>• CS pump 1B-B,</div><div>• RHR pump 1B-B,</div><div>• SI pump 1B-B,</div><div>• CCP 1B-B.</div></div></div><div>c. CLOSE bkr to 1-FCV-70-3 [Rx MOV Bd 1B2-B, Compt 14B].</div><div>d. CLOSE 1-FCV-70-3, 1B ESF Equipment Supply Header.</div><div>e. DISPATCH Operators to inspect 1B ESF Supply Header and components for leaks.</div><div>f. ISOLATE leaks.</div></div></div></div>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Indication NOT available on the simulator.

BOP

BOP

WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009
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Step	Action/Expected Response	Response Not Obtained
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3.3 CCS Out Leakage (continued)

14. CHECK SFP HX A flow NORMAL, 0-FI-70-20:

- Normal 2700 - 3500 gpm with SFP HX A in service.

PERFORM the following to isolate leak:

a. CLOSE the following:

- 0-FCV-70-197, SFP HX A Supply.
- 0-ISV-70-529A, SFPCS HX A CCS Isol [A7W/737]
- EVALUATE total CCS flow.

b. REFER TO 0-SOI-78.01, Spent Fuel Pool Cooling and Cleaning System, to place SFP HX B in service.

15. CHECK SFP HX B flow NORMAL, 0-FI-70-6:

- Normal top of scale with SFP HX B in service (may require local observation to determine if leak exists).

PERFORM the following to isolate leak:

a. CLOSE the following:

- 0-FCV-70-194, SFP HX B Supply.
- 0-ISV-70-529B, SFPCS HX B CCS Isol [A6W/737]
- EVALUATE total CCS flow.

b. REFER TO 0-SOI-78.01, Spent Fuel Pool Cooling and Cleaning System, to place SFP HX A in service.

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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>If contacted as Radiation Protection, acknowledge the direction.</div>	<div>N/A</div> <div>BOP</div> <div>BOP</div> <div>RO</div> <div>OAC</div>	<table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 CCS Out Leakage (continued)</p> <p>CAUTION If Seal Water HX is source of out-leakage, CCP mini-flow and cooling will be lost if HX is isolated from CVCS. CVCS temperature must be monitored for system operability.</p> <p>16. CHECK RCP Seal Water HX NORMAL:</p> <div><div><ul style="list-style-type: none">CCS return temp, 1-TI-70-175 normal 70 - 110°F [0-M-27].HX outlet flow, 1-FI-70-176 greater than 200 gpm [0-M-27].Radiation Protection survey.VCT level.</div><div><p>PERFORM the following isolate leak:</p><p>a. ISOLATE CVCS Seal Water HX as follows:</p><ol style="list-style-type: none">OPEN 1-BYV-62-648, CVCS Seal Water HX Bypass [A6U/713].CLOSE 1-ISV-62-647, CVCS Seal Water HX Inlet Isol [A6U/713].CLOSE 1-ISV-62-650, CVCS Seal Water HX Outlet Isol [A6U/713].<p>b. EVALUATE the following for plant shutdown:</p><ul style="list-style-type: none">heat-up of CVCSloss of mini-flow for both CCPspossible influx of CCS into VCTradiological concerns</div></div>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div><div>WBN Unit 1</div><div>Loss of Component Cooling Water (CCS)</div><div>1-AOI-15 Rev. 0009</div></div> <div><div>Step</div><div>Action/Expected Response</div><div>Response Not Obtained</div></div> <div>3.3 CCS Out Leakage (continued)</div> <div>17. CHECK CCS Train 1A OR Train 2A in service.<div>IF CCS Train 1A and 2A flow unavailable, THEN ALIGN CCS Train B to SFP HX B USING Attachment 2.</div></div> <div>18. WHEN leak is isolated, THEN<div>RETURN CCS Surge Tank to normal level by ensuring makeup valve is in Auto.<ul style="list-style-type: none">U-1, 1-LCV-70-63,U-2, 2-LCV-70-63.REFER TO 0-SOI-70.01, Component Cooling Water (CCS) as needed.</div><div>IF leak can NOT be isolated, THEN CLOSE associate makeup valve:<ul style="list-style-type: none">U-1, 1-LCV-70-63,U-2, 2-LCV-70-63.</div></div> <div>19. EVALUATE affected equipment operation USING Appendix A.</div> <div>20. CHECK only one TBBP running.<div>STOP second running TBBP AND RETURN HS to A-P AUTO.</div></div> <div>21. CHECK only one CCS pump per Train RUNNING.<div>EVALUATE loading for two CCS pumps, THEN ADJUST number of pumps running accordingly.<ul style="list-style-type: none">REFER TO 0-SOI-70.01</div></div>
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Op Test	301	Scenario #	2	Event #	5		Page	37	of	122
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Event Description:	CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<p>US evaluates Technical Specifications.</p> <p>Tech Specs:</p> <p>LCO 3.7.7, CCS, Condition A</p> <p>LCO 3.5.2, ECCS - Operating, Condition A</p> <p>LCO 3.6.6, Containment Spray System, Condition B</p> <p>TR 3.1.4, Charging Pumps - Operating, Condition A</p> <p>Examiner Note(s):</p> <p>LCO 3.6.6, NOT met with Condition A applying due to CS Pump 1B-B unavailable prior to scenario start due to maintenance.</p> <p>Role Play:</p> <p>As Work Control, acknowledge the request(s) and information provided.</p>	<p>SRO</p> <p>SRO</p> <p>SRO</p> <p>SRO</p>	<table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 CCS Out Leakage (continued)</p> <p>22. REFER TO Tech Spec 3.7.7, Component Cooling Water System (CCS).</p> <p>23. NOTIFY Work Control to initiate repairs.</p> <p>24. NOTIFY Chemistry if CCS cooling to Sample HX is isolated.</p> <p>25. DO NOT CONTINUE until repairs are complete,</p> <p>26. ENSURE 1-HS-70-63A, U1 SURGE TANK MAKEUP LCV in P-AUTO.</p> <p>27. ENSURE CCS, CVCS, CS, RHR and SI pumps are returned to normal alignment USING the following Instructions as necessary:</p> <ul style="list-style-type: none">0-SOI-70.01, Component Cooling Water (CCS).1-SOI-62.01, CVCS - Charging and Letdown.1-SOI-72.01, Containment Spray System.1-SOI-74.01, Residual Heat Removal System.1-SOI-63.01, Safety Injection System. <p>28. RETURN TO Instruction in effect.</p> <p>End of Section</p> <p>Page 23 of 48</p>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	5		Page	38	of	122
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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

1-AOI-15 Appendix A provided for information only.

WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009
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Appendix A
(Page 1 of 2)
Header Cross-Reference

ESF EQUIPMENT 1A

COMPONENT	NORMAL FLOW	FLOW INDICATOR
CCP 1A Gear & Oil Cooler	≥ 28 gpm	1-FI-70-146
SIP 1A Oil Cooler	≥ 15 gpm	1-FI-70-147
CS Pump 1A Oil Cooler	≥ 2 gpm	1-FI-70-150
RHR Pump 1A Seal HX	≥ 10 gpm	1-FI-70-151
RHR HX 1A	≥ 5000 gpm	1-FI-70-158

ESF EQUIPMENT 1B

COMPONENT	NORMAL FLOW	FLOW INDICATOR
CCP 1B Gear & Oil Cooler	≥ 28 gpm	1-FI-70-145
SIP 1B Oil Cooler	≥ 15 gpm	1-FI-70-148
CS Pump 1B Oil Cooler	≥ 2 gpm	1-FI-70-149
RHR Pump 1B Seal HX	≥ 10 gpm	1-FI-70-152
RHR HX 1B	≥ 5000 gpm	1-FI-70-155

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	5		Page	39	of	122
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Event Description: CCS leak downstream of CCS Pump C-S. 1-AOI-15. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Loss of Component Cooling Water (CCS)</td><td>1-AOI-15 Rev. 0009</td></tr><tr><td colspan="3">Appendix A (Page 2 of 2) Header Cross-Reference</td></tr><tr><td colspan="3">NOTE All listed equipment affected by isolation Misc Equip and Rx Bldg Hdrs.</td></tr><tr><td colspan="3"><table><thead><tr><th>COMPONENT</th><th>ACTION</th></tr></thead><tbody><tr><td colspan="2">RX BLDG HDR EQUIPMENT</td></tr><tr><td>Excess Letdown HX</td><td>REMOVE from service USING 1-SOI-62.01.</td></tr><tr><td>RCP Motor Bearings</td><td>STOP RCP(s) if motor bearing rises to 195°F (alarm at 185°F). RCPs must be tripped within 10 minutes of loss of CCS to oil coolers.</td></tr><tr><td>Thermal Barrier Booster Pump supply</td><td>STOP TBBPs. CHECK RCP seal temp & flow.</td></tr><tr><td>Post Accident Sampling</td><td>NOTIFY Chemistry.</td></tr><tr><td colspan="2">MISC HDR EQUIPMENT</td></tr><tr><td>Seal Water HX</td><td>CHECK VCT temp. Should be slight rise in seal supply temp (max 130°F).</td></tr><tr><td>Letdown HX</td><td>ISOLATE charging and letdown. (Excess Letdown NOT available)</td></tr><tr><td>Sample HXs</td><td>NOTIFY Chemistry.</td></tr><tr><td>Waste Gas Compressor</td><td>REMOVE from service USING 0-SOI-77.02.</td></tr></tbody></table></td></tr></table>	WBN Unit 1	Loss of Component Cooling Water (CCS)	1-AOI-15 Rev. 0009	Appendix A (Page 2 of 2) Header Cross-Reference			NOTE All listed equipment affected by isolation Misc Equip and Rx Bldg Hdrs.			<table><thead><tr><th>COMPONENT</th><th>ACTION</th></tr></thead><tbody><tr><td colspan="2">RX BLDG HDR EQUIPMENT</td></tr><tr><td>Excess Letdown HX</td><td>REMOVE from service USING 1-SOI-62.01.</td></tr><tr><td>RCP Motor Bearings</td><td>STOP RCP(s) if motor bearing rises to 195°F (alarm at 185°F). RCPs must be tripped within 10 minutes of loss of CCS to oil coolers.</td></tr><tr><td>Thermal Barrier Booster Pump supply</td><td>STOP TBBPs. CHECK RCP seal temp & flow.</td></tr><tr><td>Post Accident Sampling</td><td>NOTIFY Chemistry.</td></tr><tr><td colspan="2">MISC HDR EQUIPMENT</td></tr><tr><td>Seal Water HX</td><td>CHECK VCT temp. Should be slight rise in seal supply temp (max 130°F).</td></tr><tr><td>Letdown HX</td><td>ISOLATE charging and letdown. (Excess Letdown NOT available)</td></tr><tr><td>Sample HXs</td><td>NOTIFY Chemistry.</td></tr><tr><td>Waste Gas Compressor</td><td>REMOVE from service USING 0-SOI-77.02.</td></tr></tbody></table>			COMPONENT	ACTION	RX BLDG HDR EQUIPMENT		Excess Letdown HX	REMOVE from service USING 1-SOI-62.01.	RCP Motor Bearings	STOP RCP(s) if motor bearing rises to 195°F (alarm at 185°F). RCPs must be tripped within 10 minutes of loss of CCS to oil coolers.	Thermal Barrier Booster Pump supply	STOP TBBPs. CHECK RCP seal temp & flow.	Post Accident Sampling	NOTIFY Chemistry.	MISC HDR EQUIPMENT		Seal Water HX	CHECK VCT temp. Should be slight rise in seal supply temp (max 130°F).	Letdown HX	ISOLATE charging and letdown. (Excess Letdown NOT available)	Sample HXs	NOTIFY Chemistry.	Waste Gas Compressor	REMOVE from service USING 0-SOI-77.02.
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Op Test	301	Scenario #	2	Event #	6		Page	40	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At **CHIEF EXAMINER** Direction:

Insert Simulator Schedule File Event 6

(RCP 3 #1 Seal high leak-off)

INDICATIONS:

- 1-FR-62-50 Red Pen, RCP 3 Seal Leakoff, rising
- 100-D, RCP SEAL LEAK OFF FLOW HI
- RCP 3 Lower Bearing and Seal Outlet temperatures will change

Operator Actions:

- OAC** will announce 100-D and refer to ARI-100-D (to the right)
- Crew** will diagnose a malfunction of RCP 3 #1 Seal
- US** will announce entry to 1-AOI-24, RCP Malfunctions

Examiner Note(s):

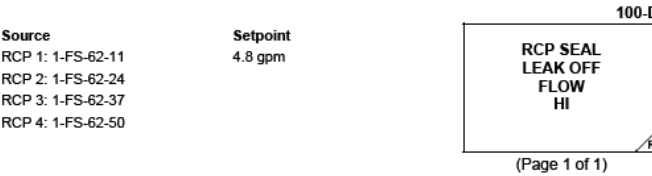
Changes in RCP 3 Lower Bearing and Seal Outlet temperatures confirm alarm.

ARI-100-D directs **US** to 1-AOI-24.

OAC

OAC/SRO

WBN Unit 1	Reactor Coolant Pumps	1-ARI-95-101 Rev. 0003 Page 39 of 50
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- Probable Cause:
- A. No. 1 seal damage
 - B. No. 1 seal NOT fully seated
 - C. Loss of seal injection water followed by high seal temperature

Corrective Action: [1] CHECK high leakoff flow condition of affected RCP(s) with the following instruments:

RCP	RECORDER	PEN/TRACE	ICS POINT
1	1-FR-62-24	Red	F1018A
2	1-FR-62-24	Blue	F1020A
3	1-FR-62-50	Red	F1022A
4	1-FR-62-50	Blue	F1024A

[2] IF high leakoff is confirmed, THEN GO TO 1-AOI-24, RCP MALFUNCTIONS DURING PUMP OPERATION.

References: 1-47W610-62-1
1-AOI-24

Op Test	301	Scenario #	2	Event #	6		Page	41	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

RCP 3 #1 seal leak-off ramps from 0 to greater than 6 gpm (but still on scale) over 10 minutes upon event insertion.
Until Event 7 is inserted, Seal Outlet and Lower Bearing temperatures will continue to drop. RCP Immediate Shutdown Criteria is seal leak-off HIGH AND Seal Outlet and/or Lower Bearing temperature rising (which will NOT occur until Event 7 is inserted).

Examiner Note(s):

US will perform crew update to enter 1-AOI-24.

US will determine that Section 3.3. applies.

SRO

WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000
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3.0 OPERATOR ACTION:

3.1 Diagnostics

IF	GO TO Subsection
RCP tripped or shutdown required	3.2
#1 seal leakoff flow HIGH,	3.3
#1 seal leakoff flow LOW, AND Standpipe level alarm DARK,	3.4
#2 Seal Leakoff Flow HIGH	3.5
(#1 seal leakoff flow LOW, AND Standpipe level alarm LIT),	
#3 seal leakoff flow HIGH	3.6
(#1 seal leakoff flow NORMAL AND Standpipe level alarm LIT),	

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	6		Page	42	of	122
Event Description:		RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.								

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Attachment 1 is on p. 51. At NOP, maximum normal seal leak-off is 5 gpm. RCP 3 seal leak-off will rise above 5 gpm during the 10 minute ramp of the fault. **US** may request an evaluation from System Engineering depending on how the crew moves through the procedure.

Examiner Note(s):

100-D will alarm at 4.8 gpm seal leak-off flow approx. 3 min and 45 seconds after Event 6 inserted. Seal-leak off will exceed 6 gpm approx. 4 min and 40 seconds after Event 6 inserted. Depending on pacing of the crew, 6 gpm seal leak-off may or may NOT be exceeded when **OAC** performs step [1]. The step is a MONITOR step, and 6 gpm will be exceeded. If step [1] is performed soon enough, the **US** will exercise the RNO and go to step [5]. If not, the **US** will proceed to step [2]. For the MONITOR step [2], Lower Bearing and Seal Outlet temperature will be stable or slowly dropping until Event 7. All steps of Section 3.3 are included.

Examiner Note(s):

1-AOI-39 is Event 7 and starts on p. 53.

OAC
OAC/SRO
N/A
Crew

OAC
OAC

SRO

WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000
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Step	Action/Expected Response	Response Not Obtained
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3.3 # 1 Seal Leakoff Flow High

- CAUTION** A seal leakoff rise to greater than 2.0 gpm AFTER experiencing low leakoff of less than 0.8 gpm may indicate seal degradation. Plant Management should be notified of leakoff trends.
- NOTE 1** Anytime #1 seal leakoff flow exceeds the values shown on Attachment 1, system engineering should be requested to perform an evaluation of the #1 seal condition.
- NOTE 2** During plant startup after seal maintenance, the #1 seal may require 24 hours of run time before the seal seats fully and operates normally.
- NOTE 3** The #1 seal return should be isolated between 3 and 5 minutes after tripping an RCP to allow for pump coastdown.

- MONITOR** #1 seal leakoff equal to or greater than 6.0 gpm. ****GO TO Step 5.**
- MONITOR** RCPs lower bearing and #1 seal outlet temp STABLE or DROPPING. ****GO TO Subsection 3.2, Step 2.**
- REFER TO** appropriate instruction to initiate a controlled shutdown to Mode 3 while continuing with this instruction:
 - AOI-39, Rapid Load Reduction.
 - GO-4, Normal Power Operation.
 - GO-5, Unit Shutdown From 30% Reactor Power to Hot Standby.

Op Test	301	Scenario #	2	Event #	6		Page	43	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): Attachment 2 is located on p. 52. No RCP Immediate Shutdown Criteria will be reached until Event 7 is inserted.</div> <div>Role Play: If contacted as System Engineering, acknowledge the request for recommendations and temporary high flow monitoring instrumentation.</div>	<div>N/A</div> <div>N/A</div> <div>OAC</div> <div>OAC</div> <div>SRO</div>	<div><table><tr><td>WBN Unit 1</td><td>RCP MALFUNCTIONS DURING PUMP OPERATION</td><td>1-AOI-24 Rev. 0000</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>3.3 # 1 Seal Leakoff Flow High (continued)</div><div>NOTE RCP shutdown time is based on an orderly reactor shutdown and may be delayed or expedited based on ongoing evaluations of current plant conditions, other pump parameters and efforts to restore seal leakoff flows to normal.</div><div>4. REMOVE RCP from service:<ul style="list-style-type: none">Within 8 hrs,ORAs directed by Plant Management.</div><div>5. MONITOR RCP immediate shutdown required: ** GO TO Step 6.<ul style="list-style-type: none">REFER TO ATTACHMENT 2, RCP Immediate Shutdown Criteria.** GO TO Subsection 3.2, Step 2.</div><div>6. ADJUST seal injection flow to exceed total #1 seal leakoff rate.</div><div>7. CONTACT System Engineer for further guidance WHILE continuing this instruction:<ul style="list-style-type: none">Recommendations for continued RCP operation.Installation of alternate flow measuring equipment (flows greater than 6 gpm).</div><div>Page 12 of 27</div></div>	WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	6		Page	44	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	6		Page	45	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>Lower Bearing and Seal Outlet temperatures will be less than 180°F and STABLE or DROPPING until Event 7 inserted.</div>	OAC	<div><table><tr><td>WBN Unit 1</td><td>RCP MALFUNCTIONS DURING PUMP OPERATION</td><td>1-AOI-24 Rev. 0000</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>3.3 # 1 Seal Leakoff Flow High (continued)</div><div>11. MONITOR RCP lower bearing and #1 seal outlet temp:<div><div>IF temp greater than 180°F AND rising, THEN</div><div>Less than or equal to 180°F</div><div>STABLE or DROPPING.</div></div><div>** GO TO Subsection 3.2.</div></div><div>12. INITIATE repairs as required.</div><div>13. RETURN TO Instruction in effect.</div><div>End of Section</div></div>	WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	6		Page	46	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

When Lower Bearing and/or Seal Outlet temperatures begin RISING, **US** will use Section 3.3 step [2] or step [11] to go to this Section. This will NOT occur until Event 7 is inserted.

Examiner Note(s):

RCP 3 is NOT tripped and **US** will exercise RNO. RCP Immediate Shutdown Criteria IAW Attachment 2 on p. 52 will be required.

OAC/SRO

OAC

Crew

OAC

OAC/SRO

WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000
Step	Action/Expected Response	Response Not Obtained

3.2 RCP Tripped Or Shutdown Required

NOTE 1	Malfuncions addressed by this procedure require RCP shutdown as soon as possible.
NOTE 2	Exceeding any of the limits listed on Attachment 2 of this procedure will require immediate shutdown of the affected RCP.
NOTE 3	Malfuncions resulting in high #1 seal leakoff will require closing #1 seal return FCV following RCP coastdown
1.	CHECK RCP tripped
	MONITOR RCP immediate shutdown Criteria: <ul style="list-style-type: none">REFER TO ATTACHMENT 2, RCP Immediate Shutdown Criteria.1) IF RCP immediate shutdown required, THEN ** GO TO Step 2.2) IF RCP immediate shutdown NOT required, THEN ** GO TO Step 9
2.	CHECK unit in Mode 1 or 2
	** GO TO Step 4.

Appendix D Required Operator Actions Form ES-D-2																	
Op Test	301	Scenario #	2	Event #	6		Page	47	of	122							
Event Description:		RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.															
Sequence of Events / Examiner Notes						Position	Applicant's Actions or Behavior										
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Examiner Note(s): Reactor Trip is EVENT 8 and starts on p. 60. This page of 1-AOI-24 is also included in EVENT 8 on p. 63 for continuity. </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Examiner Note(s): Step [4] is verifiable action for EVENT 6, but is performed in EVENT 8. </div> <div style="border: 1px solid black; padding: 5px;"> Examiner Note(s): 1-FR-62-50 Red Pen is offscale high (> 6 gpm). US will exercise RNO and RO will CLOSE 1-FCV-62-35 3 to 5 minutes after RCP 3 stopped. Step [6] RNO is verifiable action for EVENT 6, but is performed in EVENT 8. </div>						SRO	<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 15%;">WBN Unit 1</td> <td style="width: 60%;">RCP MALFUNCTIONS DURING PUMP OPERATION</td> <td style="width: 25%;">1-AOI-24 Rev. 0000</td> </tr> <tr> <td>Step</td> <td>Action/Expected Response</td> <td>Response Not Obtained</td> </tr> </table> <p>3.2 RCP Tripped Or Shutdown Required (continued)</p> <p>NOTE Control room staff should brief on Steps 3 through 6 prior to tripping the reactor. This ensures that the affected RCP is stopped and that appropriate actions are taken when unit is removed from service.</p> <p>3. TRIP the reactor, and GO TO E-0, Reactor Trip or Safety Injection, WHILE continuing with this instruction.</p> <p>4. STOP and LOCK OUT affected RCP(s).</p> <p>5. IF in Mode 3, THEN CHECK any RCP Running</p> <p>CAUTION If the RCP seal return flow control valve (FCV) is NOT closed within 5 minutes of stopping the RCP with excessive leakoff, seal damage may occur.</p> <p>6. MONITOR RCP seal leakoff less than 6 gpm per pump: • 1-FR-62-24 [RCP 1 & 2] • 1-FR-62-50 [RCP 3 & 4] • ICS "RCP DATA" • ICS "RCP SEALS"</p> <p>7. CHECK RCPs 1 and 2 running.</p> <p>WHEN the RCP has coasted down (between 3 and 5 minutes), THEN CLOSE affected RCP seal return FCV: • 1-FCV-62-9 [RCP 1] • 1-FCV-62-22 [RCP 2] • 1-FCV-62-35 [RCP 3] • 1-FCV-62-48 [RCP 4]</p> <p>CLOSE affected loop's pressurizer spray valve.</p>					WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000	Step	Action/Expected Response	Response Not Obtained
						WBN Unit 1						RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000				
						Step						Action/Expected Response	Response Not Obtained				
						OAC											
						RO											
OAC																	
Crew																	
RO																	
OAC																	

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	6		Page	48	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div><div>WBN Unit 1</div><div>RCP MALFUNCTIONS DURING PUMP OPERATION</div><div>1-AOI-24 Rev. 0000</div></div> <div><div>Step</div><div>Action/Expected Response</div><div>Response Not Obtained</div></div> <div>3.2 RCP Tripped Or Shutdown Required (continued)</div> <div>8. GO TO Step 15.</div> <div>9. CONSULT plant staff as necessary for recommendations for continued RCP operation.</div> <div>NOTE Control room staff should brief on Steps 10 through 13 prior to reducing load. This ensures that the affected RCP is stopped and that appropriate actions are taken when unit is removed from service.</div> <div>10. IF removal of RCP(s) is required, THEN REFER TO appropriate instruction to initiate a controlled shutdown to Mode 3 while continuing with this instruction:<ul style="list-style-type: none">AOI-39, Rapid Load ReductionGO-4, Normal Power Operation.GO-5, Unit Shutdown From 30% Reactor Power to Hot Standby</div> <div>11. MAINTAIN affected SG level on PROGRAM:<ul style="list-style-type: none">LOWER MFW flow as steam flow drops.ISOLATE blowdown from affected SG.</div> <div>12. WHEN unit is in Mode 3, THEN</div>	<div>SRO</div> <div>N/A</div> <div>N/A</div> <div>N/A</div> <div>N/A</div>
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	6		Page	49	of	122
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Event Description: RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A	<table><tr><td>WBN Unit 1</td><td>RCP MALFUNCTIONS DURING PUMP OPERATION</td><td>1-AOI-24 Rev. 0000</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 RCP Tripped Or Shutdown Required (continued)</p> <p>a. STOP and LOCK OUT affected RCP(s).</p> <p>b. CHECK any RCP Running</p> <p>b. **GO TO ES-0.2, Natural Circulation Cooldown, WHILE continuing with this instruction.</p> <p>CAUTION If the RCP seal return flow control valve (FCV) is NOT closed within 5 minutes of stopping the RCP with excessive leakoff, seal damage may occur.</p> <p>13. MONITOR RCP seal leakoff less than 6 gpm per pump:</p> <ul style="list-style-type: none">1-FR-62-24 [RCP 1 & 2]1-FR-62-50 [RCP 3 & 4] <p>WHEN the RCP has coasted down (between 3 and 5 minutes), THEN CLOSE affected RCP seal return FCV:</p> <ul style="list-style-type: none">1-FCV-62-9 [RCP 1]1-FCV-62-22 [RCP 2]1-FCV-62-35 [RCP 3]1-FCV-62-48 [RCP 4] <p>14. CHECK RCPs 1 and 2 running.</p> <p>CLOSE affected loop's pressurizer spray valve.</p>	WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000						
Step	Action/Expected Response	Response Not Obtained						
	N/A							
	N/A							
	N/A							

Op Test	301	Scenario #	2	Event #	6		Page	50	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	SRO	<table><tr><td>WBN Unit 1</td><td>RCP MALFUNCTIONS DURING PUMP OPERATION</td><td>1-AOI-24 Rev. 0000</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 RCP Tripped Or Shutdown Required (continued)</p> <p>15. REFER TO Tech Spec:</p> <ul style="list-style-type: none">LCO 3.4.1, RCS Press, Temp and Flow DNB Limits.LCO 3.4.2, RCS Minimum Temp For Criticality.LCO 3.4.4, RCS Loops Modes 1 and 2.LCO 3.4.5, RCS Loops Mode 3.LCO 3.4.13, RCS Operational Leakage.LCO 3.4.15, Leakage Detection Instrumentation. <p>16. INITIATE repairs as required.</p> <p>17. OBTAIN plant management approval prior to restarting any RCP.</p> <p>18. RETURN TO Instruction in effect.</p> <p>End of Section</p> <p>Page 10 of 27</p>	WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000						
Step	Action/Expected Response	Response Not Obtained						
	SRO							

Op Test	301	Scenario #	2	Event #	6		Page	51	of	122
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Event Description: RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>RCP MALFUNCTIONS DURING PUMP OPERATION</td><td>1-AOI-24 Rev. 0000</td></tr></table> <p>Attachment 1 (Page 1 of 1)</p> <p>#1 Seal Performance Parameters</p> <p>RCS pressure is used as the horizontal axis of this graph. During normal "at power" conditions, with RCS pressure approximately 2235 psig and VCT press within the normal operating range, seal delta-P cannot be read (hi scale = 400 psid). RCS pressure is therefore used as indicative of seal delta-P. At RCS pressures less than 400 psig, seal delta-P can be read and should be used to determine the minimum and maximum limits for #1 seal leakoff flow.</p> <p>NO. 1 SEAL LEAK RATE (GPM)</p> <p>RCS PRESS (less than 400 psig use seal ΔP gauge)</p> <p>2235 2400</p> <p>NOTE At normal operating pressure range, the minimum leakoff flow for continued RCP operation is 0.8 gpm.</p> <p>Page 25 of 27</p>	WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000
WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000			

Op Test	301	Scenario #	2	Event #	6		Page	52	of	122
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Event Description:	RCP 3 #1 Seal Malfunction (high leakoff). 1-AOI-24.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>RCP MALFUNCTIONS DURING PUMP OPERATION</td><td>1-AOI-24 Rev. 0000</td></tr></table> <p>Attachment 2 (Page 1 of 1)</p> <p>RCP IMMEDIATE SHUTDOWN CRITERIA</p> <p>NOTE Exceeding any of the following setpoints will require an immediate pump shutdown. Operating limits can be found in SOI 68.02. This list is immediate shutdown criteria only.</p> <p>A. Shaft vibration greater than 20 mils or 15 mils with a rate of rise equal to 1 mil/hr (alarm at 15 mils). [Indicators located on 0-PNL-52-R139, Aux Inst Rm.]</p> <p>B. Frame vibration greater than 5 mils or 3 mils with a rate of rise of 0.2 mil/hr. [Readings taken by Maint. at Aux Bldg L-Panels, el.737.]</p> <p>C. Motor windings temp greater than 302°F.</p> <p>D. Motor bearing temp greater than 195°F.</p> <p>E. Pump bearing temp greater than 225°F.</p> <p>F. Loss of CCS to oil coolers for greater than 10 minutes.</p> <p>G. No. 1 seal outlet temp greater than 225°F.</p> <p>H. No. 1 seal flow HIGH with rising pump bearing or #1 seal leakoff temperatures.</p> <p>I. No. 1 seal ΔP less than or equal to 200 psid.</p> <p>Page 26 of 27</p>	WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000
WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000			

Op Test	301	Scenario #	2	Event #	7		Page	53	of	122
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Event Description:	Downpower to support removing RCP 3 from service. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

This Event is the reactivity maneuver for this scenario.
When the Chief Examiner and Exam Team have had sufficient time to observe the crew, the next Event can be initiated by inserting Event 7.

At **CHIEF EXAMINER Direction:**

Insert Simulator Schedule File Event 7

(RCP 3 #1 Seal failure)

Examiner Note(s):

1-AOI-24 Section 3.3 step [3] directed the downpower when RCP 3 Seal Leakoff exceeded 6 gpm.
US will determine the target power level and rate of the downpower.

OAC
OAC/SRO
Crew

SRO
SRO

OAC/SRO

WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.2 Power Reduction From Greater Than 50% Power

NOTES

Rod Control should remain in automatic for Tavg Control
Reactivity Briefing Sheet, "Thumb Rules" (page 3), lists boration flows and volumes for different reduction rates.
Effect of boration will lag behind turbine load reduction and can be compensated for by temporarily increasing boric acid flow rate above recommended rate.
Steps 1 and 2 may be performed in any order based on plant conditions.
Steps 1 and 2 may be performed in parallel if additional operators are available for peer checks.

CAUTION

Over boration may result in excessive rod withdrawal, Tavg lower than desired, and AFD oscillations.

Op Test	301	Scenario #	2	Event #	7		Page	54	of	122
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Event Description: Downpower to support removing RCP 3 from service. 1-AOI-39.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC will determine boration flow rate and volume based on the target power level and rate of power reduction provided by the US.

OAC/SRO

OAC

OAC

OAC

OAC

OAC

OAC

WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.2 Power Reduction From Greater Than 50% Power (continued)

1. INITIATE a manual boration:
- a. DETERMINE boration flow rate and volume from Reactivity Briefing Sheet.

b. IF desired to use NORMAL boration, THEN

INITIATE normal boration:

1) PLACE mode selector 1-HS-62-140B to BOR.

2) ADJUST BA flow controller, 1-FC-62-139, to desired flow rate.

3) ADJUST BA batch counter 1-FQ-62-139 to required quantity.

(US MUST oversee next step)

4) (p) MOMENTARILY PLACE 1-HS-62-140A,VCT MAKEUP CONTROL, to START and RELEASE.

5) CHECK 1-HS-62-140A, Red light LIT.

6) CHECK boric acid flow indicated on 1-FI-62-139.

b. INITIATE emergency boration.

1) PLACE boric acid transfer pump aligned to blender in FAST speed

2) (p) ADJUST 1-FCV-62-138 to establish desired flow rate.

3) WHEN boration is complete, THEN

CLOSE 1-FCV-62-138, AND
PLACE boric acid transfer pump used in SLOW speed
- Page 8 of 28

Op Test	301	Scenario #	2	Event #	7		Page	55	of	122
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Event Description:	Downpower to support removing RCP 3 from service. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>US will direct turbine controls be placed in IMP IN. This will cause 82-F, DCS TROUBLE, due to IMP IN reference value at 100% power.</div> <div>US will specify load rate.</div>	<div>SRO</div> <div>BOP</div> <div>N/A</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.2 Power Reduction From Greater Than 50% Power (continued)</div> <div><div>NOTE</div><div>If the initiating condition is corrected, the power reduction may be terminated</div></div> <div><div>CAUTIONS</div><div><ul style="list-style-type: none">Condenser Backpressure limits are on pages 5&6.LOSS OF CONDENSER VACUUM may be made worse if steam dumps are actuated. 1-AOI-11 requires Tavg and Tref be maintained within 3°F.TURBINE MANUAL Operation requires continuous operator monitoring and control.</div></div> <div><div>2.</div><div><div>ESTABLISH a turbine load reduction rate less than or equal to 5%/min:</div><div><div>a.</div><div>IF desired, THEN PLACE turbine in IMP IN.</div></div><div><div>b.</div><div>SET a desired load in the SETTER.</div></div><div><div>c.</div><div>SET the LOAD RATE at less than or equal to 5%/min.</div><div>(US MUST oversee next step)</div></div><div><div>d.</div><div>(p) PRESS or CLICK GO button.</div></div></div><div><div>SELECT TURBINE MANUAL, and PERFORM Appendix A.</div><div>OR</div><div>CHECK that turbine control has tripped to MANUAL as indicated by the TURBINE MANUAL button LIT,</div><div>(p) MOMENTARILY PRESS or CLICK GV LOWER button, at intervals, that control load reduction less than or equal to 5%/min</div></div></div>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	7		Page	56	of	122
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Event Description:	Downpower to support removing RCP 3 from service. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div><div>Examiner Note(s):</div><div>The current plant conditions do NOT require an Emergency Classification. US may or may not refer the step to the SM.</div></div>	<div>OAC</div> <div>OAC</div> <div>OAC</div> <div>SRO</div>	<table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 Power Reduction From Greater Than 50% Power (continued)</p> <p>NOTE AFD green target band can be monitored using ICS Turn On code DOGHOUSE.</p> <p>3. MONITOR rod position:</p> <ul style="list-style-type: none">Rods above LO-LO insertion limitAFD within Target Band <p>a. IF manual operation of Control Rods is desired, THEN PLACE Rod Control in Manual</p> <p>b. (p) ADJUST boric acid flow rate as needed to return rods to required position</p> <p>c. IF higher boric acid flow rate is needed to compensate for load reduction rate, THEN INITIATE emergency boration:</p> <p>1. PLACE boric acid transfer pump aligned to blender in FAST speed</p> <p>2. (p) ADJUST 1-FCV-62-138 to establish desired flow rate.</p> <p>d. WHEN boration is complete, THEN</p> <p>1) CLOSE 1-FCV-62-138,</p> <p>2) PLACE boric acid transfer pump used in SLOW speed</p> <p>4. REFER TO EPIP-1, Emergency Plan Classification Flowchart</p> <p>Page 10 of 28</p>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	7		Page	57	of	122
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Event Description:	Downpower to support removing RCP 3 from service. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As Load Coordinator, acknowledge the report.</div> <div>Examiner Note(s):</div> <div>This event is the reactivity maneuver for this scenario. Sufficient time should be allowed to observe the crew performing the maneuver. Subsequent pages of 1-AOI-39 are provided to understand US communications and directions.</div> <div>If not previously inserted, then:</div> <div>Insert Simulator Schedule File Event 7</div> <div>(RCP 3 #1 Seal failure)</div> <div>Role Play:</div> <div>As AUO, acknowledge the report.</div> <div>Role Play:</div> <div>As Chemistry, acknowledge the direction.</div>	<div>SRO</div> <div>OAC/SRO</div> <div>OAC</div> <div>OAC</div> <div>SRO</div> <div>RO</div> <div>SRO</div>	<table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <div>3.2 Power Reduction From Greater Than 50% Power (continued)</div> <div>5. NOTIFY the Load Coordinator of the required load reduction and expected ramp rate</div> <div>NOTE If reactor power is stabilized at a lower level, a drop in Tav_g will occur due to Xenon build up. Dilution may be required to maintain power level.</div> <div>6. MONITOR Tav_g and Tref:<ul style="list-style-type: none">Tav_g trending to Tref.Mismatch less than 5°F.(p) CONTROL Tav_g with Control Rods in manual. IF Tav_g and Tref mismatch can NOT be maintained less than 5°F, THEN TRIP reactor, AND ** GO TO 1-E-0, Reactor Trip or Safety Injection.</div> <div>7. CHECK rate of power reduction is rapid enough for existing plant conditions.(p) TRIP reactor, and ** GO TO 1-E-0, Reactor Trip or Safety Injection.</div> <div>8. NOTIFY Condensate Demin AUO of impending pump shutdowns (REFER to Appendix B).</div> <div>9. WHEN rated thermal power change exceeds 15% in one hour, THEN NOTIFY Chemistry to initiate 1-SI-68-28.</div> <div>Page 11 of 28</div>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	7		Page	58	of	122
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Event Description:	Downpower to support removing RCP 3 from service. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>US will determine which Condensate Booster Pump and which Condensate Demin Pump will be stopped. There is no procedural preference.</p> <div>Role Play:</div> <p>As AUO, acknowledge the direction.</p>	<div>BOP</div> <div>BOP</div> <div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.2 Power Reduction From Greater Than 50% Power (continued)</div> <div>10. WHEN between 70 and 75% power, THEN</div> <div>REMOVE one Condensate Booster Pump and one Condensate Demin Pmp from service:</div> <div><ul style="list-style-type: none">PLACE selected Condensate Booster Pmp handswitch to STOP.PLACE selected Condensate Demin Pmp handswitch to STOP, and CLOSE the suction valve.NOTIFY AUO to complete shutdown of selected pumps IAW 1-SOI-2&3.01.</div> <div>Page 12 of 28</div>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	7		Page	59	of	122
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Event Description:	Downpower to support removing RCP 3 from service. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Op Test	301	Scenario #	2	Event #	8		Page	60	of	122
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Event Description:	Reactor Trip. RCP 3 Stop. 1-E-0. 1-AOI-24. 1-ES-0.1.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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INDICATIONS:

- 1-FR-62-50 Red Pen, RCP 3 Seal Leakoff, offscale HIGH
- RCP 3 Lower Bearing and Seal Outlet temperatures rapidly approaching or exceeding RCP Immediate Shutdown Criteria.

Operator Actions:

- **OAC** will manually trip reactor and perform Immediate Action steps of 1-E-0
- **RO** will stop RCP 3 (1-AOI-24 Section 3.2 step [4])
- **RO** will CLOSE 1-FCV-62-35, RCP 3 Seal Return, 3 to 5 minutes after RCP 3 stop (1-AOI-24 Section 3.2 step [6])
- **BOP** acknowledges alarms and monitors Equipment Status
- **US** updates crew on 1-E-0 entry and directs actions of 1-E-0

Examiner Note(s):

OAC will perform all (4) Immediate Action steps with NO communication. At the completion of the steps, **OAC** will notify the **US** that all Immediate Actions steps are complete and SI is NOT required. **US** will then read steps [1] through [4] and **OAC** will re-perform them.

Examiner Note(s):

Stopping RCP 3 and CLOSING 1-FCV-62-35 are 1-AOI-24 actions performed post-trip and verifiable actions for EVENT 6. 1-AOI-24 is included in this event on p. 63 for guide continuity.

OAC

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Step	Action/Expected Response	Response Not Obtained
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3.0 OPERATOR ACTIONS

- NOTE
- Steps 1 thru 4 are IMMEDIATE ACTION STEPS
 - Status Trees / SPDS should be monitored when transitioned to another instruction.

- | | | |
|----|--|---|
| 1. | ENSURE reactor trip: <ul style="list-style-type: none">• Reactor trip and bypass breakers OPEN.• RPIs at bottom of scale.• Neutron flux DROPPING. | Manually TRIP reactor.
IF reactor will NOT trip,
THEN

** GO TO 1-FR-S.1, Nuclear Power Generation / ATWS. |
| 2. | ENSURE Turbine Trip: <ul style="list-style-type: none">• All turbine stop valves CLOSED. | Manually TRIP turbine.
IF turbine will NOT trip,
THEN
<ul style="list-style-type: none">• RUNBACK turbine manually OR <ul style="list-style-type: none">• CLOSE MSIVs and bypasses |

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	8		Page	61	of	122
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Event Description:	Reactor Trip. RCP 3 Stop. 1-E-0. 1-AOI-24. 1-ES-0.1.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	OAC	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3. CHECK 6.9 kV shutdown boards:</p> <p>a. At least one board energized from:</p> <ul style="list-style-type: none">CSST (offsite), <p>OR</p> <ul style="list-style-type: none">D/G (blackout) with ERCW flow to running DG(s) [0-M-27A]:1-HS-67-66A OR 1-HS-67-68A2-HS-67-66A OR 2-HS-67-68A1-HS-67-67A OR 1-HS-67-65A2-HS-67-67A OR 2-HS-67-65A <p>RESTORE power to at least one train of shutdown boards:</p> <p>1) EMERGENCY START All D/G's [1-M-1].</p> <p>2) IF D/G did NOT start from 1-M-1, THEN</p> <p>EMERGENCY START All D/G's [0-M-26]</p> <p>3) ENSURE ERCW to running DG(s) [0-M-27A]:</p> <ul style="list-style-type: none">1-HS-67-66A OR 1-HS-67-68A2-HS-67-66A OR 2-HS-67-68A1-HS-67-67A OR 1-HS-67-65A2-HS-67-67A OR 2-HS-67-65A <p>4) IF ERCW flow CANNOT be aligned, THEN</p> <p>EMERGENCY STOP affected DG(s)</p> <p>IF power can NOT be restored to at least one train of shutdown boards, THEN</p> <p>** GO TO 1-ECA-0.0, Loss of Shutdown Power.</p>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	8		Page	62	of	122
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Event Description:	Reactor Trip. RCP 3 Stop. 1-E-0. 1-AOI-24. 1-ES-0.1.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>At this point, SI is NOT actuated and NOT required. US will update the crew and transition to 1-ES-0.1.</p> <p>Following this transition, BOP will perform 1-FR-0, Status Trees.</p>	OAC/SRO	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div><div>4. CHECK SI actuated:</div><div>a. Any SI annunciator LIT.</div><div>b. Both trains SI ACTUATED.<ul style="list-style-type: none">1-XX-55-6C1-XX-55-6D</div></div><div><div>DETERMINE if SI required:</div><div>a. IF ANY of the following exists:<ul style="list-style-type: none">S/G press less than 675 psig,OR<ul style="list-style-type: none">RCS press less than 1870 psig,OR<ul style="list-style-type: none">Cntmt press greater than 1.5 psigTHEN</div><div>ACTUATE SI manually.</div><div>IF SI NOT required, THEN</div><div>** GO TO 1-ES-0.1, Reactor Trip Response.</div><div>b. ACTUATE SI manually.</div></div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	8		Page	63	of	122
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Event Description:	Reactor Trip. RCP 3 Stop. 1-E-0. 1-AOI-24. 1-ES-0.1.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

1-AOI-24 is included here to assist in verifying proper actions post-trip. Step [4] and step [6] RNO are the verifiable actions for EVENT 6.

Examiner Note(s):

RO will stop RCP 3.

Examiner Note(s):

RCP 3 seal leakoff is offscale HIGH. US will exercise RNO and RO will CLOSE 1-FCV-62-35.

SRO

OAC

RO

OAC

SRO

RO

WBN Unit 1	RCP MALFUNCTIONS DURING PUMP OPERATION	1-AOI-24 Rev. 0000
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Step	Action/Expected Response	Response Not Obtained
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3.2 RCP Tripped Or Shutdown Required (continued)

NOTE Control room staff should brief on Steps 3 through 6 prior to tripping the reactor. This ensures that the affected RCP is stopped and that appropriate actions are taken when unit is removed from service.

3. TRIP the reactor, and

GO TO E-0, Reactor Trip or Safety Injection, WHILE continuing with this instruction.

4. STOP and LOCK OUT affected RCP(s).

5. IF in Mode 3, THEN
CHECK any RCP Running

**GO TO ES-0.2, Natural Circulation Cooldown, WHILE continuing with this instruction

CAUTION If the RCP seal return flow control valve (FCV) is NOT closed within 5 minutes of stopping the RCP with excessive leakoff, seal damage may occur.

6. MONITOR RCP seal leakoff less than 6 gpm per pump:

- 1-FR-62-24 [RCP 1 & 2]
- 1-FR-62-50 [RCP 3 & 4]
- ICS "RCP DATA"
- ICS "RCP SEALS"

WHEN the RCP has coasted down (between 3 and 5 minutes), THEN
CLOSE affected RCP seal return FCV:

- 1-FCV-62-9 [RCP 1]
- 1-FCV-62-22 [RCP 2]
- 1-FCV-62-35 [RCP 3]
- 1-FCV-62-48 [RCP 4]

7. CHECK RCPs 1 and 2 running.

CLOSE affected loop's pressurizer spray valve.

Op Test	301	Scenario #	2	Event #	8		Page	64	of	122
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Event Description:	Reactor Trip. RCP 3 Stop. 1-E-0. 1-AOI-24. 1-ES-0.1.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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When 1-FCV-62-35 is CLOSED:

Insert Simulator Schedule File Event 8

(LOCA on Loop 3 cold leg.)

Examiner Note(s):

When Schedule File Event 8 is inserted, SI actuation criteria will quickly be exceeded (1-ES-0.1 FOP on p. 66). The OAC may or may not have time to manually initiate SI before the AUTO SI occurs. SI Train A will NOT actuate automatically or from the manual handswitches. US updates crew on 1-E-0 re-entry and directs OAC to re-perform Immediate Actions and BOP to acknowledge alarms and monitor Equipment Status.

Crew

OAC/SRO

BOP

WBN Unit 1	Reactor Trip Response	1-ES-0.1 Rev. 0002
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Step	Action/Expected Response	Response Not Obtained
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CAUTION Plant conditions, AFW pump start signals and flow requirements should be evaluated as time allows.

1. MONITOR SI actuation criteria:
 - IF SI actuation occurs during the performance of this instruction, THEN
 - ** GO TO 1-E-0, Reactor Trip or Safety Injection.
2. CHECK Generator PCBs OPEN. OPEN manually.

Op Test	301	Scenario #	2	Event #	8		Page	65	of	122
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Event Description:	Reactor Trip. RCP 3 Stop. 1-E-0. 1-AOI-24. 1-ES-0.1.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC will use Loop Tavgs which are still dropping due to excessive AFW. US will exercise the RNO and RO will reduce AFW flow to between 410 gpm and 500 gpm.

OAC

WBN Unit 1	Reactor Trip Response	1-ES-0.1 Rev. 0002
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Step	Action/Expected Response	Response Not Obtained
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3. MONITOR RCS temperature stable at or trending to 557°F using:
 - RCS Loop T-avg with any RCP running.OR
 - RCS Loop T-cold with RCPs out-of-service.
- IF temperature is less than 557°F, THEN ENSURE steam dumps, S/G PORVs, and blowdown isolation valves CLOSED.
IF cooldown continues, THEN ENSURE total feed flow is less than or equal to 500 gpm:
 - REFER TO 1-SOI-3.02, Auxiliary Feedwater System, for manual control of TDAFWP.
 - MAINTAIN at least one S/G NR level greater than 29%, or total feed flow between 410 and 500 gpm for heat sink.IF cooldown continues after AFW flow is controlled, THEN:
 - CLOSE MSIVs.
 - ENSURE MSIV bypasses CLOSED.
 - PLACE steam dump controls OFF.IF temperature is less than 547°F after AFW is controlled, THEN INITIATE boration:
 - REFER TO 1-AOI-34, Immediate Boration.IF temperature is greater than 564°F, THEN ENSURE either steam dumps, or S/G PORVs OPEN.
WHEN cooldown is controlled, THEN RETURN AFW to AUTO as desired.

Op Test	301	Scenario #	2	Event #	8		Page	66	of	122
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Event Description:	Reactor Trip. RCP 3 Stop. 1-E-0. 1-AOI-24. 1-ES-0.1.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Reactor Trip Response</td><td>1-ES-0.1 Rev. 0002</td></tr></table> <p>Foldout Page (Page 1 of 1)</p> <p><u>SI ACTUATION CRITERIA</u></p> <p>ACTUATE SI and ** GO TO 1-E-0, Reactor Trip or Safety Injection IF:</p> <ul style="list-style-type: none">• RCS pressure less than 1870 psig, OR• Cntmt pressure greater than 1.5 psig, OR• S/G pressure less than 675 psig, OR• Pzr level cannot be maintained greater than 15% [33% ADV], OR• RCS Subcooling less than 65°F. <p><u>NATURAL CIRCULATION CRITERIA</u></p> <ul style="list-style-type: none">• RCS subcooling greater than 65°F.• S/G pressure controlled or dropping.• T-hot stable or dropping.• Incore T/Cs stable or dropping.• T-cold at saturation temp for S/G press. <p><u>AFW OPERATION</u></p> <ul style="list-style-type: none">• IF CST volume less than 5000 gal, THEN MONITOR AFW pumps to ensure suction transfer. <p>Page 22 of 22</p>	WBN Unit 1	Reactor Trip Response	1-ES-0.1 Rev. 0002
WBN Unit 1	Reactor Trip Response	1-ES-0.1 Rev. 0002			

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	67	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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INDICATIONS:

- RCS Pressure rapidly dropping
- Containment Pressure rapidly rising
- Safety Injection Train B Actuated
- Phase B occurs resulting in Containment Spray Pump 1A-A starting and MSIVs closing
- AUTO and MANUAL SI Train A fail
- 1-FCV-63-72 fails to OPEN automatically when RWST level drops less than 34%

Operator Actions:

- **OAC** re-performs Immediate Action steps of 1-E-0
- **BOP** acknowledges alarms and monitors Equipment Status

Critical Task(s):

1. Manually start at least one train of low head and high flow ECCS pump (RHR Pump 1A-A) prior to meeting ORANGE path criteria for implementation of 1-FR-C.2.
- **BOP** may prudently start RHR Pump 1A-A while OAC performs Immediate Action steps.
 - **SRO** updates crew on 1-E-0 re-entry and directs actions of 1-E-0
 - **Crew** will perform crew update on the Phase B signal, verify Containment Spray Pump 1A-A started and is supplying flow, and stop RCPs 1, 2 and 4 IAW 1-E-0 Fold Out Page (FOP) (p. 75 of this guide).

OAC

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Step	Action/Expected Response	Response Not Obtained
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3.0 OPERATOR ACTIONS

- NOTE
- Steps 1 thru 4 are IMMEDIATE ACTION STEPS
 - Status Trees / SPDS should be monitored when transitioned to another instruction.

1. **ENSURE** reactor trip:
 - Reactor trip and bypass breakers OPEN.
 - RPIs at bottom of scale.
 - Neutron flux DROPPING.Manually TRIP reactor.
IF reactor will NOT trip, THEN

** GO TO 1-FR-S.1, Nuclear Power Generation / ATWS.
2. **ENSURE** Turbine Trip:
 - All turbine stop valves CLOSED.Manually TRIP turbine.
IF turbine will NOT trip, THEN
 - RUNBACK turbine manuallyOR
 - CLOSE MSIVs and bypasses

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	68	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC will re-perform all (4) Immediate Action steps with no communication. At the completion of the steps, **OAC** will notify the **US** that all Immediate Actions steps are completed with SI Train A failing to actuate. **US** will then read steps [1] through [4] and **OAC** will ONLY communicate the high level step since the Immediate Actions were previously completed.

EVENT 10. AUTO SI Train A has failed. During the re-performance of the Immediate Action steps, **OAC** will attempt to MANUALLY initiate SI Train A from 1-M-4 and 1-M-6. SI Train A will NOT actuate. **BOP** may prudently begin realigning Train A equipment normally operated by the SI signal OR perform the alignments IAW 1-E-0 Appendix A (p. 104). Starting RHR Pump 1A-A is a **Critical Task**.

During the re-performance of the Immediate Action steps or shortly after, Phase B signal will occur. Member of crew will perform crew update announcing Phase B signal and requirement to use ADV (adverse) setpoint ([bracketed]). Crew will also verify Containment Spray Pump 1A-A is running and supplying flow and either the **BOP** or **OAC** will stop RCPs 1, 2 and 4 IAW 1-E-0 FOP (p. 75 of this guide).

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Step	Action/Expected Response	Response Not Obtained
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3. CHECK 6.9 kV shutdown boards:
- a. At least one board energized from:
 - CSST (offsite),

OR

- D/G (blackout) with ERCW flow to running DG(s) [0-M-27A]:
 - 1-HS-67-66A OR 1-HS-67-68A
 - 2-HS-67-66A OR 2-HS-67-68A
 - 1-HS-67-67A OR 1-HS-67-65A
 - 2-HS-67-67A OR 2-HS-67-65A
- RESTORE power to at least one train of shutdown boards:

1) EMERGENCY START All D/G's [1-M-1].

2) IF D/G did NOT start from 1-M-1, THEN

EMERGENCY START All D/G's [0-M-26]

3) ENSURE ERCW to running DG(s) [0-M-27A]:
 - 1-HS-67-66A OR 1-HS-67-68A
 - 2-HS-67-66A OR 2-HS-67-68A
 - 1-HS-67-67A OR 1-HS-67-65A
 - 2-HS-67-67A OR 2-HS-67-65A

4) IF ERCW flow CANNOT be aligned, THEN

EMERGENCY STOP affected DG(s)
- IF power can NOT be restored to at least one train of shutdown boards, THEN
- ** GO TO 1-ECA-0.0, Loss of Shutdown Power.

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	69	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

- 1-E-0 FOP p. 75
- 1-E-1 p. 76
- 1-E-1 FOP p. 89
- 1-ES-1.3 p. 90
- 1-FR-P.1 p. 103
- 1-E-0 Appendices A and B p. 104

US will transition from 1-E-0 to 1-E-1 (p. 76) on 1-E-0 step [16] RNO (p. 74). Following this transition and completion of Appendices A and B, **BOP** will perform FR-0, Status Trees. Status Trees may identify an ORANGE path for Pressurized Thermal Shock due to relatively cold RWST water being injected into the RCS Cold Legs. If diagnosed, **US** will make a momentary transition to 1-FR-P.1, Pressurized Thermal Shock, (p. 103) verify RHR flow (indication that the RCS has already broken and cannot maintain pressure) and return to 1-E-1 step in effect. During performance of 1-E-1, **US** will transition to 1-ES-1.3, Transfer to Containment Sump, on 1-E-1 step [24] (p. 87) OR using the 1-E-1 FOP (p. 89).

OAC

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Step	Action/Expected Response	Response Not Obtained
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4. CHECK SI actuated:
- a. Any SI annunciator LIT.
- DETERMINE if SI required:
- a. IF ANY of the following exists:
- S/G press less than 675 psig,
- OR
- RCS press less than 1870 psig,
- OR
- Cntmt press greater than 1.5 psig
- THEN
- ACTUATE SI manually.
- IF SI NOT required, THEN
- ** GO TO 1-ES-0.1, Reactor Trip Response.
- b. Both trains SI ACTUATED.
- 1-XX-55-6C
 - 1-XX-55-6D
- b. ACTUATE SI manually.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	70	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Appendices A and B of 1-E-0 are included near the end of this guide starting on p. 105. If not performed prudently then **Critical Task #1** (start RHR Pump 1A-A) will be completed in Appendix A.

EVENT 12. Malfunction ch29b will trip Containment Air Return Fan 1B-B on start (9 minutes after Phase B actuation). Malfunction ch29a will trip Containment Air Return Fan 1A-A 45 seconds later. This will require Containment Spray Pump 1A-A to be in service longer more quickly depleting RWST inventory.

BOP
BOP
OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Step	Action/Expected Response	Response Not Obtained
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5. **PERFORM** Appendixes A and B ,
 1-E-0, pages 16-28.
6. **ANNOUNCE** reactor trip and safety
 injection over PA system.
7. **ENSURE** secondary heat
 sink available with either:

• Total AFW flow greater
 than 410 gpm,

OR

• At least one S/G NR level
 greater than 29% [39% ADV].

** GO TO 1-FR-H.1, Loss of Secondary
Heat Sink.

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	71	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC should use Wide Range RCS Loop Tcold instrumentation due to RCPs being stopped IAW 1-E-0 FOP. Due to large amount of injection, RCS temperature will be dropping and the RNO should be exercised. However, MSIVs CLOSED automatically on the Hi-Hi Containment Pressure signal. The RCS cooldown is due to ECCS injection not excessive steam withdrawal.

OAC

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Step	Action/Expected Response	Response Not Obtained
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8.

MONITOR RCS temperature stable at or trending to 557°F using:

RCS Loop T-avg with any RCP running,

OR

RCS Loop T-cold with RCPs out-of-service.

IF temp less than 557°F, THEN

ENSURE steam dumps and S/G PORVs CLOSED.

IF cooldown continues, THEN

CONTROL total AFW flow to maintain greater than 410 gpm UNTIL NR level in at least one S/G greater than 29% [39% ADV].

IF cooldown continues after AFW flow is controlled, THEN

PLACE steam dump controls OFF.

CLOSE MSIVs.

ENSURE MSIV bypasses CLOSED.

IF RCS temp greater than 564°F, THEN

ENSURE either steam dumps or S/G PORVs OPEN.

IF required for S/G PORV operation, THEN

DISPATCH NAUO to perform Attachment 5 of (1-E-3).
9.

ENSURE excess letdown valves CLOSED

1-FCV-62-54

1-FCV-62-55

Manually CLOSE valves.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	72	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>OAC will check 1-TI-68-328, -329 and -330, SAFETY TAILPIPE TEMP, [1-M-4] which will be at ambient temperature and higher than normal due to the LOCA. OAC will also verify 91-A, PZR PORV/SAFETY OPEN, is DARK and may look at 1-XX-68-363, PZR VALVES ACOUSTIC MONITOR, on 0-M-25 and verify NO RED LEDs LIT.</p>	<div>OAC</div> <div>OAC</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>10. CHECK PZR PORVs and block valves:</p><p>a. PZR PORVs CLOSED.</p><p>a. IF RCS press less than 2335 psig, THEN</p><p>ENSURE PZR PORV or associated block valve CLOSED.</p><p>IF PORV failed OPEN, AND</p><p>Associated block valve can NOT be closed, THEN</p><p>** GO TO 1-E-1, Loss of Reactor or Secondary Coolant.</p><p>b. At least one block valve OPEN.</p><p>b. OPEN one block valve UNLESS it was closed to isolate an open PORV.</p><p>11. CHECK PZR safety valves CLOSED:</p><ul style="list-style-type: none">EVALUATE tailpipe temperatures and acoustic monitors.<p>IF RCS pressure less than 2485 psig, AND</p><p>PZR safety valve open, THEN</p><p>** GO TO 1-E-1, Loss of Reactor or Secondary Coolant.</p></div> <div>Page 8 of 47</div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	73	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): If not previously stopped prudently or IAW 1-E-0 FOP (p. 75), then OAC will stop RCPs.</div> <div>Examiner Note(s): S/G pressures will be dropping due to RCS temperature reduction caused by ECCS injection. OAC and US should determine that S/G pressures are controlled.</div>	<div>OAC</div> <div>OAC</div> <div>OAC</div>	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <div>12. CHECK PZR sprays CLOSED. IF RCS pressure less than 2260 psig, THEN CLOSE spray valves. IF spray valve failed OPEN, THEN STOP RCP(s) as necessary to stop spray flow. NOTE Seal injection flow should be maintained to all RCPs.</div> <div>13. CHECK if RCPs should remain in service: a. Phase B signals DARK [MISSP]. a. STOP all RCPs. ** GO TO Step 14. b. RCS pressure greater than 1500 psig. b. ENSURE at least one Charging pump OR SI pump injecting. WHEN injection flow established, THEN STOP all RCPs.</div> <div>14. CHECK S/G pressures: <ul style="list-style-type: none">All S/G pressures controlled or rising.All S/G pressures greater than 140 psig.IF S/G pressure low OR dropping uncontrolled, THEN ** GO TO 1-E-2, Faulted Steam Generator Isolation.</div> <div>Page 9 of 47</div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	74	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>Containment conditions are NOT normal and US will transition to 1-E-1 on step [16] RNO and perform a crew update stating the transition.</p> <p>BOP will be tasked with the initial performance of Status Trees, but may delay performance until 1-E-0 Appendices A and B are complete.</p> <p>Status Trees, at some point, may identify a RED/ORANGE path for Pressurized Thermal Shock due to relatively cold RWST water being injected into the RCS Cold Legs. US will make a momentary transition to 1-FR-P.1, Pressurized Thermal Shock, (p. 103) verify RHR flow (indication that the RCS has already broken and cannot maintain pressure) and return to 1-E-1 step in effect.</p>	<div>OAC</div> <div>BOP</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div><div>15.</div><div>CHECK for RUPTURED S/G<ul style="list-style-type: none">All S/Gs narrow range levels CONTROLLED or DROPPING.Secondary side radiation NORMAL from Appendix A.</div><div>IF any S/G has level rising in an uncontrolled manner OR has high radiation, THEN<ul style="list-style-type: none">** GO TO 1-E-3, Steam Generator Tube Rupture.</div></div> <div><div>16.</div><div>CHECK Cntmt conditions:<ul style="list-style-type: none">Cntmt pressure NORMAL.Radiation NORMAL from Appendix A.Cntmt sump level NORMAL.Cntmt temp ann window DARK [104-B].</div><div>** GO TO 1-E-1, Loss of Reactor or Secondary Coolant.</div></div> <div><div>17.</div><div>CHECK SI termination criteria:<div><div>a.</div><div>CHECK RCS subcooling greater than 65°F.</div><div>a.</div><div>** GO TO Step 18.</div></div><div><div>b.</div><div>CHECK secondary heat sink available with either:<ul style="list-style-type: none">Total feed flow greater than 410 gpm,OR<ul style="list-style-type: none">At least one S/G NR level greater than 29%.</div><div>b.</div><div>** GO TO Step 18.</div></div><div><div>c.</div><div>CHECK RCS pressure stable or rising.</div><div>c.</div><div>** GO TO Step 18.</div></div></div></div> <div>Step continued on next page</div> <div>Page 10 of 47</div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2										
Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	75	of	122
Event Description:		LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.								
Sequence of Events / Examiner Notes				Position		Applicant's Actions or Behavior				
<div>Examiner Note(s):</div> <p>RCPs may have been prudently stopped IAW 0-TI-12.04 when the Phase B signal occurred.</p>				RO		<div><div><div>WBN Unit 1</div><div>Reactor Trip or Safety Injection</div><div>1-E-0 Rev. 0016</div></div><div>Foldout Page (Page 1 of 1)</div><div>RCP TRIP CRITERIA</div><div><div>Phase B Isolation,</div><div>OR</div><div>One charging pump or one SI pump injecting AND</div><div>RCS press reduced uncontrolled to less than 1500 psig.</div></div><div>AFW OPERATION</div><div>IF CST volume less than 5000 gal,</div><div>THEN</div><div>MONITOR AFW pumps to ensure suction transfer.</div></div>				
						Page 47 of 47				

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	76	of	122
Event Description:		LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.								
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior				

Examiner Note(s):

RCPs were stopped in 1-E-0.

Examiner Note(s):

US will inform the Shift Manager to refer to EPIP-1 for event classification.

Examiner Note(s):

S/G pressures will be dropping due to RCS temperature reduction caused by ECCS injection. OAC and US should determine that S/G pressures are controlled.

OAC

SRO

SRO

OAC

WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011
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Step	Action/Expected Response	Response Not Obtained
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- 3.0 OPERATOR ACTIONS
- NOTE Seal injection flow should be maintained to all RCPs.
1. CHECK if RCPs should remain in service:

a. Phase B DARK [MISSP].

a. STOP all RCPs.
 ** GO TO Step 2.

b. RCS pressure greater than 1500 psig.

b. ENSURE at least one Charging pump or SI pump injecting.
 WHEN injection flow established, THEN
 STOP all RCPs.
2. REFER TO EPIP-1, Emergency Plan Classification Flowchart.

NOTE Time since initiation of event is defined by performance of Step 3.
3. RECORD current time to mark initiation of LOCA and determination of time for hot leg recirc.
4. CHECK S/G pressures:

- All S/G pressures controlled or rising.
 - All S/Gs pressures greater than 140 psig.

IF Faulted S/G has NOT been isolated, THEN
** GO TO 1-E-2, Faulted Steam Generator Isolation.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	77	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>5. MAINTAIN Intact S/G NR levels:</p> <table><tr><td>a. MONITOR levels greater than 29% [39% ADV].</td><td>a. MAINTAIN total feed flow greater than 410 gpm UNTIL level is greater than 29% [39% ADV] in at least one S/G.</td></tr><tr><td>b. CONTROL intact S/G levels between 29% and 50% [39% and 50% ADV].</td><td>b. IF level in any intact S/G continues to rise without feed flow, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.</td></tr></table> <p>6. CHECK secondary radiation:</p> <table><tr><td><ul style="list-style-type: none">• S/G discharge monitors NORMAL.• Condenser vacuum exhaust rad monitors NORMAL.• S/G blowdown rad monitor recorders NORMAL trend prior to isolation.</td><td>IF rad monitors NOT available, THEN a. NOTIFY RADPROT to survey main steamlines and S/G blowdown lines. b. NOTIFY Chemistry to sample S/G activity. IF radiation is high, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.</td></tr></table>	WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011	Step	Action/Expected Response	Response Not Obtained	a. MONITOR levels greater than 29% [39% ADV].	a. MAINTAIN total feed flow greater than 410 gpm UNTIL level is greater than 29% [39% ADV] in at least one S/G.	b. CONTROL intact S/G levels between 29% and 50% [39% and 50% ADV].	b. IF level in any intact S/G continues to rise without feed flow, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.	<ul style="list-style-type: none">• S/G discharge monitors NORMAL.• Condenser vacuum exhaust rad monitors NORMAL.• S/G blowdown rad monitor recorders NORMAL trend prior to isolation.	IF rad monitors NOT available, THEN a. NOTIFY RADPROT to survey main steamlines and S/G blowdown lines. b. NOTIFY Chemistry to sample S/G activity. IF radiation is high, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.
WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011												
Step	Action/Expected Response	Response Not Obtained												
a. MONITOR levels greater than 29% [39% ADV].	a. MAINTAIN total feed flow greater than 410 gpm UNTIL level is greater than 29% [39% ADV] in at least one S/G.													
b. CONTROL intact S/G levels between 29% and 50% [39% and 50% ADV].	b. IF level in any intact S/G continues to rise without feed flow, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.													
<ul style="list-style-type: none">• S/G discharge monitors NORMAL.• Condenser vacuum exhaust rad monitors NORMAL.• S/G blowdown rad monitor recorders NORMAL trend prior to isolation.	IF rad monitors NOT available, THEN a. NOTIFY RADPROT to survey main steamlines and S/G blowdown lines. b. NOTIFY Chemistry to sample S/G activity. IF radiation is high, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.													
	OAC													
	OAC													
	BOP													
	BOP													
	BOP													

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Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	78	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): When BOP performs step [7], 103-C, CNTMT H2 ANALYZER A/B ABNORMAL, will alarm.</div> <div>Role Play: As AUO, acknowledge direction to check analyzer low temperature light NOT LITand RESET local alarm. Wait 5 minutes and</div> <div>Insert Simulator Schedule File Event 22 (Reset of H2 Analyzers Train A and B). Notify MCR that H2 Analyzer local alarms have been reset.</div> <div>Examiner Note(s): When Console Operator inserts Event 22, 103-C, CNTMT H2 ANALYZER A/B ABNORMAL, will clear.</div>	<div>BOP</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div><div>7. ENSURE Cntmt hydrogen analyzers in service:<ul style="list-style-type: none">PLACE 1-HS-43-200A in ANALYZE [M-10].PLACE 1-HS-43-210A in ANALYZE [M-10].CHECK low flow lights NOT lit [M-10].LOCALLY CHECK low analyzer temp lights NOT lit ANDRESET local alarm panel. [North wall of Train A 480V SD Bd rm].</div><div>NOTIFY Chemistry to evaluate sampling Cntmt for hydrogen concentration.</div></div> <div><div>8. MONITOR PZR PORVs and block valves:<div>a. PZR PORVs CLOSED.</div><div>b. At least one block valve OPEN.</div></div><div><div>a. WHEN RCS pressure is less than 2335 psig, THEN</div><div>ENSURE PZR PORV or associated block valve CLOSED.</div><div>b. OPEN one block valve UNLESS it was closed to isolate an open PORV.</div></div></div>	WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	79	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Step [9.a] is a MONITOR step. When this step is first read, Containment Pressure will be greater than 2.0 psig. OAC should monitor Containment Pressure to immediately perform this step when Containment Pressure drops below 2.0 psig to preserve RWST inventory. Containment Spray Pump 1A-A flows approx. 4000 gpm.

OAC

OAC

OAC
OAC

OAC

OAC

WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011
Step	Action/Expected Response	Response Not Obtained

9. DETERMINE if Cntmt spray should be stopped:

a. MONITOR Cntmt pressure less than 2.0 psig.

a. WHEN Cntmt pressure is less than 2.0 psig, THEN
PERFORM Substeps 9b thru e.

b. CHECK at least one Cntmt spray pump RUNNING.

b. IF both spray pumps stopped, THEN
** GO TO Step 10.

c. RESET Cntmt spray signal.

d. STOP Cntmt spray pumps, AND
PLACE in A-AUTO.

e. CLOSE Cntmt spray discharge valves 1-FCV-72-2 and 1-FCV-72-39.
10. ENSURE both pocket sump pumps STOPPED [M-15]:

• 1-HS-77-410.

• 480V AB Com MCC A compt 2C.

• 1-HS-77-411.

• 480V AB Com MCC A compt 5A.

PLACE breakers OFF for pumps that fail to stop:

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	80	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Subcooling margin requirement of 85°F will NOT be met. **US** will exercise the RNO and read the CAUTION prior to step [12].

SRO/OAC

WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011
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Step	Action/Expected Response	Response Not Obtained
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11. CHECK SI termination criteria:
- a. CHECK RCS subcooling greater than 65°F [85°F ADV].

a. ** GO TO Caution prior to Step 12.
- b. CHECK secondary heat sink available with either:
 - Total feed flow to Intact S/Gs greater than 410 gpm,OR
 - At least one Intact S/G NR level greater than 29% [39% ADV].

b. **ENSURE** no higher priority exists, **THEN**

** GO TO 1-FR-H.1, Loss of Secondary Heat Sink.
- c. CHECK RCS pressure stable or rising.

c. ** GO TO Caution prior to Step 12.
- d. CHECK PZR level greater than 15% [33% ADV].

d. **RESTORE** PZR level:
1) **ATTEMPT** to stabilize RCS pressure with normal PZR sprays.
2) ** GO TO Caution prior to Step 12.
- e. ** GO TO 1-ES-1.1, SI Termination.

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	81	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>After depressing SI Reset pushbuttons for Train A and Train B, 70-A, SI ACTUATED, will be DARK and 70-B, AUTO SI BLOCKED, will be LIT.</p>	<div>SRO</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div><div>CAUTION</div><div>If offsite power is lost after SI reset, manual action will be required to restart the SI pumps and RHR pumps due to loss of SI start signal.</div></div><div><div>12.</div><div>RESET SI AND CHECK the following:</div><div><ul style="list-style-type: none">SI ACTUATED permissive DARK.AUTO SI BLOCKED permissive LIT.</div><div>NOTIFY IMs to block Auto SI USING IMI-99.040, Auto SI Block.</div></div></div>	WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	82	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

RCS pressure will be dropping, and **US** will exercise RNO. Unit 2 is at 100% power (MODE 1). 2-FCV-70-153 is NOT modeled on the simulator **BOP** will ENSURE 1-FCV-70-153 is OPEN. **BOP** will OPEN 1-FCV-70-156. **BOP** will CLOSE 0-FCV-70-197. **US** will go to step [14].

If crew determines that RCS pressure is stable at Containment Pressure, then 1-ES-1.3 step [3] (p. 92) will perform these valve manipulations and **US** will go to step [16].

BOP

WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011
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Step	Action/Expected Response	Response Not Obtained
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13. DETERMINE if RHR pumps should be stopped:
- a. CHECK RCS pressure stable or rising.

a. IF Unit 2 is in MODE 4, 5 or 6 THEN
ENSURE two B train CCS pumps are running on CCS train B,
AND
ENSURE RHR HX 2B OUTLET 2-FCV-70-153 THROTTLED to 5000 gpm if in service.
IF Unit 2 is in MODE 1, 2, 3 or DEFUELED, THEN
ENSURE RHR HX 2B OUTLET 2-FCV-70-153 is CLOSED.
ENSURE CCS from RHR HX 1B OUTLET 1-FCV-70-153,
AND
RHR HX 1A OUTLET 1-FCV-70-156 OPEN.
CLOSE SFP heat exchanger A CCS supply 0-FCV-70-197.
** GO TO Step 14.
- b. CHECK RCS pressure greater than 150 psig.

b. ENSURE RHR pumps RUNNING.
** GO TO Step 16.
- c. CHECK RHR suction aligned from RWST.

c. ** GO TO Step 14.

Step 13 Continued on Next Page

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	83	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>S/G pressures will be dropping due to RCS temperature reduction caused by ECCS injection. OAC and SRO should determine that S/G pressures are controlled.</div>	<div>OAC</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>13. (continued)</div><div>d. STOP RHR pumps AND PLACE in A-AUTO.</div><div>e. MONITOR RCS pressure greater than 150 psig.</div><div>e. Manually RESTART RHR pumps.</div><div>14. CHECK pressure in all S/Gs controlled or rising.</div><div>IF any S/G pressure continues to drop uncontrolled, THEN</div><div>** GO TO Note prior to Step 1.</div><div>15. CHECK RCS pressure stable or dropping.</div><div>IF RCS pressure rising, THEN</div><div>** GO TO Note prior to Step 1.</div></div>	WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	84	of	122
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Event Description: LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Role Play:

As **AUO**, acknowledge direction place all (4) D/Gs in standby IAW 0-SOI-82 series of instructions.

Role Play:

As **AUO**, acknowledge direction perform AUO portions of 1-AOI-17.

Examiner Note(s):

BOP may perform actions in 1-AOI-17 which is NOT included in this guide. These actions prevent potential damage to secondary components.

Examiner Note(s):

OAC may notice WHITE light off on 1-HS-63-72D at step [18]. This is due to NO SI Train A signal present. However, 1-FCV-63-72 remains available.

Examiner Note(s):

BOP may perform actions of 1-E-1 Appendix B (p. 88) which refers the operator to multiple System Operating Instructions.

RO**RO****BOP****BOP****OAC****OAC****BOP**

WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011
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Step	Action/Expected Response	Response Not Obtained
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16. **MONITOR** electrical board status:

- | | |
|---|--|
| <p>a. CHECK offsite power available.</p> <p>b. CHECK all shutdown boards ENERGIZED by offsite power.</p> <p>c. PLACE any unloaded D/G in standby USING 0-SOI-82 Diesel Generators.</p> | <p>a. RESTORE offsite power USING 0-AOI-35, Loss of Offsite Power.</p> <p>b. ENERGIZE shutdown boards USING:</p> <ul style="list-style-type: none"> • 0-SOI-211 Shutdown Boards <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • 0-AOI-43 Loss of Shutdown Boards <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • 0-SOI-82 Diesel Generators |
|---|--|

17. **INITIATE** BOP realignment:

- **REFER TO** 1-AOI-17, Turbine Trip.

18. **ENSURE** RHR available for Cntmt sump recirculation:

- Power to at least one operable RHR pump AVAILABLE.
- Cntmt sump valve 1-FCV-63-72 or 1-FCV-63-73 to operable RHR pump AVAILABLE.

IF neither train of RHR is available for Cntmt sump recirculation, **THEN**

**** GO TO** 1-ECA-1.1, Loss of RHR Sump Recirculation.

19. **EVALUATE** plant equipment status:

- **REFER TO** Appendix B (1-E-1), Equipment Evaluation.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	85	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As Chemistry, acknowledge report from the US.</div> <div>Examiner Note(s):</div> <div>RCS pressure is less than 150 psig. US will exercise the RNO and go to step [23].</div>	<div>BOP</div> <div>BOP</div> <div>SRO</div> <div>SRO/OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div><div>20. MONITOR Aux Bldg radiation for loss of RCS inventory outside Cntmt:</div><div><div>a. Area monitor recorders 1-RR-90-1 and 0-RR-90-12A Aux Bldg points NORMAL.</div><div>b. Vent monitor recorder 0-RR-90-101 NORMAL trend prior to isolation.</div></div><div>Locally IDENTIFY and ISOLATE radiation leakage paths without stopping any ECCS injection.</div><div>EVALUATE the following:</div><div><div><ul style="list-style-type: none">RHR pipe break alarm,Pipe chase flooded alarm,ECCS pump room flooded alarm.</div><div>IF loss of RCS inventory outside Cntmt is indicated, THEN</div><div>PERFORM the following:</div><div><div>1) REFER TO 0-AOI-31, Abnormal Release of Radioactive Material.</div><div>2) ** GO TO 1-ECA-1.2, LOCA Outside Containment.</div></div></div><div><div>21. NOTIFY Chemistry of event status and plant conditions.</div><div>22. DETERMINE if RCS cooldown and depressurization is required:</div><div><div>a. CHECK RCS pressure greater than 150 psig.</div><div>b. ** GO TO 1-ES-1.2, Post LOCA Cooldown and Depressurization.</div></div><div>a. IF RHR pump injecting to RCS, THEN</div><div>** GO TO Step 23.</div></div></div>	WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	86	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>All (4) 6.9kV Shutdown Boards remain energized. RNOs will NOT be exercised.</div>	<div>SRO</div> <div>OAC</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div><div>CAUTION</div><div>If required to perform Appendix C or D, then the appendix must be completed prior to switchover to the containment sump to ensure adequate ERCW flow to containment spray heat exchangers.</div></div> <div>23. <div>DETERMINE</div> if a complete loss of train power has occurred.</div> <div><div>a. <div>CHECK</div> either units A train 6.9kV Shutdown Board is available.</div><div>a. <div>IF</div> the 2B-B Shutdown board is power from off-site <div>THEN</div>, <div>START</div> the non-running ERCW pump using one of the following handswitches: 0-HS-67-51A, F-B ERCW Pump <div>OR</div> 0-HS-67-59A, H-B ERCW Pump. <div>IF</div> the 2B Shutdown board is power from its DG <div>THEN</div>, <div>INITIATE</div> Appendix C <div>AND</div> <div>** GO TO</div> Step 24</div><div><div>b. <div>CHECK</div> either units B train 6.9kV Shutdown Board is available.</div><div>b. <div>IF</div> the 2A-A Shutdown board is power from off-site <div>THEN</div>, <div>START</div> the non-running ERCW pump using one of the following handswitches: 0-HS-67-32A, B-A ERCW Pump. <div>OR</div> 0-HS-67-40A, D-A ERCW Pump. <div>IF</div> the 2A Shutdown board is power from its DG <div>THEN</div>, <div>INITIATE</div> Appendix D <div>AND</div> <div>** GO TO</div> Step 24</div></div><div>Page 14 of 24</div></div>	WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	87	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>If RWST level is less than 34% then US will transition to 1-ES-1.3 and perform a crew update stating the transition. If RWST level is greater than 34%, then US will return to step [18] (p. 84) and re-perform steps [18] through [24] until RWST level is less than 34%. 126-C, RWST LEVEL LO RECIRC INTLK, alarms at RWST level of 34% and dropping.</p>	<div>SRO</div> <div>OAC</div> <div>SRO</div>	<table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>NOTE Based on the size of the leak the Unit Supervisor should evaluate stationing an AUO near the 480V Reactor MOV Board 1A1-A, for the ability to quickly restore power to 1-FCV-63-1.</p> <p>24. PREPARE for switchover to RHR Cntmt sump:</p> <p>a. CHECK RWST level less than 34%. a. ** GO TO Step 18.</p> <p>b. ** GO TO 1-ES-1.3, Transfer to Containment Sump.</p> <p>25. DETERMINE if cold leg accumulators should be isolated:</p> <p>a. INITIATE restoring power to isolation valves, USING Appendix A (1-E-1), CLA Breaker Operation.</p> <p>b. CHECK RCS pressure less than 300 psig. b. WHEN RCS pressure is less than 300 psig, THEN</p> <p>PERFORM Substep 25c.</p> <p>** GO TO Step 26.</p> <p>Step continued on next page</p> <p>Page 15 of 24</p>	WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	88	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

1-E-1 step [19] (p. 84) directed the crew to refer to Appendix B. The appendix is performed as time permits.

BOP

WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011
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Appendix B
(Page 1 of 1)
Equipment Evaluation

- A. EVALUATE plant equipment and systems needed to support long term cooling and recovery actions, as time and personnel availability permits.
1. Cntmt Isolation Status.
 2. Emergency Gas Treatment System: One train in operation, REFER TO 0-SOI-65.02.
 3. Auxiliary Building Gas Treatment: One train in operation, REFER TO 0-SOI-30.06.
 4. Auxiliary Building Isolation alignment: REFER TO 0-SOI-30.06.
 5. Main Control Room Isolation alignment: REFER TO 0-SOI-31.01.
 6. ERCW System: Both trains in operation.
 7. Component Cooling Water System: Both trains in operation.
 8. Ice Condenser System: AHUs energized after Cntmt hydrogen concentration verified (if applicable). REFER TO 0-SOI-61.01.
 9. Permanent Hydrogen Mitigation System: Igniters de-energized when no longer needed. REFER TO SOI-268.01.

Appendix D Required Operator Actions Form ES-D-2													
Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	89	of	122			
Event Description:		LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.											
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior							
					SRO/OAC	<table><tr><td>WBN Unit 1</td><td>Loss of Reactor or Secondary Coolant</td><td>1-E-1 Rev. 0011</td></tr></table> <p>Foldout Page (Page 1 of 1)</p> <p><u>SI REINITIATION CRITERIA</u></p> <p>Manually START ECCS pumps as necessary:</p> <ul style="list-style-type: none">• PZR level cannot be maintained greater than 15% [33% ADV], OR• RCS subcooling less than 65°F [85°F ADV] <p><u>RCP TRIP CRITERIA</u></p> <ul style="list-style-type: none">• Phase B Isolation, OR• One charging pump or one SI pump injecting AND RCS press reduced uncontrolled to less than 1500 psig. <p><u>EVENT DIAGNOSTIC TRANSITIONS</u></p> <ul style="list-style-type: none">• IF any S/G press low or dropping uncontrolled AND S/G has NOT been isolated, THEN ** GO TO 1-E-2, Faulted Steam Generator Isolation.• IF S/G radiation abnormal or S/G level rising uncontrolled, THEN START SI pumps as necessary, AND ** GO TO 1-E-3, Steam Generator Tube Rupture. <p><u>SUMP RECIRC SWITCHOVER CRITERIA</u></p> <ul style="list-style-type: none">• IF RWST level less than 34%, THEN ** GO TO 1-ES-1.3, Transfer to RHR Containment Sump. <p><u>AFW OPERATION</u></p> <ul style="list-style-type: none">• IF CST volume less than 5000 gal, THEN MONITOR AFW pumps to ensure suction transfer. <p>Page 24 of 24</p>					WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011
						WBN Unit 1	Loss of Reactor or Secondary Coolant	1-E-1 Rev. 0011					

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	90	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>Only RHR Pump 1A-A is RUNNING. US will go to RNO and with RHR Pump 1A-A running, continue to step [2].</div>	<div>SRO/OAC</div> <div>SRO</div> <div>SRO</div> <div>SRO/OAC</div> <div>SRO/OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Transfer to Containment Sump</td><td>1-ES-1.3 Rev. 0006</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div><div>CAUTION</div><ul style="list-style-type: none">ECCS flow to RCS must be maintained at all times to ensure adequate core cooling.Transfer to recirculation mode may cause high radiation in the Auxiliary Building.<div>NOTES</div><ul style="list-style-type: none">Performance of this Instruction is a higher priority than performance of the FRs because it maintains ECCS pump suction.The transfer sequence should be performed without delay. Implementation of FRs is delayed UNTIL transfer sequence is completed or transitioned from.<div>1. ENSURE both RHR pumps RUNNING.</div><div>IF NO RHR pumps can be started, THEN</div><div>**GO TO 1-ECA-1.1, Loss of RHR Sump Recirculation.</div></div></div>	WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	91	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>OAC</div> <div>OAC</div> <div>OAC</div> <div>OAC</div>	<div><div><div><div>WBN Unit 1</div><div>Transfer to Containment Sump</div><div>1-ES-1.3 Rev. 0006</div></div><div><div>Step</div><div>Action/Expected Response</div><div>Response Not Obtained</div></div></div><div><div>2. DETERMINE if cntmt spray should be stopped:</div><div><div>a. CHECK ANY cntmt spray pump running.</div><div>a. NOTIFY TSC to evaluate starting spray pumps to pump RWST to cntmt sump</div></div><div>**GO TO Step 3.</div><div><div>b. ENSURE the following:</div><div><div>• One Cntmt Spray pump running</div><div>• One Cntmt Spray pump in PULL-TO-LOCK</div></div><div>c. MONITOR containment pressure greater than or equal to 2.0 psig.</div><div>c. WHEN cntmt press less than 2.0 psig, THEN PERFORM the following:</div><div><div>1) RESET containment spray signal</div><div>2) ENSURE BOTH cntmt spray pumps STOPPED and PLACE in A-AUTO.</div><div>3) CLOSE cntmt spray discharge valves 1-FCV-72-2 and 1-FCV-72-39.</div></div></div></div></div>
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Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	92	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

BOP previously performed requirements of step [3] at step [13] of 1-E-1 (p. 82). If RCS pressure was declared stable at 1-E-1 step [13] then valve manipulations will be performed now.
2-FCV-70-153, RHR HX 2B, can be CLOSED. Unit 2 is NOT relying on RHR Train B.

BOP
BOP

BOP
BOP

BOP

WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3. **ESTABLISH** CCS to RHR heat exchangers [M-27B]:
- a. **ENSURE** RHR HX 1B OUTLET 1-FCV-70-153 and RHR HX 1A OUTLET 1-FCV-70-156 OPEN.

b. IF Unit 2 has been SHUTDOWN > 48 hours, **THEN**

ENSURE RHR HX 2B OUTLET 2-FCV-70-153 THROTTLED to 2800 gpm if in service.

b. IF Unit 2 has been SHUTDOWN < 48 hours, **THEN**

ENSURE 2B-B and C-S CCS pumps are running on CCS train B,

AND

ENSURE RHR HX 2B OUTLET 2-FCV-70-153 THROTTLED to 5000 gpm if in service.

c. **CLOSE** SFP heat exchanger A CCS supply 0-FCV-70-197.

d. **ENSURE** CCS flow to ESF supply header is greater than 5000 gpm.
 - Train A: 1-FI-70-159
 - Train B: 1-FI-70-165

d. **WHEN** transfer to cntmt sump completed, **THEN**

REFER TO Appendix B (1-ES-1.3), CCS Operation, to adjust CCS flows as necessary.

e. **MONITOR** level in CCS surge tanks.
- Page 5 of 25

Appendix D Required Operator Actions Form ES-D-2

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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

2. OPEN 1-FCV-63-72, CNTMT SUMP TO RHR PMP A SUCT, to allow establishing at least one Train of ECCS Recirculation flow prior to RWST level reaching 8%.

Examiner Note(s):

EVENT 11. 1-FCV-63-72 failed to OPEN automatically due to no SI Train A signal present. **OAC** should momentarily PLACE 1-HS-63-72A to OPEN which will cause 1-FCV-63-72 OPEN. 1-FCV-63-72 opening will cause 1-FCV-74-3 to CLOSE.

Scenario Termination:

All Critical Tasks should be complete when crew finishes step [6.b]. Scenario may be terminated **at CHIEF EXAMINER Discretion.**

Role Play:

As **AUO**, acknowledge direction to restore power to 1-FCV-63-1.

Wait 3 minutes and

Insert Simulator Schedule File Event 23

(restore power to 1-FCV-63-1). Notify MCR that power has been restored to 1-FCV-63-1.

OAC

OAC

OAC

OAC

RO

WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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4.

CHECK RWST level less than 34%.

DO NOT CONTINUE this Instruction UNTIL RWST level less than 34%.
5.

CHECK cntmt sump level greater than or equal to 16.1 %.

**GO TO 1-ECA-1.1, Loss of RHR Sump Recirculation.
6.

ENSURE automatic switchover complete:

a.

ENSURE cntmt sump valves 1-FCV-63-72 and 1-FCV-63-73 OPEN.

IF EITHER cntmt sump valve can NOT be fully opened, THEN

STOP and PULL TO LOCK RHR pump(s) on the associated train(s).

IF flow from cntmt sump CANNOT be established from either train, THEN

** GO TO 1-ECA-1.1, Loss of RHR Sump Recirculation.

b.

ENSURE RWST to RHR suction valves 1-FCV-74-3 and 1-FCV-74-21 CLOSED.

c.

INITIATE power restoration to 1-FCV-63-1 USING Appendix A (1-ES-1.3), 1-FCV-63-1 Breaker Operation.

Appendix D Required Operator Actions Form ES-D-2

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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): RCS pressure is less than 1350 psig. RNO will NOT be exercised.</div>	<div>OAC OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Transfer to Containment Sump</td><td>1-ES-1.3 Rev. 0006</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>CAUTION If RWST level drops to 8%, then any charging, SI or cntmt spray pump taking suction from the RWST must be stopped.</div><div>7. MONITOR RWST level greater than 8%. STOP and PULL TO LOCK pumps taking suction from the RWST.</div><div>8. MONITOR RCS press less than 1350 psig. STOP both SI pumps.</div></div>	WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

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Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	95	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div><div>WBN Unit 1</div><div>Transfer to Containment Sump</div><div>1-ES-1.3 Rev. 0006</div></div> <div><div>Step</div><div>Action/Expected Response</div><div>Response Not Obtained</div></div> <div><div>CAUTION</div><div>If a valve fails during the transfer sequence, any corrective action should be postponed UNTIL transfer is complete, EXCEPT as required to satisfy each step.</div></div> <div><div>NOTE</div><div>Each transfer sequence action is identified by a number on the control board (e.g. #1).</div></div> <div><div>9.</div><div>(#1) ISOLATE SI pump miniflow:<ul style="list-style-type: none">CLOSE 1-FCV-63-3.CLOSE 1-FCV-63-175.CLOSE 1-FCV-63-4.</div><div>ENSURE either:<ul style="list-style-type: none">1-FCV-63-3 CLOSED,OR<ul style="list-style-type: none">1-FCV-63-4 and 1-FCV-63-175 CLOSED.</div></div> <div><div>10.</div><div>(#2) ISOLATE RHR crossties:<ul style="list-style-type: none">CLOSE 1-FCV-74-33.CLOSE 1-FCV-74-35.</div><div>ENSURE either 1-FCV-74-33 or 1-FCV-74-35 CLOSED.</div></div> <div><div>11.</div><div>(#3) ALIGN charging pump and SI pump supply from RHR:<ul style="list-style-type: none">OPEN 1-FCV-63-6.OPEN 1-FCV-63-7.ENSURE 1-FCV-63-177 OPEN.</div><div>ENSURE either 1-FCV-63-6 or 1-FCV-63-7 OPEN.</div></div>	<div>SRO/OAC</div> <div>SRO/OAC</div> <div>OAC</div> <div>OAC</div> <div>OAC</div>
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Appendix D Required Operator Actions Form ES-D-2

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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>SRO/OAC</div> <div>OAC</div> <div>OAC</div> <div>SRO</div>	<div><table><tr><td>WBN Unit 1</td><td>Transfer to Containment Sump</td><td>1-ES-1.3 Rev. 0006</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div><p>NOTE 1-FCV-63-8 and 1-FCV-63-11 are interlocked with the SI pump miniflows being full closed.</p><p>12. (#4) ALIGN RHR discharge to charging pump and SI pump suction:</p><div><div>a. OPEN 1-FCV-63-8.</div><div>a. ENSURE Train B RHR operation:<ul style="list-style-type: none">Train B RHR pump RUNNING.1-FCV-63-11 OPEN.Either 1-FCV-63-6 or 1-FCV-63-7 OPEN.</div><div>b. OPEN 1-FCV-63-11.</div><div>b. ENSURE Train A RHR operation:<ul style="list-style-type: none">Train A RHR pump RUNNING.1-FCV-63-8 OPEN.Either 1-FCV-63-6 or 1-FCV-63-7 OPEN.</div></div><p>13. DO NOT CONTINUE this Instruction UNTIL Steps 9 thru 12 complete.</p></div>	WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>SI previously reset by step [12] of 1-E-1 (p. 81).</div>	<div>SRO/OAC</div> <div>N/A</div> <div>SRO/OAC</div> <div>OAC</div> <div>SRO/OAC</div>	<table><tr><td>WBN Unit 1</td><td>Transfer to Containment Sump</td><td>1-ES-1.3 Rev. 0006</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <div><div>CAUTION</div><div>If RCS press is greater than 1350 psig, the SI pumps should NOT be restarted because the recirc path is isolated.</div></div> <div>14. RESTART any charging pumps and SI pumps as necessary.</div> <div><div>CAUTION</div><div>If offsite power is lost after SI reset, manual action will be required to restart the SI pumps and RHR pumps due to loss of SI start signal.</div></div> <div>15. (#5) RESET SI, and CHECK the following:<ul style="list-style-type: none">SI ACTUATED permissive DARK.AUTO SI BLOCKED permissive LIT.NOTIFY IMs to block Auto SI USING IMI-99.040, Auto SI Block.</div> <div>16. IF offsite power is lost, THEN<ul style="list-style-type: none">PLACE charging pumps in PULL TO LOCK.RESTART RHR pumps.RESTART charging pumps.IF RCS press less than 1350 psig, THEN RESTART SI pumps.</div> <div>Page 10 of 25</div>	WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	98	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>If not previously reported (step [6.c] on p. 93), as AUO report to the MCR: "Power has been restored to 1-FCV-63-1."</div>	<div>OAC</div> <div>OAC</div> <div>OAC</div> <div>OAC</div> <div>OAC</div> <div>RO</div> <div>OAC</div>	<div><div><div>WBN Unit 1</div><div>Transfer to Containment Sump</div><div>1-ES-1.3 Rev. 0006</div></div><div><div>Step</div><div>Action/Expected Response</div><div>Response Not Obtained</div></div></div> <div><div>CAUTION</div><div>ECCS pump discharge flow and motor amps should be monitored WHILE closing the RWST suction valves.</div></div> <div><div>17.</div><div>(#6) ISOLATE charging pump suction from RWST:<div><div>a. CLOSE 1-LCV-62-135.</div><div>b. CLOSE 1-LCV-62-136.</div><div>c. ENSURE 1-HS-62-135A in A-AUTO (pushed in).</div><div>d. ENSURE 1-HS-62-136A in A-AUTO (pushed in).</div></div></div></div> <div><div>18.</div><div>(#7) ISOLATE SI pump suction from RWST:<div><div>• CLOSE 1-FCV-63-5.</div></div></div></div> <div><div>19.</div><div>(#8) ISOLATE RHR suction from RWST:<div><div>a. ENSURE power restored to 1-FCV-63-1 USING Appendix A (1-ES-1.3), 1-FCV-63-1 Breaker Operation.</div><div>b. CLOSE 1-FCV-63-1.</div></div></div></div> <div>Page 11 of 25</div>
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	99	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<div><div><div>WBN Unit 1</div><div>Transfer to Containment Sump</div><div>1-ES-1.3 Rev. 0006</div></div><div><div>Step</div><div>Action/Expected Response</div><div>Response Not Obtained</div></div><div><div>CAUTION</div><div><ul style="list-style-type: none">The containment spray pump MUST stay aligned to the RWST UNTIL the RWST level is less than 8% to ensure sufficient sump inventory for spray pump operation.If containment pressure is greater than or equal to 2.0 psig, the containment spray pump suction must be aligned and pump restarted within 120 seconds.</div></div><div><div>NOTE</div><div>FRs may now be implemented as required.</div></div><div><div>20.</div><div><div>ALIGN cntmt spray suction to containment sump:</div><div><div>a.</div><div>CHECK RWST level less than 8%.</div><div>a.</div><div>WHEN RWST level less than 8%, THEN</div><div>CONTINUE with Substeps 20b and c through Step 24 of this instruction.</div><div>**GO TO Caution prior to Step 25.</div></div><div><div>b.</div><div>ENSURE both cntmt spray pumps STOPPED, AND</div><div>PLACE in PULL TO LOCK.</div></div><div><div>c.</div><div>ISOLATE cntmt spray suction from RWST:</div><div><ul style="list-style-type: none">CLOSE 1-FCV-72-22.CLOSE 1-FCV-72-21.</div></div></div></div></div>
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	100	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Transfer to Containment Sump</td><td>1-ES-1.3 Rev. 0006</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>21. ALIGN cntmt spray sump suction:</p> <p>a. OPEN 1-FCV-72-44 cntmt spray suction from cntmt sump.</p> <p>a. ENSURE suction from RWST 1-FCV-72-22 FULLY CLOSED.</p> <p>b. OPEN 1-FCV-72-45 cntmt spray suction from cntmt sump.</p> <p>b. ENSURE suction from RWST 1-FCV-72-21 FULLY CLOSED.</p> <p>22. MONITOR cntmt press less than 2.0 psig.</p> <p>INITIATE cntmt spray:</p> <p>a. START cntmt spray pumps.</p> <p>b. OPEN discharge valves 1-FCV-72-2 and 1-FCV-72-39.</p> <p>c. ENSURE spray flow on 1-FI-72-34 and 1-FI-72-13.</p> <p>23. ENSURE cntmt spray pumps in A-AUTO for pumps with suction aligned.</p> <p>24. ENSURE ERCW aligned for sump recirc operation:</p> <ul style="list-style-type: none">REFER TO Appendix C (1-ES-1.3), ERCW Operation. <p>CONSULT TSC for ERCW limitations.</p> <p>Page 13 of 25</p>	WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	101	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Transfer to Containment Sump</td><td>1-ES-1.3 Rev. 0006</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>CAUTION Continued ECCS or Containment Spray pump operation following loss of suction will result in pump damage. Loss of suction to RHR pumps will require stopping all ECCS pumps.</p> <p>25. MONITOR for containment sump blockage.</p> <p>a. INITIATE Appendix D (1-ES-1.3), Monitoring for Containment Sump Blockage.</p> <p>b. CHECK for indications of cavitation on ECCS or Containment Spray.</p> <p>b. **GO TO Note prior to Step 26.</p> <p>c. IF sump blockage results in loss of suction to ECCS pumps, THEN</p> <p>STOP CCPs, SI pumps and RHR pumps,</p> <p>PLACE in PULL TO LOCK, AND</p> <p>NOTIFY TSC.</p> <p>d. IF sump blockage results in loss of suction to Cntmt Spray pumps, THEN</p> <p>STOP Cntmt Spray pumps,</p> <p>PLACE in PULL TO LOCK AND</p> <p>NOTIFY TSC.</p> <p>Step continued on next page</p> <p>Page 14 of 25</p>	WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	102	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Transfer to Containment Sump</td><td>1-ES-1.3 Rev. 0006</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>25. (continued)</p> <p>e. IF ECCS or Cntmt Spray flow lost due to sump blockage, THEN</p> <p>**GO TO 1-ECA-1.1, Loss of RHR Sump Recirculation.</p> <p>NOTE Time since initiation of event and guidance for transfer to hot leg recirculation is defined in E-1, Loss of Reactor or Secondary Coolant.</p> <p>26. VERIFY that this instruction was entered from 1-E-1. CONSULT TSC for guidance on when to transfer to hot leg recirculation (1-ES-1.4).</p> <p>27. RETURN TO Instruction in effect.</p> <p>End of Section</p> <p>Page 15 of 25</p>	WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Transfer to Containment Sump	1-ES-1.3 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	9, 10, 11, 12		Page	103	of	122
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Event Description:	LOCA. Auto and Manual SI Train A fail. CARFs trip on start. 1-FCV-63-72 does NOT OPEN automatically. 1-E-0. 1-E-1. 1-ES-1.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

BOP will be tasked with the initial performance of Status Trees, but may delay performance until 1-E-0 Appendices A and B are complete. Status Trees may identify a RED/ORANGE path for Pressurized Thermal Shock due to relatively cold RWST water being injected into the RCS Cold Legs. **US** will make a momentary transition to 1-FR-P.1, Pressurized Thermal Shock, verify RHR flow (indication that the RCS has already broken and cannot maintain pressure) and return to 1-E-1 step in effect.

RCS pressure is less than 150 psig. **US** will exercise RNO and verify RHR Pump 1A-A injecting and return to the procedure in effect.

SRO/OAC

WBN Unit 1	Pressurized Thermal Shock	1-FR-P.1 Rev. 0001
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Step	Action/Expected Response	Response Not Obtained
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- 3.0 OPERATOR ACTIONS
1. CHECK RCS pressure greater than 150 psig. IF RHR pump injecting greater than 1350 gpm to RCS, THEN RETURN TO Instruction in effect.
2. CHECK T-cold stable or rising. IF T-cold dropping uncontrolled, THEN:
- ENSURE steam dump valves CLOSED.
 - ENSURE S/G PORVs CLOSED.
- IF RHR System in Shutdown Cooling mode, THEN
- STOP any cooldown from RHR.
- IF uncontrolled cooldown continues, THEN:
- CLOSE MSIVs,
 - ENSURE MSIV bypasses CLOSED.
 - PLACE steam dump controls OFF.
- Step continued on next page.

Op Test	301	Scenario #	2	Event #	N/A		Page	104	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

All steps of 1-E-0 Appendices A and B are typically performed by the **BOP** and therefore a Position is not specified for every step. **ROLE PLAY** may be required at several steps and has been provided.

BOP

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Appendix A
(Page 1 of 12)
Equipment Verification

NOTE The high level steps of this appendix are listed sequentially, but strict sequential performance is not mandated.

Step	Action/Expected Response	Response Not Obtained
1.	ENSURE all DGs RUNNING.	EMERGENCY START DGs
2.	ENSURE DG NORM ERCW Supply OPEN for running DG(s) [0-M-27A]: <ul style="list-style-type: none">1-HS-67-66A2-HS-67-66A1-HS-67-67A2-HS-67-67A.	OPEN affected DG(s) Backup ERCW Supply [0-M-27A]: <ul style="list-style-type: none">1-HS-67-68A2-HS-67-68A1-HS-67-65A2-HS-67-65A IF ERCW CANNOT be aligned to the affected DG(s), THEN EMERGENCY STOP the affected DG(s).
3.	ENSURE at least four ERCW pumps RUNNING; <ul style="list-style-type: none">One on each Shutdown Board preferred	MANUALLY START pumps as necessary.

Op Test	301	Scenario #	2	Event #	N/A		Page	105	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td colspan="3">Appendix A (Page 2 of 12) Equipment Verification</td></tr><tr><td>4.</td><td>ENSURE CCS pumps RUNNING:<ul style="list-style-type: none">1A-A CCS pump.1B-B CCS pump.C-S CCS pump.</td><td>IF 1A Train CCS Flow Lost, THEN PERFORM the following:<ul style="list-style-type: none">ENSURE CCP 1B-B Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1A-ATBBPs 1A & 1BCS Pump 1A-ASI Pump 1A-ARHR Pump 1A-ASTOP RCPsIF 1B Train CCS Flow Lost, THEN PERFORM the following:<ul style="list-style-type: none">ENSURE CCP 1A-A Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1B-BCS Pump 1B-BSI Pump 1B-BRHR Pump 1B-B</td></tr><tr><td>5.</td><td>ENSURE PCBs OPEN:<ul style="list-style-type: none">PCB 5084.PCB 5088.</td><td>OPEN manually.</td></tr></table>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Appendix A (Page 2 of 12) Equipment Verification			4.	ENSURE CCS pumps RUNNING: <ul style="list-style-type: none">1A-A CCS pump.1B-B CCS pump.C-S CCS pump.	IF 1A Train CCS Flow Lost, THEN PERFORM the following: <ul style="list-style-type: none">ENSURE CCP 1B-B Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1A-ATBBPs 1A & 1BCS Pump 1A-ASI Pump 1A-ARHR Pump 1A-ASTOP RCPs IF 1B Train CCS Flow Lost, THEN PERFORM the following: <ul style="list-style-type: none">ENSURE CCP 1A-A Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1B-BCS Pump 1B-BSI Pump 1B-BRHR Pump 1B-B	5.	ENSURE PCBs OPEN: <ul style="list-style-type: none">PCB 5084.PCB 5088.	OPEN manually.
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016												
Appendix A (Page 2 of 12) Equipment Verification														
4.	ENSURE CCS pumps RUNNING: <ul style="list-style-type: none">1A-A CCS pump.1B-B CCS pump.C-S CCS pump.	IF 1A Train CCS Flow Lost, THEN PERFORM the following: <ul style="list-style-type: none">ENSURE CCP 1B-B Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1A-ATBBPs 1A & 1BCS Pump 1A-ASI Pump 1A-ARHR Pump 1A-ASTOP RCPs IF 1B Train CCS Flow Lost, THEN PERFORM the following: <ul style="list-style-type: none">ENSURE CCP 1A-A Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1B-BCS Pump 1B-BSI Pump 1B-BRHR Pump 1B-B												
5.	ENSURE PCBs OPEN: <ul style="list-style-type: none">PCB 5084.PCB 5088.	OPEN manually.												

Op Test	301	Scenario #	2	Event #	N/A		Page	106	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td colspan="3">Appendix A (Page 3 of 12) Equipment Verification</td></tr><tr><td>6.</td><td>ENSURE AFW pump operation:<ul style="list-style-type: none">Both MD AFW pumps RUNNING.TD AFW pump RUNNING.LCVs in AUTO, OR controlled in MANUAL.</td><td>ESTABLISH at least one train AFW operation.</td></tr><tr><td>7.</td><td>ENSURE MFW isolation:<ul style="list-style-type: none">MFW isolation and bypass isolation valves CLOSED.MFW reg and bypass reg valves CLOSED.MFP A and B TRIPPED.Standby MFP STOPPED.Cond demin pumps TRIPPED.Cond booster pumps TRIPPED.#3 HDT Pumps TRIPPED.#7 HDT Pumps TRIPPED.</td><td>Manually CLOSE valves AND STOP pumps, as necessary. IF any valves can NOT be closed, THEN CLOSE #1 heater outlet valves.</td></tr></table>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Appendix A (Page 3 of 12) Equipment Verification			6.	ENSURE AFW pump operation: <ul style="list-style-type: none">Both MD AFW pumps RUNNING.TD AFW pump RUNNING.LCVs in AUTO, OR controlled in MANUAL.	ESTABLISH at least one train AFW operation.	7.	ENSURE MFW isolation: <ul style="list-style-type: none">MFW isolation and bypass isolation valves CLOSED.MFW reg and bypass reg valves CLOSED.MFP A and B TRIPPED.Standby MFP STOPPED.Cond demin pumps TRIPPED.Cond booster pumps TRIPPED.#3 HDT Pumps TRIPPED.#7 HDT Pumps TRIPPED.	Manually CLOSE valves AND STOP pumps, as necessary. IF any valves can NOT be closed, THEN CLOSE #1 heater outlet valves.
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016												
Appendix A (Page 3 of 12) Equipment Verification														
6.	ENSURE AFW pump operation: <ul style="list-style-type: none">Both MD AFW pumps RUNNING.TD AFW pump RUNNING.LCVs in AUTO, OR controlled in MANUAL.	ESTABLISH at least one train AFW operation.												
7.	ENSURE MFW isolation: <ul style="list-style-type: none">MFW isolation and bypass isolation valves CLOSED.MFW reg and bypass reg valves CLOSED.MFP A and B TRIPPED.Standby MFP STOPPED.Cond demin pumps TRIPPED.Cond booster pumps TRIPPED.#3 HDT Pumps TRIPPED.#7 HDT Pumps TRIPPED.	Manually CLOSE valves AND STOP pumps, as necessary. IF any valves can NOT be closed, THEN CLOSE #1 heater outlet valves.												

Op Test	301	Scenario #	2	Event #	N/A		Page	107	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Critical Task(s):</div> <div>1. Manually start at least one train of low head and high flow ECCS pump (RHR Pump 1A-A) prior to meeting ORANGE path criteria for implementation of 1-FR-C.2.</div> <div>Examiner Note(s):</div> <div>EVENT 10. BOP may have prudently started SI Pump 1A-A and RHR Pump 1A-A upon failure of MANUAL and AUTO SI.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 4 of 12)</div><div>Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>8. MONITOR ECCS operation:</div><div><div>a. Charging pumps RUNNING.</div><div>a. Manually START charging pumps.</div><div>b. Charging pump alignment:<ul style="list-style-type: none">RWST outlets 1-LCV-62-135 and 1-LCV-62-136 OPEN.VCT outlets 1-LCV-62-132 and 1-LCV-62-133 CLOSED.Charging 1-FCV-62-90 and 1-FCV-62-91 CLOSED.</div><div>b. ENSURE at least one valve in each set aligned.</div><div>c. RHR pumps RUNNING.</div><div>c. Manually START RHR pumps.</div><div>d. SI pumps RUNNING.</div><div>d. Manually START SI pumps.</div><div>e. BIT alignment:<ul style="list-style-type: none">Outlets 1-FCV-63-25 and 1-FCV-63-26 OPEN.Flow thru BIT.</div><div>e. ENSURE at least one valve aligned, and flow thru BIT.</div><div>f. RCS pressure greater than 1650 psig.</div><div>f. ENSURE SI pump flow.</div><div>IF RCS press drops to less than 150 psig, THEN</div><div>ENSURE RHR pump flow.</div></div><div>Page 19 of 47</div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	N/A		Page	108	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<div><div><div>WBN Unit 1</div><div>Reactor Trip or Safety Injection</div><div>1-E-0 Rev. 0016</div></div><div>Appendix A (Page 5 of 12)</div><div>Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div><div>9. CHECK Cntmt isolation:<div>a. Phase A isolation:<ul style="list-style-type: none">Train A GREEN.Train B GREEN.</div><div>b. Cntmt vent isolation:<ul style="list-style-type: none">Train A GREEN.Train B GREEN.</div></div><div><div>ACTUATE Phase A and Cntmt Vent Isolation signal,</div><div>OR</div><div>Manually CLOSE valves and dampers as necessary.</div><div>REFER to applicable Attachment as necessary:<ul style="list-style-type: none">Attachment 7, Train A Cntmt VentAttachment 8, Train A Phase AAttachment 9, Train B Cntmt VentAttachment 10, Train B Phase A</div></div></div></div>	Step	Action/Expected Response	Response Not Obtained
Step	Action/Expected Response	Response Not Obtained			

Op Test	301	Scenario #	2	Event #	N/A		Page	109	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): Phase B and Containment Spray signal will both be LIT with Containment Pressure greater than 2.8 psig. BOP will exercise the RNO. These actions may have been completed prudently upon initial receipt of Phase B signal.</div> <div>Examiner Note(s): EVENT 12. Containment Air Return Fan 1B-B will trip on start. Containment Air Return Fan 1A-A will trip shortly after starting. This is to ensure Containment Pressure remains greater than 2.0 psig to require Containment Spray Pump 1A-A running which will lower RWST inventory more rapidly. 138-A, PANEL M-9 MOTOR TRIPOUT, will alarm and a buzzer will sound. Placing Containment Air Return Fan B-B handswitch to STOP will silence the buzzer.</div> <div>Role Play: As AUO, acknowledge direction to OPEN Ice Condenser AHU breakers. Wait 3 minutes and notify the MCR that 1-E-0 Attachment 1 is complete.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 6 of 12) Equipment Verification</div><table><tr><th>Step</th><th>Action/Expected Response</th><th>Response Not Obtained</th></tr><tr><td>10.</td><td>CHECK Cntmt pressure:<ul style="list-style-type: none">Phase B DARK [MISSP].Cntmt Spray DARK [MISSP].Cntmt press less than 2.8 psig.</td><td>PERFORM the following: 1) ENSURE Phase B actuated. 2) ENSURE Cntmt Spray actuated. 3) ENSURE Cntmt spray pumps running. 4) ENSURE Cntmt spray flow. 5) ENSURE Phase B isolation:<ul style="list-style-type: none">Train A GREEN.Train B GREENManually CLOSE valves and dampers as necessary. 6) STOP all RCPs. 7) ENSURE MSIVs and bypasses CLOSED. 8) PLACE steam dump controls OFF. 9) WHEN 10 minutes has elapsed since Phase B actuated, THEN ENSURE air return fans start. 10) USE adverse Cntmt [ADV] setpoints where provided.</td></tr><tr><td>11.</td><td>DISPATCH AUO to perform Attachment 1 (1-E-0), Ice Condenser AHU Breaker Operation.</td><td></td></tr></table></div> <div>Page 21 of 47</div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained	10.	CHECK Cntmt pressure: <ul style="list-style-type: none">Phase B DARK [MISSP].Cntmt Spray DARK [MISSP].Cntmt press less than 2.8 psig.	PERFORM the following: 1) ENSURE Phase B actuated. 2) ENSURE Cntmt Spray actuated. 3) ENSURE Cntmt spray pumps running. 4) ENSURE Cntmt spray flow. 5) ENSURE Phase B isolation: <ul style="list-style-type: none">Train A GREEN.Train B GREENManually CLOSE valves and dampers as necessary. 6) STOP all RCPs. 7) ENSURE MSIVs and bypasses CLOSED . 8) PLACE steam dump controls OFF. 9) WHEN 10 minutes has elapsed since Phase B actuated, THEN ENSURE air return fans start. 10) USE adverse Cntmt [ADV] setpoints where provided.	11.	DISPATCH AUO to perform Attachment 1 (1-E-0), Ice Condenser AHU Breaker Operation.	
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016												
Step	Action/Expected Response	Response Not Obtained												
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11.	DISPATCH AUO to perform Attachment 1 (1-E-0), Ice Condenser AHU Breaker Operation.													

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	2	Event #	N/A		Page	110	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td colspan="3">Appendix A (Page 7 of 12) Equipment Verification</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>12.</td><td>CHECK plant radiation NORMAL:<ul style="list-style-type: none">S/G blowdown rad recorder 1-RR-90-120 NORMAL prior to isolation [0-M-12].Condenser vacuum exhaust rad recorder 1-RR-90-119 NORMAL prior to trip [0-M-12].1-RR-90-106 and 1-RR-90-112 radiation recorders NORMAL prior to isolation [0-M-12].S/G main steamline discharge monitors NORMAL [1-M-30].Upper and Lower containment high range monitors NORMAL [1-M-30].NOTIFY Unit Supervisor conditions NORMAL.</td><td>NOTIFY Unit Supervisor IMMEDIATELY.</td></tr><tr><td>13.</td><td>ENSURE ABGTS operation:<ul style="list-style-type: none">ABGTS fans RUNNING.ABGTS dampers OPEN:<ul style="list-style-type: none">FCO-30-146A.FCO-30-146B.FCO-30-157A.FCO-30-157B.</td><td><ul style="list-style-type: none">Manually START fans.Locally OPEN dampers.</td></tr></table>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Appendix A (Page 7 of 12) Equipment Verification			Step	Action/Expected Response	Response Not Obtained	12.	CHECK plant radiation NORMAL: <ul style="list-style-type: none">S/G blowdown rad recorder 1-RR-90-120 NORMAL prior to isolation [0-M-12].Condenser vacuum exhaust rad recorder 1-RR-90-119 NORMAL prior to trip [0-M-12].1-RR-90-106 and 1-RR-90-112 radiation recorders NORMAL prior to isolation [0-M-12].S/G main steamline discharge monitors NORMAL [1-M-30].Upper and Lower containment high range monitors NORMAL [1-M-30].NOTIFY Unit Supervisor conditions NORMAL.	NOTIFY Unit Supervisor IMMEDIATELY.	13.	ENSURE ABGTS operation: <ul style="list-style-type: none">ABGTS fans RUNNING.ABGTS dampers OPEN:<ul style="list-style-type: none">FCO-30-146A.FCO-30-146B.FCO-30-157A.FCO-30-157B.	<ul style="list-style-type: none">Manually START fans.Locally OPEN dampers.
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016															
Appendix A (Page 7 of 12) Equipment Verification																	
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Op Test	301	Scenario #	2	Event #	N/A		Page	111	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As AUO, acknowledge direction to shut down Upper and Lower Containment Radiation Monitors. Wait 10 minutes and notify the MCR that Upper and Lower Containment Radiation Monitors have been shut down IAW 0-SOI-90.02</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 8 of 12) Equipment Verification</div><table><tr><th>Step</th><th>Action/Expected Response</th><th>Response Not Obtained</th></tr><tr><td>14.</td><td>ENSURE 0-FCV-67-152, CCS HX C ALT DISCH TO HDR B, is open to position A.</td><td>Manually OPEN 0-FCV-67-152 to position A.</td></tr><tr><td>15.</td><td>CLOSE 0-FCV-67-144, CCS HX C DISCH TO HDR A.</td><td></td></tr><tr><td>16.</td><td>ENSURE 1-FCV-67-146, CCS HX A OUTLET ERCW FLOW CNTL, is OPEN to position B</td><td>Manually OPEN 1-FCV-67-146 to position B.</td></tr><tr><td>17.</td><td>CLOSE 1-FCV-67-143, CCS HX A OUTLET ERCW FLOW CNTL BYP.</td><td></td></tr><tr><td>18.</td><td>ENSURE 2-FCV-67-146, CCS HX B OUTLET ERCW FLOW CNTL is OPEN to position A.</td><td>Manually OPEN 2-FCV-67-146 to position A.</td></tr><tr><td>19.</td><td>CLOSE 2-FCV-67-143, CCS HX B OUTLET ERCW FLOW CNTL BYP.</td><td></td></tr><tr><td>20.</td><td>MONITOR EGTS operation:<ul style="list-style-type: none">EGTS fans RUNNING.ENSURE dampers OPENCHECK filter bank dp between 2 and 5 inches of water.</td><td>Manually START fans AND OPEN dampers.</td></tr><tr><td>21.</td><td>DISPATCH AUO to shutdown Upper and Lower CNTMT rad monitors USING 0-SOI-90.02, Gaseous Process Radiation Monitors</td><td></td></tr></table><div>Page 23 of 47</div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained	14.	ENSURE 0-FCV-67-152, CCS HX C ALT DISCH TO HDR B, is open to position A.	Manually OPEN 0-FCV-67-152 to position A.	15.	CLOSE 0-FCV-67-144, CCS HX C DISCH TO HDR A.		16.	ENSURE 1-FCV-67-146, CCS HX A OUTLET ERCW FLOW CNTL, is OPEN to position B	Manually OPEN 1-FCV-67-146 to position B.	17.	CLOSE 1-FCV-67-143, CCS HX A OUTLET ERCW FLOW CNTL BYP.		18.	ENSURE 2-FCV-67-146, CCS HX B OUTLET ERCW FLOW CNTL is OPEN to position A.	Manually OPEN 2-FCV-67-146 to position A.	19.	CLOSE 2-FCV-67-143, CCS HX B OUTLET ERCW FLOW CNTL BYP.		20.	MONITOR EGTS operation: <ul style="list-style-type: none">EGTS fans RUNNING.ENSURE dampers OPENCHECK filter bank dp between 2 and 5 inches of water.	Manually START fans AND OPEN dampers.	21.	DISPATCH AUO to shutdown Upper and Lower CNTMT rad monitors USING 0-SOI-90.02, Gaseous Process Radiation Monitors	
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016																														
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Op Test	301	Scenario #	2	Event #	N/A		Page	112	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>As AUO, if 3 minutes have elapsed from direction provided in step [11] and MCR has NOT been notified, then notify MCR that 1-E-0 Attachment 1 is complete.</p>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 9 of 12) Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>22. WHEN Attachment 1 is complete (Ice Condenser AHU Breakers OPEN), THEN ENERGIZE hydrogen igniters [1-M-10]:<ul style="list-style-type: none">1-HS-268-73 ON.1-HS-268-74 ON. NOTE The following equipment is located on 1-M-9.</div><div>23. CHECK CNTMT PURGE fans STOPPED. STOP fans AND PLACE handswitch in PULL-TO-LOCK.</div><div>24. CHECK FUEL HANDLING EXH fans STOPPED, Fuel and Cask loading dampers CLOSED: STOP fans AND PLACE handswitch in PULL-TO-LOCK, THEN Manually CLOSE dampers.</div><div>25. ENSURE AB GEN SUPPLY and EXH fans STOPPED. STOP fans AND PLACE handswitch in PULL-TO-LOCK. NOTE Dampers 1-HS-30-158 and 2-HS-30-270 remain open during ABI.</div><div>26. ENSURE AB GEN SUP & EXH dampers CLOSED. Manually CLOSE dampers.</div><div>Page 24 of 47</div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	N/A		Page	113	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td colspan="3">Appendix A (Page 10 of 12) Equipment Verification</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>27.</td><td>ENSURE MCR & SPREAD RM FRESH AIR dampers CLOSED:<ul style="list-style-type: none">FCV-31-3.FCV-31-4.</td><td>Manually CLOSE dampers.</td></tr><tr><td>28.</td><td>ENSURE at least one CB EMER CLEANUP fan RUNNING and associated damper OPEN:<ul style="list-style-type: none">CB EMERG CLEANUP FAN A-A,OR<ul style="list-style-type: none">Fan B-B RUNNING..<ul style="list-style-type: none">FCO-31-8, OPEN.OR<ul style="list-style-type: none">FCO-31-7, OPEN</td><td>Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.</td></tr><tr><td>29.</td><td>ENSURE at least one CB EMER PRESS fan RUNNING and associated damper OPEN:<ul style="list-style-type: none">CB EMERG PRESS FAN A-A,OR<ul style="list-style-type: none">FAN B-B RUNNING.<ul style="list-style-type: none">FCO-31-6, OPEN.OR<ul style="list-style-type: none">FCO-31-5, OPEN.</td><td>Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.</td></tr><tr><td colspan="3">Page 25 of 47</td></tr></table>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Appendix A (Page 10 of 12) Equipment Verification			Step	Action/Expected Response	Response Not Obtained	27.	ENSURE MCR & SPREAD RM FRESH AIR dampers CLOSED: <ul style="list-style-type: none">FCV-31-3.FCV-31-4.	Manually CLOSE dampers.	28.	ENSURE at least one CB EMER CLEANUP fan RUNNING and associated damper OPEN: <ul style="list-style-type: none">CB EMERG CLEANUP FAN A-A, OR <ul style="list-style-type: none">Fan B-B RUNNING.. <ul style="list-style-type: none">FCO-31-8, OPEN. OR <ul style="list-style-type: none">FCO-31-7, OPEN	Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.	29.	ENSURE at least one CB EMER PRESS fan RUNNING and associated damper OPEN: <ul style="list-style-type: none">CB EMERG PRESS FAN A-A, OR <ul style="list-style-type: none">FAN B-B RUNNING. <ul style="list-style-type: none">FCO-31-6, OPEN. OR <ul style="list-style-type: none">FCO-31-5, OPEN.	Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.	Page 25 of 47		
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016																					
Appendix A (Page 10 of 12) Equipment Verification																							
Step	Action/Expected Response	Response Not Obtained																					
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Page 25 of 47																							

Op Test	301	Scenario #	2	Event #	N/A		Page	114	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As U2 Operator, acknowledge direction to check U2 Containment Vent Isolation GREEN on both Trains. Immediately report that both Trains of CVI on U2 are GREEN.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 11 of 12) Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>30. ENSURE Control Building fans STOPPED and dampers CLOSED:<ul style="list-style-type: none">SPREADING ROOM SUPPLY and EXH FANS AND dampers.TOILET & LKR RM EXHAUST FAN AND dampers.<div>NOTE Loss of shutdown power could result in a loss of SFP cooling. Annunciator Window 128-A and 128-B could be indicative of this condition and increased monitoring of SFP level, temperature and radiation levels will be necessary..</div></div><div>31. CHECK at least one 6.9kV Shutdown Board ENERGIZED.<div>DISPATCH AUO to perform Attachment 6, Monitor Spent Fuel Pool. IF AUO reports abnormal SFP level or temperature, THEN REFER to 0-AOI-45, Loss of Spent Fuel Pool Level or Cooling</div></div><div>32. CHECK U2 Cntmt isolation [2-M-6]:<div>a. Cntmt vent isolation:<ul style="list-style-type: none">Train A GREEN.Train B GREEN.</div>ACTUATE Cntmt Vent Isolation signal, OR Manually CLOSE valves and dampers as necessary.</div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	2	Event #	N/A		Page	115	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As U2 Operator, acknowledge direction to check U2 Containment Purge Fans stopped. Immediately report that all U2 Containment Purge fans are stopped.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 12 of 12)</div><div>Equipment Verification</div><div>33. CHECK CNTMT PURGE fans STOPPED [2-M-9].</div><div>STOP fans AND PLACE handswitch in PULL-TO-LOCK. DISPATCH AUO to perform Attachment 11 (1-E-0).</div><div>34. INITIATE Appendix B (1-E-0), Phase B Pipe Break Contingencies.</div></div> <div>Page 27 of 47</div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016			

Op Test	301	Scenario #	2	Event #	N/A		Page	116	of	122
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td colspan="3">Appendix B (Page 1 of 1) Phase B Pipe Break Contingencies</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>1.</td><td>CHECK PHASE B actuated. [MISSP - 1-XX-55-6C, -6D]</td><td>WHEN PHASE B actuation occurs, THEN GO TO step 2.</td></tr><tr><td>2.</td><td>ENSURE thermal barrier booster pumps are STOPPED:<ul style="list-style-type: none">1-HS-70-131A in Pull To Lock.1-HS-70-130A in Pull To Lock.</td><td></td></tr><tr><td>3.</td><td>ENSURE 1-FCV-32-110 CLOSED. [CISP - 1-XX-55-6E] (A-train, window 13)</td><td>DISPATCH AUO to perform Attachment 2 (1-E-0). IF control air can NOT be isolated, THEN COORDINATE with SM to shutdown Unit 2. WHEN Unit 2 is in Mode 3, THEN DIRECT AUO to complete Attachment 2 (1-E-0).</td></tr></table>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Appendix B (Page 1 of 1) Phase B Pipe Break Contingencies			Step	Action/Expected Response	Response Not Obtained	1.	CHECK PHASE B actuated. [MISSP - 1-XX-55-6C, -6D]	WHEN PHASE B actuation occurs, THEN GO TO step 2.	2.	ENSURE thermal barrier booster pumps are STOPPED: <ul style="list-style-type: none">1-HS-70-131A in Pull To Lock.1-HS-70-130A in Pull To Lock.		3.	ENSURE 1-FCV-32-110 CLOSED. [CISP - 1-XX-55-6E] (A-train, window 13)	DISPATCH AUO to perform Attachment 2 (1-E-0). IF control air can NOT be isolated, THEN COORDINATE with SM to shutdown Unit 2. WHEN Unit 2 is in Mode 3, THEN DIRECT AUO to complete Attachment 2 (1-E-0).
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016																		
Appendix B (Page 1 of 1) Phase B Pipe Break Contingencies																				
Step	Action/Expected Response	Response Not Obtained																		
1.	CHECK PHASE B actuated. [MISSP - 1-XX-55-6C, -6D]	WHEN PHASE B actuation occurs, THEN GO TO step 2.																		
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3.	ENSURE 1-FCV-32-110 CLOSED. [CISP - 1-XX-55-6E] (A-train, window 13)	DISPATCH AUO to perform Attachment 2 (1-E-0). IF control air can NOT be isolated, THEN COORDINATE with SM to shutdown Unit 2. WHEN Unit 2 is in Mode 3, THEN DIRECT AUO to complete Attachment 2 (1-E-0).																		

Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 2
Simulator Console Operators Instructions

1. SIMULATOR SET UP

- a. **ENSURE** exam security is established.
- b. **LOAD IC 252.**
- c. **LOAD** schedule file for 2019-301 NRC Examination Scenario 2.
- d. **ENSURE** the following are BYPASSED in DCS:
 - 1) **1-FM-3-48B** (SG 2 STEAM FLOW)
 - 2) **1-PM-68-334** (PZR PRESSURE)
- e. **ENSURE** DCS workstations are in "Initial environment"
- f. **ENSURE** ICS Screens are clear
- g. **ENSURE** ICS alarms are acknowledged (BISI for CS Pump 1B-B)
- h. **REMOVE** ICS point P0481A from SCAN (1-SI-68-106)
- i. **CRITICAL STEP: ENSURE** Scenario 2.evt loaded.
- j. **PLACE** Equipment Off Normal tags on control boards as follows:
 - 1) **Indicators:**
 - a) **1-FI-3-48B** (SG 2 FEED FLOW, 1-M-4)
 - b) **1-PI-68-334** (PZR PRESSURE, 1-M-5)
 - 2) **Alarms:**
 - a) **1-XX-55-5 window 38** (Protection Set II Door OPEN, 1-M-5)
 - b) **61-C** (SG 2, STM-FW FLOW MISMATCH)
 - c) **67-D** (PROT SET II BYPASS, 1-M-4)
- k. **PLACE** the following in the specified position and **ATTACH** a Clearance tag (DANGER):
 - 1) **(PTL) 1-HS-72-10A** CNTMT SPRAY PUMP B (1-M-6) Position ☐ Tag ☐
 - 2) **1-HS-72-21A** RWST TO CS PMP B (1-M-6) Position ☐ Tag ☐
 - 3) **1-HS-72-45A** CNTMT SUMP TO CS PUMP B SUCT (1-M-6) Position ☐ Tag ☐
 - 4) **1-HS-73-13A** CNTMT SPRAY PMP B MINI FLOW (1-M-6) Position ☐ Tag ☐
- l. **PLACE** protected equipment tags on the following:
 - 1) **1-HS-72-27A** CNTMT SPRAY PMP A (1-M-6)
 - 2) **1-HS-82-18** DG MODE SELECTOR (1A-A) (0-M-26)
- m. **DEPRESS** "CLR" pushbutton on Area Rad Monitors (5) and Wide Range Condenser Vacuum Exhaust Rad Monitors (2)
- n. **ENSURE** MOL Reactivity Briefing Book and placard are used. **ENSURE** MOL Reactivity Briefing Book is UPDATED for current conditions. RCS Cb = 764 ppm. CBD at 220 steps in AUTO. ΔI at -1.1% against a target of -1.1% with limits of -12.0% and 7.0%.
- o. **ENSURE** ALL malfunctions listed on the Simulator Input Summary are loaded in Director.
- p. **PERFORM** Independent Verification that ALL malfunctions listed on the Simulator Input Summary are loaded in Director.

- q. **ENSURE** "B" Train Channel II sign, MODE 1 sign, and "A" Protected train sign are posted on 1-M-30.

**Watts Bar Nuclear Plant
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Simulator Console Operators Instructions**

- r. **ENSURE** correct AUO cards are available to US, OAC and BOP.
- s. **ENSURE** ALL operator aids NOT required for the scenario are removed from the boards.
- t. **ENSURE** ALL recorders are clear.
- u. **PLACE** simulator in RUN until alarm 82-F, DCS Trouble, clears.

NOTE: IF desired, **THEN** Simulator may be placed in FREEZE until prompted by NRC CHIEF EXAMINER to return to **RUN**.

- v. **ENSURE** ALL ARIs are clear of all writing.
 - 1) 1-ARI-81-87
 - 2) 1-ARI-64-70
 - 3) 1-ARI-109-115
 - 4) 0-ARI-241-253
 - 5) 1-ARI-95-101
- w. **IF** the first scenario of the day **THEN ENSURE:**
 - 1) ALL EOIs are clear of all writing
 - 2) ALL AOIs are clear of all writing
 - 3) ALL ECAs are clear of all writing
 - 4) ALL FRs are clear of all writing
 - 5) ALL Tech Specs are clear of all writing
 - 6) ALL back-up copies are clear of all writing
- x. **IF NOT** the first scenario of the day **THEN ENSURE** the following procedures to be used are not written on:
 - 1) 1-AOI-2
 - 2) 1-AOI-20
 - 3) 1-AOI-15
 - 4) 1-AOI-24
 - 5) 1-AOI-39
 - 6) 1-E-0
 - 7) 1-E-0 Appendices A and B
 - 8) 1-ES-0.1
 - 9) 1-E-1
 - 10) 1-ES-1.3
 - 11) 1-FR-0
 - 12) 1-FR-P.1

**Watts Bar Nuclear Plant
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Simulator Console Operators Instructions**

2. GENERIC SCENARIO NOTES

- a. Typical Response Times:** Unless specified in the SEG or determined by the **NRC CHIEF EXAMINER**, the response time of AUOs or other personnel dispatched should be approximately 3 to 5 min.
- b. Plant Data or Information Requests:** Information not contained in this exam guide should be discussed with the **NRC CHIEF EXAMINER** before providing any information to the crew.
- c. General Notifications:** If not specifically addressed in the SEG, general notifications to Operations Management, Shift Manager, Load Coordinator, Plant Duty Manager, etc. will be acknowledged by the Console Operator.

3. TURNOVER INFORMATION

- a) Provide Crew with the following information:
 - Shift Turnover sheet with current Unit Status.
 - Blank copy of 1-SOI-62.01 Section 6.2

**Watts Bar Nuclear Plant
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Simulator Console Operators Instructions**

SIMULATOR INPUT SUMMARY							
Key	Description	Event	Delay	Ramp	Initial	Final	Value
mux_19c051	67-D, Protection Set II Bypass (1-R-5)		0:00:00	0:00:00	---	ALARM	None
rx13f	FT-3-48B failure		0:00:00	0:00:00	---	0.0	85.7141
rp02b1	SI Train A AUTO failure		0:00:00	0:00:00	---	Active	Inactive
rp02a1	SI Train A MANUAL failure		0:00:00	0:00:00	---	Active	Inactive
ch29b	Containment Air Return Fan B-B overcurrent trip		0:00:00	0:00:00	---	Active	Inactive
ch29a	Containment Air Return Fan A-A overcurrent trip (slight delay)	13	0:10:45	0:00:00	---	Active	Inactive
rx11b	1-PT-1-72 failure	3	0:00:00	0:00:30	---	80	90.9017
rx11b	1-PT-1-72 failure	3	0:01:00	0:20:00	---	0	90.9017
cv52	1-PT-62-81 failure	4	0:00:00	0:05:00	---	0	304.934
cc10c	CCS break downstream of CCS Pump C-S	5	0:00:00	0:01:00	---	20	0
cv17c	RCP 3 Seal #1 failure	6	0:00:00	0:10:00	---	0.2	0
cv17c	RCP 3 Seal #1 failure	7	0:00:00	0:02:00	---	1	0
th02c	Loop 3 Cold Leg LOCA	8	0:00:00	0:00:00	---	100	0
ccr10	0-ISV-70-505, CCS Pump C-S Discharge, CLOSED	21	0:00:00	0:05:00	---	0	1
chr20	Reset H2 Analyzer Train A low temperature	22	0:00:00	0:00:00	---	Reset	Normal
chr21	Reset H2 Analyzer Train B low temperature	22	0:00:00	0:00:00	---	Reset	Normal
sir14	Power restored to 1-FCV-63-1	23	0:00:00	0:00:00	---	ON	OFF

**Watts Bar Nuclear Plant
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Simulator Console Operators Instructions**

SIMULATOR INPUT SUMMARY							
Key	Description	Event	Delay	Ramp	Initial	Final	Value
hs-72-10a	CS Pump 1B-B		0:00:00	0:00:00	---	ptlock	nastop
hs-72-10a-1	HS-72-10A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-21a	FCV-72-21, RWST to CS Pump 1B-B		0:00:00	0:00:00	---	CLOSE	blank
hs-72-21a-1	HS-72-21A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-45a	FCV-72-45, Containment Sump to CS Pump 1B-B		0:00:00	0:00:00	---	CLOSE	blank
hs-72-45a-1	HS-72-45A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-45a-2	HS-72-45A RED light		0:00:00	0:00:00	---	OFF	OFF
hs-72-13a-1	HS-72-13A GREEN light		0:00:00	0:00:00	---	OFF	ON
xx-55-5-38	Status Panel Protection Set II Door Open LIT (MIG PZR Press SI)		0:00:00	0:00:00	---	ON	OFF

SHIFT TURNOVER CHECKLIST			
<input type="checkbox"/>	SM		
<input checked="" type="checkbox"/>	US	Unit	<u>1</u>
<input checked="" type="checkbox"/>	UO	Unit	<u>2</u>
<input type="checkbox"/>	AUO	Station	<u>WBN</u>
<input type="checkbox"/>	STA		
		Off-going - Name	
		On-coming - Name	
Part 1 - Completed by off-going shift / Reviewed by on-coming shift:			
<ul style="list-style-type: none"> • Abnormal equipment lineup / conditions: <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">Containment Spray Pump 1B-B tagged 4 hours ago for scheduled component outage. LCO 3.6.6 Condition A entered. 12 hours of scheduled work remain.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">1-LPP-68-334, PZR Pressure, is removed from scan in ICS and bypassed in DCS to support 1-SI-68-106, 184D Channel Operational Test Pressurizer Pressure Channel II. 1-LPP-68-334 is BYPASSED in Eagle-21 (67-D LIT). LCO 3.3.1 Conditions A, W and X entered. LCO 3.3.2 Conditions A, D and L entered.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">1-FT-3-48B, SG 2 Feed Flow, failed and was bypassed in DCS (61-C LIT).</div> • SIs/Tests in progress / planned: (including need for conduct of evolution briefings) <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">1-SI-68-106, 184D COT Pressurizer Pressure Channel II</div> <div style="border: 1px solid black; padding: 2px; margin: 2px 0;"> <input type="checkbox"/> US/ SM review late SI report (SQN and WBN only) </div> • Major Activities / Procedures in progress or planned: <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">Train B Channel II Work Week. 100% power. RCS Cb 763 ppm. CBD at 220 steps. Rod control in AUTO.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">OAC to start CCP 1A-A and shut down CCP 1B-B IAW 1-SOI-62.01 Section 6.2 to support 1-SI-68-33, Measurement of RCP Seal Injection Flow.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">Plant Risk: Green. Grid: Qualified.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">Unit 2 is in MODE 1 at 100% power.</div> • Radiological changes during the shift: <div style="border: 1px solid black; padding: 2px; margin: 2px 0;">None</div> 			
Part 2 - Completed by on-coming shift prior to assuming duties:			
<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> Review station rounds /Abnormal readings (AUOs only) <input type="checkbox"/> Review Narrative Logs (previous day and carry-over items) <input type="checkbox"/> Current qualification status <input type="checkbox"/> Leadership and Team Effectiveness applicability <input type="checkbox"/> Review the current controlling Reactivity Management Plans (N/A for AUOs) <input type="checkbox"/> Review current TS/TRM/ODCM/FPR Required Actions (N/A for AUOs) <input type="checkbox"/> Walk down MCR Control Boards with off-going Operator (N/A for AUOs, as applicable for SM /STA) <input type="checkbox"/> CR reviews complete for previous shift (SM/US/STA) <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Relief Time: _____ Relief Date: _____ </div> </div>			
Part 3 - Completed by on-coming shift. These items may be reviewed after assuming duties:			
<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> Review Operator Workarounds, Burdens and Challenges (applicable Unit / Station) <input type="checkbox"/> Review applicable ODMI actions (first shift of shift week) <input type="checkbox"/> Review changes in Standing / Shift Orders (since last shift worked) <input type="checkbox"/> Review changes to TACFs issued (since last shift worked) (N/A for AUOs) <input type="checkbox"/> Review Control Room Deficiencies (first shift of shift week) (N/A for AUOs) <input type="checkbox"/> Review Component Deviation Log (N/A for AUOs) </div>			

Watts Bar Nuclear Plant

NRC EXAM 2019-301

Scenario 3

Facility:	Watts Bar Nuclear Plant	Scenario No.	3	Op Test No.:	2019-301
Examiners:	_____	Operators:	_____	SRO	
	_____		_____	RO	
	_____		_____	BOP	
Run Time: 75 to 85 minutes					
Initial Conditions:	<p>Unit 1 is in MODE 1 at 75% power.</p> <ul style="list-style-type: none"> Containment Spray Pump 1B-B tagged 6 hours ago for scheduled component outage. LCO 3.6.6 Condition A entered. 12 hours of scheduled work remain. 1-LPP-68-334, PZR Pressure, is removed from scan in ICS and bypassed in DCS to support 1-SI-68-106, 184D Channel Operational Test Pressurizer Pressure Channel II. 1-LPP-68-334 is BYPASSED in Eagle-21 (68-B LIT). LCO 3.3.1 Conditions A, W and X entered. LCO 3.3.2 Conditions A, D and L entered. 1-FT-3-48B, SG 2 Feed Flow, failed and was bypassed in DCS. <p>Unit 2 is at 100% power.</p>				
Turnover:	<p>Train B Channel II Work Week.</p> <p>Unit 1 is at 75% power to support 1-TRI-47-3, Main Turbine Steam Inlet Valve Testing.</p> <p>Lower VCT pressure to 25 psig IAW 1-SOI-62.01 Section 8.27 to support shiftily dilutions.</p>				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N-OAC/SRO	Lower VCT pressure to 25 psig IAW 1-SOI-62.01 Section 8.27. (5 min)		
2	N/A	N/A	DELETED		
3	cv31a	C-OAC/SRO TS-SRO	CCP 1B-B broken coupling requiring entry into 1-AOI-20, Malfunction of Pressurizer Level Control System, Section 3.3, Loss of Charging or Abnormal Charging Flow. (20 min)		
4	rp18c	C-BOP/SRO TS-SRO	Eagle-21 1-R-3 loses power requiring entry into 1-AOI-44, Eagle 21 Malfunctions. Loss of power to 1-R-3 causes loss of feed flow indication to SG 2 requiring entry into 1-AOI-16, Loss of Normal Feedwater. (20 to 25 min)		
5	th05b	C-OAC/SRO	SG 2 tube leak requiring entry into 1-AOI-33		
6	N/A	R-OAC/SRO	Rapid downpower to 50% to comply with 1-AOI-33 actions requiring entry into 1-AOI-39, Rapid Load Reduction. (5 min)		
7	th05b	M-OAC/SRO M-BOP	SG 2 tube leak develops into tube rupture. Crew transitions from 1-E-0, Reactor Trip or Safety Injection, to 1-E-3, Steam Generator Tube Rupture, (25 to 30 min)		
8	si09a, si09b	C-BOP/SRO	1-FCV-63-25 and -26 fail to OPEN automatically.		
9	fw26	C-OAC/SRO	Steam Dumps fail to operate in Pressure Mode.		
10	ch10b	C-BOP	ABI Train B fails.		
*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Scenario 3 - Summary

Event	Description
1	OAC lowers VCT pressure IAW 1-SOI-62.01 Section 8.27.
2	DELETED
3	CCP 1B-B coupling breaks. US enters 1-AOI-20, Malfunction of Pressurizer Level Control. OAC isolates charging and letdown, starts CCP 1A-A and restores charging and letdown. US evaluates LCO 3.5.2 and TR LCO 3.1.4.
4	Eagle-21 1-R-3 (Channel I) loses power. US will enter 1-AOI-44, Eagle 21 Malfunctions. Loss of 1-R-3 causes a complete loss of feed flow indication to SG 2. BOP must take MANUAL control of 1-FCV-3-48, SG 2 MFW Reg Valve, to prevent turbine trip on SG Hi Hi Level. US enters 1-AOI-16, Loss of Normal Feedwater, then proceeds to 1-AOI-44. US evaluates LCOs 3.3.2, 3.3.3 and TR LCO 3.3.7.
5	Tube leak develops on SG 2. US enters 1-AOI-33, Steam Generator Tube Leak.
6	OAC lowers power to 50% at 2%/min as directed by 1-AOI-33 and IAW 1-AOI-39, Rapid Load Reduction.
7	SG tube leak worsens to SG tube rupture during rapid load reduction requiring a reactor trip and Safety Injection. MDAFW Pump 1A-A fails to AUTO start. US enters 1-E-0, Reactor Trip or Safety Injection, and then transitions to 1-E-3, Steam Generator Tube Rupture. Scenario can be terminated when crew fully opens SG 1, 3 and 4 PORVs, or at Lead Examiner's discretion.
8	BOP will prudently open 1-FCV-63-25 and/or -26 or BOP will open 1-FCV-63-25 and/or -26 IAW 1-E-0 Appendix A, Equipment Verification.
9	OAC will cool down the RCS using Intact SG PORVs IAW 1-E-3.
10	BOP will start ABGTS B-B and CLOSE appropriate dampers on 1-M-9 IAW 1-E-0 Appendix A, Equipment Verification.

Technical Specification determination for Event 4 revised based on Facility Post Exam Comment. (ref ML#19256B032 and ML#19297E281, Enclosure 2, Item 1)

Scenario 3 - Critical Tasks

Critical Task	Description
1	Manually control SG 2 level prior to requiring a Manual Reactor Trip or reaching an Automatic Reactor Trip setpoint (82.4% on HI-HI and 17% on LO-LO).
2	Isolate SG 2 IAW 1-E-3, Steam Generator Tube Rupture, to prevent entry into 1-ECA-3.1, SGTR and LOCA – Subcooled Recovery.
3	Fully OPEN SG 1, 3 and 4 PORVs to initiate a max rate RCS cooldown to limit RCS inventory loss to SG 2 via tube rupture and radiation release from the site.

References

Number	Title	Revision
N/A	WBN U1 Technical Specifications	Amendment 123
1-SOI-62.01	CVCS - Charging and Letdown	0011
1-ARI-102-108	HVAC & CVCS (108-A)	0012
1-ARI-95-101	RCPs (101-E)	0003
1-ARI-109-115	CVCS & RHR - RPS & ESF	0009
1-AOI-20	Malfunction of Pressurizer Level Control System	0008
1-ARI-109-115	CVCS & RHR - RPS & ESF	0009
1-AOI-16	Loss of Normal Feedwater	0006
1-AOI-44	Eagle 21 Malfunctions	0008
1-ARI-173-179	U1 Radiation Detectors (175-B and 178-A)	0010
1-ARI-57-63	Feedwater & Main Steam (62-F)	0003
1-AOI-33	Steam Generator Tube Leak	0008
1-AOI-39	Rapid Load Reduction	0006
1-E-0	Reactor Trip or Safety Injection	0016
1-E-3	Steam Generator Tube Rupture	0007
1-FR-0	Status Trees	0000

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	1		Page	5	of	103
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Event Description: Lower VCT pressure IAW 1-SOI-62.01 Section 8.27.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Role Play:

If contacted as Chemistry, state: "Waste Gas Decay Tank D, the in-service tank, has a hydrogen content of 0.1% and an oxygen content of 0.3%."

Role Play:

When contacted as AUO, wait 2 minutes and notify the MCR: "H2 has been isolated from the VCT. N2 was already isolated from the VCT."

Role Play:

When contacted as Radwaste Operator, acknowledge the direction and state: "Waste Gas Compressor A-A is in AUTO, but based on vent header pressure, there is no need for it to start."

OAC**RO****N/A****OAC****RO****RO****OAC**

WBN Unit 1	CVCS - Charging and Letdown	1-SOI-62.01 Rev. 0011 Page 118 of 129
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Date _____ Initials _____
8.27 Venting VCT to Reduce Pressure

CAUTION

Oxygen content in the Waste Gas Holdup system must **NOT** exceed 2% by volume when Hydrogen concentration exceeds 4% by volume as indicated on 0-XIC-43-50, Gas Analyzer H₂/O₂ Processor.

- [1] CHECK in-service Gas Decay Tank Hydrogen/Oxygen concentration within specification to receive gas from VCT. _____

_____ Hydrogen% _____ Oxygen%

- [1.1] IF in-service Gas Decay Tank cannot receive gas from VCT, THEN

PLACE a Gas Decay Tank that has satisfactory Hydrogen/ Oxygen concentration in-service. _____

- [2] ENSURE CVCS in operation with Letdown and Charging flow. _____

- [3] ENSURE H₂ and N₂ pressure regulators CLOSED. _____

- [4] NOTIFY Radwaste Operator to monitor Vent Header pressure, while venting the VCT, AND

PERFORM one of the following: _____

- [4.1] IF Waste Gas Compressor in AUTO, THEN

ENSURE Compressor starts as required. _____

- [4.2] IF Waste Gas Compressor is NOT in AUTO, THEN

START/STOP Compressor as required. _____

- [5] OPEN 1-FCV-62-125, VOLUME CONTROL TANK WDS VENT HEADER ISOL, using 1-HS-62-125, VCT VENT TO WDS VENT HDR [1-M-6] _____

Op Test	301	Scenario #	3	Event #	1		Page	6	of	103
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Event Description: Lower VCT pressure IAW 1-SOI-62.01 Section 8.27.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

160-F, WASTE GAS COMPR O2 (2%) HI, and 159-F, WASTE GAS COMPR O2 (4%) HI-Hi, will alarm if oxygen concentration reaches 4%.

Role Play:

If contacted as Chemistry or Radwaste Operator, state: "No indications of high oxygen content from the VCT."

N/A

OAC

RO

RO

Role Play:

If contacted as Chemistry, then acknowledge the direction(s).

Role Play:

When contacted as Radwaste Operator, acknowledge the direction.

WBN Unit 1	CVCS - Charging and Letdown	1-SOI-62.01 Rev. 0011 Page 119 of 129
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Date _____ Initials _____

8.27 Venting VCT to Reduce Pressure (continued)

[6] IF Waste Gas Compressor Discharge Oxygen concentration increases to greater than 4%, THEN

NOTIFY Radwaste Operator to perform Section 8.7 of 0-SOI-77.02, Waste Gas Disposal System. _____

[7] WHEN desired pressure is reached, THEN

CLOSE 1-FCV-62-125, VOLUME CONTROL TANK WDS VENT HEADER ISOL, using 1-HS-62-125, VCT VENT TO WDS VENT HDR. [1-M-6] _____

[8] IF desired to sample VCT, THEN

REQUEST Chemistry to sample VCT O₂, H₂, or N₂ as needed, AND

NOTIFY UO of results. _____

[9] ENSURE Waste Gas Compressors are SHUT DOWN and placed in AUTO or STOP/PTL as applicable per 0-SOI-77.02, Waste Gas Disposal System. _____

End of Section

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	3		Page	7	of	103
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Event Description: Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At CHIEF EXAMINER Direction:**Insert Simulator Schedule File Event 3**

(CCP 1B-B broken coupling)

INDICATIONS:

- 108-A, CHARGING FLOW HI/LO
- 101-E, RCP SEAL SUPPLY FLOW LO
- 110-A, REGEN HX LTDN TEMP HI
- 1-PI-62-92 and 1-FI-62-93 downscale low
- 1-EI-62-108A very low
- 1-TI-62-71 rising

Operator Actions:

- **OAC** will announce 108-A, 101-E and/or 110-A and refer to ARI-108-A (to the right), ARI-101-E (next page) and/or 110-A (following page)
- **CREW** will diagnose CCP 1B-B broken coupling
- **OAC** will place CCP 1B-B in STOP PULL TO LOCK
- **OAC** may isolate charging and letdown
- **US** will announce entry to 1-AOI-20, Malfunction of Pressurizer Level Control System, Section 3.3, Loss of Charging or Abnormal Charging Flow

Role Play:

RO may dispatch an AUO to investigate CCP 1B-B. If dispatched to CCP 1B-B, wait 5 minutes and notify MCR: "Speed changer on CCP 1B-B is damaged and the motor is no longer coupled to the pump."

Examiner Note(s):

108-A directs **US** to 1-AOI-20. 101-E directs **US** to 1-AOI-24. 1-AOI-20 is the correct procedure for this condition.

OAC
OAC
OAC/SRO
OAC

OAC

WBN Unit 1	HVAC & CVCS	1-ARI-102-108 Rev. 0012 Page 40 of 47
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Source

HI: 1-FS-62-93A (DCS)
LO: 1-FS-62-93B (DCS)

Setpoint

150 gpm
47 gpm with BOTH
75 gpm orifice valves
CLOSED OR
55 gpm with EITHER
75 gpm orifice valve
OPEN

108-A

CHARGING
FLOW
HI/LO

(Page 1 of 1)

Probable Cause:

- A. System pipe break
B. Charging pump tripped
C. Malfunction of Pressurizer Level Control System

Corrective Action:

- [1] CHECK 1-FI-62-93A, CHARGING FLOW [1-M-5] to determine if flow is high or low.
[2] CHECK 1-LI-68-320, -335A, and -339A, PZR LEVEL [1-M-4].
[3] IF PZR Level Control System malfunctions, THEN GO TO 1-AOI-20.
[4] IF charging flow is low, THEN
[4.1] CHECK letdown temperature.
[4.2] EVALUATE the following:
• INCREASING charging flow, OR
• ISOLATING letdown per Step 5.1 (below).
[5] IF charging is lost, THEN
[5.1] PERFORM the following to immediately isolate letdown:
[5.1.1] CLOSE letdown orifice isolation valves:
• 1-FCV-62-74, (75 gpm).
• 1-FCV-62-73, (75 gpm).
• 1-FCV-62-72, (45 gpm).
• 1-FCV-62-76, (5 gpm).
[5.1.2] CLOSE the letdown isolation valves:
• 1-FCV-62-69.
• 1-FCV-62-70.
[5.2] REFER TO 1-AOI-20.
[6] DETERMINE cause of problem, AND INITIATE corrective action, as necessary.
[7] REFER TO 1-SOI-62.01 for CVCS system operation.

References: 1-47W610-62-2
1-47W809-1
1-AOI-20
1-SOI-62.01
08F734235-FD-1605

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	3		Page	8	of	103
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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

237-D, RCP THRM BAR RET HDR TEMP HI, will alarm on loss of charging flow. 247-A, LTDN HX RET FLOW LO; and 247-B, LTDN HX RET TEMP HI, will alarm on isolation of letdown.

OAC

OAC

N/A

OAC

WBN Unit 1	Reactor Coolant Pumps	1-ARI-95-101 Rev. 0003 Page 47 of 50
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Source
RCP 1: 1-FS-62-1
RCP 2: 1-FS-62-14
RCP 3: 1-FS-62-27
RCP 4: 1-FS-62-40

Setpoint
6.5 gpm

101-E

RCP SEAL SUPPLY FLOW LO

(Page 1 of 1)

Probable Cause: A. Failure of FCV-62-89, Seal Water Supply Back Pressure Control valve (valve fails open)
B. Seal water injection filter dirty
C. Valve misalignment to individual RCP
D. Charging pumps shut down

Corrective Action: [1] CHECK seal water flow to each pump [1-M-5].
• RCP 1: FI-62-1A
• RCP 2: FI-62-14A
• RCP 3: FI-62-27A
• RCP 4: FI-62-40A
[2] IF all seal water flows are low, THEN
[2.1] CHECK FCV-62-89 for proper operation.
[2.2] CHECK Window 101-D in alarm for indication of dirty filter.
[3] IF only one pump's seal water flow is low, THEN
[3.1] MONITOR pump leakoffs.
[3.2] MONITOR pump vibrations.
[4] REFER TO 1-AOI-24, RCP MALFUNCTIONS DURING PUMP OPERATION.

References: 1-47W610-62-1
1-AOI-24

Appendix D Required Operator Actions Form ES-D-2

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Event Description: Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>OAC OAC OAC OAC OAC OAC</div>	<div><div><div>WBN Unit 1</div><div>CVCS & RHR - RPS & ESF</div><div>1-ARI-109-115 Rev. 0009 Page 11 of 49</div></div><div><div>Source 1-TS-62-71 (DCS)</div><div>Setpoint 397°F</div><div>110-A</div></div><div><div>REGEN HX LTDN TEMP HI</div><div>(Page 1 of 1)</div></div><div><div>Probable Cause:</div><div>A. High Letdown flow B. Low Charging flow</div></div><div><div>Corrective Action:</div><div>[1] CHECK letdown temperature on 1-TI-62-71 [1-M-6]. [2] ENSURE 1-HIC-62-81 maintaining 320 to 350 psig on 1-PI-62-81 [1-M-6]. [3] ENSURE charging flow on 1-FI-62-93A [1-M-5] is 12 to 15 gpm greater than letdown flow on 1-FI-62-82 [1-M-6]. [4] CONSIDER the following operations to reduce letdown temperature:<ul style="list-style-type: none">REDUCE letdown flow.MAINTAIN letdown pressure at approximately 340 psig.INCREASE charging flow. [5] MONITOR RCP seal flow. [6] MONITOR PZR level.</div></div><div><div>References:</div><div>1-47W809-1 1-47W610-62-2 08F734235-FD-1609</div></div></div>
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Op Test	301	Scenario #	3	Event #	3		Page	10	of	103
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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US performs a crew update and enters 1-AOI-20.
US determines that the failure is a loss of charging and goes to Section 3.3.

SRO

WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
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3.0 OPERATOR ACTIONS

3.1 Diagnostics

IF	GO TO Subsection
Instrumentation and Control Malfunction	3.2
Malfunction of 1-FCV-62-93 or 89	3.2
Loss of Charging or Abnormal Charging Flow	3.3

Op Test	301	Scenario #	3	Event #	3		Page	11	of	103
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Event Description: Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): Attachment 3 is on p. 22.</div>	<div>OAC/SRO OAC/SRO OAC/SRO N/A</div>	<div><table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW</p><p>CAUTION Standby CCP should NOT be started if failure of running CCP was due to common issue such as cavitation, gas binding, etc.</p><p>NOTE 1 Attachment 3 may be used throughout this section to assist with monitoring.</p><p>NOTE 2 Cavitation is indicated by fluctuating header pressure, amps and flow. Gas Binding / Sheared Shaft indicated by low amps and zero flow.</p><p>1. IF indication of cavitation or gas binding, THEN</p><p>a. PLACE BOTH CCPs in STOP PULL-TO-LOCK</p><p>b. ENSURE Letdown Isolated:</p><ul style="list-style-type: none">CLOSE letdown orifice(s)CLOSE 1-FCV-62-69CLOSE 1-FCV-62-70<p>c. ENSURE Excess Letdown isolated:</p><ul style="list-style-type: none">CLOSE 1-FCV-62-54CLOSE 1-FCV-62-55<p>d. DISPATCH NAUO with Maintenance personnel to vent CCP(s) using Attachment 4.</p><p>e. ** GO TO Caution prior to STEP 5.</p><p>Page 11 of 42</p></div>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	3		Page	12	of	103
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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	OAC/SRO N/A	<table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW (continued)</p> <p>NOTE Header Rupture indicated by high amps and low discharge pressure.</p> <p>2. IF indication of a Charging header rupture, THEN</p> <p>a. DETERMINE location of the leak and leak rate.</p> <p>a. IF location is unknown and/or rate is a threat to personnel/equipment, THEN :</p> <p>b. ENSURE Letdown Isolated if required:</p> <ul style="list-style-type: none">• PLACE RUNNING CCP's in STOP Pull-To-Lock.• CHECK thermal barrier cooling in service to RCP seals.• DETERMINE if leak is isolable to one CCP. <ul style="list-style-type: none">• CLOSE letdown orifice(s)• CLOSE 1-FCV-62-69• CLOSE 1-FCV-62-70 <p>c. ENSURE Excess Letdown isolated if required:</p> <ul style="list-style-type: none">• CLOSE 1-FCV-62-54• CLOSE 1-FCV-62-55 <p>d. DISPATCH Operations and RP personnel to identify and isolate rupture.</p> <p>e. REFER to 1-AOI-6, WHILE CONTINUING this AOI at Caution before step 5.</p>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	3		Page	13	of	103
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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC may have previously placed CCP 1B-B HS in STOP PULL TO LOCK and previously isolated letdown.

OAC
OAC

OAC

Examiner Note(s):

Thermal Barrier cooling is in service. **US** will go to step [7] (p. 15).

WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW (continued)

3. **PERFORM** the following:

a. **STOP PULL-TO-LOCK**
affected CCP.

b. **ENSURE** Letdown Isolated:

- CLOSE letdown orifice(s)
- CLOSE 1-FCV-62-69
- CLOSE 1-FCV-62-70

c. **ENSURE** Excess Letdown isolated:

- CLOSE 1-FCV-62-54
- CLOSE 1-FCV-62-55

4. **CHECK Thermal Barriers in service.** **** GO TO Step 5**

**** GO TO Step 7**

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	3		Page	14	of	103
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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table border="1"> <tr> <td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr> </table>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008			
		<table border="1"> <tr> <td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr> </table>	Step	Action/Expected Response	Response Not Obtained
Step	Action/Expected Response	Response Not Obtained			
	N/A	<p>3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW (continued)</p> <p style="margin-left: 40px;">CAUTION If both RCP thermal barrier cooling flow and seal injection flow have been lost, RCP seals will overheat rapidly.</p> <p style="margin-left: 40px;">NOTE If reactor trip required, this AOI should be resumed upon entry into 1-ES-0.1.</p>			
	N/A	<p>5. IF both Charging and Thermal Barrier cooling are lost, THEN</p> <ul style="list-style-type: none"> a. (p) TRIP reactor (if in Mode 1 or 2) b. STOP all RCP's c. PERFORM 1-E-0 (if in Mode 1or 2) d. WHEN 1-E-0 immediate actions complete, THEN ISOLATE RCP seals using Attachment 2. 			
	N/A	<p>6. MONITOR RCP lower bearing AND seal water outlet temperature less than 225°F.</p> <p style="margin-left: 40px;">IF greater than 225°F, THEN</p> <ul style="list-style-type: none"> a. (p) TRIP reactor (if in Mode 1 or 2) b. STOP all RCPs c. PERFORM 1-E-0 (if in Mode 1 or 2) d. WHEN 1-E-0 immediate actions complete, THEN ISOLATE RCP seals using Attachment 2. 			

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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW
(continued)

7. ENSURE CCP suction path established:

a. CHECK SI signal NOT actuated.	a. **GO TO applicable EOP procedure, WHILE CONTINUING this Instruction.
b. ENSURE suction from VCT established: <ul style="list-style-type: none">VCT greater than 13%1-LCV-62-132 and 1-LCV-62-133 OPEN.	b. IF in Mode 1 or 2, THEN ATTEMPT to restore suction from VCT prior to starting CCP. IF VCT suction CANNOT be established, THEN ENSURE 1-LCV-62-135 or 1-LCV-62-136 OPEN AND PERFORM 1-AOI-39 in conjunction with this AOI to place plant in Mode 3.

OAC
OAC

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Op Test	301	Scenario #	3	Event #	3		Page	16	of	103
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Event Description: Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Role Play:

RO may dispatch an AUO to ensure CCP 1A-A is ready for a start.
If dispatched to CCP 1A-A, wait 30 seconds and notify MCR: "Manual suction and discharge valves are OPEN; lube oil levels are good, room cooler is available in AUTO, and suction pressure is approx. 35 psig. CCP 1A-A is ready for a start."
Following start, notify MCR: "Good start on CCP 1A-A. Room cooler is running."

Examiner Note(s):

On a normal start, the HS will start the aux lube oil pump. CCP 1A-A will start approx. 5 seconds after the HS is placed to START.

OAC/SRO
RO/SRO
OAC/SRO
OAC
OAC/SRO
N/A
RO
OAC

WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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- 3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW (continued)
- CAUTION If gas intrusion is suspected or suction to a running CCP was lost, NO CCP should be started UNTIL pump and piping are vented.
- NOTE If RCP thermal barrier cooling is established and sufficient time exists for local inspection, then CCP start should be delayed until after completion of inspection.
8. CHECK any CCP available for start: **GO TO step 15.
- gas intrusion NOT suspected OR venting complete
 - suction path established
 - rupture has NOT occurred OR isolated
 - venting performed as required
 - NAUO verified ready locally as time allows
9. START available CCP.

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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>US will exercise the RNO and use Attachment 1 to establish charging and letdown. Attachment 1 is on pp. 19-21.</p>	OAC	<table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW (continued)</p> <p>10. CHECK letdown in SERVICE</p> <ul style="list-style-type: none">1-FCV-62-69 OPEN1-FCV-62-70 OPEN1-FCV-62-77 OPENLetdown orifice OPENLetdown flow NORMAL <p>ENSURE PZR heater banks D and C ON.</p> <p>ESTABLISH charging and letdown, refer to Attachment 1</p> <p>IF letdown CANNOT be established, THEN PERFORM the following:</p> <ol style="list-style-type: none">CLOSE charging valves 1-FCV-62-90 and 1-FCV-62-91MAINTAIN RCP seal flow between 8 and 13 gpm with charging valve controller 1-HIC-62-93APLACE excess letdown in service:<ol style="list-style-type: none">OPEN 1-FCV-70-143OPEN 1-FCV-70-85OPEN 1-FCV-62-54OPEN 1-FCV-62-55ENSURE 1-HS-62-59A in NORMALENSURE 1-FCV-62-61 OPENENSURE 1-FCV-62-63 OPENADJUST 1-HIC-62-56A to obtain maximum flow and maintain Excess Letdown HX outlet temp less than 200°FSTABILIZE PZR level by adjusting seal injection and Excess Letdown flows <p>IF 1-PCV-62-81 failed closed, THEN REFER TO Attachment 1 to restore charging and letdown in conjunction with 1-SOI-62.01, WHEN ready to LOCALLY CONTROL 1-PCV-62-81.</p> <p>Page 17 of 42</p>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

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<p>US evaluates Technical Specifications.</p> <p>Tech Specs:</p> <ul style="list-style-type: none">• LCO 3.5.2, ECCS - Operating, Condition A• TR 3.1.4, Charging Pumps – Operating, Condition A <p>Role Play:</p> <p>When US contacts SM, Work Control, FIN, Duty Managers, Ops Superintendent, Ops Director and/or Plant Manager, acknowledge the request(s) and information provided.</p> <p>Examiner Note(s):</p> <p>US performs crew update to exit 1-AOI-20. US may then conduct crew brief to discuss failure and LCO NOT met.</p>	<p>SRO</p> <p>SRO</p> <p>SRO</p> <p>SRO</p> <p>N/A</p>	<table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 LOSS OF CHARGING OR ABNORMAL CHARGING FLOW (continued)</p> <p>11. REFER TO the following Tech Specs:</p> <ul style="list-style-type: none">• 3.4.9 Pressurizer• 3.5.2, Emergency Core Cooling Systems (ECCS)• TR 3.1.4 Charging Pump, Operating <p>12. NOTIFY SM to evaluate NPG-SPP-01.12, TVA Nuclear Event Response Process.</p> <p>13. NOTIFY WCC to initiate repairs if necessary.</p> <p>14. RETURN TO instruction in effect.</p> <p>15. IF gas intrusion suspected, THEN DISPATCH NAUO with Maintenance personnel to vent CCP(s) using Attachment 4.</p> <p>Page 18 of 42</p>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table border="1"> <tr> <td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr> </table> <p style="text-align: center;">Attachment 1 (Page 1 of 3)</p> <p style="text-align: center;">ALIGNMENT OF CHARGING AND LETDOWN</p> <p>1.0 OPERATOR ACTIONS</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">NOTE</p> <p>This section can be used in conjunction with 1-SOI-62.01 for local control of 1-FCV-62-89, 1-PCV-62-81 or 1-FCV-62-93. Substitute local actions as appropriate for Steps 1.1B.1, 1.1B.2, 1.1B.6, 1.1E, 1.1H and 1.1F.</p> </div> <p>1.1 Establish Charging and Letdown</p> <ul style="list-style-type: none"> <li>A. ENSURE DCS inputs for PZR Level are Restored IAW 1-SOI-98.01. <li>B. IF charging NOT established, THEN PERFORM the following: <ul style="list-style-type: none"> <li>1. CLOSE 1-FCV-62-89, CHRG HDR-RCP SEALS FLOW CONTROL. <li>2. CLOSE 1-FCV-62-93, CHARGING FLOW PZR EVEL CONTROL. <li>3. ENSURE Charging Pump running. <li>4. OPEN 1-FCV-62-90 and 1-FCV-62-91, CHARGING LINE ISOL. <li>5. ENSURE 1-FCV-62-85, NORM CHARGING TO LOOP 1, or 1-FCV-62-86, ALT CHARGING TO LOOP 4, OPEN. <li>6. ADJUST 1-FCV-62-93 and 1-FCV-62-89 to maintain seal injection flow between 8 and 13 gpm for each RCP. <li>C. ENSURE letdown isol valves OPEN: <ul style="list-style-type: none"> <li>1. 1-FCV-62-69, CVCS LETDOWN ISOLATION. <li>2. 1-FCV-62-70, CVCS LETDOWN ISOLATION <li>3. 1-FCV-62-77, CVCS LP LETDOWN ISOLATION. <li>D. PLACE 1-HIC-62-78A, LETDOWN HX OUTLET TEMP 1-TCV-70-192 CNTL, in MANUAL at 25% OPEN. <li>E. PLACE 1- HIC-62-81A, LETDOWN PRESS CONTROL, in MANUAL at 40-50% OPEN if using 75 gpm orifice (20-30% OPEN if using 45 gpm orifice). <p style="text-align: right;">Page 33 of 42</p>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008			

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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>OAC should OPEN a 75 gpm orifice.</div>	<div>OAC</div> <div>OAC/SRO</div> <div>OAC</div> <div>OAC</div> <div>OAC</div> <div>OAC</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr></table></div> <div>Attachment 1 (Page 2 of 3)</div> <div>F. ESTABLISH 75 gpm or greater charging flow while maintaining seal injection flow between 8 and 13 gpm for each RCP using 1-FCV-62-93 and 1-FCV-62-89.</div> <div><div>NOTE</div><div>Sufficient charging flow should be established prior to performing this next step.</div></div> <div>G. OPEN letdown orifices as needed:<ul style="list-style-type: none">1-FCV-62-72 (45 gpm)1-FCV-62-73 (75 gpm).1-FCV-62-74 (75 gpm).1-FCV-62-76 (5 gpm).</div> <div>H. ADJUST 1-HIC-62-81A, LETDOWN PRESS CONTROL, for desired press, (320 psig at normal letdown temp)</div> <div>I. PLACE 1-HIC-62-81A, LETDOWN PRESS CONTROL in AUTO.</div> <div>J. PLACE 1-HIC-62-78A, LETDOWN HX OUTLET TEMP TCV-70-192 CNTL, in AUTO.</div> <div>K. RETURN PZR level to program.</div> <div>L. WHEN ready to return 1-FCV-62-93 to AUTO control, THEN PERFORM Section 1.2</div> <div>Page 34 of 42</div>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008			

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Event Description:	Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

This section of Attachment 1 is typically NOT used.
Provided for completeness.

Examiner Note(s):

OAC and US may use step [C] to minimize deviation on
1-HIC-62-93A.

OAC
OAC

OAC

OAC

OAC
OAC

OAC

WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
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Attachment 1
(Page 3 of 3)

- 1.2 Establish AUTO Control of 1-FCV-62-93
- A. ENSURE DCS inputs for PZR Level are Restored IAW 1-SOI-98.01.
 - B. RETURN 1-FCV-62-93 to AUTO.
OR
 - C. IF large controller deviation exists, THEN
PERFORM the following:
 - 1. PLACE 1-LIC-68-339, CHRGR FLOW/PZR LEVEL CONTROL in MANUAL. [1-M-4]
 - 2. ADJUST 1-LIC-68-339, CHRGR FLOW/PZR LEVEL CONTROL to obtain zero deviation on 1-HIC-62-93A, CHARGING FLOW PZR LEVEL CONTROL. [1-M-4]
 - 3. PLACE 1-HIC-62-93A, CHARGING FLOW PZR LEVEL CONTROL in AUTO. [1-M-5]
 - 4. ADJUST 1-LIC-68-339, CHRGR FLOW/PZR LEVEL CONTROL to obtain zero deviation. [1-M-4]
 - 5. PLACE 1-LIC-68-339, CHRGR FLOW/PZR LEVEL CONTROL in AUTO. [1-M-4]

Op Test	301	Scenario #	3	Event #	3		Page	22	of	103
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Event Description: Loss of CCP 1B-B. 1-AOI-20. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Attachment 3 is provided for information only. No actions are taken in Attachment 3.

WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
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Attachment 3
(Page 1 of 1)

Monitor Steps During Loss of Charging

1.0 MONITOR STEPS DURING LOSS OF CHARGING

NOTE
This Attachment can be used as a guide to help notify the operator when different monitoring steps are required during the performance of section 3.3.

STEP	ACTION
6	Lower bearing AND seal water temperature less than 225°F
16	IF Mode 1 or 2 MONITOR <ul style="list-style-type: none">Pressurizer level within 10% of program band.Boration required to comply with Tech Specs
24	RCS T-cool greater than 350°F
25	SI actuation needed <ul style="list-style-type: none">containment pressure greater than 1.5 psigRCS pressure less than 1670 psig uncontrolledSi/G pressure less than 675 psig uncontrolled
26	SI injection needed <ul style="list-style-type: none">boration requiredPZR level less than 15%PZR level raised to support cooldown

Appendix D Required Operator Actions Form ES-D-2									
Op Test	301	Scenario #	3	Event #	4		Page	23	of 103
Event Description:		Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.							
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior			
<p>At CHIEF EXAMINER Direction:</p> <p>Insert Simulator Schedule File Event 4</p> <p>(1-R-3 loses power. SG 2 FRV OPENS in AUTO.)</p> <p>INDICATIONS:</p> <ul style="list-style-type: none">• 110-F, PROT SET TROUBLE• 111-F, PROT SET I CHANNEL FAILURE• 82-F, DCS TROUBLE• 81-F, DCS CRITICAL LOOP• 1-FI-3-35A, SG 1 MFW FLOW, and 1-FI-3-48A, SG 2 MFW FLOW, fail LOW• 1-PI-1-2A, SG 1 PRESSURE, and 1-PI-1-9A, SG 2 PRESSURE, fail LOW• 1-FI-1-3A, SG 1 STEAM FLOW, and 1-FI-1-10A, SG 2 STEAM FLOW, fail LOW• 1-LI-63-50, RWST LEVEL, fails LOW• 1-PI-30-45, CONTAINMENT PRESSURE, fails LOW• 1-LI-62-238, BAT A LEVEL, fails LOW									

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	4		Page	24	of	103
Event Description:		Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.								
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior				

Operator Actions:

- **OAC** will announce 110-F and/or 111-F and refer to ARI-110-F (following page) and ARI-111-F (p. 28)

Critical Task(s):

1. Manually control SG 2 level prior to requiring a Manual Reactor Trip or reaching an Automatic Reactor Trip setpoint (82.4% on HI-HI and 17% on LO-LO).
- **BOP** will take MANUAL control of 1-FIC-3-48A, SG 2 FRV, by depressing the AUTO/Man pushbutton. **BOP** should begin lowering output by depressing the << pushbutton. With no operator action, the turbine will trip on SG Hi Hi level in less than 2 min.
 - **CREW** will diagnose loss of power to 1-R-3
 - **US** will announce entry to 1-AOI-44, Eagle 21 Malfunctions, or 1-AOI-16, Loss of Normal Feedwater

Examiner Note(s):

If the turbine and reactor trip, **CREW** will enter 1-E-0, Reactor Trip or Safety Injection, and transition to 1-ES-0.1, Reactor Trip Response, on 1-E-0 step [4]. First four steps of 1-E-0 are located in Event 7 (p. 61).

If reactor trip occurs, after transition to 1-ES-0.1 and

at **CHIEF EXAMINER Direction:**

Insert Simulator Schedule File Event 7

(SG tube rupture on SG 2.)

Go to Event 7 on p. 61 of this guide.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	4		Page	25	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<p>Role Play:</p> <p>When contacted as AUO, wait 2 minutes, then notify the MCR: "No one is in the Unit 1 Aux Instrument Room. I do not see a cause for the alarm."</p> <p>Role Play:</p> <p>When contacted as Security, acknowledge the report.</p> <p>Role Play:</p> <p>When contacted as Work Control, acknowledge the request(s) and information provided.</p>	<p>OAC OAC/SRO RO SRO SRO</p>	<div><div><div>WBN Unit 1</div><div>CVCS & RHR - RPS & ESF</div><div>1-ARI-109-115 Rev. 0009 Page 16 of 49</div></div><div><div>Source</div><div>14 PROTECTION RACKS</div><div>110-F</div><div><div>PROT SET TROUBLE</div><div>R</div></div><div>(Page 1 of 1)</div></div><div><div>NOTE</div><div>A channel in bypass for Instrument Maintenance work, due to Eagle software makeup, may generate a mismatch signal which will give a protection set trouble alarm.</div></div><div><div>Probable Cause:</div><div><div>A. Instrument Maintenance work being performed in any of 14 Protection Racks</div><div>B. Internal cabinet temperature greater than 120°F</div><div>C. Loss of power</div><div>D. Channel bypass failure</div><div>E. Eagle 21 system equipment failure</div><div>F. RTD trouble</div></div></div><div><div>Corrective Action:</div><div><div>[1] CHECK Protection Set status panel lights 1-XX-55-5 on 1-M-5 to identify which set is in alarm AND INFORM SRO.</div><div>[2] REFER TO 1-AOI-44, EAGLE 21 MALFUNCTIONS.</div><div>[3] IF source of alarm is unknown, THEN DISPATCH Operator to Aux Instrument Rm to investigate AND INFORM SRO.</div><div>[4] IF alarm was unexpected, THEN NOTIFY Security.</div><div>[5] NOTIFY Work Control to initiate corrective action, as necessary.</div></div></div><div><div>References:</div><div><div>47W610-99 Series</div><div>W 5D63347 Sheets 3-29</div><div>W 108D408-57</div><div>1-AOI-44</div></div></div></div>
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Op Test	301	Scenario #	3	Event #	4		Page	26	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>When contacted as Security, acknowledge the report.</p> <div>Examiner Note(s):</div> <p>ARI-110-F and 112-F direct the US to 1-AOI-44.</p> <p>However, 1-AOI-44 will direct the US to 1-AOI-16 to stabilize the plant due to SG 2 FRV not able to control SG 2 Level in AUTO. 1-AOI-16 begins on p. 33.</p>	<div>OAC</div> <div>OAC/SRO</div> <div>RO</div>	<div><div><div>WBN Unit 1</div><div>CVCS & RHR - RPS & ESF</div><div>1-ARI-109-115 Rev. 0009 Page 22 of 49</div></div><div>Source CHANNEL I</div><div>111-F</div><div><div>PROT SET I CHANNEL FAILURE</div><div>R</div></div><div>(Page 1 of 1)</div><div><div>NOTES</div><div>1) Illumination of this Window may indicate the channel has a fatal error that would prevent proper actuation of the protection system. 2) Failure of a protection set or components which result in inability of the protection set to provide its protective function will trip bistable outputs associated with that protection set.</div></div><div><div>Probable Cause:</div><div>A. Loss of 120V ac Supply from:<ul style="list-style-type: none">120V ac Vital Inst Power Bd 1-I120V ac Vital Inst Power Bd 2-IB. Eagle 21 input data NOT being updated C. Eagle 21 hardware or software failure</div></div><div><div>CAUTION</div><div>Analog indications originating from failed protection set/channel may fail at the value of the last signal that was input to the indicator. [C.1]</div></div><div><div>Corrective Action:</div><div>[1] INFORM SRO. [2] ** GO TO 1-AOI-44, EAGLE 21 MALFUNCTIONS. [3] IF alarm was unexpected, THEN NOTIFY Security.</div></div><div><div>References:</div><div>47W610-99 Series W 5D63347-3, -5, -7, -9 W 108D408-57 1-AOI-44</div></div></div>
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Op Test	301	Scenario #	3	Event #	4		Page	27	of	103
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Event Description:	Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>1-FIC-3-48A is forced to single element due to the loss of 1-FI-3-48A and 1-FI-3-48B being bypassed in DCS at the beginning of shift.</div> <div>Examiner Note(s):</div> <div>RO should identify 1-R-3 as the failed rack using either the alarm printer or ICS.</div>	<div>BOP/SRO</div> <div>RO/SRO</div> <div>RO</div>	<div><table><tr><td>WBN Unit 1</td><td>Eagle 21 Malfunctions</td><td>1-AOI-44 Rev. 0008</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.0 OPERATOR ACTIONS</div> <div>3.1 Protection Set And Failure Type Identification</div> <div><div>CAUTION</div><div>Rack failure with existing OOS loops may result in some controls forced to MANUAL by Distributed Control System (DCS) logic.</div></div> <div><div>NOTE</div><div>DCS may auto bypass some or all associated inputs.</div></div> <div>1. IDENTIFY rack associated with failure:</div> <div><div>• REFER TO ALARM printer.</div><div>OR</div><div>• ENTER "EGLRCK" Turn-on code into ICS computer screen (failed rack will have red lights next to any status):</div><div>OR</div><div>• REFER TO Appendix A to identify failed rack from bistable pattern</div></div> <div>Page 5 of 65</div>	WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	4		Page	28	of	103
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Event Description:	Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Additional bistables are LIT for SG Lo Pressure and SG Pressure Negative Rate for SGs 1 and 2, RWST Lo Level and Containment Pressure Hi and Hi Hi due to loss of power to the associated bistables. (All additional bistables are Channel II and will be in the second row of status panels on 1-M-6.)

US will exercise the step [2] RNO and GO TO Section 3.2.

OAC
OAC

WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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3.1 Protection Set And Failure Type Identification (continued)

NOTE Additional bistables lit in row may indicate a power or Loop Calculation Processor (LCP) failure. (PROT SET TROUBLE lights 19, 39, 59, & 79 are not bistables)

2. CHECK bistable indications NORMAL. **GO TO Section 3.2, Response to LCP or Output Failure.
3. CHECK rack outputs are NORMAL: **GO TO Section 3.2, Response to LCP or Output Failure.
 - REFER TO ICS computer screen:

1) SELECT NSSS AND BOP

2) SELECT EAGLE 21 MENU

3) SELECT RACK [with rack number] top row.
 - OR
 - COMPARE indications with operable channels.

NOTE Protection set OPERABILITY is not affected by a TSP failure. A rack with a failed TSP will not be capable of alerting the operator of a rack internal diagnostic error.

4. NOTIFY work control to evaluate Eagle 21 TSP failure and reset system failure.
5. CHECK other racks normal. **GO TO Step 1.
6. RETURN TO Instruction in effect.

End of Section

Op Test	301	Scenario #	3	Event #	4		Page	29	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Section 3.1 step [1] determined that 1-R-3 was the failed rack.

SRO

WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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3.2 Response to LCP or Output Failure

IF FAILURE IN	**GO TO	PAGE
Protection Set I/Channel 1		
1-R-1	Section 3.2.1	8
1-R-2	Section 3.2.2	11
1-R-3	Section 3.2.3	14
1-R-4	Section 3.2.4	17
Protection Set II/Channel 2		
1-R-5	Section 3.2.5	20
1-R-6	Section 3.2.6	24
1-R-7	Section 3.2.7	27
1-R-8	Section 3.2.8	30
Protection Set III/Channel 3		
1-R-9	Section 3.2.9	33
1-R-10	Section 3.2.10	37
1-R-11	Section 3.2.11	39
Protection Set IV/Channel 4		
1-R-12	Section 3.2.12	42
1-R-13	Section 3.2.13	45
1-R-28	Section 3.2.14	48

Op Test	301	Scenario #	3	Event #	4		Page	30	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

SG 2 feedwater is NOT controlled. **US** will exercise the RNO and REFER to 1-AOI16 (p. 33).

N/A
OAC/SRO

SRO

BOP

WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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3.2.3 Rack 1-R-3 Failure

CAUTION All analog outputs from failed rack are FROZEN in place (providing power supply has not failed). This may include inputs to recorders.

NOTES Instrument loop inputs to U1118 and U2118 may be affected by LCP failure.

1-IMI-99.003 may be referenced for 1-R-3 Eagle 21 loop identifiers and failure responses.

1. CHECK Feedwater controls in AUTO and CONTROLLED.
- IF Feedwater controls forced to manual, THEN

CONTROL feed flow as necessary.

IF Feedwater CANNOT be maintained on program, THEN

REFER TO 1-AOI-16 while continuing with this procedure.

Op Test	301	Scenario #	3	Event #	4		Page	31	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	RO RO RO	<table><tr><td>WBN Unit 1</td><td>Eagle 21 Malfunctions</td><td>1-AOI-44 Rev. 0008</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2.3 Rack 1-R-3 Failure (continued)</p> <p>2. ENSURE 1-R-3 inputs to DCS are bypassed using DCS Operator Display:</p> <ul style="list-style-type: none">a. NAVIGATE to "1-AOI-44 EAGLE CHANNEL BYPASS" screenb. SELECT 1-R-3 to bring up bypass overlay.c. CHECK all EAO channels listed indicate yellow "BYPASSED" condition.c. PERFORM the following to bypass all Rack 3 inputs to DCS:<ul style="list-style-type: none">1) CHANGE to NSSS Operator or BOP Operator, Environment. Refer to 1-SOI-98.01 as necessary.2) NAVIGATE to "EAGLE CHANNEL BYPASS" screen3) SELECT 1-R-3 to bring up bypass overlay.4) SELECT BYPASS EAGLE RACK 1-R-3 on overlay.5) CHECK channel(s) indicate yellow "BYPASSED" condition.6) CHANGE to INITIAL environment. <p>Page 15 of 65</p>	WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	4		Page	32	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Loss of venturi-based feed flow to SG 2 affects the venturi-based calorimetric, ICS 1118 series of points. Loss of steam flows and steam pressures affect both the venturi-based calorimetric and the LEFM-based calorimetric (ICS 2118 series of points). However, in the case of steam flows and steam pressures, ICS can use the redundant Channel II input to continue to calculate LEFM-based calorimetric power. TR 3.3.7 remains met. TR 3.1.6, Borated Water Sources, Operating, is TRACKING ONLY due to loss of BAT A level indication. TR 3.1.6 is only required as specified by TR 3.1.2, Borated Systems Flow Paths, Operating, which ONLY requires the RWST OPERABLE (RWST provides 2 of the 3 paths required by TR 3.1.2).

US evaluates Technical Specifications.

Tech Specs:

- LCO 3.3.2, ESFAS, Condition A
 - SI Containment Pressure, Function 1.c, Condition D
 - SI Steam Line Pressure, Function 1.e, Condition D
 - Containment Spray, Function 2.c, Condition E
 - Phase B, Function 3.b.(3), Condition E
 - SLI Containment Pressure, Function 4.d.(1), Condition D
 - Sump Swapover, Function 7.b, Condition K
- LCO 3.3.3, Post Accident Monitoring, Condition A
 - Containment Pressure (NR), Function 10
 - RWST Level, Function 23
 - SG Pressure for SGs 1 and 2, Function 24

Role Play:

When contacted as Work Control, acknowledge the request(s) and information provided. Notify the MCR: "Work Control SRO will evaluate EOOS for potential elevation of risk."

RO/SRO

SRO

SRO
SRO

RO

RO

SRO

Technical Specification determination for Event 4 revised based on Facility Post Exam Comment. (ref ML#19256B032 and ML#19297E281, Enclosure 2, Item 1):

LCO 3.3.2 requires entry into Condns A, D (Functions 1.e & 4.d.(1)), E (Functions 2.c, 3.b.(3) and 4.c), K (Function 7.b)

LCO 3.3.3 requires entry into Condns A (Functions 10, 23 & 24)

WBN Unit 1	Eagle 21 Malfunctions	1-AOI-44 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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3.2.3 Rack 1-R-3 Failure (continued)

NOTE The following instrument loops are affected by this failure:

- Feedwater Flow Loops 1-LPF-3-35A & 48A.
- Steam Flow Loops 1-LPF-1-3A & 10A.
- RWST Level including Auto Recirc Intlk on RWST Lo Lvl 1-LPL-63-50.
- Steam Press Loops 1-LPP-1-2A & 9A.
- Containment Press Loop 1-LPP-30-45.
- Boric Acid Tank A Level 1-LPL-62-238

3. REFER TO TECH SPECS:

- 3.3.2 for Modes 1, 2 and 3
- 3.3.3 for Modes 1, 2 and 3
- TR 3.3.7 >15% RTP
- TR 3.1.6 for Modes 1, 2 and 3

4. INITIATE repairs to failed rack.

5. EVALUATE EOOS for potential action in accordance with NPG-SPP-09.11.1.

6. CHECK indications normal for other Eagle 21 rack(s). RETURN TO Section 3.1, Protection Set Failure Identification.

7. MONITOR any alternate indications available for inputs lost to IIT alarms.

8. RETURN TO Instruction in effect.

End of Section

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Op Test	301	Scenario #	3	Event #	4		Page	33	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US will perform crew update to enter 1-AOI-16.
US will determine that Section 3.5 applies.

SRO

WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006
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3.0 OPERATOR ACTIONS

3.1 Diagnostics

	GO TO Subsection	PAGE
IF TDMFP Trip or Loss of Flow with:		
Main Turbine Offline	3.2	6
LESS than 800 MWe (67% Turbine Load)	3.3	8
GREATER than or equal to 800 MWe (67% Turbine Load)	3.4	11
IF:		
Failure of Automatic S/G Level Control	3.5	16
Failure Of Automatic MFW Pump Control	3.6	22
Standby MFWP TRIP (without trip of a TDMFP)	3.7	26
Single Feedwater Control Instrument Failure	3.8	30

Op Test	301	Scenario #	3	Event #	4		Page	34	of	103
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Event Description:	Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

1. Manually control SG 2 level prior to requiring a Manual Reactor Trip or reaching an Automatic Reactor Trip setpoint (82.4% on HI-HI and 17% on LO-LO).

Examiner Note(s):

US should establish a “trigger” value to trip the reactor. Typical “trigger” values would be 25% and lowering or 80% and rising.

Examiner Note(s):

US will exercise the step [4] RNO.

BOP
BOP
OAC/SRO
BOP

BOP
OAC

BOP
N/A

WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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- 3.5 Failure of Automatic S/G Level Control
1. RESTORE S/G level(s)
- a. ENSURE failed MFW reg. or bypass reg. valve in MANUAL.
- b. CONTROL feedwater flow on affected S/G(s) to maintain S/G level on program.
- b. (p) IF reactor trip imminent due high or low S/G level, THEN TRIP reactor, and **GO TO 1-E-0, Reactor Trip or Safety Injection.
2. EVALUATE placing control rods in MANUAL.
3. CHECK MFW pumps recirc valves CLOSED. PLACE affected valve in MANUAL and CONTROL as necessary.

NOTES
1) Bypass reg. valve may be manually positioned up to 0.85 x 10 ⁶ lb./hr. flow to dampen oscillations in feedwater flow in loop of affected main reg. valve.
2) A power tilt in the affected core quadrant may occur due to a rise in bypass flow. Flows above 84,500 lbm/hr. in the bypass line will invalidate the value of computer point U1118.

4. CHECK SG levels on bypass reg. valve control. ** GO TO Step 7.
5. CONTROL failed bypass reg. valve to restore S/G levels on program.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	4		Page	35	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A	<table><tr><td>WBN Unit 1</td><td>Loss of Normal Feedwater</td><td>1-AOI-16 Rev. 0006</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.5 Failure of Automatic S/G Level Control (continued)</p> <p>6. CHECK S/G levels returning to PROGRAM.</p> <p>IF turbine in service, THEN TRIP turbine AND **GO TO 1-AOI-17.</p> <p>IF turbine out of service, THEN</p> <p>1) (p) INSERT control rods to reduce reactor power to within AFW capabilities (less than 4%), then MAINTAIN zero startup rate.</p> <p>2) ENSURE AFW pumps running.</p> <p>3) ENSURE AFW LCVs controlling S/G levels to 38%:</p> <ul style="list-style-type: none">• AFW LCVs in auto or manual. <p>7. MONITOR MFPT speed normal for current power level</p> <p>PLACE MFPT Master Speed Control in MANUAL, THEN ADJUST speed as necessary.</p> <p>8. CHECK S/G levels returning to PROGRAM.</p> <p>(p) IF S/G level RISING OR DROPPING uncontrolled, THEN TRIP reactor, and **GO TO 1-E-0, Reactor Trip or Safety Injection.</p>	WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						
	BOP							
	BOP							

Op Test	301	Scenario #	3	Event #	4		Page	36	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Loss of Normal Feedwater</td><td>1-AOI-16 Rev. 0006</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.5 Failure of Automatic S/G Level Control (continued)</p> <table><tr><td colspan="3">NOTE</td></tr><tr><td colspan="3">A LO FW FLOW WTR HAMMER annunciation [59-C] will be received when any main feedwater flow drops to less than 0.76×10^6 lb./hr.</td></tr></table>	WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006	Step	Action/Expected Response	Response Not Obtained	NOTE			A LO FW FLOW WTR HAMMER annunciation [59-C] will be received when any main feedwater flow drops to less than 0.76×10^6 lb./hr.		
WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006												
Step	Action/Expected Response	Response Not Obtained												
NOTE														
A LO FW FLOW WTR HAMMER annunciation [59-C] will be received when any main feedwater flow drops to less than 0.76×10^6 lb./hr.														
	BOP	<p>9. CHECK window 59-C DARK.</p> <p>IF any S/G MFW flow drops to less than 0.55×10^6 lb./hr., THEN INITIATE manual anti-water hammer actions:</p> <ul style="list-style-type: none">a. CLOSE affected loop(s) MFW reg. valve and FW isolation valve.b. MAINTAIN affected S/G levels on program with bypass reg. valves.c. (p) REDUCE turbine load to within capability of bypass reg. valves.d. TRANSFER S/G level control to bypass reg. valves: REFER TO 1-SOI-2 & 3.01, Condensate and Feedwater System. <p>(p) IF S/G level loss IMMINENT, THEN TRIP reactor, AND</p> <p>** GO TO 1-E-0, Reactor Trip or Safety Injection.</p>												

Op Test	301	Scenario #	3	Event #	4		Page	37	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): US will exercise the step [10] RNO.</div>	<div>BOP</div> <div>N/A</div> <div>BOP</div> <div>N/A</div>	<div><table><tr><td>WBN Unit 1</td><td>Loss of Normal Feedwater</td><td>1-AOI-16 Rev. 0006</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.5 Failure of Automatic S/G Level Control (continued)</div> <div><div>NOTES</div><div>1) Failed channels are manually placed in Maintenance Bypass in preparation for repair. Two channels of an input in Bypass will result in affected controller forced to manual control.</div><div>2) It is possible for the DCS "voter" to bypass a good instrument loop, if the failed loop value is actually closer to the non-affected SG parameters it is compared with.</div></div> <div><div>10. CHECK if a good instrument loop is bypassed in DCS, instead of a failed one.</div><div>** GO TO Step 12.</div></div> <div><div>11. PERFORM the following, IAW 1-SOI-98.01, to correct the wrong channels selected by DCS "voter":</div><div>a. PLACE affected SG control in 1 ELEMENT control</div><div>b. PLACE failed instrument in BYPASS.</div><div>c. RESTORE the good instrument loop from BYPASS.</div><div>d. PLACE affected SG in 3 Element control.</div></div> <div>Page 19 of 35</div>	WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	4		Page	38	of	103
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Event Description:	Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

SG Pressures, Steam Flows and Feed Flows for SGs 1 and 2 are NOT normal.

US will exercise the step [12] RNO.

1-AOI-44 also ensures bypass of ALL 1-R-3 inputs to DCS.

Examiner Note(s):

SG pressure compensation channels for SGs 1 and 3 are NOT normal.

US will exercise the step [13] RNO.

1-AOI-44 also addresses Technical Specifications (p. 32).

Role Play:

When contacted as Work Control, acknowledge the request(s) and information provided.

BOP

BOP

SRO

WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.5 Failure of Automatic S/G Level Control (continued)

12. **CHECK** level control channels
NORMAL using control board
indications and DCS Operator
Display:

- S/G pressure.
- S/G level.
- S/G feed flow.
- S/G steam flow.

ENSURE any failed channel(s) are **BYPASSED** in DCS.

IF failed input is NOT BYPASSED
THEN

- CHANGE** to either NSSS Operator or BOP Operator, environment. Refer to 1-SOI-98.01 as necessary.
- NAVIGATE** to affected input screen on DCS Operator Display
- SELECT** DCS input to be **BYPASSED**.
- SELECT** appropriate "MAINT BYP SIGNAL" button.
- CONFIRM** "MAINT BYP SIGNAL" button changes from gray to red.
- CHECK** input has yellow "BYP" displayed.
- REPEAT** steps as necessary to place failed inputs in Maintenance Bypass.
- CHANGE** to INITIAL environment.

13. CHECK press compensation channel(s) NORMAL.

REFER TO Tech Specs:

- 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.
- 3.3.3, Post Accident Monitoring (PAM) Instrumentation.
- 3.3.4, Remote Shutdown System.

14. **INITIATE** repairs to failed equipment.

Op Test	301	Scenario #	3	Event #	4		Page	39	of	103
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Event Description: Eagle-21 1-R-3 (Channel I) loses power. SG 2 FRV OPENS. 1-AOI-16 and 1-AOI-44. Technical Specification Evaluation.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US will perform a crew update to exit 1-AOI-44. A crew Brief would typically be conducted for this event.

OAC
OAC
OAC

WBN Unit 1	Loss of Normal Feedwater	1-AOI-16 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.5 Failure of Automatic S/G Level Control (continued)

15. WHEN conditions allow auto rod control, THEN
- a. (p) ENSURE Tavg and Tref within 1°F.
 - b. ENSURE zero demand on control rod position indication [1-M-4].
 - c. PLACE rods in AUTO.

16. WHEN affected S/G controlling inputs NORMAL, THEN
- ENSURE the following:
- a. Affected input restored from bypass. (1-SOI-98.01)
 - b. MFW reg. valve in AUTO.
 - c. TDMFP Speed Control in AUTO

17. RETURN TO Instruction in effect.
- End of Section

Op Test	301	Scenario #	3	Event #	5		Page	40	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At **CHIEF EXAMINER** Direction:

Insert Simulator Schedule File Event 5

(SG tube leak on SG 2)

INDICATIONS:

- 175-B, VAC PMP EXH 1-RM-119 RAD HI
- 178-A, SG BLDN 1-RM-120/121 LIQ RAD HI
- 62-F, SG BLOWDOWN DISC TO CTBD CLOSED
- Net charging (ICS point UF1016) slowly going up
- Counts rising on 1-RR-90-119, VACUUM PMP EXH
- SG 2 MFW flow slowly lowering

Operator Actions:

- **BOP** will announce 175-B and refer to ARI-175-B (to the right and next page)
- **CREW** will diagnose a SG tube leak
- **US** will announce entry to 1-AOI-33, Steam Generator Tube Leak
- **US/RO** may contact Chemistry and Radiation Protection to sample all SGs for activity and survey main steam lines for radiation

Role Play:

If **US/RO** contacts Chemistry and/or Radiation Protection, then acknowledge the request(s).
Wait 15 minutes and as Radiation Protection, notify MCR: “Main steam line from SG 2 on Unit 1 has higher than background radiation levels with counts slowly rising.”
Wait 15 minutes and as Chemistry, notify MCR: “The Unit 1 SG 2 sample shows higher than normal activity.”

SRO
BOP
BOP
RO

N/A

WBN Unit 1	U-1 Radiation Detectors	1-ARI-173-179 Rev. 0010 Page 22 of 54
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Source	Setpoint	175-B
1-RM-90-119	determined by Chemistry	VAC PMP EXH 1-RM-119 RAD HI
(Page 1 of 2)		

Probable Cause: A. Steam Generator tube leak
B. Loss of power to rate meter
C. Background radiation rise at monitor

NOTES	
1)	If switching in the switchyard causes this window to annunciate, the system engineer should be notified.
2)	1-RM-90-119 has associated ICS computer point R0001A.
3)	ICS computer points in parentheses ().

Corrective Action:	[1] REFER TO 1-AOI-33, Steam Generator Tube Leak. [2] CHECK 1-RM-90-120 (R1020A) and 1-RM-90-121 (R1021A). [3] CHECK Post Accident monitors 1-RM-90-421 (R9055A), 1-RM-90-422 (R9056A), 1-RM-90-423 (R9057A), and 1-RM-90-424 (R9058A). [4] IF Alarm is valid, THEN REQUEST Chemistry to evaluate appropriate SG Blowdown routing when monitor alarms (i.e., CTBD or hotwell), based on ODCM limitations.
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NOTE
1-HS-15-44 is key-operated. Obtain key from Unit SRO.

[5] IF Step [4] Chemistry evaluation determines that SG Blowdown routing should divert to the hotwell on alarm, THEN DISPATCH AUO to check 1-HS-15-44, SG BLOWDOWN DISCH TO CTBD [TSI/708] NOT IN OPEN.

Continued on Next Page

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	5		Page	41	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<p>Role Play:</p> <p>When contacted as Chemistry, acknowledge the request for SG Blowdown routing evaluation. Wait 5 minutes and notify the MCR: "Maintain SG Blowdown aligned to CTBD."</p> <p>Role Play:</p> <p>When contacted as Chemistry, acknowledge the request to perform CM-9.09 When contacted as Radiation Protection, acknowledge the request to investigate. When contacted as Chemistry, wait 15 minutes and notify the MCR: "1-CM-5.01, Primary to Secondary Leak Rate Methods, has determined that Unit 1 SG 2 has a tube leak." When contacted as Radiation Protection, wait 15 minutes and notify the MCR: "Main steam line from Unit 1 SG 2 has higher than background radiation levels with counts slowly rising and technicians are surveying the Turbine Building and restricting access as necessary."</p> <p>Examiner Note(s):</p> <p>Based on indications, US may refer to 1-AOI-31, but should NOT enter 1-AOI-31.</p>	<p>RO/SRO RO/SRO N/A SRO</p>	<div><div><div>WBN Unit 1</div><div>U-1 Radiation Detectors</div><div>1-ARI-173-179 Rev. 0010 Page 23 of 54</div></div><div>175-B</div><div>VAC PMP EXH 1-RM-119 RAD HI</div><div>Corrective Action: (Continued)</div><div>(Page 2 of 2)</div><div>NOTE</div><div>ICS screen CHEM7 provides calculated instantaneous primary to secondary leak rate value.</div><div>[6] NOTIFY Chemistry to perform CM-9.09 "Effluent Radiation Monitor Alarm Guidelines".</div><div>[7] NOTIFY Radiation Protection to investigate alarm.</div><div>[8] IF monitor declared inoperable, THEN</div><div>NOTIFY Chemistry Count Room to initiate compensatory sampling.</div><div>[9] REFER TO 1-AOI-31, Abnormal Release Of Radioactive Material.</div><div>References: 1-47w610-90-1 45N1651-10 1-AOI-31 1-AOI-33 CM-9.09</div></div>
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Op Test	301	Scenario #	3	Event #	5		Page	42	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div><div>Role Play:</div><p>If contacted as AUO, acknowledge the direction to ensure 1-FCV-15-6 OPEN and 1-FCV-15-8 and -44 CLOSED.</p><p>Wait 5 minutes and notify the MCR: "1-FCV-15-6 is OPEN. 1-FCV-15-8 and -44 are CLOSED."</p><div>Role Play:</div><p>When contacted as Chemistry, acknowledge the request to perform CM-9.09</p><p>When contacted as Radiation Protection, acknowledge the request to investigate.</p><p>When contacted as Chemistry, wait 15 minutes and notify the MCR: "1-CM-5.01, Primary to Secondary Leak Rate Methods, has determined that Unit 1 SG 2 has a tube leak."</p><p>When contacted as Radiation Protection, wait 15 minutes and notify the MCR: "Main steam line from Unit 1 SG 2 has higher than background radiation levels with counts slowly rising and technicians are surveying the Turbine Building and restricting access as necessary."</p><div>Examiner Note(s):</div><p>Based on indications, US may refer to 1-AOI-31, but should NOT enter 1-AOI-31.</p></div>	<div>RO</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>RO/SRO</div> <div>RO/SRO</div> <div>SRO</div> <div>SRO</div> <div>SRO</div>	<div><div><div><div>WBN Unit 1</div><div>U-1 Radiation Detectors</div><div>1-ARI-173-179 Rev. 0010 Page 40 of 54</div></div><div><div>Source</div><div>Setpoint</div><div>178-A</div></div><div><div>1-RM-90-120A 1-RM-90-121A</div><div>determined by Chemistry</div><div><div>SG BLDN 1-RM-120/121 LIQ RAD HI</div><div>(Page 1 of 1)</div></div></div><div><div>Probable Cause:</div><div>A. Steam Generator tube leak B. Loss of power to rate meter C. Background radiation rise at monitor</div></div><div><div>NOTES</div><div>1) 1-RM-90-120/-121 has associated ICS computer point R1020A/R1021A. 2) ICS computer points in parentheses ().</div></div><div><div>Corrective Action:</div><div>[1] IF SGBD routed to Cooling Tower Blowdown, THEN CHECK automatic actions have occurred by performing one of the following: [1.1] DISPATCH Operator to ensure the automatic actions occur:<ul style="list-style-type: none">1-FCV-15-6, SGBD Disch to Cond Demin, OPENS.1-FCV-15-8, SGBD to Cooling Tower BLDN, CLOSES.1-FCV-15-44, Stm Gen Blwdn Disch to Cooling Tower Blwdn, CLOSES. OR [1.2] CHECK alarm window 62-F is lit, AND hotwell level stabilizes due to SGBD diverted to condensate.</div><div>[2] CHECK 1-RM-90-119, VAC PMP EXH (R0001A).</div><div>[3] CHECK Post Accident monitors 1-RM-90-421 (R9055A), 1-RM-90-422 (R9056A), 1-RM-90-423 (R9057A), and 1-RM-90-424 (R9058A).</div><div>[4] NOTIFY Chemistry to perform CM-9.09 "Effluent Radiation Monitor Alarm Guidelines".</div><div>[5] NOTIFY Radiation Protection to investigate alarm.</div><div>[6] REFER TO 1-AOI-31, Abnormal Release Of Radioactive Material.</div><div>[7] REFER TO 1-AOI-33, Steam Generator Tube Leak.</div><div>[8] REFER TO EPIP-1.</div></div><div><div>References:</div><div>47W610-90-2 1-AOI-31 1-AOI-33 EPIP-1 CM-9.09</div></div></div></div>
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Op Test	301	Scenario #	3	Event #	5		Page	43	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>BOP will NOT restore SG Blowdown to Cooling Tower Blowdown.</div>	<div>BOP</div> <div>BOP</div> <div>BOP</div>	<div><div><div><div>WBN Unit 1</div><div>Feedwater & Main Steam</div><div>1-ARI-57-63 Rev. 0003 Page 43 of 52</div></div><div>----</div><div><div>Source</div><div>1-FCV-15-44 limit switch</div><div>Setpoint</div><div>NOT OPEN</div><div>62-F</div><div><div>SG BLOWDOWN DISCH TO CTBD CLOSED</div><div>(Page 1 of 1)</div></div></div></div><div><div>Probable Cause:</div><div><div>A. 1-HS-15-44 in the CLOSED position</div><div>B. CTBD flow less than 35,000 gpm</div><div>C. Hi Rad on SG blowdown rad monitors 1-RM-120 or 1-RM-90-121</div></div></div></div> <div><div>NOTES</div><div><div>1) With 1-HS-15-44 in AUTO, 1-FCV-15-44 auto-closes and diverts blowdown to the Cond Demin if high rad is detected in SGBD line OR if CTBD flow less than 35,000 gpm.</div><div>2) With 1-HS-15-44 in OPEN, 1-FCV-15-44 auto-closes and diverts blowdown to the Cond Demin if high rad is detected in SGBD line (maximum SGBD flow is 220 gpm).</div></div></div> <div><div>Corrective Action:</div><div><div>[1] CHECK CTBD flow by one of the following:<ul style="list-style-type: none">0-FR-27-98, 72" DIFFUSER SUP FLOW-GPM X 1000 [1-M-15].Plant computer point Y8000A from 0-FT-27-98, plant discharge.</div><div>[2] CHECK 1-RM-90-120 and 1-RM-90-121.</div><div>[3] REFER TO 1-SOI-15.01, STEAM GENERATOR BLOWDOWN SYSTEM, to restore SGBD to CTBD.</div></div></div> <div><div>References:</div><div><div>1-45W600-15</div><div>1-47W610-15-1</div><div>1-SOI-15.01</div></div></div>
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Op Test	301	Scenario #	3	Event #	5		Page	44	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<p>OAC should raise output (>>) on 1-HIC-62-93A and/or 1-HIC-62-89A to raise charging flow to compensate for the SG 2 tube leak. OAC may notify US to expect 108-A, CHARGING FLOW HI/LO.</p>	<p>OAC/SRO</p> <p>OAC</p> <p>OAC</p>	<table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Leak</td><td>1-AOI-33 Rev. 0008</td></tr></table> <p>3.0 OPERATOR ACTIONS</p> <p>NOTE Sufficient time must be allowed for level to respond following changes in charging flow in order to determine if PZR level can be maintained.</p> <p>1. MAINTAIN PZR Level:</p> <p>a. CONTROL charging flow using 1-FCV-62-93 and 1-FCV-62-89 as necessary to maintain PZR level.</p> <p>b. CHECK letdown flow is 75 gpm.</p> <p>b. IF letdown at 120 gpm, THEN</p> <p>1) PLACE 1-HIC-62-81A, in MANUAL.</p> <p>2) CLOSE 1-FCV-62-72, (45 gpm).</p> <p>3) ADJUST 1-HIC-62-81A as necessary AND ENSURE in AUTO.</p> <p>Step continued on next page</p> <p>Page 5 of 49</p>	WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008
WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008			

Op Test	301	Scenario #	3	Event #	5		Page	45	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC should be able to maintain Pressurizer level STABLE with the SG 2 tube leak at 30 gpm with a single CCP and 1-HIC-62-93A in MANUAL.
US may set “trigger” values for Reactor Trip and Safety Injection on Pressurizer Level and Pressure. **OAC** may place standardized “trigger” value placard on control board.

OAC

WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008
Step	Action/Expected Response	Response Not Obtained

Step 1 continued.

- c. **MONITOR** PZR level STABLE or INCREASING.
- PERFORM the following:

a. **ISOLATE** letdown as necessary.

b. **INCREASE** chg flow

c. **START** additional CCP as needed.

d. IF loss of PZR level is imminent, THEN

1) (p) **TRIP** the reactor.

2) **WHEN** reactor trip is verified, THEN

INITIATE Safety Injection.

3) GO TO 1-E-0, Reactor Trip or Safety Injection, Step 1.

e. IF second CCP was started, THEN
NOTIFY SM for reportability evaluation.
- Page 6 of 49

Op Test	301	Scenario #	3	Event #	5		Page	46	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Role Play:

When contacted as Chemistry and/or Radiation Protection, then acknowledge the request(s).
If not previously contacted, wait 15 minutes and as Radiation Protection, notify MCR: "Main steam line from SG 2 on Unit 1 has higher than background radiation levels."
If not previously contacted, wait 15 minutes and as Chemistry, notify MCR: "Unit 1 SG 2 sample confirms a tube leak."
If Crew directs Chemistry and/or Radiation Protection to start sampling and/or surveying with SG 2, then reduce respective wait time from 15 minutes to 5 minutes.

Examiner Note(s):

Crew may be able to identify SG 2 as the SG with a tube leak based on steam flow-feed flow mismatch or SG 2 FRV output.
When identified, BOP may prudently adjust SG 2 PORV setpoint to 90%.

BOP/SRO

Crew

WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008
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Step	Action/Expected Response	Response Not Obtained
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3.0 OPERATOR ACTIONS (continued)

- NOTE

Condenser Vacuum Exhaust and SG blowdown Radiation Monitors should be monitored at approximately 15 minute intervals for indications of rising leak rate. If in Action Level 3 and NO additional rad monitor is available, then plant shutdown should be initiated based upon a single rad monitor.
2. IDENTIFY Leaking SG(s);

a. EVALUATE the following:

 - Unexpected rise in any SG narrow range level,
 - Feedwater flow mismatches,
 - High radiation from any Chemistry SG sample results,
 - High radiation on any SG main steamline radiation monitor,
 - RADPRO survey of main steamlines and SG blowdown lines.

b. MONITOR Condenser Vacuum Exhaust and SG Blowdown Radiation Monitors
- IF unable to identify leaking SG(s) at this time, THEN

CONTINUE performance of subsequent steps while continuing efforts to identify leaking SG(s).

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	5		Page	47	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	SRO	
	N/A	
	OAC	

WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008

Step	Action/Expected Response	Response Not Obtained
3.0 OPERATOR ACTIONS (continued)		
	<p>NOTE Changing PW controller setpoint from 70 gpm allows the DCS to re-adjust boric acid flow rate to maintain the required PPM, while 1-HS-62-140B is in AUTO.</p>	
3.	INCREASE VCT Auto Makeup if desired: <ul style="list-style-type: none"> a. PRESS and HOLD 1-FC-62-142 PW Flow Controller, setpoint button. b. USE raise button to increase flow rate. c. RELEASE 1-FC-62-142 setpoint button. d. ENSURE RED light LIT on 1-HS-62-140A. 	
4.	MAINTAIN VCT level greater than 13% by using either: OR • AUTO makeup • MANUAL makeup	IF VCT level CANNOT be maintained, THEN PERFORM the following: <ol style="list-style-type: none"> 1) (p) ENSURE CCP suction aligned to RWST. 2) (p) TRIP the reactor. 3) PERFORM the following: <ul style="list-style-type: none"> GO TO 1-E-0, Reactor Trip or Safety Injection, AND CONTINUE performance of this procedure at Step 12 in parallel with 1-E-0.

Page 8 of 49

Op Test	301	Scenario #	3	Event #	5		Page	48	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Role Play:

If contacted as STA, then notify the MCR: "I will arrive in 10 minutes."

Examiner Note(s):

Attachment 3 is on p. 53.

SRO
SRO

BOP

WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008
Step	Action/Expected Response	Response Not Obtained

3.0 OPERATOR ACTIONS (continued)

- NOTES
- Attempts to quantify leak rate should not delay performance of the remaining steps.
 - Attachment 3 will be used by the STA to estimate RCS leak rate.

5. INITIATE Attachment 3 to estimate RCS leak rate.

Op Test	301	Scenario #	3	Event #	5		Page	49	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): Plant shutdown is required due to Primary-to-Secondary leakage exceeding LCO 3.4.13 limits (150 gallons/day).</div>	<div>SRO</div> <div>SRO</div>	<div><table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Leak</td><td>1-AOI-33 Rev. 0008</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>3.0 OPERATOR ACTIONS (continued)</p><p>NOTE</p><p>If Primary-to-Secondary leakage in any steam generator is greater than or equal to 100 gpd, power should be reduced to less than or equal to 50% within ONE hour from initial indication of leak rate greater than or equal to 100 gpd AND be in Mode 3 within the next two hours (total of 3 hrs) in accordance with Appendix C.</p><p>If Primary-to-Secondary leakage in any steam generator is greater than or equal to 75 gpd for greater than one hour, the unit should be placed in MODE 3 within 24 hours in accordance with Appendix C.</p><p>Additionally, if Primary-to-Secondary leakage in any steam generator is greater than or equal to the TS 3.4.13 limit of 150 gpd, the unit should be placed in MODE 5 within 36 hours.</p><p>6. DETERMINE if Plant Shutdown Is Required:</p><p>GO TO APPENDIX A to monitor SG leakage.</p><ul style="list-style-type: none">High Secondary Radiation,<p>AND</p><ul style="list-style-type: none">PZR level continues to decrease,<p>OR</p><p>Charging flow continues to rise.</p><p>OR</p><ul style="list-style-type: none">Primary to secondary leakage in EXCESS of TS LCO 3.4.13 limits.</div>	WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	5		Page	50	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play: When contacted as Ops Manager, acknowledge the report.</div> <div>Role Play: When contacted as Radiation Protection, acknowledge the request to survey the entire secondary plant and site environment.</div> <div>When contacted as Chemistry, acknowledge the direction to sample Unit 1 RCS for boron concentration every hour and the direction to perform all CM procedures specified by 1-AOI-33.</div>	<div>RO</div> <div>SRO</div> <div>SRO</div>	<div><table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Leak</td><td>1-AOI-33 Rev. 0008</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.0 OPERATOR ACTIONS (continued)</div> <div>7. NOTIFY the following:</div> <div><div>a. Plant personnel via PA system.<ul style="list-style-type: none">"Attention plant personnel. Unit 1 has developed a S/G tube leak and Unit shutdown is in progress. Treat all Unit 1 leaks as radioactive."</div><div>b. Operations Manager.</div><div>c. RADPRO to survey secondary plant and site environment.</div><div>d. Chemistry to initiate the following:<ul style="list-style-type: none">Hourly RCS Cb sampling.1-CM-5.01, Primary to Secondary Leak Rate Methods.CM-9.93, Abnormal Release Assessment (for unmonitored steam releases such as SG PORVs and TD AFWP).1-ODI-90-2, Steam Generator Blowdown Release.0-ODI-40-01, Quantification of Nuclide Activity Released From Groundwater Sump0-ODI-90-3, Conditional Turbine Building Station Sump Release</div></div> <div>Page 11 of 49</div>	WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	5		Page	51	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>When contacted as AUO, acknowledge the direction to align the Turbine Building sump to the Unlined Pond. Wait 15 minutes and notify the MCR: "Turbine Building sump is aligned to the Unlined Pond IAW 1-AOI-33 Attachment 1."</p>	<div>BOP</div> <div>BOP</div> <div>BOP</div> <div>RO</div> <div>RO</div>	<table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Leak</td><td>1-AOI-33 Rev. 0008</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.0 OPERATOR ACTIONS (continued)</p> <p>8. MINIMIZE Secondary System Contamination:</p> <p>a. CONTROL Condensate return to CST:</p> <div><div>1) PLACE 1-LIC-2-3, in MANUAL, and CLOSE.</div><div>1) CLOSE 1-LCV-2-3 manual isol valves [T3H/708]:<ul style="list-style-type: none">1-ISV-2-529 or 1-ISV-2-5301-LCV-2-3 bypass isol valve, 1-BYV-2-531</div><div>2) MAINTAIN condenser level 1-LR-2-12 on- scale [1-M-3].</div><div>2) CONTROL Level using either of the following:<ul style="list-style-type: none">Dumpback to CST A or B.Drain hotwell to TB Sump.</div></div> <p>b. CHECK Cond DI - BYPASSED.</p> <p>b. INITIATE shutdown of Cond DI using 1-SOI-14.01, Condensate Demineralizer Polisher Operation.</p> <p>c. INITIATE Attachment 1, Minimize Secondary Contamination, to realign turbine bldg sump to unlined pond.</p> <p>c. IF unable to align to unlined holding pond, THEN NOTIFY Chemistry to periodically sample turbine bldg sump.</p> <p>9. CHECK Unit Load - GREATER THAN 30%.</p> <p>INITIATE unit shutdown USING:</p> <ul style="list-style-type: none">1-GO-5, Plant Shutdown From 30% Reactor Power To Hot Shutdown, ANDCONTINUE performance of this procedure at Step 11. <div>Page 12 of 49</div>	WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	5		Page	52	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): US will perform a crew update to enter 1-AOI-39, Rapid Load Reduction (Event 6 on p. 54).</div> <div>Examiner Note(s): Chemistry will NOT have provided detailed SG sample results at this point. No scenario requirement for LCO 3.7.14, Secondary Specific Activity.</div>	<div>SRO</div> <div>SRO</div> <div>BOP</div>	<table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Leak</td><td>1-AOI-33 Rev. 0008</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <div>3.0 OPERATOR ACTIONS (continued)</div> <div>10. INITIATE unit shutdown USING 1-AOI-39, Rapid Load Reduction, while continuing with this procedure.</div> <div>NOTE SG Tube Leakage is considered RCS Identified Leakage</div> <div>11. PERFORM the following evaluations:<div>a. EVALUATE Tech Specs for applicability:<ul style="list-style-type: none">3.4.13, RCS Operational Leakage,3.7.5, Auxiliary Feedwater (AFW) System,3.7.6, Condensate Storage Tank (CST),3.7.14, Secondary Specific Activity,</div><div>b. EVALUATE EPIP-1, Emergency Plan Classification Matrix.</div><div>c. EVALUATE NPG-SPP-03.5 reportability.</div><div>d. INITIATE manning the TSC. (if necessary)</div></div> <div>12. MONITOR CST Level - GREATER THAN 200,000 GAL. INITIATE CST refill using 0-SOI-59.01, Demineralized System.</div> <div>13. CHECK Reactor Trip Breakers - OPEN. DO NOT CONTINUE until Reactor Trip Breakers are OPEN.</div> <div>Page 13 of 49</div>	WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	5		Page	53	of	103
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Event Description:	Tube leak on SG 2. 1-AOI-33.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Crew will begin lowering power. During load reduction, BOP will have manual control of SG 2 MFW Reg Valve. Attachment 3 performance is NOT required for this scenario. Provided for information only.

WBN Unit 1	Steam Generator Tube Leak	1-AOI-33 Rev. 0008
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Attachment 3
(Page 1 of 1)
Estimation of RCS Leakage

NOTES									
1) This attachment CANNOT be used during VCT makeup, boration, or dilution.									
2) Conversion factors used: VCT level 20 gal/%; PZR level 62 gal/%; Tavg 74 gal/°F.									

Time (minutes)	VCT Level (%)	PZR Level (%)	Tavg (°F)	VCT Level Change (%)	PZR Level Change (%)	Tavg Change (°F)	VCT Level Rate of Change (positive for level decreasing) (VCT Level Change*20)/time (GPM)	PZR Level Rate of Change (positive for level decreasing) (PZR Level Change*62)/time (GPM)	GPM change from Tavg change (Tavg Level Change*74)/time (GPM)	RCS Leak Rate VCT+PZR - Tavg (GPM)
Initial										

Op Test	301	Scenario #	3	Event #	6		Page	54	of	103
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Event Description:	Rapid downpower to 50%. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

This Event is the reactivity maneuver for this scenario. When the Chief Examiner and Exam Team have had sufficient time to observe the crew, the next Event can be initiated by inserting Event 7.

At CHIEF EXAMINER Direction:

Insert Simulator Schedule File Event 7

(SG 2 Tube Rupture)

Examiner Note(s):

1-AOI-33 Section 3.0 step [10] directed the downpower when SG 2 tube leakage exceeded 150 gal/day. US will determine the target power level and rate of the downpower.

OAC
OAC/SRO
Crew

SRO
SRO

OAC/SRO

WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.2 Power Reduction From Greater Than 50% Power

NOTES

Rod Control should remain in automatic for Tavg Control

Reactivity Briefing Sheet, "Thumb Rules" (page 3), lists boration flows and volumes for different reduction rates.

Effect of boration will lag behind turbine load reduction and can be compensated for by temporarily increasing boric acid flow rate above recommended rate.

Steps 1 and 2 may be performed in any order based on plant conditions.

Steps 1 and 2 may be performed in parallel if additional operators are available for peer checks.

CAUTION

Over boration may result in excessive rod withdrawal, Tavg lower than desired, and AFD oscillations.

Op Test	301	Scenario #	3	Event #	6		Page	55	of	103
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Event Description:	Rapid downpower to 50%. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC will determine boration flow rate and volume based on the target power level and rate of power reduction provided by the US.

OAC/SRO

OAC

OAC

OAC

OAC

OAC

OAC

WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.2 Power Reduction From Greater Than 50% Power (continued)

1. INITIATE a manual boration:
- a. DETERMINE boration flow rate and volume from Reactivity Briefing Sheet.

b. IF desired to use NORMAL boration, THEN

INITIATE normal boration:

1) PLACE mode selector 1-HS-62-140B to BOR.

2) ADJUST BA flow controller, 1-FC-62-139, to desired flow rate.

3) ADJUST BA batch counter 1-FQ-62-139 to required quantity.

(US MUST oversee next step)

4) (p) MOMENTARILY PLACE 1-HS-62-140A,VCT MAKEUP CONTROL, to START and RELEASE.

5) CHECK 1-HS-62-140A, Red light LIT.

6) CHECK boric acid flow indicated on 1-FI-62-139.

b. INITIATE emergency boration.

1) PLACE boric acid transfer pump aligned to blender in FAST speed

2) (p) ADJUST 1-FCV-62-138 to establish desired flow rate.

3) WHEN boration is complete, THEN
 - CLOSE 1-FCV-62-138,AND
 - PLACE boric acid transfer pump used in SLOW speed
- Page 8 of 28

Op Test	301	Scenario #	3	Event #	6		Page	56	of	103
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Event Description:	Rapid downpower to 50%. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): US will direct turbine controls be placed in IMP IN. This will cause 82-F, DCS TROUBLE, due to IMP IN reference value at 100% power. US will specify load rate.</div>	<div>SRO BOP N/A BOP BOP BOP BOP BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>3.2 Power Reduction From Greater Than 50% Power (continued)</p><p>NOTE If the initiating condition is corrected, the power reduction may be terminated</p><p>CAUTIONS</p><ul style="list-style-type: none">Condenser Backpressure limits are on pages 5&6.LOSS OF CONDENSER VACUUM may be made worse if steam dumps are actuated. 1-AOI-11 requires Tavg and Tref be maintained within 3°F.TURBINE MANUAL Operation requires continuous operator monitoring and control.<p>2. ESTABLISH a turbine load reduction rate less than or equal to 5%/min:</p><p>a. IF desired, THEN PLACE turbine in IMP IN.</p><p>b. SET a desired load in the SETTER.</p><p>c. SET the LOAD RATE at less than or equal to 5%/min. (US MUST oversee next step)</p><p>d. (p) PRESS or CLICK GO button.</p><p>SELECT TURBINE MANUAL, and PERFORM Appendix A. OR CHECK that turbine control has tripped to MANUAL as indicated by the TURBINE MANUAL button LIT, (p) MOMENTARILY PRESS or CLICK GV LOWER button, at intervals, that control load reduction less than or equal to 5%/min</p></div>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	6		Page	57	of	103
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Event Description:	Rapid downpower to 50%. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>OAC</div> <div>OAC</div> <div>OAC</div> <div>SRO</div>	<div><table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.2 Power Reduction From Greater Than 50% Power (continued)</div> <div>NOTE AFD green target band can be monitored using ICS Turn On code DOGHOUSE.</div> <div>3. MONITOR rod position:<ul style="list-style-type: none">Rods above LO-LO insertion limitAFD within Target Band<div>a. IF manual operation of Control Rods is desired, THEN PLACE Rod Control in Manual</div><div>b. (p) ADJUST boric acid flow rate as needed to return rods to required position</div><div>c. IF higher boric acid flow rate is needed to compensate for load reduction rate, THEN INITIATE emergency boration:<div><div>1. PLACE boric acid transfer pump aligned to blender in FAST speed</div><div>2. (p) ADJUST 1-FCV-62-138 to establish desired flow rate.</div></div></div><div>d. WHEN boration is complete, THEN<div><div>1) CLOSE 1-FCV-62-138,</div><div>2) PLACE boric acid transfer pump used in SLOW speed</div></div></div></div> <div>4. REFER TO EPIP-1, Emergency Plan Classification Flowchart</div> <div>Page 10 of 28</div>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	6		Page	58	of	103
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Event Description:	Rapid downpower to 50%. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As Load Coordinator, acknowledge the report.</div> <div>Examiner Note(s):</div> <div>This event is the reactivity maneuver for this scenario. Sufficient time should be allowed to observe the crew performing the maneuver. Subsequent pages of 1-AOI-39 are provided to understand US communications and directions.</div> <div>If not previously inserted, then:</div> <div>Insert Simulator Schedule File Event 7 (SG 2 Tube Rupture)</div> <div>Role Play:</div> <div>As AUO, acknowledge the report.</div> <div>Role Play:</div> <div>As Chemistry, acknowledge the direction.</div>	<div>SRO</div> <div>OAC/SRO</div> <div>OAC</div> <div>OAC</div> <div>SRO</div> <div>RO</div> <div>SRO</div>	<table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <div>3.2 Power Reduction From Greater Than 50% Power (continued)</div> <div>5. NOTIFY the Load Coordinator of the required load reduction and expected ramp rate</div> <div>NOTE If reactor power is stabilized at a lower level, a drop in Tav_g will occur due to Xenon build up. Dilution may be required to maintain power level.</div> <div>6. MONITOR Tav_g and Tref:<ul style="list-style-type: none">Tav_g trending to Tref.Mismatch less than 5°F.(p) CONTROL Tav_g with Control Rods in manual. IF Tav_g and Tref mismatch can NOT be maintained less than 5°F, THEN TRIP reactor, AND ** GO TO 1-E-0, Reactor Trip or Safety Injection.</div> <div>7. CHECK rate of power reduction is rapid enough for existing plant conditions.(p) TRIP reactor, and ** GO TO 1-E-0, Reactor Trip or Safety Injection.</div> <div>8. NOTIFY Condensate Demin AUO of impending pump shutdowns (REFER to Appendix B).</div> <div>9. WHEN rated thermal power change exceeds 15% in one hour, THEN NOTIFY Chemistry to initiate 1-SI-68-28.</div> <div>Page 11 of 28</div>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	6		Page	59	of	103
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Event Description:	Rapid downpower to 50%. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>US will determine which Condensate Booster Pump and which Condensate Demin Pump will be stopped. There is no procedural preference.</p> <div>Role Play:</div> <p>As AUO, acknowledge the direction.</p>	<div>BOP</div> <div>BOP</div> <div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Rapid Load Reduction</td><td>1-AOI-39 Rev. 0006</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.2 Power Reduction From Greater Than 50% Power (continued)</div> <div>10. WHEN between 70 and 75% power, THEN</div> <div>REMOVE one Condensate Booster Pump and one Condensate Demin Pmp from service:</div> <div><ul style="list-style-type: none">PLACE selected Condensate Booster Pmp handswitch to STOP.PLACE selected Condensate Demin Pmp handswitch to STOP, and CLOSE the suction valve.NOTIFY AUO to complete shutdown of selected pumps IAW 1-SOI-2&3.01.</div> <div>Page 12 of 28</div>	WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Rapid Load Reduction	1-AOI-39 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	6		Page	60	of	103
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Event Description:	Rapid downpower to 50%. 1-AOI-39.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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US will determine which #3 Heater Drain Tank Pump will be stopped. There is no procedural preference.

As AUO, acknowledge the direction.

US will determine which #7 Heater Drain Tank Pump will be stopped. There is no procedural preference.

As AUO, acknowledge the direction.

BOP
BOP
BOP
BOP
BOP
BOP

Step	Action/Expected Response	Response Not Obtained
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NOTES

- A MFPT may be removed from service at power levels between 65% and 45%, if approved by the SM.
- If holding power level at less than 60%, the Cnds Demin pumps may be left running based on header pressure and the ability of the pumps to pump forward.

REMOVE both operating Condensate Demin Pumps and one of three #3 Heater Drain Pumps from service:

- SIMULTANEOUSLY PLACE** Condensate Demin Pump handswitches to STOP.
- CLOSE** Condensate Demin Pump suction valves.
- STOP and PULL-TO-LOCK** one of three #3 Heater Drain Pumps.
- NOTIFY** AUO to complete shutdown of Cnds Demin Pumps IAW 1-SOI-2&3.01 and selected #3 HDTP IAW 1-SOI-5&6.01.

- STOP** and **PULL-TO-LOCK** one of two #7 Heater Drain Pumps.
- NOTIFY** AUO to complete shutdown of selected #7 HDTP IAW 1-SOI-5&6.01.

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	61	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At **CHIEF EXAMINER** Direction:

Insert Simulator Schedule File Event 7

(SG 2 Tube Rupture)

INDICATIONS:

- Reactor Trip Breakers OPEN
- Safety Injection ACTUATED
- 1-FCV-63-25 and -26 fail to OPEN automatically
- ABI Train B fails to initiate

Operator Actions:

- **OAC** performs Immediate Action steps of 1-E-0
- **BOP** acknowledges alarms and monitors Equipment Status
- **BOP** may prudently open 1-FCV-63-25 and/or -26
- **US** updates crew on 1-E-0 entry and directs actions of 1-E-0

Examiner Note(s):

OAC will re-perform all (4) Immediate Action steps with no communication. At the completion of the steps, **OAC** will notify the **US** that all Immediate Actions steps are completed with any discrepancies. **US** will then read steps [1] through [4] and **OAC** will re-perform them. EVENT 8.

During the re-performance of the Immediate Action steps, **RO** may recognize that 1-FCV-63-25 and -26 failed to AUTO OPEN on SI signal and perform Prudent Operator Actions to open the valves. After Immediate Actions steps are completed non-verbally by the **OAC**, **RO** should notify the **US** (or **Crew** via crew update) of the failure of 1-FCV-63-25 and -26. Otherwise, **BOP** will open 1-FCV-63-25 and/or -26 IAW 1-E-0 Appendix A (p. 89).

OAC

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
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Step	Action/Expected Response	Response Not Obtained
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3.0 OPERATOR ACTIONS

- NOTE
- Steps 1 thru 4 are **IMMEDIATE ACTION STEPS**
 - Status Trees / SPDS should be monitored when transitioned to another instruction.

- | | | |
|----|--|---|
| 1. | ENSURE reactor trip: <ul style="list-style-type: none">• Reactor trip and bypass breakers OPEN.• RPIs at bottom of scale.• Neutron flux DROPPING. | Manually TRIP reactor.
IF reactor will NOT trip,
THEN

** GO TO 1-FR-S.1, Nuclear Power Generation / ATWS. |
| 2. | ENSURE Turbine Trip: <ul style="list-style-type: none">• All turbine stop valves CLOSED. | Manually TRIP turbine.
IF turbine will NOT trip,
THEN <ul style="list-style-type: none">• RUNBACK turbine manually <p>OR</p> <ul style="list-style-type: none">• CLOSE MSIVs and bypasses |

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	62	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

- 1-E-0 FOP p. 69
- 1-E-3 p. 70
- 1-E-3 FOP p. 85
- 1-E-0 Appendices A and B p. 86

US will transition from 1-E-0 to 1-E-3 (p. 70) on 1-E-0 step [15] RNO (p. 68).

Following this transition and completion of Appendices A and B, **BOP** will perform FR-0, Status Trees.

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
Step	Action/Expected Response	Response Not Obtained

3. CHECK 6.9 kV shutdown boards:
- a. At least one board energized from:
 - CSST (offsite),

OR

- D/G (blackout) with ERCW flow to running DG(s) [0-M-27A]:
 - 1-HS-67-66A OR 1-HS-67-68A
 - 2-HS-67-66A OR 2-HS-67-68A
 - 1-HS-67-67A OR 1-HS-67-65A
 - 2-HS-67-67A OR 2-HS-67-65A
- RESTORE power to at least one train of shutdown boards:

1) **EMERGENCY START** All D/G's [1-M-1].

2) IF D/G did **NOT** start from 1-M-1, **THEN**

EMERGENCY START All D/G's [0-M-26]

3) **ENSURE** ERCW to running DG(s) [0-M-27A]:
 - 1-HS-67-66A OR 1-HS-67-68A
 - 2-HS-67-66A OR 2-HS-67-68A
 - 1-HS-67-67A OR 1-HS-67-65A
 - 2-HS-67-67A OR 2-HS-67-65A

4) IF ERCW flow **CANNOT** be aligned, **THEN**

EMERGENCY STOP affected DG(s)
- IF power can **NOT** be restored to at least one train of shutdown boards, **THEN**
- ** GO TO 1-ECA-0.0, Loss of Shutdown Power.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	63	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	OAC	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>4. CHECK SI actuated:</p> <p>a. Any SI annunciator LIT.</p> <p>DETERMINE if SI required:</p> <p>a. IF ANY of the following exists:</p> <ul style="list-style-type: none">S/G press less than 675 psig, <p>OR</p> <ul style="list-style-type: none">RCS press less than 1870 psig, <p>OR</p> <ul style="list-style-type: none">Cntmt press greater than 1.5 psig <p>THEN</p> <p>ACTUATE SI manually.</p> <p>IF SI NOT required, THEN</p> <p>** GO TO 1-ES-0.1, Reactor Trip Response.</p> <p>b. Both trains SI ACTUATED.</p> <ul style="list-style-type: none">1-XX-55-6C1-XX-55-6D <p>b. ACTUATE SI manually.</p>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						
	OAC							

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	64	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Appendix A of 1-E-0 is included near the end of this guide starting on p. 86.

Examiner Note(s):

Step [7] is Heat Sink verification.

Critical Task(s):

2. Isolate SG 2 IAW 1-E-3, Steam Generator Tube Rupture, to prevent entry into 1-ECA-3.1, SGTR and LOCA – Subcooled Recovery.

Following step [7], if SG 2 Narrow Range level is greater than 29%, then the **OAC** may prudently isolate AFW to SG 2 by placing MDAFW LCV and TDAFW LCV to SG 2 handswitches to ACC. RESET and then PULL TO LOCK. **OAC** will also place the MDAFW LCV and TDAFW LCV to SG 2 controllers in MANUAL by pressing the R(emote)/M(annual) pushbuttons and locking the control levers to the left.

Examiner Note(s):

Success of **Critical Task #2** with respect of AFW will be determined by 1-FI-3-155A and -155B, AFW TO SG2 FLOW [1-M-3], indicating 0 gpm.

BOP
BOP
OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
Step	Action/Expected Response	Response Not Obtained

5. PERFORM Appendixes A and B , 1-E-0, pages 16-28.
6. ANNOUNCE reactor trip and safety injection over PA system.
7. ENSURE secondary heat sink available with either:

• Total AFW flow greater than 410 gpm,

OR

• At least one S/G NR level greater than 29% [39% ADV].

** GO TO 1-FR-H.1, Loss of Secondary Heat Sink.

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	65	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

OAC should use Narrow Range RCS Loop Tavgs with all RCPs running. Due to ECCS injection and AFW flow, RCS temperature will be dropping and the RNO should be exercised.

OAC will control AFW to minimize cooldown. **OAC** will take manual control of MDAFW and TDAFW LCVs to all SGs (MDAFW and TDAFW LCVs to SG 2 may already be CLOSED as Prudent Operator Actions) and reduce total AFW flow to just above 410 gpm.

OAC achieves manual control by placing LCV handswitch to ACC. RESET and then placing the associated controller in MANUAL by pressing the R(emote)/M(annual) pushbutton.

Adjustments are made with the lever at the bottom of the controller.

OAC

OAC

WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
Step	Action/Expected Response	Response Not Obtained

8. **MONITOR** RCS temperature stable at or trending to 557°F using:
 - RCS Loop T-avg with any RCP running,
 - OR
 - RCS Loop T-cold with RCPs out-of-service.

IF temp less than 557°F,
THEN

ENSURE steam dumps and S/G PORVs CLOSED.

IF cooldown continues,
THEN

CONTROL total AFW flow to maintain greater than 410 gpm UNTIL NR level in at least one S/G greater than 29% [39% ADV].

IF cooldown continues after AFW flow is controlled,
THEN

 - **PLACE** steam dump controls OFF.
 - **CLOSE** MSIVs.
 - **ENSURE** MSIV bypasses CLOSED.

IF RCS temp greater than 564°F,
THEN

ENSURE either steam dumps or S/G PORVs OPEN.

IF required for S/G PORV operation, **THEN**

DISPATCH NAUO to perform Attachment 5 of (1-E-3).
9. **ENSURE** excess letdown valves CLOSED
 - 1-FCV-62-54
 - 1-FCV-62-55

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	66	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>OAC will check 1-TI-68-328, -329 and -330, SAFETY TAILPIPE TEMP, [1-M-4] which will be at ambient temperature and higher than normal due to the LOCA. OAC will also verify 91-A, PZR PORV/SAFETY OPEN, is DARK and may look at 1-XX-68-363, PZR VALVES ACOUSTIC MONITOR, on 0-M-25 and verify NO RED LEDs LIT.</p>	<div>OAC</div> <div>OAC</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>10. CHECK PZR PORVs and block valves:</p><div><div>a. PZR PORVs CLOSED.</div><div>a. IF RCS press less than 2335 psig, THEN ENSURE PZR PORV or associated block valve CLOSED. IF PORV failed OPEN, AND Associated block valve can NOT be closed, THEN ** GO TO 1-E-1, Loss of Reactor or Secondary Coolant.</div></div><p>b. At least one block valve OPEN.</p><div>b. OPEN one block valve UNLESS it was closed to isolate an open PORV.</div><p>11. CHECK PZR safety valves CLOSED:</p><div><div><ul style="list-style-type: none">EVALUATE tailpipe temperatures and acoustic monitors.</div><div>IF RCS pressure less than 2485 psig, AND PZR safety valve open, THEN ** GO TO 1-E-1, Loss of Reactor or Secondary Coolant.</div></div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	67	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>S/G pressures will be dropping due to RCS temperature reduction caused by ECCS injection. OAC and US should determine that S/G pressures are controlled.</p>	<div>OAC</div> <div>OAC</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div><div>12.</div><div>CHECK PZR sprays CLOSED.</div><div><div>IF RCS pressure less than 2260 psig, THEN</div><div>CLOSE spray valves.</div><div>IF spray valve failed OPEN, THEN</div><div>STOP RCP(s) as necessary to stop spray flow.</div></div><div>NOTE Seal injection flow should be maintained to all RCPs.</div></div><div><div>13.</div><div>CHECK if RCPs should remain in service:</div><div><div>a. Phase B signals DARK [MISSP].</div><div>a. STOP all RCPs.</div><div>** GO TO Step 14.</div></div><div><div>b. RCS pressure greater than 1500 psig.</div><div>b. ENSURE at least one Charging pump OR SI pump injecting.</div><div>WHEN injection flow established, THEN</div><div>STOP all RCPs.</div></div></div><div><div>14.</div><div>CHECK S/G pressures:</div><div><div>All S/G pressures controlled or rising.</div><div>IF S/G pressure low OR dropping uncontrolled, THEN</div><div>** GO TO 1-E-2, Faulted Steam Generator Isolation.</div></div><div><div>All S/G pressures greater than 140 psig.</div></div></div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2																								
Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	68	of 103															
Event Description:		SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.																						
Sequence of Events / Examiner Notes				Position		Applicant's Actions or Behavior																		
<div>Examiner Note(s):</div> <p>SG 2 Narrow Range level is NOT controlled and secondary side radiation is NOT normal. US will transition to 1-E-3 on step [15] RNO and perform a crew update stating the transition.</p> <p>BOP will be tasked with the initial performance of Status Trees, but may delay performance until 1-E-0 Appendix A is complete.</p>				OAC/SRO		<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>15.</td><td>CHECK for RUPTURED S/G<ul style="list-style-type: none">All S/Gs narrow range levels CONTROLLED or DROPPING.Secondary side radiation NORMAL from Appendix A.</td><td>IF any S/G has level rising in an uncontrolled manner OR has high radiation, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.</td></tr><tr><td>16.</td><td>CHECK Cntmt conditions:<ul style="list-style-type: none">Cntmt pressure NORMAL.Radiation NORMAL from Appendix A.Cntmt sump level NORMAL.Cntmt temp ann window DARK [104-B].</td><td>** GO TO 1-E-1, Loss of Reactor or Secondary Coolant.</td></tr><tr><td>17.</td><td>CHECK SI termination criteria: a. CHECK RCS subcooling greater than 65°F. b. CHECK secondary heat sink available with either:<ul style="list-style-type: none">Total feed flow greater than 410 gpm,OR<ul style="list-style-type: none">At least one S/G NR level greater than 29%. c. CHECK RCS pressure stable or rising.</td><td>a. ** GO TO Step 18. b. ** GO TO Step 18. c. ** GO TO Step 18.</td></tr></table> <p>Step continued on next page</p> <p>Page 10 of 47</p>				WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained	15.	CHECK for RUPTURED S/G <ul style="list-style-type: none">All S/Gs narrow range levels CONTROLLED or DROPPING.Secondary side radiation NORMAL from Appendix A.	IF any S/G has level rising in an uncontrolled manner OR has high radiation, THEN ** GO TO 1-E-3, Steam Generator Tube Rupture.	16.	CHECK Cntmt conditions: <ul style="list-style-type: none">Cntmt pressure NORMAL.Radiation NORMAL from Appendix A.Cntmt sump level NORMAL.Cntmt temp ann window DARK [104-B].	** GO TO 1-E-1, Loss of Reactor or Secondary Coolant.	17.	CHECK SI termination criteria: a. CHECK RCS subcooling greater than 65°F. b. CHECK secondary heat sink available with either: <ul style="list-style-type: none">Total feed flow greater than 410 gpm, OR <ul style="list-style-type: none">At least one S/G NR level greater than 29%. c. CHECK RCS pressure stable or rising.	a. ** GO TO Step 18. b. ** GO TO Step 18. c. ** GO TO Step 18.
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016																						
Step	Action/Expected Response	Response Not Obtained																						
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	69	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table> <p>Foldout Page (Page 1 of 1)</p> <p><u>RCP TRIP CRITERIA</u></p> <ul style="list-style-type: none">Phase B Isolation, <p>OR</p> <ul style="list-style-type: none">One charging pump or one SI pump injecting AND RCS press reduced uncontrolled to less than 1500 psig. <p><u>AFW OPERATION</u></p> <p>IF CST volume less than 5000 gal, THEN</p> <p>MONITOR AFW pumps to ensure suction transfer.</p> <p>Page 47 of 47</p>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016			

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	70	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US will perform a crew update to transition to 1-E-3.

Examiner Note(s):

Chemistry and Radiation Protection notified during 1-AOI-33 performance.

Examiner Note(s):

US will inform the Shift Manager to refer to EPIP-1 for event classification.

SRO

SRO

OAC

OAC/SRO

OAC

OAC

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

- 3.0 OPERATOR ACTIONS
- NOTE Early notification of Radiation Protection and Chemistry could expedite subsequent sampling efforts if needed.
1. REFER TO EPIP-1, Emergency Plan Classification Flowchart.
- NOTES
- Seal injection flow should be maintained to all RCPs.
 - Tripping RCPs if less than 1500 psig is NOT required if Operator initiated cooldown and depressurization is in progress.
2. CHECK if RCPs should remain in service:
- a. Phase B DARK [MISSP].
- a. STOP all RCPs.
- ** GO TO Step 3.
- b. RCS pressure greater than 1500 psig.
- b. ENSURE at least one charging pump or SI pump injecting.
- WHEN injection flow established, THEN
- STOP all RCPs.

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	71	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

SG 2 Narrow Range level will be rising rapidly due to the SG Tube Rupture. If not previously identified, **Crew** should be able to determine SG 2 is ruptured.

Crew

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

3. IDENTIFY Ruptured S/G based on ANY of the following:
- Unexpected rise in S/G NR level.

OR

 - S/G discharge monitor high radiation.

OR

 - RP Survey.

OR

 - Chemistry sample.

CONTINUE efforts to identify Ruptured S/G.

NOTIFY Radiation Protection and Chemistry.

WHEN Ruptured S/G identified, THEN

PERFORM Steps 4 thru 8.

** GO TO Step 9.

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	72	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

2. Isolate SG 2 IAW 1-E-3, Steam Generator Tube Rupture, to prevent entry into 1-ECA-3.1, SGTR and LOCA – Subcooled Recovery.

Examiner Note(s):

Step [4.a] may have been completed previously as a Prudent Operator Action. If completed prudently, BOP may have performed the setpoint action.

OAC
OAC
OAC

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

4. ENSURE Ruptured S/G PORV aligned:
- a. ENSURE controller in AUTO set at 90%.
 - b. ENSURE HS in P-AUTO.
 - c. WHEN Ruptured S/G pressure less than 1130 psig. THEN
 - 1) ENSURE Ruptured S/G PORV CLOSED,
OR
 - 2) OBTAIN Radiation Protection support AND
Locally CLOSE Ruptured S/G isolation valve:
 - Loop 1, 1-ISV-1-619 [South Valve Room].
 - Loop 2, 1-ISV-1-620 [North Valve Room].
 - Loop 3, 1-ISV-1-621 [North Valve Room].
 - Loop 4, 1-ISV-1-622 [South Valve Room].

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	73	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

2. Isolate SG 2 IAW 1-E-3, Steam Generator Tube Rupture, to prevent entry into 1-ECA-3.1, SGTR and LOCA – Subcooled Recovery.

Examiner Note(s):

SG 1, which is Intact, is supplying steam to the TDAFW Pump.

OAC/SRO

OAC

OAC

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

CAUTION If turbine-driven AFW pump is only available source of feed flow, then steam supply to the turbine-driven AFW pump must be maintained.

5. ENSURE TD AFW pump being supplied from Intact S/G.
- ENSURE at least one MD AFW pump aligned to an Intact S/G, AND
- ISOLATE steam to TD AFW pump:
- a. INITIATE electrical overspeed trip USING 1-HS-46-55A-S.
- b. CLOSE 1-FCV-1-17.
- c. CLOSE 1-FCV-1-18.
6. ENSURE Ruptured S/G blowdown isolated.

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	74	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

2. Isolate SG 2 IAW 1-E-3, Steam Generator Tube Rupture, to prevent entry into 1-ECA-3.1, SGTR and LOCA – Subcooled Recovery.

OAC/SRO

OAC

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

CAUTION At least Two S/G must be maintained available for RCS cooldown.

7. CLOSE Ruptured S/G MSIV and bypass valve.
- DISPATCH NAUO to perform Attachment 2 (1-E-3), MSIV And MSIV Bypass Isolation, for Ruptured SG.

CLOSE Intact S/G MSIVs and bypass valves, using MCR handswitches or Attachment 2 (1-E-3), to isolate Ruptured S/G from intact S/Gs.

PERFORM Attachment 3 (1-E-3), Steamline Isolation (MCR), to isolate secondary pathways to limit depressurization and contamination.

DISPATCH NAUO to perform Attachment 4 (1-E-3), Steamline Isolation (Local).

USE Intact S/G PORVs for dumping steam when required.

IF at least one Intact S/G can NOT be isolated from Ruptured S/G, THEN

** GO TO 1-ECA-3.1, SGTR and LOCA - Subcooled Recovery.

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	75	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

2. Isolate SG 2 IAW 1-E-3, Steam Generator Tube Rupture, to prevent entry into 1-ECA-3.1, SGTR and LOCA – Subcooled Recovery.

Examiner Note(s):

Step [8.c] is also performed by **BOP** in 1-E-0 Appendix A step [7] (p. 88). The 1-E-0 Appendix A step will be performed first.

Examiner Note(s):

If not previously performed, **OAC** isolate AFW to SG 2 by placing MDAFW LCV and TDAFW LCV to SG 2 handswitches to ACC. RESET and then PULL TO LOCK. **OAC** will also place the MDAFW LCV and TDAFW LCV to SG 2 controllers in MANUAL by pressing the R(emote)/M(anual) pushbuttons and locking the control levers to the left.

Examiner Note(s):

Success of **Critical Task #2** with respect of AFW will be determined by 1-FI-3-155A and -155B, AFW TO SG2 FLOW [1-M-3], indicating 0 gpm.

OAC/SRO

OAC

OAC

OAC
OAC
OAC

OAC
OAC

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

CAUTION If any Ruptured S/G is also faulted, feed flow should remain isolated in subsequent steps UNLESS needed for RCS cooldown.

8. CONTROL Ruptured S/G level:
- a. CHECK Ruptured S/G NR level greater than 29% [39% ADV].

a. MAINTAIN feed flow to Ruptured S/G.

WHEN Ruptured S/G NR level greater than 29% [39% ADV], THEN

PERFORM Substeps 8b and 8c.

** GO TO Substep 8d.
- b. ISOLATE AFW flow to Ruptured S/G.

c. ENSURE MFW ISOLATED to Ruptured S/G:
 - MFW isolation valves CLOSED.
 - MFW bypass isolations CLOSED.
 - MFW reg and bypass reg valves CLOSED.
 - MFW pumps TRIPPED.

c. Manually CLOSE valves as necessary.
- d. CONTROL Ruptured S/G NR level greater than 29% [39% ADV].

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	76	of	103																									
Event Description:		SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.																																	
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior																													
<p>Examiner Note(s): Previously performed in 1-AOI-33.</p> <p>Examiner Note(s): 1-ZI-14-3, CNDS DEMIN BYPASS FCV-14-3 [1-M-3 top left], RED light LIT indicating 1-FCV-14-3 is already OPEN.</p> <p>Role Play: When contacted as Radiation Protection, acknowledge direction and immediately notify the MCR: "Secondary plant surveys are in progress." (Direction previously given in 1-AOI-33.)</p> <p>Role Play: When contacted as Chemistry, acknowledge direction. (Direction previously given in 1-AOI-33.)</p>					<p>OAC</p> <p>OAC</p> <p>N/A</p> <p>SRO</p> <p>SRO</p> <p>RO</p>	<table border="1"> <tr> <td>WBN Unit 1</td> <td>Steam Generator Tube Rupture</td> <td>1-E-3 Rev. 0007</td> </tr> <tr> <td>Step</td> <td>Action/Expected Response</td> <td>Response Not Obtained</td> </tr> <tr> <td>9.</td> <td> PLACE dumpback valve to CST, 1-LIC-2-3, in MANUAL AND CLOSE valve. </td> <td> Locally ISOLATE dumpback LCV [T3H/708]: <ul style="list-style-type: none"> CLOSE isolation valve 1-ISV-2-529 or 1-ISV-2-530. CLOSE bypass 1-BYV-2-531. </td> </tr> <tr> <td>10.</td> <td> MAINTAIN condenser level 1-LR-2-12 on-scale [M-3]. </td> <td> NOTIFY TSC to evaluate options: <ul style="list-style-type: none"> Dumpback to CST A or B, OR <ul style="list-style-type: none"> Drain hotwell to TB Sump. </td> </tr> <tr> <td>11.</td> <td> DISPATCH operator to OPEN 1-FCV-14-3 to bypass condensate DI if not already open. </td> <td></td> </tr> <tr> <td>12.</td> <td> ENSURE Radiation Protection dispatched to survey secondary plant. </td> <td></td> </tr> <tr> <td>13.</td> <td> NOTIFY Chemistry to obtain samples as necessary for confirming Ruptured S/G. </td> <td></td> </tr> <tr> <td>14.</td> <td> NOTIFY plant personnel of potential contaminated release: <p>"Attention plant personnel. Unit 1 has developed a S/G tube Rupture. Treat all Unit 1 leaks as radioactive."</p> </td> <td></td> </tr> </table>						WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007	Step	Action/Expected Response	Response Not Obtained	9.	PLACE dumpback valve to CST, 1-LIC-2-3, in MANUAL AND CLOSE valve.	Locally ISOLATE dumpback LCV [T3H/708]: <ul style="list-style-type: none"> CLOSE isolation valve 1-ISV-2-529 or 1-ISV-2-530. CLOSE bypass 1-BYV-2-531. 	10.	MAINTAIN condenser level 1-LR-2-12 on-scale [M-3].	NOTIFY TSC to evaluate options: <ul style="list-style-type: none"> Dumpback to CST A or B, OR <ul style="list-style-type: none"> Drain hotwell to TB Sump. 	11.	DISPATCH operator to OPEN 1-FCV-14-3 to bypass condensate DI if not already open.		12.	ENSURE Radiation Protection dispatched to survey secondary plant.		13.	NOTIFY Chemistry to obtain samples as necessary for confirming Ruptured S/G.		14.	NOTIFY plant personnel of potential contaminated release: <p>"Attention plant personnel. Unit 1 has developed a S/G tube Rupture. Treat all Unit 1 leaks as radioactive."</p>	
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

3. Fully OPEN SG 1, 3 and 4 PORVs to initiate a max rate RCS cooldown to limit RCS inventory loss to SG 2 via tube rupture and radiation release from the site.

Examiner Note(s):

SG 2 Pressure will be slightly greater than 1100 psig. US will select 491°F as Target Incore Temp.

OAC

OAC

OAC

RO/SRO

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
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Step	Action/Expected Response	Response Not Obtained
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15. **ENSURE** major steam flowpaths from the ruptured S/G isolated:

- a. TD AFW pump steam supply from Ruptured S/G CLOSED (if applicable).
- b. Ruptured S/G MSIV and bypass valve CLOSED,

OR

Intact S/G MSIVs and bypass valves CLOSED.

16. **CHECK** Ruptured S/G pressure greater than 710 psig. ** GO TO 1-ECA-3.1, SGTR and LOCA - Subcooled Recovery.

17. **DETERMINE** target Incore temp for RCS cooldown:

- IF Ruptured S/G pressure is between listed values, **THEN**

USE lower value:

RUPTURED S/G PRESSURE (PSIG)	TARGET INCORE TEMP (°F)
1100	491°F [471°F ADV]
1000	479°F [459°F ADV]
900	466°F [446°F ADV]
800	451°F [431°F ADV]
710	437°F [417°F ADV]

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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	78	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

RO may return MDAFW LCVs and TDAFW LCVs to SGs 1, 3 and 4 to AUTO in preparation for cooldown.

OAC/SRO
RO
RO/SRO
N/A

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

- CAUTION
- The 1500 psig RCP trip criteria is **NOT** applicable during or after a controlled RCS cooldown and depressurization.
 - If total feed flow CAPABILITY of 410 gpm is AVAILABLE, 1-FR-H.1, Loss of Secondary Heat Sink, should **NOT** be implemented.
 - Excessive steam dump cooldown rate will cause MSIV isolation due to the rate sensitive signal.
 - If RCPs are **NOT** running, a false red or orange path may be indicated for 1-FR-P.1 during the following steps. T-cold in the ruptured loop should be disregarded until Step 43.

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	79	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Critical Task(s):

3. Fully OPEN SG 1, 3 and 4 PORVs to initiate a max rate RCS cooldown to limit RCS inventory loss to SG 2 via tube rupture and radiation release from the site.

Examiner Note(s):

RO will place 1-HS-1-103A, STEAM DUMP FSV A [1-M-4], and 1-HS-1-103B, STEAM DUMP FSV B [1-M-4], to OFF. RO will then place 1-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS. The WHITE arming light will NOT be LIT indicating failure of steam dumps in Pressure Mode. RO will return 1-HS-1-103A and 1-HS-1-103B to ON.

EVENT 9

When RO places 1-PIC-1-33A in MANUAL and raises output, steam dumps will NOT OPEN.

US will exercise step [18.a] RNO, and direct the RO to place SG PORV handswitches for SGs 1, 3 and 4 to OPEN.

RO
RO
RO
RO
RO

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

18. INITIATE RCS cooldown to target Incore temp, determined from Step 17.
- a. DUMP steam to condenser from Intact S/G(s) at maximum achievable rate:
IF dumps are in Tavg mode, THEN:
1) PLACE steam dump controls OFF.
2) PLACE steam dump mode switch in STEAM PRESSURE.
3) ENSURE steam dump demand indicator 1-XI-1-33 reading zero.
4) PLACE steam dump controls ON.
5) PLACE steam dump controller in MAN, AND FULLY OPEN three cooldown valves (≤ 25% demand).
- a. IF condenser steam dumps NOT available, THEN
USE Intact S/G PORVs at maximum achievable cooldown rate.
IF Intact S/G PORVs are unavailable due to a loss of Train power or loss of air, THEN
DISPATCH NAUO to PERFORM Attachment 5 (1-E-3), for Controlling S/G PORVs with N2.
IF an Intact S/G is NOT available, THEN
PERFORM one BUT NOT BOTH of the following:
• USE Faulted S/G,
OR
• ** GO TO 1-ECA-3.1, SGTR LOCA - Subcooled Recovery.

Step continued on the next page

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	80	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): OAC may notify US to expect 69-B, PZR PRESS SI BLOCKED, and 68-B, LO STM PRESS SI-BLKD STM PRESS RATE SLI-ACTIVE (P-11), to alarm.</div> <div>Examiner Note(s): Intact SG PORVs are accomplishing the cooldown.</div> <div>Critical Task(s): 3. Fully OPEN SG 1, 3 and 4 PORVs to initiate a max rate RCS cooldown to limit RCS inventory loss to SG 2 via tube rupture and radiation release from the site.</div>	<div>OAC OAC</div> <div>N/A</div> <div>BOP</div> <div>SRO</div>	<table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Rupture</td><td>1-E-3 Rev. 0007</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>18. (continued)</p> <p>b. WHEN RCS pressure is less than 1962 psig (P-11), THEN:</p> <ul style="list-style-type: none">BLOCK low PZR pressure SI.BLOCK low steam pressure SI. <p>c. WHEN Tavg is less than 550°F (P-12), THEN</p> <p>BYPASS Lo-Lo Tavg interlock.</p> <p>d. WHEN Incore temp is less than target temp, THEN</p> <p>STOP RCS cooldown, AND</p> <p>MAINTAIN Incore temperature less than or equal to target.</p> <p>e. CONTINUE with Step 19 of this Instruction.</p> <p>Page 13 of 58</p>	WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	81	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Rupture</td><td>1-E-3 Rev. 0007</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>19. MONITOR Intact S/G levels:</p> <table><tr><td>a. At least one S/G NR level greater than 29% [39% ADV].</td><td>a. ENSURE feed flow greater than 410 gpm.</td></tr><tr><td>b. S/G NR levels less than 50% and controlled.</td><td>b. IF NR level in any unisolated S/G continues to rise with no feed flow, THEN STOP RCS cooldown, AND ** GO TO Note prior to Step 2.</td></tr></table> <p>20. CONTROL Intact S/G NR levels between 29% and 50% [39% and 50% ADV].</p> <p>21. MONITOR PZR PORVs and block valves:</p> <table><tr><td>a. PZR PORVs CLOSED.</td><td>a. WHEN RCS pressure less than 2335 psig, THEN ENSURE PZR PORV or associated block valve CLOSED. IF PORV fails open AND associated block valve can NOT be closed, THEN ** GO TO 1-ECA-3.1, SGTR and LOCA - Subcooled Recovery.</td></tr><tr><td>b. At least one block valve OPEN.</td><td>b. OPEN one block valve UNLESS it was closed to isolate an open PORV.</td></tr></table>	WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007	Step	Action/Expected Response	Response Not Obtained	a. At least one S/G NR level greater than 29% [39% ADV].	a. ENSURE feed flow greater than 410 gpm.	b. S/G NR levels less than 50% and controlled.	b. IF NR level in any unisolated S/G continues to rise with no feed flow, THEN STOP RCS cooldown, AND ** GO TO Note prior to Step 2.	a. PZR PORVs CLOSED.	a. WHEN RCS pressure less than 2335 psig, THEN ENSURE PZR PORV or associated block valve CLOSED. IF PORV fails open AND associated block valve can NOT be closed, THEN ** GO TO 1-ECA-3.1, SGTR and LOCA - Subcooled Recovery.	b. At least one block valve OPEN.	b. OPEN one block valve UNLESS it was closed to isolate an open PORV.
WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007														
Step	Action/Expected Response	Response Not Obtained														
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	BOP															
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	OAC															
	OAC															

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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	82	of	103							
Event Description:		SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.															
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior											
<p>Examiner Note(s):</p> <p>OAC will check 1-TI-68-328, -329 and -330, SAFETY TAILPIPE TEMP, [1-M-4] which will be at ambient temperature and higher than normal due to the LOCA. OAC will also verify 91-A, PZR PORV/SAFETY OPEN, is DARK and may look at 1-XX-68-363, PZR VALVES ACOUSTIC MONITOR, on 0-M-25 and verify NO RED LEDs LIT.</p> <p>Examiner Note(s):</p> <p>After depressing SI Reset pushbuttons for Train A and Train B, 70-A, SI ACTUATED, will be DARK and 70-B, AUTO SI BLOCKED, will be LIT.</p>					<p>OAC</p> <p>SRO</p> <p>OAC</p> <p>OAC</p> <p>OAC</p> <p>OAC</p> <p>OAC</p>	<table border="1"> <tr> <td>WBN Unit 1</td> <td>Steam Generator Tube Rupture</td> <td>1-E-3 Rev. 0007</td> </tr> <tr> <td>Step</td> <td>Action/Expected Response</td> <td>Response Not Obtained</td> </tr> </table> <p>22. CHECK PZR safety valves CLOSED:</p> <ul style="list-style-type: none"> EVALUATE tailpipe temperatures and acoustic monitors. <p>CAUTION If offsite power is lost after SI reset, manual action will be required to restart the SI pumps and RHR pumps due to loss of SI start signal.</p> <p>IF RCS pressure is less than 2485 psig, and PZR safety valve failed open, THEN</p> <p>** GO TO 1-ECA-3.1, SGTR and LOCA - Subcooled Recovery.</p> <p>23. RESET SI, AND CHECK the following:</p> <ul style="list-style-type: none"> SI ACTUATED permissive DARK. AUTO SI BLOCKED permissive LIT. <p>NOTIFY IMs to block auto SI USING IMI-99.040, Auto SI Block.</p> <p>24. RESET Phase A and Phase B.</p> <p>25. ENSURE Cntmt air in service:</p> <p>a. Aux air pressure greater than 75 psig [M-15].</p> <p>a. DISPATCH Operator to aux air compressors:</p> <ol style="list-style-type: none"> ENSURE affected compressor(s) running. ENSURE affected train isolation valve CLOSED: <ul style="list-style-type: none"> Train A, 0-FCV-32-82. Train B, 0-FCV-32-85. <p>b. Cntmt air supply valves OPEN [M-15]:</p> <ul style="list-style-type: none"> 1-FCV-32-80. 1-FCV-32-102. 1-FCV-32-110. <p>Page 15 of 58</p>						WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007															
Step	Action/Expected Response	Response Not Obtained															

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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

If step [26.c] is performed during the RCS cooldown, RCS pressure will be lowering, and the **US** will exercise the RNO to align CCS to both Unit 1 RHR Heat Exchangers, and isolate CCS to SFP Heat Exchanger A. Otherwise, **OAC** will STOP RHR Pumps and place in A AUTO.

OAC
OAC
OAC

OAC
OAC

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

26. DETERMINE if RHR pumps should be stopped:
- a. CHECK RHR suction aligned from RWST.

a. ** GO TO Step 27.
- b. CHECK RCS pressure greater than 150 psig.

b. ENSURE RHR pumps RUNNING.

** GO TO Step 27.
- c. CHECK RCS pressure stable or rising.

c. ENSURE CCS from RHR HX 1B OUTLET 1-FCV-70-153 and RHR HX 1A OUTLET 1-FCV-70-156 OPEN.

ENSURE RHR HX 2B OUTLET 2-FCV-70-153 THROTTLED to 2800 gpm if in service.

CLOSE SFP heat exchanger A CCS supply 0-FCV-70-197.

** GO TO Step 27.
- d. STOP RHR pumps AND PLACE in A-AUTO.
- e. MONITOR RCS pressure greater than 150 psig.

e. Manually RESTART RHR pumps.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	84	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

BOP may periodically lower setpoints on SG 1, 3 and 4 PORV controllers by simultaneously depressing the SP and << pushbuttons to maintain deviation at 0%.

Examiner Note(s):

Upon completion of step [27.b], SG 1, 3 and 4 PORV handswitches will be in P AUTO with controller deviations at approx. 0%.

Scenario Termination:

All Critical Tasks previously completed.
Terminate the Scenario at CHIEF EXAMINER Discretion.

BOP

BOP

BOP

SRO

WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
Step	Action/Expected Response	Response Not Obtained

27. CHECK target Incore temperature:
- a. CHECK Incore temperature less than target temperature.

a. DO NOT CONTINUE this instruction UNTIL Incore temperature less than target temperature.
- b. STOP RCS cooldown.
- c. MAINTAIN Incore temperature less than target temperature.
28. MONITOR Ruptured S/G pressure stable or rising.
- MAINTAIN Ruptured S/G at least 250 psig greater than the pressure of the S/G(s) used for cooldown:

Slowly DUMP steam from S/G(s) used for cooldown.

MAINTAIN RCS cooldown rate less than 100° F in one hour.

IF the Ruptured S/G depressurizes to less than 250 psig above the pressure of the S/G(s) used for cooldown, THEN

** GO TO 1-ECA-3.1, SGTR and LOCA - Subcooled Recovery.

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	7, 8, 9, 10		Page	85	of	103
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Event Description:	SG 2 SGTR. Reactor Trip and SI. 1-FCV-63-25 and -26 fail to OPEN automatically. Steam Dumps fail to operate in Pressure Mode. ABI Train B fails. 1-E-0. 1-E-3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Steam Generator Tube Rupture</td><td>1-E-3 Rev. 0007</td></tr></table> <p>Foldout Page (Page 1 of 1)</p> <p><u>SI REINITIATION CRITERIA</u></p> <p>Manually START ECCS pumps as necessary:</p> <ul style="list-style-type: none">• PZR level can NOT be maintained greater than 15% [33% ADV], OR• RCS subcooling less than 65°F [85°F ADV] <p>IF Step 33 has been completed AND SI Reinitiation occurs, THEN</p> <p>** GO TO 1-ECA-3.1, SGTR and LOCA - Subcooled Recovery:</p> <p><u>RCP TRIP CRITERIA</u></p> <ul style="list-style-type: none">• Phase B Isolation, OR• One charging pump OR one SI pump injecting AND <p>RCS press dropped UNCONTROLLED to less than 1500 psig.</p> <p><u>EVENT DIAGNOSTIC TRANSITIONS</u></p> <ul style="list-style-type: none">• IF any S/G press low or dropping uncontrolled AND has NOT been isolated, THEN <p>** GO TO 1-E-2, Faulted Steam Generator Isolation, unless that S/G is needed for cooldown.</p> <ul style="list-style-type: none">• IF intact S/G radiation abnormal or S/G level rising uncontrolled, THEN <p>** GO TO 1-E-3, Steam Generator Tube Rupture, Note prior to Step 2.</p> <p><u>SUMP RECIRC SWITCHOVER CRITERIA</u></p> <ul style="list-style-type: none">• IF RWST level less than 34%, THEN <p>** GO TO 1-ES-1.3, Transfer to RHR Containment Sump.</p> <p><u>AFW OPERATION</u></p> <ul style="list-style-type: none">• IF CST volume less than 5000 gal, THEN <p>MONITOR AFW pumps to ensure suction transfer.</p> <p>Page 58 of 58</p>	WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007
WBN Unit 1	Steam Generator Tube Rupture	1-E-3 Rev. 0007			

Op Test	301	Scenario #	3	Event #	N/A		Page	86	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>All steps of 1-E-0 Appendices A and B are typically performed by the BOP and therefore a Position is not specified for every step. ROLE PLAY may be required at several steps and has been provided.</p>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><p>Appendix A (Page 1 of 12) Equipment Verification</p><p>NOTE The high level steps of this appendix are listed sequentially, but strict sequential performance is not mandated.</p><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>1.</td><td>ENSURE all DGs RUNNING.</td><td>EMERGENCY START DGs</td></tr><tr><td>2.</td><td>ENSURE DG NORM ERCW Supply OPEN for running DG(s) [0-M-27A]:<ul style="list-style-type: none">1-HS-67-66A2-HS-67-66A1-HS-67-67A2-HS-67-67A.</td><td>OPEN affected DG(s) Backup ERCW Supply [0-M-27A]:<ul style="list-style-type: none">1-HS-67-68A2-HS-67-68A1-HS-67-65A2-HS-67-65AIF ERCW CANNOT be aligned to the affected DG(s), THEN EMERGENCY STOP the affected DG(s).</td></tr><tr><td>3.</td><td>ENSURE at least four ERCW pumps RUNNING;<ul style="list-style-type: none">One on each Shutdown Board preferred</td><td>MANUALLY START pumps as necessary.</td></tr></table><p>Page 16 of 47</p></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained	1.	ENSURE all DGs RUNNING.	EMERGENCY START DGs	2.	ENSURE DG NORM ERCW Supply OPEN for running DG(s) [0-M-27A]: <ul style="list-style-type: none">1-HS-67-66A2-HS-67-66A1-HS-67-67A2-HS-67-67A.	OPEN affected DG(s) Backup ERCW Supply [0-M-27A]: <ul style="list-style-type: none">1-HS-67-68A2-HS-67-68A1-HS-67-65A2-HS-67-65A IF ERCW CANNOT be aligned to the affected DG(s), THEN EMERGENCY STOP the affected DG(s).	3.	ENSURE at least four ERCW pumps RUNNING; <ul style="list-style-type: none">One on each Shutdown Board preferred	MANUALLY START pumps as necessary.
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016															
Step	Action/Expected Response	Response Not Obtained															
1.	ENSURE all DGs RUNNING.	EMERGENCY START DGs															
2.	ENSURE DG NORM ERCW Supply OPEN for running DG(s) [0-M-27A]: <ul style="list-style-type: none">1-HS-67-66A2-HS-67-66A1-HS-67-67A2-HS-67-67A.	OPEN affected DG(s) Backup ERCW Supply [0-M-27A]: <ul style="list-style-type: none">1-HS-67-68A2-HS-67-68A1-HS-67-65A2-HS-67-65A IF ERCW CANNOT be aligned to the affected DG(s), THEN EMERGENCY STOP the affected DG(s).															
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Op Test	301	Scenario #	3	Event #	N/A		Page	87	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td colspan="3">Appendix A (Page 2 of 12) Equipment Verification</td></tr><tr><td>4.</td><td>ENSURE CCS pumps RUNNING:<ul style="list-style-type: none">1A-A CCS pump.1B-B CCS pump.C-S CCS pump.</td><td>IF 1A Train CCS Flow Lost, THEN PERFORM the following:<ul style="list-style-type: none">ENSURE CCP 1B-B Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1A-ATBBPs 1A & 1BCS Pump 1A-ASI Pump 1A-ARHR Pump 1A-ASTOP RCPsIF 1B Train CCS Flow Lost, THEN PERFORM the following:<ul style="list-style-type: none">ENSURE CCP 1A-A Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1B-BCS Pump 1B-BSI Pump 1B-BRHR Pump 1B-B</td></tr><tr><td>5.</td><td>ENSURE PCBs OPEN:<ul style="list-style-type: none">PCB 5084.PCB 5088.</td><td>OPEN manually.</td></tr></table>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Appendix A (Page 2 of 12) Equipment Verification			4.	ENSURE CCS pumps RUNNING: <ul style="list-style-type: none">1A-A CCS pump.1B-B CCS pump.C-S CCS pump.	IF 1A Train CCS Flow Lost, THEN PERFORM the following: <ul style="list-style-type: none">ENSURE CCP 1B-B Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1A-ATBBPs 1A & 1BCS Pump 1A-ASI Pump 1A-ARHR Pump 1A-ASTOP RCPs IF 1B Train CCS Flow Lost, THEN PERFORM the following: <ul style="list-style-type: none">ENSURE CCP 1A-A Running, THEN STOP and LOCKOUT the following pumps:<ul style="list-style-type: none">CCP 1B-BCS Pump 1B-BSI Pump 1B-BRHR Pump 1B-B	5.	ENSURE PCBs OPEN: <ul style="list-style-type: none">PCB 5084.PCB 5088.	OPEN manually.
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016												
Appendix A (Page 2 of 12) Equipment Verification														
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5.	ENSURE PCBs OPEN: <ul style="list-style-type: none">PCB 5084.PCB 5088.	OPEN manually.												

Op Test	301	Scenario #	3	Event #	N/A		Page	88	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr><tr><td colspan="3">Appendix A (Page 3 of 12) Equipment Verification</td></tr><tr><td>6.</td><td>ENSURE AFW pump operation:<ul style="list-style-type: none">Both MD AFW pumps RUNNING.TD AFW pump RUNNING.LCVs in AUTO, OR controlled in MANUAL.</td><td>ESTABLISH at least one train AFW operation.</td></tr><tr><td>7.</td><td>ENSURE MFW isolation:<ul style="list-style-type: none">MFW isolation and bypass isolation valves CLOSED.MFW reg and bypass reg valves CLOSED.MFP A and B TRIPPED.Standby MFP STOPPED.Cond demin pumps TRIPPED.Cond booster pumps TRIPPED.#3 HDT Pumps TRIPPED.#7 HDT Pumps TRIPPED.</td><td>Manually CLOSE valves AND STOP pumps, as necessary. IF any valves can NOT be closed, THEN CLOSE #1 heater outlet valves.</td></tr></table>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Appendix A (Page 3 of 12) Equipment Verification			6.	ENSURE AFW pump operation: <ul style="list-style-type: none">Both MD AFW pumps RUNNING.TD AFW pump RUNNING.LCVs in AUTO, OR controlled in MANUAL.	ESTABLISH at least one train AFW operation.	7.	ENSURE MFW isolation: <ul style="list-style-type: none">MFW isolation and bypass isolation valves CLOSED.MFW reg and bypass reg valves CLOSED.MFP A and B TRIPPED.Standby MFP STOPPED.Cond demin pumps TRIPPED.Cond booster pumps TRIPPED.#3 HDT Pumps TRIPPED.#7 HDT Pumps TRIPPED.	Manually CLOSE valves AND STOP pumps, as necessary. IF any valves can NOT be closed, THEN CLOSE #1 heater outlet valves.
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016												
Appendix A (Page 3 of 12) Equipment Verification														
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Op Test	301	Scenario #	3	Event #	N/A		Page	89	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>EVENT 8</div> <div>1-FCV-63-25 and -26 did not automatically OPEN. BOP will open 1-FCV-63-25 and/or -26 IAW step [8.e] RNO.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 4 of 12)</div><div>Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>8. MONITOR ECCS operation:</div><div><div>a. Charging pumps RUNNING.</div><div>a. Manually START charging pumps.</div><div>b. Charging pump alignment:<ul style="list-style-type: none">RWST outlets 1-LCV-62-135 and 1-LCV-62-136 OPEN.VCT outlets 1-LCV-62-132 and 1-LCV-62-133 CLOSED.Charging 1-FCV-62-90 and 1-FCV-62-91 CLOSED.</div><div>b. ENSURE at least one valve in each set aligned.</div><div>c. RHR pumps RUNNING.</div><div>c. Manually START RHR pumps.</div><div>d. SI pumps RUNNING.</div><div>d. Manually START SI pumps.</div><div>e. BIT alignment:<ul style="list-style-type: none">Outlets 1-FCV-63-25 and 1-FCV-63-26 OPEN.Flow thru BIT.</div><div>e. ENSURE at least one valve aligned, and flow thru BIT.</div><div>f. RCS pressure greater than 1650 psig.</div><div>f. ENSURE SI pump flow.</div><div>IF RCS press drops to less than 150 psig, THEN ENSURE RHR pump flow.</div></div><div>Page 19 of 47</div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	N/A		Page	90	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<div><div><div>WBN Unit 1</div><div>Reactor Trip or Safety Injection</div><div>1-E-0 Rev. 0016</div></div><div>Appendix A (Page 5 of 12)</div><div>Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div><div>9. CHECK Cntmt isolation:<div>a. Phase A isolation:<ul style="list-style-type: none">Train A GREEN.Train B GREEN.</div><div>b. Cntmt vent isolation:<ul style="list-style-type: none">Train A GREEN.Train B GREEN.</div></div><div>ACTUATE Phase A and Cntmt Vent Isolation signal, OR Manually CLOSE valves and dampers as necessary. REFER to applicable Attachment as necessary:<ul style="list-style-type: none">Attachment 7, Train A Cntmt VentAttachment 8, Train A Phase AAttachment 9, Train B Cntmt VentAttachment 10, Train B Phase A</div></div></div>	Step	Action/Expected Response	Response Not Obtained
Step	Action/Expected Response	Response Not Obtained			

Op Test	301	Scenario #	3	Event #	N/A		Page	91	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>As AUO, acknowledge direction to OPEN Ice Condenser AHU breakers. Wait 3 minutes and notify the MCR that 1-E-0 Attachment 1 is complete.</p>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><p>Appendix A (Page 6 of 12) Equipment Verification</p><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div><div>10.</div><div><div>CHECK Cntmt pressure:</div><ul style="list-style-type: none">Phase B DARK [MISSP].Cntmt Spray DARK [MISSP].Cntmt press less than 2.8 psig.</div><div><div>PERFORM the following:</div><div><div>1) ENSURE Phase B actuated.</div><div>2) ENSURE Cntmt Spray actuated.</div><div>3) ENSURE Cntmt spray pumps running.</div><div>4) ENSURE Cntmt spray flow.</div><div>5) ENSURE Phase B isolation:<ul style="list-style-type: none">Train A GREEN.Train B GREENManually CLOSE valves and dampers as necessary.</div><div>6) STOP all RCPs.</div><div>7) ENSURE MSIVs and bypasses CLOSED.</div><div>8) PLACE steam dump controls OFF.</div><div>9) WHEN 10 minutes has elapsed since Phase B actuated, THEN</div><div>ENSURE air return fans start.</div><div>10) USE adverse Cntmt [ADV] setpoints where provided.</div></div></div></div><div><div>11.</div><div>DISPATCH AUO to perform Attachment 1 (1-E-0), Ice Condenser AHU Breaker Operation.</div></div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	N/A		Page	92	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>EVENT 10 ABI Train B signal did NOT occur. BOP will exercise step [13.a] RNO and start ABGTS B-B and verify Train B damper alignment.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 7 of 12)</div><div>Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>12. CHECK plant radiation NORMAL: NOTIFY Unit Supervisor IMMEDIATELY.<ul style="list-style-type: none">S/G blowdown rad recorder 1-RR-90-120 NORMAL prior to isolation [0-M-12].Condenser vacuum exhaust rad recorder 1-RR-90-119 NORMAL prior to trip [0-M-12].1-RR-90-106 and 1-RR-90-112 radiation recorders NORMAL prior to isolation [0-M-12].S/G main steamline discharge monitors NORMAL [1-M-30].Upper and Lower containment high range monitors NORMAL [1-M-30].NOTIFY Unit Supervisor conditions NORMAL.</div><div>13. ENSURE ABGTS operation:<div><div>a. ABGTS fans RUNNING.</div><div>a. Manually START fans.</div><div>b. ABGTS dampers OPEN:<ul style="list-style-type: none">FCO-30-146A.FCO-30-146B.FCO-30-157A.FCO-30-157B.</div><div>b. Locally OPEN dampers.</div></div></div><div>Page 22 of 47</div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	N/A		Page	93	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>As AUO, acknowledge direction to shut down Upper and Lower Containment Radiation Monitors. Wait 10 minutes and notify the MCR that Upper and Lower Containment Radiation Monitors have been shut down IAW 0-SOI-90.02</p>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 8 of 12) Equipment Verification</div><table><tr><th>Step</th><th>Action/Expected Response</th><th>Response Not Obtained</th></tr><tr><td>14.</td><td>ENSURE 0-FCV-67-152, CCS HX C ALT DISCH TO HDR B, is open to position A.</td><td>Manually OPEN 0-FCV-67-152 to position A.</td></tr><tr><td>15.</td><td>CLOSE 0-FCV-67-144, CCS HX C DISCH TO HDR A.</td><td></td></tr><tr><td>16.</td><td>ENSURE 1-FCV-67-146, CCS HX A OUTLET ERCW FLOW CNTL, is OPEN to position B</td><td>Manually OPEN 1-FCV-67-146 to position B.</td></tr><tr><td>17.</td><td>CLOSE 1-FCV-67-143, CCS HX A OUTLET ERCW FLOW CNTL BYP.</td><td></td></tr><tr><td>18.</td><td>ENSURE 2-FCV-67-146, CCS HX B OUTLET ERCW FLOW CNTL is OPEN to position A.</td><td>Manually OPEN 2-FCV-67-146 to position A.</td></tr><tr><td>19.</td><td>CLOSE 2-FCV-67-143, CCS HX B OUTLET ERCW FLOW CNTL BYP.</td><td></td></tr><tr><td>20.</td><td>MONITOR EGTS operation:<ul style="list-style-type: none">EGTS fans RUNNING.ENSURE dampers OPENCHECK filter bank dp between 2 and 5 inches of water.</td><td>Manually START fans AND OPEN dampers.</td></tr><tr><td>21.</td><td>DISPATCH AUO to shutdown Upper and Lower CNTMT rad monitors USING 0-SOI-90.02, Gaseous Process Radiation Monitors</td><td></td></tr></table><div>Page 23 of 47</div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained	14.	ENSURE 0-FCV-67-152, CCS HX C ALT DISCH TO HDR B, is open to position A.	Manually OPEN 0-FCV-67-152 to position A.	15.	CLOSE 0-FCV-67-144, CCS HX C DISCH TO HDR A.		16.	ENSURE 1-FCV-67-146, CCS HX A OUTLET ERCW FLOW CNTL, is OPEN to position B	Manually OPEN 1-FCV-67-146 to position B.	17.	CLOSE 1-FCV-67-143, CCS HX A OUTLET ERCW FLOW CNTL BYP.		18.	ENSURE 2-FCV-67-146, CCS HX B OUTLET ERCW FLOW CNTL is OPEN to position A.	Manually OPEN 2-FCV-67-146 to position A.	19.	CLOSE 2-FCV-67-143, CCS HX B OUTLET ERCW FLOW CNTL BYP.		20.	MONITOR EGTS operation: <ul style="list-style-type: none">EGTS fans RUNNING.ENSURE dampers OPENCHECK filter bank dp between 2 and 5 inches of water.	Manually START fans AND OPEN dampers.	21.	DISPATCH AUO to shutdown Upper and Lower CNTMT rad monitors USING 0-SOI-90.02, Gaseous Process Radiation Monitors	
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016																														
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Op Test	301	Scenario #	3	Event #	N/A		Page	94	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>As AUO, if 3 minutes have elapsed from direction provided in step [11] and MCR has NOT been notified, then notify MCR that 1-E-0 Attachment 1 is complete.</p> <div>Examiner Note(s):</div> <p>EVENT 10. ABI Train B signal did NOT occur. BOP may exercise step [26] RNO and CLOSE Train B dampers. Not required as dampers are in series with Train A dampers which did CLOSE.</p>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><p>Appendix A (Page 9 of 12) Equipment Verification</p><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><p>22. WHEN Attachment 1 is complete (Ice Condenser AHU Breakers OPEN), THEN ENERGIZE hydrogen igniters [1-M-10]:</p><ul style="list-style-type: none">1-HS-268-73 ON.1-HS-268-74 ON.<p>NOTE The following equipment is located on 1-M-9.</p><p>23. CHECK CNTMT PURGE fans STOPPED. STOP fans AND PLACE handswitch in PULL-TO-LOCK.</p><p>24. CHECK FUEL HANDLING EXH fans STOPPED, Fuel and Cask loading dampers CLOSED: STOP fans AND PLACE handswitch in PULL-TO-LOCK, THEN Manually CLOSE dampers.</p><p>25. ENSURE AB GEN SUPPLY and EXH fans STOPPED. STOP fans AND PLACE handswitch in PULL-TO-LOCK.</p><p>NOTE Dampers 1-HS-30-158 and 2-HS-30-270 remain open during ABI.</p><p>26. ENSURE AB GEN SUP & EXH dampers CLOSED. Manually CLOSE dampers.</p><p>Page 24 of 47</p></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	N/A		Page	95	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<div><div>WBN Unit 1</div><div>Reactor Trip or Safety Injection</div><div>1-E-0 Rev. 0016</div></div> <div>Appendix A (Page 10 of 12) Equipment Verification</div> <table><tr><th>Step</th><th>Action/Expected Response</th><th>Response Not Obtained</th></tr><tr><td>27.</td><td>ENSURE MCR & SPREAD RM FRESH AIR dampers CLOSED:<ul style="list-style-type: none">FCV-31-3.FCV-31-4.</td><td>Manually CLOSE dampers.</td></tr><tr><td>28.</td><td>ENSURE at least one CB EMER CLEANUP fan RUNNING and associated damper OPEN:<ul style="list-style-type: none">CB EMERG CLEANUP FAN A-A,<div>OR</div><ul style="list-style-type: none">Fan B-B RUNNING..<ul style="list-style-type: none">FCO-31-8, OPEN.<div>OR</div><ul style="list-style-type: none">FCO-31-7, OPEN</td><td>Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.</td></tr><tr><td>29.</td><td>ENSURE at least one CB EMER PRESS fan RUNNING and associated damper OPEN:<ul style="list-style-type: none">CB EMERG PRESS FAN A-A,<div>OR</div><ul style="list-style-type: none">FAN B-B RUNNING.<ul style="list-style-type: none">FCO-31-6, OPEN.<div>OR</div><ul style="list-style-type: none">FCO-31-5, OPEN.</td><td>Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.</td></tr></table> <div>Page 25 of 47</div>	Step	Action/Expected Response	Response Not Obtained	27.	ENSURE MCR & SPREAD RM FRESH AIR dampers CLOSED: <ul style="list-style-type: none">FCV-31-3.FCV-31-4.	Manually CLOSE dampers.	28.	ENSURE at least one CB EMER CLEANUP fan RUNNING and associated damper OPEN: <ul style="list-style-type: none">CB EMERG CLEANUP FAN A-A, <div>OR</div> <ul style="list-style-type: none">Fan B-B RUNNING.. <ul style="list-style-type: none">FCO-31-8, OPEN. <div>OR</div> <ul style="list-style-type: none">FCO-31-7, OPEN	Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.	29.	ENSURE at least one CB EMER PRESS fan RUNNING and associated damper OPEN: <ul style="list-style-type: none">CB EMERG PRESS FAN A-A, <div>OR</div> <ul style="list-style-type: none">FAN B-B RUNNING. <ul style="list-style-type: none">FCO-31-6, OPEN. <div>OR</div> <ul style="list-style-type: none">FCO-31-5, OPEN.	Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.
Step	Action/Expected Response	Response Not Obtained												
27.	ENSURE MCR & SPREAD RM FRESH AIR dampers CLOSED: <ul style="list-style-type: none">FCV-31-3.FCV-31-4.	Manually CLOSE dampers.												
28.	ENSURE at least one CB EMER CLEANUP fan RUNNING and associated damper OPEN: <ul style="list-style-type: none">CB EMERG CLEANUP FAN A-A, <div>OR</div> <ul style="list-style-type: none">Fan B-B RUNNING.. <ul style="list-style-type: none">FCO-31-8, OPEN. <div>OR</div> <ul style="list-style-type: none">FCO-31-7, OPEN	Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.												
29.	ENSURE at least one CB EMER PRESS fan RUNNING and associated damper OPEN: <ul style="list-style-type: none">CB EMERG PRESS FAN A-A, <div>OR</div> <ul style="list-style-type: none">FAN B-B RUNNING. <ul style="list-style-type: none">FCO-31-6, OPEN. <div>OR</div> <ul style="list-style-type: none">FCO-31-5, OPEN.	Manually START fan. NOTIFY TSC if at least one damper NOT OPEN.												

Op Test	301	Scenario #	3	Event #	N/A		Page	96	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As U2 Operator, acknowledge direction to check U2 Containment Vent Isolation GREEN on both Trains. Immediately report that both Trains of CVI on U2 are GREEN.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 11 of 12)</div><div>Equipment Verification</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>30. ENSURE Control Building fans STOPPED and dampers CLOSED:<ul style="list-style-type: none">• SPREADING ROOM SUPPLY and EXH FANS AND dampers.• TOILET & LKR RM EXHAUST FAN AND dampers.<div>NOTE Loss of shutdown power could result in a loss of SFP cooling. Annunciator Window 128-A and 128-B could be indicative of this condition and increased monitoring of SFP level, temperature and radiation levels will be necessary..</div><div>31. CHECK at least one 6.9kV Shutdown Board ENERGIZED. DISPATCH AUO to perform Attachment 6, Monitor Spent Fuel Pool. IF AUO reports abnormal SFP level or temperature, THEN REFER to 0-AOI-45, Loss of Spent Fuel Pool Level or Cooling</div><div>32. CHECK U2 Cntmt isolation [2-M-6]:<div>a. Cntmt vent isolation:<ul style="list-style-type: none">• Train A GREEN.• Train B GREEN.</div><div>ACTUATE Cntmt Vent Isolation signal, OR Manually CLOSE valves and dampers as necessary.</div></div></div></div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	3	Event #	N/A		Page	97	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <div>As U2 Operator, acknowledge direction to check U2 Containment Purge Fans stopped. Immediately report that all U2 Containment Purge fans are stopped.</div>	<div>BOP</div>	<div><table><tr><td>WBN Unit 1</td><td>Reactor Trip or Safety Injection</td><td>1-E-0 Rev. 0016</td></tr></table><div>Appendix A (Page 12 of 12) Equipment Verification</div><div><div>33. CHECK CNTMT PURGE fans STOPPED [2-M-9].</div><div>STOP fans AND PLACE handswitch in PULL-TO-LOCK. DISPATCH AUO to perform Attachment 11 (1-E-0).</div></div><div><div>34. INITIATE Appendix B (1-E-0), Phase B Pipe Break Contingencies.</div></div></div> <div>Page 27 of 47</div>	WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016
WBN Unit 1	Reactor Trip or Safety Injection	1-E-0 Rev. 0016			

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	3	Event #	N/A		Page	98	of	103
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Event Description:	1-E-0 Appendices A and B
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	BOP	<div><div><div>WBN Unit 1</div><div>Reactor Trip or Safety Injection</div><div>1-E-0 Rev. 0016</div></div><div>Appendix B (Page 1 of 1)</div><div>Phase B Pipe Break Contingencies</div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>1.</td><td>CHECK PHASE B actuated. [MISSP - 1-XX-55-6C, -6D]</td><td>WHEN PHASE B actuation occurs, THEN GO TO step 2.</td></tr><tr><td>2.</td><td>ENSURE thermal barrier booster pumps are STOPPED:<ul style="list-style-type: none">1-HS-70-131A in Pull To Lock.1-HS-70-130A in Pull To Lock.</td><td></td></tr><tr><td>3.</td><td>ENSURE 1-FCV-32-110 CLOSED. [CISP - 1-XX-55-6E] (A-train, window 13)</td><td>DISPATCH AUO to perform Attachment 2 (1-E-0). IF control air can NOT be isolated, THEN COORDINATE with SM to shutdown Unit 2. WHEN Unit 2 is in Mode 3, THEN DIRECT AUO to complete Attachment 2 (1-E-0).</td></tr></table></div>	Step	Action/Expected Response	Response Not Obtained	1.	CHECK PHASE B actuated. [MISSP - 1-XX-55-6C, -6D]	WHEN PHASE B actuation occurs, THEN GO TO step 2.	2.	ENSURE thermal barrier booster pumps are STOPPED: <ul style="list-style-type: none">1-HS-70-131A in Pull To Lock.1-HS-70-130A in Pull To Lock.		3.	ENSURE 1-FCV-32-110 CLOSED. [CISP - 1-XX-55-6E] (A-train, window 13)	DISPATCH AUO to perform Attachment 2 (1-E-0). IF control air can NOT be isolated, THEN COORDINATE with SM to shutdown Unit 2. WHEN Unit 2 is in Mode 3, THEN DIRECT AUO to complete Attachment 2 (1-E-0).
Step	Action/Expected Response	Response Not Obtained												
1.	CHECK PHASE B actuated. [MISSP - 1-XX-55-6C, -6D]	WHEN PHASE B actuation occurs, THEN GO TO step 2.												
2.	ENSURE thermal barrier booster pumps are STOPPED: <ul style="list-style-type: none">1-HS-70-131A in Pull To Lock.1-HS-70-130A in Pull To Lock.													
3.	ENSURE 1-FCV-32-110 CLOSED. [CISP - 1-XX-55-6E] (A-train, window 13)	DISPATCH AUO to perform Attachment 2 (1-E-0). IF control air can NOT be isolated, THEN COORDINATE with SM to shutdown Unit 2. WHEN Unit 2 is in Mode 3, THEN DIRECT AUO to complete Attachment 2 (1-E-0).												

Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 3
Simulator Console Operators Instructions

1. SIMULATOR SET UP

- a. **ENSURE** exam security is established.
- b. **LOAD IC 251.**
- c. **LOAD** schedule file for 2019-301 NRC Examination Scenario 3.
- d. **ENSURE** the following are BYPASSED in DCS:
 - 1) **1-FM-3-48B** (SG 2 STEAM FLOW)
 - 2) **1-PM-68-334** (PZR PRESSURE)
- e. **ENSURE** DCS workstations are in "Initial environment"
- f. **ENSURE** ICS Screens are clear
- g. **ENSURE** ICS alarms are acknowledged (BISI for CS Pump 1B-B)
- h. **REMOVE** ICS point P0481A from SCAN (1-SI-68-106)
- i. **ENSURE** Scenario 3.evt loaded.
- j. **PLACE** Equipment Off Normal tags on control boards as follows:
 - 1) **Indicators:**
 - a) **1-FI-3-48B** (SG 2 FEED FLOW, 1-M-4)
 - b) **1-PI-68-334** (PZR PRESSURE, 1-M-5)
 - 2) **Alarms:**
 - a) **1-XX-55-5 window 38** (Protection Set II Door OPEN, 1-M-5)
 - b) **61-C** (SG 2, STM-FW FLOW MISMATCH)
 - c) **67-D** (PROT SET II BYPASS, 1-M-4)
- k. **PLACE** the following in the specified position and **ATTACH** a Clearance tag (DANGER):
 - 1) **(PTL) 1-HS-72-10A** CNTMT SPRAY PUMP B (1-M-6) Position ☐ Tag ☐
 - 2) **1-HS-72-21A** RWST TO CS PMP B (1-M-6) Position ☐ Tag ☐
 - 3) **1-HS-72-45A** CNTMT SUMP TO CS PUMP B SUCT (1-M-6) Position ☐ Tag ☐
 - 4) **1-HS-73-13A** CNTMT SPRAY PMP B MINI FLOW (1-M-6) Position ☐ Tag ☐
- l. **PLACE** protected equipment tags on the following:
 - 1) **1-HS-72-27A** CNTMT SPRAY PMP A (1-M-6)
 - 2) **1-HS-82-18** DG MODE SELECTOR (1A-A) (0-M-26)
- m. **DEPRESS** "CLR" pushbutton on Area Rad Monitors (5) and Wide Range Condenser Vacuum Exhaust Rad Monitors (2)
- n. **ENSURE** MOL Reactivity Briefing Book and placard are used. **ENSURE** MOL Reactivity Briefing Book is UPDATED for current conditions. RCS Cb = 824 ppm. CBD at 186 steps in AUTO. ΔI at -0.8% against a target of -0.9% with limits of -20.6% and 14.5%.
- o. **ENSURE** ALL malfunctions listed on the Simulator Input Summary are loaded in Director.
- p. **PERFORM** Independent Verification that ALL malfunctions listed on the Simulator Input Summary are loaded in Director.

**Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 3
Simulator Console Operators Instructions**

- q. **ENSURE** "B" Train Channel II sign, MODE 1 sign, and "A" Protected train sign are posted on 1-M-30.
- r. **ENSURE** correct AUO cards are available to US, OAC and BOP.
- s. **ENSURE** ALL operator aids NOT required for the scenario are removed from the boards.
- t. **ENSURE** ALL recorders are clear.
- u. **PLACE** simulator in RUN until alarm 82-F, DCS Trouble, clears.

NOTE: IF desired, **THEN** Simulator may be placed in FREEZE until prompted by NRC CHIEF EXAMINER to return to **RUN**.

- v. **ENSURE** ALL ARIs are clear of all writing.
 - 1) 1-ARI-57-63
 - 2) 1-ARI-95-101
 - 3) 1-ARI-102-108
 - 4) 1-ARI-109-115
 - 5) 1-ARI-173-179
- w. **IF** the first scenario of the day **THEN ENSURE**:
 - 1) ALL EOIs are clear of all writing
 - 2) ALL AOIs are clear of all writing
 - 3) ALL ECAs are clear of all writing
 - 4) ALL FRs are clear of all writing
 - 5) ALL Tech Specs are clear of all writing
 - 6) ALL back-up copies are clear of all writing
- x. **IF NOT** the first scenario of the day **THEN ENSURE** the following procedures to be used are not written on:
 - 1) 1-AOI-20
 - 2) 1-AOI-16
 - 3) 1-AOI-44
 - 4) 1-AOI-33
 - 5) 1-AOI-39
 - 6) 1-E-0
 - 7) 1-E-0 Appendices A and B
 - 8) 1-E-3
 - 9) 1-FR-0

**Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 3
Simulator Console Operators Instructions**

2. GENERIC SCENARIO NOTES

- a. Typical Response Times:** Unless specified in the SEG or determined by the **NRC CHIEF EXAMINER**, the response time of AUOs or other personnel dispatched should be approximately 3 to 5 min.
- b. Plant Data or Information Requests:** Information not contained in this exam guide should be discussed with the **NRC CHIEF EXAMINER** before providing any information to the crew.
- c. General Notifications:** If not specifically addressed in the SEG, general notifications to Operations Management, Shift Manager, Load Coordinator, Plant Duty Manager, etc. will be acknowledged by the Console Operator.

3. TURNOVER INFORMATION

- a) Provide Crew with the following information:
 - Shift Turnover sheet with current Unit Status.
 - Blank copy of 1-SOI-62.01 Section 8.27

**Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 3
Simulator Console Operators Instructions**

SIMULATOR INPUT SUMMARY							
Key	Description	Event	Delay	Ramp	Initial	Final	Value
mux_19c051	67-D, Protection Set II Bypass (1-R-5)		0:00:00	0:00:00	---	ALARM	None
rx13f	FT-3-48B failure		0:00:00	0:00:00	---	0.0	85.7141
si09a	1-FCV-63-26 fails to OPEN automatically		0:00:00	0:00:00	---	Active	Inactive
si09b	1-FCV-63-25 fails to OPEN automatically		0:00:00	0:00:00	---	Active	Inactive
ch10b	ABI Train B fails		0:00:00	0:00:00	---	Active	Inactive
cv31b	CCP 1B-B broken coupling	3	0:00:00	0:00:00	---	Active	Inactive
rp18c	Loss of power to Eagle 21 1-R-3	4	0:00:00	0:00:00	---	Active	Inactive
th05b	SG 2 tube leak	5	0:00:00	0:02:00	---	1.2	0
th05b	SG 2 tube rupture	7	0:01:00	0:20:00	---	15.5	0
ms12a to 12l	Mechanical binding of steam dumps	25	0:00:00	0:10:00	---	0	0
hs-72-10a	CS Pump 1B-B		0:00:00	0:00:00	---	ptlock	nastop
hs-72-10a-1	HS-72-10A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-21a	FCV-72-21, RWST to CS Pump 1B-B		0:00:00	0:00:00	---	CLOSE	blank
hs-72-21a-1	HS-72-21A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-45a	FCV-72-45, Containment Sump to CS Pump 1B-B		0:00:00	0:00:00	---	CLOSE	blank
hs-72-45a-1	HS-72-45A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-45a-2	HS-72-45A RED light		0:00:00	0:00:00	---	OFF	OFF
hs-72-13a-1	HS-72-13A GREEN light		0:00:00	0:00:00	---	OFF	ON
xx-55-5-38	Status Panel Protection Set II Door Open LIT (MIG PZR Press SI)		0:00:00	0:00:00	---	ON	OFF

SHIFT TURNOVER CHECKLIST			
<input type="checkbox"/>	SM		
<input checked="" type="checkbox"/>	US	Unit	<u>1</u>
<input checked="" type="checkbox"/>	UO	Unit	<u>2</u>
<input type="checkbox"/>	AUO	Station	<u>WBN</u>
<input type="checkbox"/>	STA		
		Off-going - Name	
		On-coming - Name	
Part 1 - Completed by off-going shift / Reviewed by on-coming shift:			
<ul style="list-style-type: none"> Abnormal equipment lineup / conditions: <div style="border: 1px solid black; padding: 2px; margin: 2px;">Containment Spray Pump 1B-B tagged 4 hours ago for scheduled component outage. LCO 3.6.6 Condition A entered. 12 hours of scheduled work remain.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">1-LPP-68-334, PZR Pressure, is removed from scan in ICS and bypassed in DCS to support 1-SI-68-106, 184D Channel Operational Test Pressurizer Pressure Channel II. 1-LPP-68-334 is BYPASSED in Eagle-21 (67-D LIT). LCO 3.3.1 Conditions A, W and X entered. LCO 3.3.2 Conditions A, D and L entered.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">1-FT-3-48B, SG 2 Feed Flow, failed and was bypassed in DCS (61-C LIT).</div> SI/Tests in progress / planned: (including need for conduct of evolution briefings) <div style="border: 1px solid black; padding: 2px; margin: 2px;">1-SI-68-106, 184D COT Pressurizer Pressure Channel II</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">1-TRI-47-3, Main Turbine Steam Inlet Valve Testing</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;"><input type="checkbox"/> US/ SM review late SI report (SQN and WBN only)</div> Major Activities / Procedures in progress or planned: <div style="border: 1px solid black; padding: 2px; margin: 2px;">Train B Channel II Work Week. 72% power. RCS Cb 824 ppm. CBD at 186 steps. Rod control in AUTO.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">OAC to lower VCT pressure to 25 psig IAW 1-SOI-62.01 Section 8.27 to support shiftly dilutions.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">Plant Risk: Green. Grid: Qualified.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">Unit 2 is in MODE 1 at 100% power.</div> Radiological changes during the shift: <div style="border: 1px solid black; padding: 2px; margin: 2px;">None</div> 			
Part 2 - Completed by on-coming shift prior to assuming duties:			
<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> Review station rounds /Abnormal readings (AUOs only) <input type="checkbox"/> Review Narrative Logs (previous day and carry-over items) <input type="checkbox"/> Current qualification status <input type="checkbox"/> Leadership and Team Effectiveness applicability <input type="checkbox"/> Review the current controlling Reactivity Management Plans (N/A for AUOs) <input type="checkbox"/> Review current TS/TRM/ODCM/FPR Required Actions (N/A for AUOs) <input type="checkbox"/> Walk down MCR Control Boards with off-going Operator (N/A for AUOs, as applicable for SM /STA) <input type="checkbox"/> CR reviews complete for previous shift (SM/US/STA) <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Relief Time: _____ Relief Date: _____ </div> </div>			
Part 3 - Completed by on-coming shift. These items may be reviewed after assuming duties:			
<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> Review Operator Workarounds, Burdens and Challenges (applicable Unit / Station) <input type="checkbox"/> Review applicable ODML actions (first shift of shift week) <input type="checkbox"/> Review changes in Standing / Shift Orders (since last shift worked) <input type="checkbox"/> Review changes to TACFs issued (since last shift worked) (N/A for AUOs) <input type="checkbox"/> Review Control Room Deficiencies (first shift of shift week) (N/A for AUOs) <input type="checkbox"/> Review Component Deviation Log (N/A for AUOs) </div>			

Watts Bar Nuclear Plant

NRC EXAM 2019-301

Scenario 4

Facility:	Watts Bar Nuclear Plant	Scenario No.	4	Op Test No.:	2019-301
Examiners:	_____	Operators:	_____	SRO	
	_____		_____	RO	
	_____		_____	BOP	
Run Time: 75 to 85 minutes					
Initial Conditions:	Unit 1 is in MODE 1 at 3% power. <ul style="list-style-type: none"> Containment Spray Pump 1B-B tagged 6 hours ago for scheduled component outage. LCO 3.6.6 Condition A entered. 12 hours of scheduled work remain. Unit 2 is at 100% power.				
Turnover:	Train B Channel II Work Week. Raise Reactor Power from 3% to 15% to support rolling and testing the Main Turbine IAW 1-GO-3 Section 5.3.				
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	N/A	DELETED		
2	ni04b	R-OAC/SRO	Raise Reactor Power from 3% to 15% IAW 1-GO-3 Section 5.3. (10 min)		
3	N/A	I-BOP/SRO TS-SRO	Intermediate Range Channel II fails LOW requiring entry into 1-AOI-4, Nuclear Instrument Malfunctions. (10 min)		
4	N/A	N-OAC/SRO	Block IR and PR Low Reactor trips above P-10.		
5	cv29 hs-62-70a-1 hs-62-70a-2 mux_21c040	C-OAC/SRO	1-FCV-62-70 fails CLOSED due to blown fuse requiring entry into 1-AOI-20, Malfunction of Pressurizer Level Control System. Crew isolates charging and letdown. Crew places Excess Letdown in service. (20 to 25 min)		
6	rw18e	C-BOP/SRO TS-SRO	ERCW Pump E-B coupling breaks requiring entry into 0-AOI-13, Loss of ERCW. Crew starts redundant Train B ERCW Pump. (10 min)		
7	rc08b	C-OAC/SRO	Loop 2 Pressurizer Spray valve fails OPEN requiring entry into 1-AOI-18, Malfunction of Pressurizer Pressure Control System. OAC unable to CLOSE Loop 2 Pressurizer Spray valve. Crew will attempt to trip reactor to allow stopping RCPs 1 and 2. (5 min)		
8	rp01c	M-OAC M-BOP/SRO	Reactor fails to trip requiring entry into 1-FR-S.1, Nuclear Power Generation/ATWS. OAC will insert control rods. When less than 5% power, BOP will stop RCPs 1 and 2 (stopping RCPs is part of Event 6). (20 to 25 min)		
9	si08g si08h fw22c	C-BOP/SRO	MDAFW pumps fail to AUTO start on Low Pressure SI. TDAFW Pump is steam bound 2 minutes after start. BOP will manually start MDAFW pumps.		
*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Scenario 4 - Summary

Event	Description
1	DELETED.
2	OAC raises reactor power to approx. 15% in preparation for rolling the Main Turbine. 1-GO-3 Section 5.3 completed through step [3]. OAC performs manual dilution and rod withdrawal.
3	Intermediate Range Channel II fails LOW (no reactor trip). US enters 1-AOI-4, Nuclear Instrumentation Malfunctions. BOP bypasses IR Channel II IAW 1-AOI-4. US evaluates LCOs 3.3.1 and 3.3.3.
4	OAC blocks IR and PR LO trips when reactor power is greater than 10% IAW 1-GO-3 Section 5.3 step [7].
5	1-FCV-62-70 fails CLOSED due to blown fuse. US enters 1-AOI-20, Malfunction of Pressurizer Level Control System. OAC isolates charging and letdown. OAC places Excess Letdown in service.
6	ERCW Pump E-B coupling breaks. US enters 0-AOI-13, Loss of ERCW. BOP starts redundant Train B ERCW Pump. US evaluates LCOs 3.7.8 and 3.8.1.
7	Loop 2 Pressurizer Spray valve fails OPEN. US enters 1-AOI-18, Malfunction of Pressurizer Pressure Control System. OAC attempts and is unable to CLOSE Loop 2 Pressurizer Spray valve. OAC will attempt to trip U1 reactor.
8	<p>U1 reactor fails to trip. US enters 1-FR-S.1, Nuclear Power Generation/ATWS. OAC will insert control rods. When less than 5% reactor power, BOP will stop RCPs 1 and 2.</p> <p>Scenario can be terminated when US returns to 1-E-0, Reactor Trip or Safety Injection, or at the Lead Examiner's discretion.</p>
9	BOP will start AFW (MDAFW Pump AUTO starts are disabled and TDAFW Pump will become airborne 2 minutes after start and will NOT supply AFW).

Scenario 4 - Critical Tasks

Critical Task	Description
1	Start AFW prior to all SG NR levels dropping < 29% (RED path entry conditions for 1-FR-H.1, Loss of Secondary Heat Sink).
2	Insert control rods to reduce reactor power to less than 5% to allow stopping of RCPs 1 and 2 prior to 1500 psig.

References

Number	Title	Revision
N/A	WBN U1 Technical Specifications	Amendment 123
1-GO-3	Unit Startup from Less Than 4% Reactor Power to 30%	0013
1-ARI-88-94	RCS (94-A)	0003
1-ARI-81-87	NIS & Rod Control (82-A)	0011
1-AOI-4	Nuclear Instrumentation Malfunctions	0001
1-ARI-15-21	Cntl Pwr & Fire Prot (17-B)	0004
0-ARI-241-253	CCS (247-A)	003
1-AOI-20	Malfunction of Pressurizer Level Control System	0008
0-ARI-223-229	ERCW (227-A)	0003
0-AOI-13	Loss of ERCW	0006
1-ARI-88-94	RCS (90-B)	0003
1-AOI-18	Malfunction of Pressurizer Pressure Control System	0006
1-FR-S.1	Nuclear Power Generation/ATWS	0002
1-FR-0	Status Trees (laminated copy)	0000
1-E-0	Reactor Trip or Safety Injection	0016

Op Test	301	Scenario #	4	Event #	2		Page	5	of	47
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Event Description:	Raise Reactor Power from 3% to 15% IAW 1-GO-3 Section 5.3
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play: If contacted as Chemistry with request for desired SG Blowdown flow rate state: "Desired SG Blowdown flow rate for U1 is 80 gpm."</div>	<div>SRO SRO Crew Crew RO RO Crew OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power</td><td>1-GO-3 Rev. 0013 Page 18 of 43</td></tr></table><div>Date _____Initials _____</div><div>5.3 Raise Reactor Power to Between 13 and 15%</div><div><div>NOTES</div><div>1) To enter this section, reactor power should be between 1 and 4%. 2) The main emphasis of this section is transition to MODE 1 and raise reactor power to between 13 and 15%. 3) Power escalation should progress based on Operator control of SG levels until the MFW Regs are in AUTO.</div><div>[1] REVIEW plant parameters and indications. _____ [2] CHECK stability before reactor power escalation. _____</div><div><div>NOTES</div><div>1) Before raising reactor power above 5%, SG blowdown should be in service. 2) Blowdown flow should be maintained between 5 and 60 gpm per SG. Minimum desired flow rate is determined by chemical analysis.</div><div><div>CAUTION</div><div>If loop blowdown isolation valves are closed, severe water hammer could occur unless 1-FCV-15-43 is also closed then reopened slowly after loop blowdown isolation valves are reopened.</div></div><div>[3] IF SG blowdown is in service, THEN ADJUST 1-HIC-15-43, SG BLOWDOWN FLOW CONTROL to _____desired flow rate (pt. F0619A).</div></div></div></div>	WBN Unit 1	Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power	1-GO-3 Rev. 0013 Page 18 of 43
WBN Unit 1	Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power	1-GO-3 Rev. 0013 Page 18 of 43			

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	2		Page	6	of	47
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Event Description: Raise Reactor Power from 3% to 15% IAW 1-GO-3 Section 5.3

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

Dilutions to support raising power to 15% performed by previous shift. AFD is slightly low supporting rod withdrawal. Reactivity Control Plan only specifies rod withdrawal.

Examiner Note(s):

94-A, TAVG-TREF DEVIATION, will alarm at approx. 6% power. 82-F, DCS TROUBLE, will also alarm on the Tavg-Tref deviation.

Examiner Note(s):

OAC will raise power by withdrawing control rods in MANUAL not to exceed 3 steps in any one minute. Control Bank D will be withdrawn approx. 20 steps to raise power to 15%. Tavg will go up and Steam Dump demand will also go up resulting in feedwater flow through the bypass regulating valves rising.

Examiner Note(s):

1-GO-3 continues on p. 12 with Event 4 which is the Normal Event for this scenario.

Examiner Note(s):

At 8% power,

Simulator Schedule File Event 24 Automatically Inserts
(IR Range Channel II fails LOW)

N/A

OAC/SRO
OAC/SROOAC
SRO

BOP

SRO/BOP

BOP

WBN Unit 1	Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power	1-GO-3 Rev. 0013 Page 19 of 43
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Date _____

Initials _____

5.3 Raise Reactor Power to Between 13 and 15% (continued)

NOTES

- 1) Dilution should be performed in a deliberate manner with small batches every 12 to 15 minutes for a steady rise in T_{avg}. Refer to the Reactivity Briefing Binder to establish batch sizes. Dilution and rod movement rates may be adjusted depending on SG level stability.
- 2) While raising power both the Intermediate Range and Power Range indicators should be monitored to ensure proper NI calibration.
- 3) While raising power to between 13 and 15%, Tavg and Tref will deviate due to raising average temperature and Tref remaining the same due to no change in turbine impulse pressure. 3°F limit does not apply until the turbine is synced to the grid.

[4] **INITIATE** a methodical and deliberate rise in reactor power to between 13 and 15% by rod withdrawal and/or RCS dilution. _____

[5] **WHEN** greater than 5% power, **THEN** _____

LOG MODE 1 ENTRY. _____

NOTE

Additional hotwell pumps may be placed in service as needed.

CAUTION

The MFW Bypass Reg. valves may be taken to manual to stabilize SG levels during level transients. Auto control should be reestablished after SG level has been stabilized at program level.

[6] **ENSURE** MFW Bypass Reg. Controllers maintain SG levels on program. _____

Op Test	301	Scenario #	4	Event #	2		Page	7	of	47
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Event Description:

Raise Reactor Power from 3% to 15% IAW 1-GO-3 Section 5.3

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div><div>Examiner Note(s):</div><div>Crew should continue to raise power and Tav_g will rise greater than 561°F. 1-SI-68-34, Minimum Temperature for Criticality Tav_g-Tref Deviation Alarm Not Reset, is used to verify that RCS temperature is not below the minimum for reactor power operations when the alarm cannot notify the operators. 1-SI-68-34 will NOT be performed based on Note 3 prior to step [4] of 1-GO-3 Section 5.3.</div></div>	<div>OAC</div> <div>SRO/OAC</div> <div>OAC</div> <div>N/A</div> <div>N/A</div> <div>N/A</div> <div>N/A</div>	<div><div><div><div>WBN Unit 1</div><div>Reactor Coolant System</div><div>1-ARI-88-94 Rev. 0003 Page 41 of 49</div></div><div><div>Source</div><div>1-TS-68-2P (DCS) 1-TS-68-2Q (DCS)</div></div><div><div>Setpoint</div><div>Auctioneered Tav_g greater than ± 3°F of Tref</div></div><div><div>94-A</div><div>TAVG-TREF DEVIATION</div><div>(Page 1 of 2)</div></div></div><div><div>Probable Cause:</div><div>A. Reactor control system or steam dumps maintaining improper Tav_g B. Channel test and/or malfunction C. Heatup or cooldown in progress D. Turbine runback E. Load change with control rods in manual F. DCS Malfunction</div></div><div><div>Corrective Action:</div><div>[1] CHECK Loop Tav_g on 1-TI-68-2E, -25E, -44E, and -67E [1-M-5]. [2] IF Tav_g is less than or equal to 561°F, THEN PERFORM 1-SI-68-34 within 30 minutes. [3] CHECK Tref & Auct Tav_g recorder 1-TR-68-2B [1-M-5]. [4] IF control rods are in AUTO AND fail to control Tav_g within 3°F of Tref, THEN: [4.1] PLACE control rods in MANUAL. [4.2] RESTORE Tav_g to Tref using rods OR ADJUST turbine load to match Tav_g with Tref. [5] IF rods move uncontrolled OR fail to move on demand, THEN REFER TO 1-AOI-2, Malfunction of Reactor Control System. [6] IF the Reactor is being maintained in Hot Standby, THEN ADJUST Steam Dump controls to maintain 557°F.</div></div><div><div>NOTE</div><div>Windows 90-F, 91-F, 92-F, and 93-F indicate an RTD failure. Loop Tav_g and ΔT indicator anomalies could also be indicative of an RTD or loop instrument failure. T_{cold} and Thot indicators on 1-M-5 are for indication only.</div></div><div><div>[7] IF Tav_g, Thot or T_{cold} instrumentation has failed, THEN: [7.1] ENSURE failed DCS inputs are bypassed. REFER TO 1-SOI-98.01 as necessary. [7.2] ENSURE operable Loop ΔT selected for recording (1-XS-68-2B).</div></div><div>Continued on Next Page</div></div>
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	2		Page	8	of	47
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Event Description: Raise Reactor Power from 3% to 15% IAW 1-GO-3 Section 5.3

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A N/A	<div><div><div>WBN Unit 1</div><div>Reactor Coolant System</div><div>1-ARI-88-94 Rev. 0003 Page 42 of 49</div></div><div>94-A</div><div>TAVG-TREF DEVIATION</div><div>Corrective Actions: (Continued)</div><div>(Page 2 of 2)</div><div>CAUTION</div><div>To avoid undesired control rod movement at least 5 minutes should elapse between removing failed instrument from service and placing control rods in AUTO.</div><div>[8] IF automatic control of control rods is desired, THEN ENSURE zero demand on control rod position indication [1-M-4] AND PLACE control rods in AUTO.</div><div>[9] IF ΔT or Tavg channels failed, THEN: [9.1] NOTIFY Work Control to remove failed RPS Channel from service if necessary. [9.2] REFER TO Tech Specs.</div><div>References: 1-47W610-68-8, -9, -10, -11 08F734235-FD-1201, -1202, -1205 1-SI-68-34 1-AOI-2 1-SOI-98.01 Tech Specs</div></div>
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	3		Page	9	of	47
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Event Description:	IR Channel II fails LOW. 1-AOI-4. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At 8% power,
 Simulator Schedule File Event 24 Automatically Inserts
 (IR Range Channel II fails LOW)

- 82-A, CHANNEL II SOURCE/INTERM RANGE TROUBLE
- 1-NI-92-136A failed downscale LOW

- **OAC** will announce 82-A and refer to ARI-82A (to the right)
- **CREW** will diagnose IR Channel II failing LOW
- **US** will announce entry to 1-AOI-4, Nuclear Instrumentation Malfunctions, Section 3.3, Intermediate Range Monitor Malfunction.

ARI-82-A directs US to 1-AOI-4.

Crew
SRO
SRO

WBN Unit 1	NIS & Rod Controls	1-ARI-81-87 Rev. 0011 Page 11 of 52
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82-A

References: W 583F190
1-AOI-4
Tech Specs

Op Test	301	Scenario #	4	Event #	3		Page	10	of	47
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Event Description:	IR Channel II fails LOW. 1-AOI-4. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>US will perform crew update to notify crew that 1-AOI-4 will be used to address the failure of IR Channel II.</div> <div>US will determine that Section 3.3 applies.</div>	SRO	<div><table><tr><td>WBN Unit 1</td><td>Nuclear Instrumentation Malfunctions</td><td>1-AOI-4 Rev. 0001</td></tr></table><div>3.0 OPERATOR ACTIONS</div><div>3.1 Diagnostics</div><table><tr><td>IF</td><td>GO TO Subsection</td><td>PAGE</td></tr><tr><td>Source Range Monitor malfunction</td><td>3.2</td><td>7</td></tr><tr><td>Intermediate Range Monitor malfunction</td><td>3.3</td><td>12</td></tr><tr><td>Power Range Monitor malfunction</td><td>3.4</td><td>14</td></tr></table></div> <div>Page 6 of 42</div>	WBN Unit 1	Nuclear Instrumentation Malfunctions	1-AOI-4 Rev. 0001	IF	GO TO Subsection	PAGE	Source Range Monitor malfunction	3.2	7	Intermediate Range Monitor malfunction	3.3	12	Power Range Monitor malfunction	3.4	14
WBN Unit 1	Nuclear Instrumentation Malfunctions	1-AOI-4 Rev. 0001															
IF	GO TO Subsection	PAGE															
Source Range Monitor malfunction	3.2	7															
Intermediate Range Monitor malfunction	3.3	12															
Power Range Monitor malfunction	3.4	14															

Appendix D Required Operator Actions Form ES-D-2															
Op Test	301	Scenario #	4	Event #	3		Page	11	of 47						
Event Description:		IR Channel II fails LOW. 1-AOI-4. Technical Specification Evaluation.													
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior									
<div>Examiner Note(s):</div> <p>Reactor power is greater than P-6, but less than P-10. However, ONLY one IR channel has failed.</p> <p>SRO evaluates Technical Specifications.</p> <div>Tech Specs:</div> <ul style="list-style-type: none">LCO 3.3.1, Table 3.3.1-1, Reactor Trip Instrumentation, Condition A:<ul style="list-style-type: none">- IR Neutron Flux, Function 4, Condition FLCO 3.3.3, Table 3.3.3-1, PAM Instrumentation, Condition A:<ul style="list-style-type: none">- IR, Function 1(TRACKING ONLY on LCO 3.3.1, P-6, Function 16, Condition R) <div>Role Play:</div> <p>When US contacts Operations Duty Manager, acknowledge the information provided, and state: "I will notify the Duty Team including Reactor Engineering."</p> <div>Role Play:</div> <p>When US contacts Work Control, acknowledge the request(s) and information provided.</p> <div>Examiner Note(s):</div> <p>A Crew Brief would typically be conducted for this event. The crew briefing is optional.</p>					N/A	<table><tr><td>WBN Unit 1</td><td>Nuclear Instrumentation Malfunctions</td><td>1-AOI-4 Rev. 0001</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.3 Intermediate Range Monitor (IRM) Failure</p> <p>1. IF greater than P-6 and less then P-10 with BOTH IRM channels failed, THEN STOP positive reactivity changes.</p> <p>NOTE Placing the affected channel in bypass will cause either window 64B or 65B to alarm.</p> <p>2. PLACE failed channel LEVEL TRIP switch to BYPASS [1-M-13].</p> <p>3. ENSURE 1-NR-92-145 recording an operable IRM.</p> <p>4. REFER TO Tech Spec 3.3.1, Rx Trip System Instrumentation and 3.3.3, PAM Instruments.</p> <p>5. NOTIFY Operations Duty Manager and Rx Engineering of any failed channel.</p> <p>6. INITIATE repair of IRM.</p> <p>7. DO NOT CONTINUE UNTIL repairs are complete.</p> <p>Page 12 of 42</p>				WBN Unit 1	Nuclear Instrumentation Malfunctions	1-AOI-4 Rev. 0001	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Nuclear Instrumentation Malfunctions	1-AOI-4 Rev. 0001													
Step	Action/Expected Response	Response Not Obtained													

Op Test	301	Scenario #	4	Event #	4		Page	12	of	47
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Event Description:	Block IR and PR Low Reactor trips above P-10 IAW 1-GO-3 Section 5.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

If Crew is reluctant to raise power above P-10 (10%), then with CHIEF EXAMINER Permission:

Role Play:

As Operations Duty Manager, call MCR on phone and state: "Continue directed power ascension IAW turnover sheet."

OAC
OAC
OAC
N/A

WBN Unit 1	Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power	1-GO-3 Rev. 0013 Page 20 of 43
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Date _____ Initials _____

5.3 Raise Reactor Power to Between 13 and 15% (continued)

[7] WHEN greater than or equal to 10% power on at least 2-out-of-4 PRMs, THEN:

[7.1] CHECK Permissive 64-E, P-10 NUC AT POWER PERMISSIVE, is LIT. _____

[7.2] CHECK Permissive 70-D, P-7 LO POWER TRIPS BLOCKED, is NOT LIT. _____

[7.3] COMPARE the highest PRM with the highest loop ΔT indication. _____

[7.4] IF greater than 5% deviation exists, THEN

[7.4.1] STOP power rise. _____

[7.4.2] NOTIFY the SRO. _____

Initials Time Date

Op Test	301	Scenario #	4	Event #	4		Page	13	of	47
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Event Description:	Block IR and PR Low Reactor trips above P-10 IAW 1-GO-3 Section 5.3.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power</td><td>1-GO-3 Rev. 0013 Page 21 of 43</td></tr><tr><td colspan="2">Date _____</td><td>Initials _____</td></tr><tr><td colspan="3">5.3 Raise Reactor Power to Between 13 and 15% (continued)</td></tr><tr><td colspan="3">Start of Critical Step(s)</td></tr><tr><td>[7.5]</td><td>BLOCK the IR Hi-Flux Reactor trip and PR Lo-Flux Reactor trips by performing the following:</td><td></td></tr><tr><td>[7.5.1]</td><td>PLACE both of the following switches to BLOCK:</td><td></td></tr><tr><td></td><td>• 1-N38A, IR TRIP BLOCK P-10</td><td>_____</td></tr><tr><td></td><td>• 1-N38B, IR TRIP BLOCK P-10</td><td>_____</td></tr><tr><td>[7.5.2]</td><td>CHECK PERMISSIVE 65-C, INTERMED RANGE TRIP BLOCKED, is LIT.</td><td>_____</td></tr><tr><td>[7.5.3]</td><td>PLACE both of the following switches to BLOCK:</td><td></td></tr><tr><td></td><td>• 1-N47A, PR LO POWER TRIP BLOCK P-10</td><td>_____</td></tr><tr><td></td><td>• 1-N47B, PR LO POWER TRIP BLOCK P-10</td><td>_____</td></tr><tr><td>[7.5.4]</td><td>CHECK ALARM 64-D, POWER RANGE LO SETPOINT TRIP BLOCKED, IS LIT.</td><td>_____</td></tr><tr><td colspan="3">End of Critical Step(s)</td></tr><tr><td>[8]</td><td>IF MFP Master Speed Controller is in MANUAL AND AUTO control is desired, THEN</td><td></td></tr><tr><td>[8.1]</td><td>ADJUST 1-PC-46-20, MFPT A & B MASTER SPEED CONTROLLER, to ZERO the deviation.</td><td>_____</td></tr><tr><td>[8.2]</td><td>PLACE 1-PC-46-20, MFPT A & B MASTER SPEED CONTROLLER, in AUTO.</td><td>_____</td></tr><tr><td colspan="3">End of Section</td></tr></table>	WBN Unit 1	Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power	1-GO-3 Rev. 0013 Page 21 of 43	Date _____		Initials _____	5.3 Raise Reactor Power to Between 13 and 15% (continued)			Start of Critical Step(s)			[7.5]	BLOCK the IR Hi-Flux Reactor trip and PR Lo-Flux Reactor trips by performing the following:		[7.5.1]	PLACE both of the following switches to BLOCK:			• 1-N38A, IR TRIP BLOCK P-10	_____		• 1-N38B, IR TRIP BLOCK P-10	_____	[7.5.2]	CHECK PERMISSIVE 65-C, INTERMED RANGE TRIP BLOCKED, is LIT.	_____	[7.5.3]	PLACE both of the following switches to BLOCK:			• 1-N47A, PR LO POWER TRIP BLOCK P-10	_____		• 1-N47B, PR LO POWER TRIP BLOCK P-10	_____	[7.5.4]	CHECK ALARM 64-D, POWER RANGE LO SETPOINT TRIP BLOCKED, IS LIT.	_____	End of Critical Step(s)			[8]	IF MFP Master Speed Controller is in MANUAL AND AUTO control is desired, THEN		[8.1]	ADJUST 1-PC-46-20, MFPT A & B MASTER SPEED CONTROLLER, to ZERO the deviation.	_____	[8.2]	PLACE 1-PC-46-20, MFPT A & B MASTER SPEED CONTROLLER, in AUTO.	_____	End of Section		
WBN Unit 1	Unit Startup From Less Than 4% Reactor Power to 30% Reactor Power	1-GO-3 Rev. 0013 Page 21 of 43																																																						
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	OAC																																																							
	N/A																																																							

Appendix D Required Operator Actions Form ES-D-2									
Op Test	301	Scenario #	4	Event #	5			Page	14 of 47
Event Description:		1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.							
Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior			
<p>At CHIEF EXAMINER Direction: Insert Simulator Schedule File Event 5 (1-FCV-62-70 CLOSED with blown fuse.)</p> <p>INDICATIONS:</p> <ul style="list-style-type: none"> 17-B, 125 DC VITAL BATT BD I ABNORMAL CKTS ISOLATED 82-E, DCS TROUBLE, will alarm on Regen HX Outlet Temperature being offscale low 247-A, LTDN HX RET FLOW LO 1-LI-62-129A, VCT LEVEL, drops 1-FI-62-82, LETDOWN FLOW, drops 1-TI-62-78, LETDOWN HX OUTLET TEMP, drops 1-PI-62-81, LP LETDOWN PRESS, drops 1-TI-62-87, REGEN HX OUT CHRGR TEMP, drops Pressurizer Level rising 1-HS-62-70A GREEN and RED lights NOT LIT <p>Operator Actions:</p> <ul style="list-style-type: none"> BOP will announce 17-B and/or 247-A, and refer to ARI-17-B (next page and/or ARI-247-A (following page) OAC will announce 82-E and refer to ARI-82-E OAC may complete Letdown isolation. OAC may isolate charging and/or take MANUAL control of 1-HIC-62-93A, CHARGING FLOW CONTROL, to minimize rise in Pressurizer Level Crew will diagnose loss of power to 1-FCV-62-70 and isolation of Letdown US will announce entry to 1-AOI-20, Malfunction of Pressurizer Level Control System 									

Op Test	301	Scenario #	4	Event #	5		Page	15	of	47
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Event Description:	1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<p>Role Play:</p> <p>If dispatched as AUO, then acknowledge the direction. Wait 3 minutes and notify the MCR: "Vital Battery Board I fuse A9 for 1-FCV-62-70 has cleared."</p> <p>If MCR requests AUO replace fuse, then acknowledge the direction. Wait 30 seconds and</p> <p>Insert Simulator Schedule File Event 21</p> <p>(Replacement fuse clears.)</p> <p>Notify MCR: "Replacement fuse immediately cleared."</p> <p>Role Play:</p> <p>If MCR requests AUO remove the fuse to clear the alarm, then acknowledge the request.</p> <p>Remove malfunction "mux_21c040"</p> <p>Notify MCR: "Fuse removed."</p> <p>Role Play:</p> <p>If contacted as Work Control, then acknowledge the request(s) and information provided.</p>	<p>N/A RO BOP SRO N/A</p>	<div><div><div>WBN Unit 1</div><div>CNTL PWR & Fire PROT</div><div>1-ARI-15-21 Rev. 0004 Page 17 of 48</div></div><div><div>Source</div><div>Batt Bd I</div><div>Any Batt Bd I fuse</div><div>Any Batt Bd I breaker</div><div>1-HS-3-945-A/1-HS-30-1080</div><div>120 VAC Instrument Pwr Bd 1-I Bkr</div></div><div><div>Setpoint</div><div>Ground</div><div>Blown</div><div>Tripped</div><div>OFF position</div><div>Tripped</div></div><div><div>17-B</div><div>125 DC VITAL BATT BD I ABNORMAL CKTS ISOLATED</div><div>(Page 1 of 1)</div></div><div><div>Probable Cause:</div><div>A. Feeder overload</div><div>B. Ground on bus or feeder</div><div>C. Blown fuse</div><div>D. Any Batt Bd I breaker open or tripped</div><div>E. Operator Manual action</div><div>F. Bkr 36 on 120 VAC Vital Instrument Power Bd 1-I open</div></div><div><div>CAUTION</div><div>Power loss to some feeders or placing 1-HS-3-945-A in OFF could cause a Unit 1 trip.</div></div><div><div>NOTE</div><div>1-HS-3-945-A & 1-HS-30-1080 [Vital Batt Bd Rm I] are MANUALLY actuated to isolate various system 3 and 30 valves for Appendix R-Fire Safe Shutdown.</div></div><div><div>Corrective Action:</div><div>[1] IF Vital Battery Bd I is lost, THEN GO TO 1-AOI-21.01, LOSS OF 125V DC BATTERY BD I.</div><div>[2] DISPATCH Operator to determine cause of alarm.</div><div>[3] REFER TO 0-SOI-236.01, 125V DC BATTERY BOARD I, for system operating instructions.</div><div>[4] NOTIFY Work Control to initiate corrective action, if necessary.</div><div>[5] IF High or Low Voltage condition exist, THEN REFER TO 0-SI-236-21 for performance.</div></div><div><div>References:</div><div>1-45W600-55-3</div><div>1-45W703-1</div><div>1-AOI-21.01</div><div>0-SOI-236.01</div></div></div>
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	5		Page	16	of	47
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Event Description: 1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): Alarm is due to low Letdown flow.</div>	<div>BOP OAC OAC BOP N/A N/A N/A</div>	<div><div><div>WBN Unit 0</div><div>CCS</div><div>0-ARI-241-253 Rev. 0003 Page 35 of 73</div></div><div><div>Source 1-FS-70-190</div><div>Setpoint 150 gpm</div><div>247-A <div>LTDN HX RET FLOW LO</div></div></div><div>(Page 1 of 1)</div><div><div>Probable Cause:</div><div><div>A. Lost/Reduced CVCS letdown flow</div><div>B. 1-TCV-70-192, LETDOWN HX CCS OUT TEMP CNTL, failure</div><div>C. Low CCS pressure</div><div>D. One of more of the following valves misaligned:<div><div>1. 1-ISV-70-574, CVCS LETDOWN HX 1A CCS INLET ISOLATION</div><div>2. 1-THV-70-577, CVCS LETDOWN HX 1A CCS OUTLET THROTTLE</div></div></div><div>E. Isolation or rupture of Misc Eq Hdr</div></div></div><div><div>Corrective Action:</div><div><div>[1] CHECK 1-FI-70-190, LTDN HX FLOW [0-M-27B].</div><div>[2] CHECK letdown flow NORMAL [1-M-6].</div><div>[3] CHECK 1-TCV-70-192 maintaining letdown temp at setpoint.</div></div></div><div><div>NOTE</div><div>If alarm is due to low letdown flow no further action is required.</div></div><div><div>References:</div><div><div>1-45W600-55-34</div><div>1-47W610-70-2</div><div>1-47W809-1</div><div>1-47W859-2</div><div>1-AOI-15</div><div>0-SOI-70.01</div></div></div></div>
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Op Test	301	Scenario #	4	Event #	5		Page	17	of	47
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Event Description:	1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US will perform crew update to notify crew that 1-AOI-20 will be used to address the failure of 1-FCV-62-70.
US will select Section 3.2 to address the failure.

SRO

WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008
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3.0 OPERATOR ACTIONS

3.1 Diagnostics

IF	GO TO Subsection
Instrumentation and Control Malfunction	3.2
Malfunction of 1-FCV-62-93 or 89	3.2
Loss of Charging or Abnormal Charging Flow	3.3

Op Test	301	Scenario #	4	Event #	5		Page	18	of	47
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Event Description:	1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s): US will exercise the RNO.</div>	<div>OAC</div> <div>OAC OAC OAC</div> <div>OAC</div> <div>N/A</div>	<table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 INSTRUMENTATION AND CONTROL MALFUNCTION</p> <div><div><div>1.</div><div>CHECK PZR level program signal NORMAL:<ul style="list-style-type: none">1-LR-68-339</div></div><div><div>2.</div><div>CHECK level control channels NORMAL using control board indications or DCS Operator Display:<ul style="list-style-type: none">1-LI-68-339A1-LI-68-335A1-LI-68-320</div></div><div><div>3.</div><div>CHECK the following:<ul style="list-style-type: none">Only a single instrument failureAuto Control NOT impacted</div></div><div><div>4.</div><div>GO to step 9.</div></div></div> <div><div>IF charging and letdown are in service, THEN<ul style="list-style-type: none">PLACE charging valve controller 1-HIC-62-93A in MAN.RESTORE level to normal.</div><div>ENSURE any failed channel(s) are BYPASSED in DCS. IF failed input is NOT BYPASSED THEN<ul style="list-style-type: none">CHANGE to either NSSS or BOP Operator environment. Refer to 1-SOI-98.01 as necessary.NAVIGATE to affected input screen on DCS Operator Display.SELECT channel to be bypassed.SELECT appropriate "MAINT BYP SIGNAL" button.CONFIRM "MAINT BYP SIGNAL" button changes from gray to red.CHECK input has yellow "BYP" displayed.REPEAT steps as necessary to place all appropriate failed channels in Maint Bypass.CHANGE to INITIAL environment.</div><div><ul style="list-style-type: none">**GO TO Step 5**GO TO Step 5</div></div>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	4	Event #	5		Page	19	of	47
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Event Description:	1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <p>US will exercise the RNO.</p> <p>Letdown cannot be established. US will direct performance of step [5] RNO substeps [a], [b] and [c] to establish Excess Letdown.</p>	<div>OAC</div> <div>OAC</div>	<table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 INSTRUMENTATION AND CONTROL MALFUNCTION (continued)</p> <p>5. CHECK letdown in SERVICE</p> <ul style="list-style-type: none">1-FCV-62-69 OPEN1-FCV-62-70 OPEN1-FCV-62-77 OPENLetdown orifice OPENLetdown flow NORMAL <p>ENSURE PZR heater banks D and C ON. ESTABLISH charging and letdown, refer to Attachment 1</p> <p>IF letdown can NOT be established, THEN PERFORM the following:</p> <ol style="list-style-type: none">CLOSE charging valves 1-FCV-62-90 and 1-FCV-62-91MAINTAIN RCP seal flow between 8 and 13 gpm with charging valve controller 1-HIC-62-93APLACE excess letdown in service:<ol style="list-style-type: none">OPEN 1-FCV-70-143OPEN 1-FCV-70-85OPEN 1-FCV-62-54OPEN 1-FCV-62-55ENSURE 1-HS-62-59A in NORMALENSURE 1-FCV-62-61 OPENENSURE 1-FCV-62-63 OPENADJUST 1-HIC-62-56A to obtain maximum flow and maintain Excess Letdown HX outlet temp less than 200°FSTABILIZE PZR level by adjusting seal injection and Excess Letdown flows <p>IF 1-PCV-62-81 failed closed, THEN REFER TO Attachment 1 to restore charging and letdown in conjunction with 1-SOI-62.01, WHEN ready to LOCALLY CONTROL 1-PCV-62-81.</p> <p>Page 7 of 42</p>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	4	Event #	5		Page	20	of	47
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Event Description: 1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	OAC OAC	<table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>3.2 INSTRUMENTATION AND CONTROL MALFUNCTION (continued)</p> <p>6. ENSURE PZR Level returning to program:</p> <ul style="list-style-type: none">CONTROL 1-HIC-62-93A in MAN as necessaryMAINTAIN Regen HX letdown temp < 380 °F. <p>IF MCR control of 1-FCV-62-93 or 89 is lost, THEN</p> <p>a. IF PZR level rising uncontrolled, THEN</p> <ol style="list-style-type: none">CLOSE letdown orifices.CLOSE charging valves 1-FCV-62-90 and 1-FCV-62-91EVALUATE placing excess Letdown in service: REFER TO 1-SOI-62.01, CVCS-Charging and Letdown. <p>b. WHEN ready to locally control 1-FCV-62-93 and/or 1-FCV-62-89 THEN REFER TO ATTACHMENT 1 in conjunction with 1-SOI-62.01, CVCS-Charging and Letdown.</p> <p>Page 8 of 42</p>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	4	Event #	5		Page	21	of	47
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Event Description: 1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.

Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	<div>OAC</div> <div>OAC</div> <div>OAC</div>	<div><table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr></table></div> <div><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table></div> <div>3.2 INSTRUMENTATION AND CONTROL MALFUNCTION (continued)</div> <div>7. CHECK PZR Heaters ENERGIZED:<div><div>a. Control Heaters D red light LIT.</div><div>a. MOMENTARILY PLACE 1-HS-68-341F, CONTROL HEATERS D to ON.</div></div><div><div>b. Backup Heaters C red light LIT.</div><div>b. ENERGIZE C heater:<div>1) MOMENTARILY PLACE 1-HS-68-341H, BACKUP HEATERS C, to OFF.<div>2) PLACE 1-HS-68-341H, BACKUP HEATERS C, to ON.</div></div></div></div><div>8. CHECK 1-HIC-62-93A in AUTO. WHEN desired to return 1-HIC-62-93A to AUTO, THEN PERFORM ATTACHMENT 1, Section 1.2.</div></div>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	4	Event #	5		Page	22	of	47
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Event Description:	1-FCV-62-70 fails CLOSED isolating Letdown. Excess Letdown place in service. 1-AOI-20.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Role Play:</div> <p>When contacted as Work Control, acknowledge the request(s) and information provided.</p> <div>Examiner Note(s):</div> <p>A Crew Brief would typically be conducted for this event. The crew briefing is optional. The next event may be initiated prior to the brief, at CHIEF EXAMINER discretion.</p>	<div>N/A</div> <div>N/A SRO</div>	<div><table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM</td><td>1-AOI-20 Rev. 0008</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>3.2 INSTRUMENTATION AND CONTROL MALFUNCTION (continued)</div><div>9. REFER TO the following Tech Specs:<ul style="list-style-type: none">3.3.1, Reactor Trip System (RTS) Instrumentation.3.3.3, Post Accident Monitoring (PAM) Instrumentation.3.4.9 Pressurizer</div><div>10. NOTIFY Work Control to remove any failed channel from service.</div><div>11. INITIATE repairs to failed instrument/circuitry.</div><div>12. WHEN conditions support THEN PERFORM Attachment 1 to establish Normal Letdown & Charging if not already in service.</div><div>13. RETURN TO instruction in effect.</div><div>End of Section</div><div>Page 10 of 42</div></div>	WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER LEVEL CONTROL SYSTEM	1-AOI-20 Rev. 0008						
Step	Action/Expected Response	Response Not Obtained						

Op Test	301	Scenario #	4	Event #	6		Page	23	of	47
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Event Description:	ERCW Pump E-B coupling breaks. 0-AOI-13. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At **CHIEF EXAMINER** Direction:

Insert Simulator Schedule File Event 6

(ERCW Pump E-B coupling breaks.)

INDICATIONS:

- 227-A, ERCW PMP E-B DISCH PRESS LO
- 0-PI-67-48A, ERCW PMP E-B DISCH PRESS, reading 0 psig
- 0-EI-67-46A, ERCW PMP E-B AMPS, reading LOW

Operator Actions:

- **BOP** will announce 227-A and refer to ARI-227-A (to the right)
- **BOP** may place 0-HS-67-47A, ERCW PMP E-B, in STOP PULL TO LOCK
- **BOP** may start an additional Train B ERCW Pump
- **Crew** will diagnose a broken coupling for ERCW Pump E-B
- **US** will announce entry to 0-AOI-13, Loss of ERCW.

Role Play:

If dispatched as AUO, then acknowledge the direction. Wait 5 minutes and notify the MCR: “Cannot see anything wrong with ERCW Pump E-B. Pump is several feet below.”

Examiner Note(s):

ARI-227-A directs **US** to 0-AOI-13.

BOP
BOP
RO
BOP/SRO

WBN	ERCW	0-ARI-223-229 Rev. 0003 Page 28 of 47
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Source
0-PS-67-48

Setpoint
65 psig

227-A

ERCW PMP E-B DISCH PRESS LO

(Page 1 of 1)

Probable Cause: A. ERCW leak
B. ERCW Pump E-B shaft broken

Corrective Action: [1] CHECK the following [0-M-27A]:

- 0-PI-67-48A, ERCW PMP E-B DISCH PRESS
- 0-EI-67-46A, ERCW PMP E-B AMPS

[2] START additional pumps, if needed.
[3] DISPATCH Operator to check ERCW Pump E-B at IPS.
[4] REFER TO 0-AOI-13, Loss of Essential Raw Cooling Water.

References: 1-47W845-1
1-47W610-67-1
0-AOI-13

Op Test	301	Scenario #	4	Event #	6		Page	24	of	47
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Event Description:	ERCW Pump E-B coupling breaks. 0-AOI-13. Technical Specification Evaluation.									
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Sequence of Events / Examiner Notes				Position	Applicant's Actions or Behavior					
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Examiner Note(s):

US will perform crew update to notify crew that 0-AOI-13 will be used to address the failure of ERCW Pump E-B. US will determine that Section 3.2 applies.

SRO

WBN Unit 0	Loss of Essential Raw Cooling Water	0-AOI-13 Rev. 0006
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3.0 OPERATOR ACTIONS

3.1 Diagnostics

IF	GO TO SECTION	PAGE
Loss of ERCW pump or indications of broken pump shaft: Motor trip out alarm OR Low amps and discharge pressure on running pump	3.2	6
Supply Header Rupture in Auxiliary Building; HIGH flow on supply header AND Building flood alarm LIT.	3.3	8
Supply Header Rupture in Yard/Downstream of Strainer: Strainer DP alarm LIT AND LOW flow on individual supply header with LOW pressure on IPS supply header. IF IPS strainer room sump alarm is LIT rupture may be downstream of strainer in strainer room.	3.4	17
Plugged Strainer: Strainer DP alarm LIT AND LOW flow on individual supply header with HIGH pressure indicated on IPS supply header.	3.4	17
Supply Header Rupture in IPS; Supply headers flow LOW AND IPS header pressure LOW with Strainer DP alarm DARK, AND IPS strainer room sump alarm LIT.	3.5	28
Discharge Header Rupture in Auxiliary Building: Building flood alarm LIT AND Supply header flows NORMAL.	3.6	35
Loss of flow on ALL ERCW supply headers Unit 1	3.7.1	42
Loss of flow on ALL ERCW supply headers Unit 2	3.7.2	75

Op Test	301	Scenario #	4	Event #	6		Page	25	of	47
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Event Description:	ERCW Pump E-B coupling breaks. 0-AOI-13. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US will exercise step [1] RNO. BOP may have already started an additional Train B ERCW Pump. If not, BOP will start an additional Train B ERCW Pump.

Examiner Note(s):

Emergency power selector switch determines which of the (2) ERCW Pumps on a 6.9kV Shutdown Board will start on SI or Loss of Offsite Power.

LCO 3.7.8, ERCW, and LCO 3.8.1, AC Sources – Operating, are MET when switch is selected to an OPERABLE ERCW Pump.

Role Play:

If not previously dispatched as AUO, then acknowledge the direction. Wait 5 minutes and notify the MCR: “Cannot see anything wrong with ERCW Pump E-B. Pump is several feet below.”

Role Play:

When contacted as AUO, acknowledge the direction to CLOSE 0-ISV-67-504E.

Insert Simulator Schedule File Event 28

(0-ISV-67-504E CLOSED.)

When ramp is complete, notify the MCR: “0-ISV-67-504E is CLOSED.”

BOP

BOP
BOP

BOP

BOP

BOP

RO

WBN Unit 0	Loss of Essential Raw Cooling Water	0-AOI-13 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.2 Loss of ERCW Pump

1.

CHECK header pressure and flows adequate for current conditions.

START redundant trained ERCW Pump.
2.

ENSURE pump amps NORMAL.
3.

PLACE failed pump HS in PULL TO LOCK.
4.

ENSURE applicable emergency power selector switch selected away from failed pump.
5.

DISPATCH personnel to determine reason for pump failure.
6.

ENSURE header pressures and flows return to expected values for existing plant conditions.

IF ERCW header pressures and flows cannot be returned to NORMAL, THEN
**GO TO Section 3.1 Diagnostics to evaluate for a potential rupture.
7.

Locally CLOSE discharge valve on failed pump.

A TRAIN PUMPS	DISCHARGE VALVE	B TRAIN PUMPS	DISCHARGE VALVE
A-A	0-ISV-67-504A	E-B	0-ISV-67-504E
B-A	0-ISV-67-504B	F-B	0-ISV-67-504F
C-A	0-ISV-67-504C	G-B	0-ISV-67-504G
D-A	0-ISV-67-504D	H-B	0-ISV-67-504H

Op Test	301	Scenario #	4	Event #	6		Page	26	of	47
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Event Description:	ERCW Pump E-B coupling breaks. 0-AOI-13. Technical Specification Evaluation.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Role Play:

When contacted as Work Control, then acknowledge the request(s) and information provided.

SRO evaluates Technical Specifications.

Tech Specs:

- LCO 3.7.8, ERCW, Condition A
- LCO 3.8.1, AC Sources – Operating, Conditions B and C

LCOs were NOT met until Emergency power selector switch was selected to an OPERABLE ERCW Pump.

Examiner Note(s):

A Crew Brief would typically be conducted for this event. The next event may be initiated prior to the brief, at CHIEF EXAMINER discretion.

SRO
SRO

SRO

WBN Unit 0	Loss of Essential Raw Cooling Water	0-AOI-13 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.2 Loss of ERCW Pump (continued)

8. INITIATE repair.
9. REFER TO Tech Spec 3.7.8, Essential Raw Cooling Water System (ERCW).
10. RETURN TO Instruction in effect.

End of Section

Op Test	301	Scenario #	4	Event #	7		Page	27	of	47
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Event Description:	Loop 2 Pressurizer Spray valve fails OPEN. 1-AOI-18.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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At **CHIEF EXAMINER Direction:**
Insert Simulator Schedule File Event 7
(Loop 2 Pressurizer Spray valve fails OPEN.)

- INDICATIONS:**
- 90-B, PZR PRESS LO-DEVN BACKUP HEATERS ON
 - 1-XI-68-340B, PZR SPRAY LOOP 2, RED light LIT
 - Pressurizer Pressure lowering
 - 0-EI-67-46A, ERCW PMP E-B AMPS, reading LOW

- Operator Actions:**
- OAC** will announce 90-B and refer to ARI-90-B (to the right)
 - OAC** will attempt to CLOSE 1-PCV-68-340B using the DCS Handstation as an Immediate Action
 - Crew** will diagnose failed OPEN Loop 2 Spray Valve
 - US** will announce entry to 1-AOI-18, Malfunction of Pressurizer Pressure Control System.

Examiner Note(s):
ARI-90-B directs **US** to 1-AOI-18.

OAC

OAC

OAC

OAC/SRO

WBN Unit 1

Reactor Coolant System

1-ARI-88-94
Rev. 0003
Page 18 of 49

Source
1-PS-68-340G (DCS)

Setpoint
2210 psig (Nominal),
variable based on output
from 1-PIC-68-340A

90-B

PZR
PRESS
LO-DEVN
BACKUP HTRS ON

(Page 1 of 1)

Probable Cause:

A. Load transient condition
B. Control group heaters malfunctioning
C. Pressurizer Pressure control malfunctioning (DCS)

NOTE

Variable heaters are full on when PZR pressure is less than a nominal value of 2220 psig. Backup heaters are on when PZR pressure is less than a nominal value of 2210 psig. This alarm is driven by the output of 1-PIC-68-340A. When the output (in manual or Auto) reaches the appropriate value, this alarm will actuate. This means that this alarm may actuate at different PZR pressures depending on the integral output (when in auto) or the manual output (1-PIC-68-340A in Man.).

Corrective Action:

[1] CHECK PZR pressure on 1-PI-68-334, 1-PI-68-340A, 1-PI-68-323, and 1-PI-68-322 [1-M-5].

[2] IF PZR pressure is less than 2210 psig without a known transient load condition, THEN PLACE PZR master controller 1-PIC-68-340A in manual control and stabilize pressure.

[3] IF unable to control PZR pressure, THEN GO TO 1-AOI-18, Malfunction of Pressurizer Pressure Control System.

[4] NOTIFY Work Control to remove any failed channel from service and repair any failed controllers.

[5] REFER TO Tech Specs.

References:

1-45W600-57-15 1-AOI-18
1-45W760-68-4 1-SOI-98.01
1-47W610-68-5 08F734235-FD-1400, -1401 Tech Specs

Op Test	301	Scenario #	4	Event #	7		Page	28	of	47
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Event Description:	Loop 2 Pressurizer Spray valve fails OPEN. 1-AOI-18.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US will perform crew update to notify crew that 1-AOI-18 will be used to address the failed OPEN Loop 2 Spray Valve.
US will determine that Section 3.2 applies.

SRO

WBN Unit 1	MALFUNCTION OF PRESSURIZER PRESSURE CONTROL SYSTEM	1-AOI-18 Rev. 0006
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3.0 OPERATOR ACTIONS

IF	GO TO SECTION	PAGE
Instrument or Controller Malfunction	3.1	6
PZR pressure drop due to failed PORV/Safety or spray valve	3.2	13

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	7		Page	29	of	47
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Event Description:	Loop 2 Pressurizer Spray valve fails OPEN. 1-AOI-18.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

US will exercise the step [1] RNO. Loop 2 Spray Valve cannot be CLOSED.

Examiner Note(s):

US will exercise the step [3] RNO. **OAC** will energize all Pressurizer Heater groups. **US** will establish a "trigger" value for tripping the reactor on low Pressurizer Pressure. Typical "trigger" value for reactor trip on low Pressurizer Pressure is 2050 psig. When **Crew** realizes that the Loop 2 Spray Valve cannot be CLOSED, **US** may decide to trip the reactor prior to the "trigger" value. After Reactor Trip, **OAC** must stop both RCP 1 and RCP 2 to stop spray flow.

Examiner Note(s):

When **Crew** trips the reactor, go to Event 8 on p. 32.

OAC
SRO**OAC****OAC****OAC**

WBN Unit 1	MALFUNCTION OF PRESSURIZER PRESSURE CONTROL SYSTEM	1-AOI-18 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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3.2 PZR Pressure Drop Due to Failed PORV/Safety or Spray Valve**NOTES**

- Step 1 and 2 are **IMMEDIATE ACTION** steps.
- In the event a PORV Block valve is closed, **US** should review OR 14.10 for OR entries or fire watch requirements (fire watch required within 1 hour).

- CHECK** PZR spray valves
CLOSED:

 - Green indicating lights LIT
 - PZR spray demand meters, 1-PIC-68-340B and 1-PIC-68-340D indicating ZERO [1-M-4]

IF PZR press is less than 2260,
THEN
CLOSE sprays manually.
- CHECK** PZR PORVs **CLOSED**

 - PORV indicating lights
 - tailpipe temperature
 - acoustic monitoring

IF PZR press is less than 2335,
THEN
CLOSE PORV
OR
CLOSE associated block valve
- CHECK** actions taken in Steps 1 and 2 have **STOPPED** press drop.

ENERGIZE all PZR heaters.

IF low pressure reactor trip (1970) is **IMMINENT**,
THEN
PERFORM the following:

 - TRIP** Rx
 - ENSURE** RCP alternate bkr in MAN and **STOP** RCP 1 AND RCP 2.
 - **GO TO** 1-E-0, Reactor Trip or Safety Injection.

EVALUATE continued plant operation.

Op Test	301	Scenario #	4	Event #	7		Page	30	of	47
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Event Description:	Loop 2 Pressurizer Spray valve fails OPEN. 1-AOI-18.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

A complete 1-AOI-18 Section 3.2 is NOT provided. Enough steps are provided for Pressurize Pressure to reach a “trigger” value if **US** does NOT direct a Reactor Trip after realizing Loop 2 Spray Valve cannot be CLOSED.

OAC

OAC

OAC

WBN Unit 1	MALFUNCTION OF PRESSURIZER PRESSURE CONTROL SYSTEM	1-AOI-18 Rev. 0006
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Step	Action/Expected Response	Response Not Obtained
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- 3.2 PZR Pressure Drop Due to Failed PORV/Safety or Spray Valve (continued)
4. CHECK PZR Safeties CLOSED:
 - tailpipe temperatures
 - acoustic monitorIF PZR press can NOT be maintained above 1970 psig,
THEN:
 - TRIP Rx and INITIATE SI.
 - **GO TO 1-E-0, Rx Trip or Safety Injection.EVALUATE continued plant operation.
5. ENSURE PZR heaters on as required:
 - Control Group on at 2220 psig
 - Backup Groups on at 2210 psig
6. CHECK aux spray, 1-FCV-62-84, CLOSED. CLOSE aux spray manually.
IF aux spray can NOT be closed,
THEN
PERFORM the following:
 - CLOSE letdown orifice valves:
 - 1-FCV-62-72
 - 1-FCV-62-73
 - 1-FCV-62-74
 - 1-FCV-62-76
 - CLOSE charging isolation valves:
 - 1-FCV-62-90
 - 1-FCV-62-91
 - PLACE excess letdown in service using Attachment 2 EXCESS LETDOWN.

Op Test	301	Scenario #	4	Event #	7		Page	31	of	47
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Event Description:	Loop 2 Pressurizer Spray valve fails OPEN. 1-AOI-18.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>US will exercise step [7] RNO</div>	OAC	<div><table><tr><td>WBN Unit 1</td><td>MALFUNCTION OF PRESSURIZER PRESSURE CONTROL SYSTEM</td><td>1-AOI-18 Rev. 0006</td></tr></table><table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table><div>3.2 PZR Pressure Drop Due to Failed PORV/Safety or Spray Valve (continued)</div><div>7. CHECK PZR press STABLE or RISING.</div><div>IF RCS temp DROPPING THEN REFER TO 1-AOI-38, Main Steam or Feedwater Line Leak.</div><div>IF VCT or PZR level DROPPING, THEN REFER TO 1-AOI-6, Small Reactor Coolant System Leak.</div><div>IF PZR press can NOT be maintained above 1970 psig, THEN a. TRIP Rx and INITIATE SI. b. **GO TO 1-E-0, Reactor Trip or Safety Injection.</div></div>	WBN Unit 1	MALFUNCTION OF PRESSURIZER PRESSURE CONTROL SYSTEM	1-AOI-18 Rev. 0006	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	MALFUNCTION OF PRESSURIZER PRESSURE CONTROL SYSTEM	1-AOI-18 Rev. 0006						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2											
Op Test	301	Scenario #	4	Event #	8			Page	32	of	47
Event Description:		ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.									
Sequence of Events / Examiner Notes						Position	Applicant's Actions or Behavior				
<p>INDICATIONS:</p> <ul style="list-style-type: none"> Reactor Trip Breakers fail to OPEN Safety Injection Actuated MDAFW Pumps 1A-A and 1B-B fail to AUTO start <p>Operator Actions:</p> <ul style="list-style-type: none"> OAC performs Immediate Action steps of 1-FR-S.1 and inserts control rods at maximum speed from memory as an Immediate Action <p>Critical Task(s):</p> <ol style="list-style-type: none"> Start AFW prior to all SG NR levels dropping < 29% (RED path entry conditions for 1-FR-H.1, Loss of Secondary Heat Sink). <ul style="list-style-type: none"> BOP may prudently START MDAFW Pump 1A-A and 1B-B SRO updates crew on 1-FR-S.1 entry and directs actions of 1-FR-S.1 <p>Role Play:</p> <p>If dispatched as AUO to OPEN Reactor Trip Breakers and MG Set Output Breakers and MG Set Feeder Breakers, acknowledge the direction.</p> <p>When reactor power is less than 5% then</p> <p>Insert Simulator Schedule File Event 22</p> <p>(MG Set Feeder Breakers and Reactor Trip Breakers OPEN.)</p> <p>When appropriate delays complete, notify the MCR: "Unit 1 MG Set Feeder Breakers are OPEN." (4 minutes)</p> <p>"Unit 1 Reactor Trip Breakers are OPEN." (6 minutes)</p>											

Op Test	301	Scenario #	4	Event #	8			Page	33	of	47
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Event Description:	ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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Examiner Note(s):

1-AOI-18 directed RCPs 1 and 2 be stopped to stop Pressurizer Pressure from lowering due to Loop 2 Spray Valve failed OPEN.
RCPs 1 and 2 must remain running for heat removal until reactor power is less than 5%.

Critical Task(s):

2. Insert control rods to reduce reactor power to less than 5% to allow stopping of RCPs 1 and 2 prior to RCS pressure reaching 1500 psig.

Examiner Note(s):

TDAFW Pump becomes airborne. MDAFW Pumps 1A-A and 1B-B fail to AUTO start.

Critical Task(s):

1. Start AFW prior to all SG NR levels dropping < 29% (RED path entry conditions for 1-FR-H.1, Loss of Secondary Heat Sink).

RO
OAC

OAC

BOP

BOP
BOP
BOP

WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002
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Step	Action/Expected Response	Response Not Obtained
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CAUTION RCPs should not be tripped UNTIL reactor power is less than 5%.

NOTE Steps 1 and 2 are IMMEDIATE ACTION steps.

1.

ENSURE Reactor Trip:

- Reactor trip and bypass breakers OPEN.
 - RPIs at bottom of scale.
 - Neutron flux DROPPING.

Manually TRIP reactor.

IF reactor will NOT trip, THEN INSERT control rods.
2.

ENSURE Turbine Trip:

- All turbine stop valves CLOSED.

Manually TRIP turbine.

IF turbine will NOT trip, THEN Manually runback turbine.

IF turbine can NOT be run back, THEN CLOSE MSIVs and bypasses.
3.

CHECK AFW pumps operation:

Manually START pumps and open valves as necessary.

a. Both MD AFW pumps RUNNING.

b. TD AFW pump RUNNING.

c. LCVs in AUTO or controlled in MANUAL.

Op Test	301	Scenario #	4	Event #	8			Page	34	of	47
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Event Description:	ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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<div>Examiner Note(s):</div> <div>If Safety Injection has actuated, steps [a] through [e] will already be complete. BOP will verify.</div>	<div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div> <div>BOP</div>	<table><tr><td>WBN Unit 1</td><td>Nuclear Power Generation/ATWS</td><td>1-FR-S.1 Rev. 0002</td></tr></table> <table><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <div>4. INITIATE RCS Boration:</div> <div><div>a. ENSURE at least one centrifugal charging pump RUNNING.</div><div>b. OPEN RWST outlet valves 1-LCV-62-135 and 1-LCV-62-136.</div><div>c. CLOSE VCT outlet valves 1-LCV-62-132 and 1-LCV-62-133.</div><div>d. OPEN BIT outlet valves 1-FCV-63-25 and 1-FCV-63-26.</div><div>e. CHECK BIT flow.</div><div>f. PLACE BA pumps in FAST speed.</div><div><div>g. Throttle OPEN emergency borate valve 1-FCV-62-138 to maintain boric acid flow greater than 35 gpm.</div><div>g. IF BA flow less than or equal to 35 gpm, THEN:<ul style="list-style-type: none">Locally OPEN emergency borate valve 1-FCV-62-138 [blender station el 713], ORALIGN manual boration:<div><div>1) Locally OPEN alternate boration valve 1-ISV-62-929 [blender station el 713].</div><div>2) OPEN blender BA supply 1-FCV-62-140.</div><div>3) MONITOR BA flow.</div></div></div></div></div>	WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	8			Page	35	of	47
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Event Description:	ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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		<table><tr><td>WBN Unit 1</td><td>Nuclear Power Generation/ATWS</td><td>1-FR-S.1 Rev. 0002</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>5.</td><td>CHECK PZR pressure less than 2335 psig.</td><td>DEPRESSURIZE RCS: a. ENSURE PZR PORVs and block valves OPEN. b. WHEN RCS pressure is less than 2135 psig, THEN ENSURE PZR PORV or associated block valve CLOSED.</td></tr><tr><td></td><td>NOTE The following step is for verifying containment purge supply and exhaust fans and dampers only. Rad Monitor (system 90) valves, 1-FCV-30-37 and 1-FCV-30-40 do NOT need to be verified closed.</td><td></td></tr><tr><td>6.</td><td>VERIFY Cntmt Purge isolated [1-M-6]:<ul style="list-style-type: none">Train A GREEN.Train B GREEN.</td><td>PERFORM the following: a. ENSURE containment purge supply and exhaust fans STOPPED. [M-9] b. CLOSE Cntmt Purge dampers. [M-9]</td></tr><tr><td>7.</td><td>IF AFW flow established, THEN a. PLACE 1-HS-3-45 to LONG CYCLE RECIRC. b. PLACE MFW Bypass Reg Valves in AUTO.</td><td></td></tr><tr><td>8.</td><td>IF SI actuated OR required, THEN PERFORM Steps 1 through 6 of 1-E-0, Reactor Trip or Safety Injection, as time allows.</td><td></td></tr></table>	WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002	Step	Action/Expected Response	Response Not Obtained	5.	CHECK PZR pressure less than 2335 psig.	DEPRESSURIZE RCS: a. ENSURE PZR PORVs and block valves OPEN. b. WHEN RCS pressure is less than 2135 psig, THEN ENSURE PZR PORV or associated block valve CLOSED.		NOTE The following step is for verifying containment purge supply and exhaust fans and dampers only. Rad Monitor (system 90) valves, 1-FCV-30-37 and 1-FCV-30-40 do NOT need to be verified closed.		6.	VERIFY Cntmt Purge isolated [1-M-6]: <ul style="list-style-type: none">Train A GREEN.Train B GREEN.	PERFORM the following: a. ENSURE containment purge supply and exhaust fans STOPPED. [M-9] b. CLOSE Cntmt Purge dampers. [M-9]	7.	IF AFW flow established, THEN a. PLACE 1-HS-3-45 to LONG CYCLE RECIRC. b. PLACE MFW Bypass Reg Valves in AUTO.		8.	IF SI actuated OR required, THEN PERFORM Steps 1 through 6 of 1-E-0, Reactor Trip or Safety Injection, as time allows.	
WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002																					
Step	Action/Expected Response	Response Not Obtained																					
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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	8			Page	36	of	47
Event Description:		ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.									
Sequence of Events / Examiner Notes						Position	Applicant's Actions or Behavior				

Examiner Note(s):

US will exercise RNO for step [9.a]. Turbine was not in service.

Role Play:

When contacted as AUO, if not previously dispatched to OPEN Reactor Trip Breakers and MG Set Output Breakers and MG Set Feeder Breakers, acknowledge the direction.

When reactor power is less than 5% then

Insert Simulator Schedule File Event 22

(MG Set Feeder Breakers and Reactor Trip Breakers OPEN.)

When appropriate delays complete, notify the MCR: "Unit 1 MG Set Feeder Breakers are OPEN." (4 minutes)
"Unit 1 Reactor Trip Breakers are OPEN. (6 minutes)

Critical Task(s):

2. Insert control rods to reduce reactor power to less than 5% to allow stopping of RCPs 1 and 2 prior to RCS pressure reaching 1500 psig.

Examiner Note(s):

When Power Range is less than 5%, RCPs 1 and 2 must be stopped (1-AOI-18 step [3] RNO on p. 29.

RO

RO

OAC
SRO

OAC

OAC
OAC

WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002
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Step	Action/Expected Response	Response Not Obtained
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9. **ENSURE** the following trips:

- | | |
|--|---|
| <ol style="list-style-type: none"> a. Reactor Trip. b. Turbine Trip. | <ol style="list-style-type: none"> a. DISPATCH operator to locally trip reactor: <ul style="list-style-type: none"> • OPEN reactor trip breakers and MG set output breakers [MG set room]. • OPEN breakers to MG sets [480V unit boards A and B]. b. DISPATCH operator to locally trip turbine: <ul style="list-style-type: none"> • TRIP from front standard. • STOP and PULL TO LOCK both EHC pumps. |
|--|---|

10. **MAINTAIN** rod insertion UNTIL rods fully inserted.

11. **REFER TO** EPIP-1, Emergency Plan Classification Flowchart for ATWS event.

12. **MONITOR** reactor subcriticality:

- | | |
|---|--|
| <ol style="list-style-type: none"> a. CHECK Power range channels less than 5%. b. CHECK Intermediate range startup rate NEGATIVE. c. ** GO TO Step 21. | <ol style="list-style-type: none"> a. ** GO TO Step 13. b. ** GO TO Step 13. |
|---|--|

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	8			Page	37	of	47
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Event Description:	ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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N/A

N/A

WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002
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Step	Action/Expected Response	Response Not Obtained
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13. **MONITOR** CST volume greater than 200,000 gal. **INITIATE** CST refill USING SOI-59.01, Demineralized Water System.
IF CST volume drops to less than 5000 gal,
THEN
MONITOR AFW pumps to ensure suction transfer to ERCW supply.

14. **CONTROL** S/G NR levels:

a. **CHECK** at least one S/G NR level greater than 29% [39% ADV]. a. **ENSURE** total feed flow greater than 820 gpm UNTIL at least one S/G NR level is greater than 29% [39% ADV]:

- AFW LCVs in AUTO or MANUAL.
- MPW bypass regs in MANUAL.

b. **CONTROL** S/G NR levels between 29% and 50% [39% and 50% ADV].

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Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	8			Page	38	of	47
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Event Description:	ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A	<table><tr><td>WBN Unit 1</td><td>Nuclear Power Generation/ATWS</td><td>1-FR-S.1 Rev. 0002</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>15. ENSURE all dilution paths ISOLATED:</p> <ul style="list-style-type: none">• PLACE primary water pumps OFF.• PLACE 1-FCV-62-79 to VCT position.• CHECK PWST alignment - NORMAL (PWST not bypassed)• DISPATCH AUO to perform Appendix A, Boron Dilution Path Isolation. <p>16. IF controlled cooldown in progress, THEN STOP cooldown:</p> <ul style="list-style-type: none">a. ENSURE steam dumps and S/G PORVs CLOSED.b. REDUCE total feed flow to slightly greater than 410 gpm.c. MAINTAIN greater than 410 gpm UNTIL at least one S/G NR level is greater than 29% [39% ADV]. <p>17. IF RCS temp dropping uncontrolled, THEN ENSURE MSIVs and bypass valves CLOSED.</p> <p>Page 8 of 16</p>	WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002						
Step	Action/Expected Response	Response Not Obtained						
	N/A							
	N/A							

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	8			Page	39	of	47
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Event Description:	ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
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	N/A N/A N/A N/A	<table><tr><td>WBN Unit 1</td><td>Nuclear Power Generation/ATWS</td><td>1-FR-S.1 Rev. 0002</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table> <p>CAUTION</p> <ul style="list-style-type: none">At least one S/G must be maintained available for RCS cooldown.If all S/Gs are faulted, at least a minimum detectable flow should be maintained to each S/G.If the turbine driven AFW pump is the only available source of feed flow, steam supply to the turbine driven AFW pump must be maintained from at least one S/G. <p>18. CHECK S/G pressures:</p> <ul style="list-style-type: none">All S/G pressures controlled or rising.All S/G pressures greater than 140 psig. <p>ISOLATE Faulted S/Gs:</p> <p>a. ENSURE the following valves CLOSED on faulted S/Gs:</p> <ul style="list-style-type: none">MSIVs and MSIV BypassesFeedwater Isolation and Bypass Isolation ValvesFeedwater Reg and Bypass Reg ValvesAFW Level Control ValvesS/G PORVsS/G Blowdown Valves . <p>b. ENSURE TD AFW pump being supplied from Intact S/G.</p> <p>c. IF BOTH S/Gs 1 AND 4 Faulted, THEN ENSURE at least one MD AFW pump is aligned to an Intact S/G before isolating steam to TD AFW pump.</p> <p>Page 9 of 16</p>	WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002	Step	Action/Expected Response	Response Not Obtained
WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002						
Step	Action/Expected Response	Response Not Obtained						

Appendix D Required Operator Actions Form ES-D-2

Op Test	301	Scenario #	4	Event #	8			Page	40	of	47
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Event Description:	ATWS. MDAFW Pump 1A-A and 1B-B fail to AUTO start. TDAFW Pump airborne. 1-FR-S.1 to 1-E-0.
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Sequence of Events / Examiner Notes	Position	Applicant's Actions or Behavior
-------------------------------------	----------	---------------------------------

	N/A	<table><tr><td>WBN Unit 1</td><td>Nuclear Power Generation/ATWS</td><td>1-FR-S.1 Rev. 0002</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr><tr><td>19.</td><td>CHECK Incore T/Cs less than 1200°F.</td><td>IF Incore T/Cs are greater than 1200°F AND rising, THEN ** GO TO SAG-1, Main Control Room Severe Accident Guideline Initial Response.</td></tr><tr><td>20.</td><td>CHECK reactor subcritical: a. Power range channels less than 5%. b. Intermediate range startup rate NEGATIVE.</td><td>CONTINUE to borate. IF boration is NOT available, THEN ALLOW RCS to heat up to insert negative reactivity from temperature coefficients. IF red OR orange condition exists on other Status Trees, THEN PERFORM actions of other FR Procedures which do not cool down or otherwise add positive reactivity to the core. ** GO TO Step 4.</td></tr><tr><td>21.</td><td>TERMINATE emergency boration: a. PLACE BA transfer pumps in SLOW speed. b. CLOSE emergency borate valve 1-FCV-62-138. c. IF alternate boration opened, THEN Locally CLOSE 1-ISV-62-929.</td><td></td></tr></table>	WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002	Step	Action/Expected Response	Response Not Obtained	19.	CHECK Incore T/Cs less than 1200°F.	IF Incore T/Cs are greater than 1200°F AND rising, THEN ** GO TO SAG-1, Main Control Room Severe Accident Guideline Initial Response.	20.	CHECK reactor subcritical: a. Power range channels less than 5%. b. Intermediate range startup rate NEGATIVE.	CONTINUE to borate. IF boration is NOT available, THEN ALLOW RCS to heat up to insert negative reactivity from temperature coefficients. IF red OR orange condition exists on other Status Trees, THEN PERFORM actions of other FR Procedures which do not cool down or otherwise add positive reactivity to the core. ** GO TO Step 4.	21.	TERMINATE emergency boration: a. PLACE BA transfer pumps in SLOW speed. b. CLOSE emergency borate valve 1-FCV-62-138. c. IF alternate boration opened, THEN Locally CLOSE 1-ISV-62-929.	
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	N/A																
	RO																
	RO																
	RO																

Appendix D Required Operator Actions Form ES-D-2																	
Op Test	301	Scenario #	4	Event #	8			Page	41	of	47						
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Sequence of Events / Examiner Notes					Position	Applicant's Actions or Behavior											
<div>Scenario Termination:</div> <p>All Critical Tasks should be complete when crew finishes step [23]. Scenario may be terminated at CHIEF EXAMINER Discretion.</p>					SRO BOP/SRO SRO	<table><tr><td>WBN Unit 1</td><td>Nuclear Power Generation/ATWS</td><td>1-FR-S.1 Rev. 0002</td></tr><tr><td>Step</td><td>Action/Expected Response</td><td>Response Not Obtained</td></tr></table>						WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002	Step	Action/Expected Response	Response Not Obtained
						WBN Unit 1	Nuclear Power Generation/ATWS	1-FR-S.1 Rev. 0002									
						Step	Action/Expected Response	Response Not Obtained									
						<p>NOTE If the reactor is verified to be subcritical, Status Trees may be implemented for other Red or Orange paths</p>											
<p>22. IMPLEMENT other Red or Orange paths identified on Status Trees</p> <p>23. IF SI actuated, THEN RETURN TO Instruction in effect.</p>																	
Page 11 of 16																	

**Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 4
Simulator Console Operators Instructions**

1. SIMULATOR SET UP

- a. **ENSURE** exam security is established.
- b. **LOAD IC 253.**
- c. **LOAD** schedule file for 2019-301 NRC Examination Scenario 4.
- d. **ENSURE** DCS workstations are in "Initial environment"
- e. **ENSURE** ICS Screens are clear
- f. **ENSURE** ICS alarms are acknowledged (BISI for CS Pump 1B-B)
- g. **ENSURE** Scenario 4.evt loaded.

- h. **PLACE** the following in the specified position and **ATTACH** a Clearance tag (DANGER):
 - 1) **(PTL) 1-HS-72-10A** CNTMT SPRAY PUMP B (1-M-6) Position ☐ Tag ☐
 - 2) **1-HS-72-21A** RWST TO CS PMP B (1-M-6) Position ☐ Tag ☐
 - 3) **1-HS-72-45A** CNTMT SUMP TO CS PUMP B SUCT (1-M-6) Position ☐ Tag ☐
 - 4) **1-HS-73-13A** CNTMT SPRAY PMP B MINI FLOW (1-M-6) Position ☐ Tag ☐
- i. **PLACE** protected equipment tags on the following:
 - 1) **1-HS-72-27A** CNTMT SPRAY PMP A (1-M-6)
 - 2) **1-HS-82-18** DG MODE SELECTOR (1A-A) (0-M-26)

- j. **DEPRESS** "CLR" pushbutton on Area Rad Monitors (5) and Wide Range Condenser Vacuum Exhaust Rad Monitors (2)
ENSURE BOL Reactivity Briefing Book and placard are used.

- k. **ENSURE** ALL malfunctions listed on the Simulator Input Summary are loaded in Director.
- l. **PERFORM** Independent Verification that ALL malfunctions listed on the Simulator Input Summary are loaded in Director.
- m. **ENSURE** "B" Train Channel II sign, **MODE 2** sign, and "A" Protected train sign are posted on 1-M-30.
- n. **ENSURE** correct AUO cards are available to US, OAC and BOP.
- o. **ENSURE** ALL operator aids NOT required for the scenario are removed from the boards.
- p. **ENSURE** ALL recorders are clear.
- q. **PLACE** simulator in RUN.

NOTE: IF desired, **THEN** Simulator may be placed in FREEZE until prompted by NRC CHIEF EXAMINER to return to **RUN**.

**Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 4
Simulator Console Operators Instructions**

- r. **ENSURE** ALL ARIs are clear of all writing.
 - 1) 1-ARI-81-87
 - 2) 1-ARI-15-21
 - 3) 0-ARI-241-253
 - 4) 0-ARI-223-229
 - 5) 1-ARI-88-94
- s. **IF** the first scenario of the day **THEN ENSURE**:
 - 1) ALL EOIs are clear of all writing
 - 2) ALL AOIs are clear of all writing
 - 3) ALL ECAs are clear of all writing
 - 4) ALL FRs are clear of all writing
 - 5) ALL Tech Specs are clear of all writing
 - 6) ALL back-up copies are clear of all writing
- t. **IF NOT** the first scenario of the day **THEN ENSURE** the following procedures to be used are not written on:
 - 1) 1-AOI-4
 - 2) 0-AOI-13
 - 3) 1-AOI-18
 - 4) 1-AOI-20
 - 5) 1-FR-S.1
 - 6) 1-E-0

**Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 4
Simulator Console Operators Instructions**

2. GENERIC SCENARIO NOTES

- a. Typical Response Times:** Unless specified in the SEG or determined by the **NRC CHIEF EXAMINER**, the response time of AUOs or other personnel dispatched should be approximately 3 to 5 min.
- b. Plant Data or Information Requests:** Information not contained in this exam guide should be discussed with the **NRC CHIEF EXAMINER** before providing any information to the crew.
- c. General Notifications:** If not specifically addressed in the SEG, general notifications to Operations Management, Shift Manager, Load Coordinator, Plant Duty Manager, etc. will be acknowledged by the Console Operator.

3. TURNOVER INFORMATION

- a) Provide Crew with the following information:
 - Shift Turnover sheet with current Unit Status.
 - Blank copy of 1-GO-3 Section 5.3
 - Completed and approved Reactivity Control Plan

Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 4
Simulator Console Operators Instructions

SIMULATOR INPUT SUMMARY							
Key	Description	Event	Delay	Ramp	Initial	Final	Value
rp01c	Failure of AUTO and MANUAL Reactor Trip		0:00:00	0:00:00	---	Active	InActive
fw22c	TDAFW Pump airborne		0:00:00	0:00:00	---	Active	Inactive
si08g	MDAFW Pump 1A-A fails to AUTO start		0:00:00	0:00:00	---	Active	Inactive
si08h	MDAFW Pump 1B-B fails to AUTO start		0:00:00	0:00:00	---	Active	Inactive
ni04b	IR Channel II fails LOW	24	0:00:00	0:00:00	---	0.0	100.0
mux_14c004	82-A, SR/IR CHANNEL II TROUBLE	24	0:00:00	0:00:00	---	On	None
rw18e	ERCW Pump E-B broken coupling	6	0:00:00	0:00:00	---	Active	InActive
cv29	FCV-62-70 fails CLOSED	5	0:00:00	0:00:00	---	Active	InActive
mux_21c040	17-B, 125 DC VITAL BATT BD I ABNORMAL	5	0:00:00	0:00:00	---	Alarm	None
mux_21c040	17-B, 125 DC VITAL BATT BD I ABNORMAL	21	0:00:00	0:00:00	---	Off	None
mux_21c040	17-B, 125 DC VITAL BATT BD I ABNORMAL	21	0:00:05	0:00:00	---	Alarm	None
rc08b	PCV-68-340B, Loop 2 Spray Valve, fails OPEN	7	0:00:00	0:00:30	---	80	3.085
rdr01	MG Set 1A feeder breaker	22	0:04:00	0:00:00	---	Trip	0
rdr02	MG Set 1B feeder breaker	22	0:03:00	0:00:00	---	Trip	0
rpr68	RTB A	22	0:05:00	0:00:00	---	Trip	Normal
rpr69	RTB B	22	0:05:05	0:00:00	---	Trip	Normal
rwr54e	0-ISV-67-504E CLOSED	28	0:00:00	0:03:00	---	0	1

**Watts Bar Nuclear Plant
2019-301 NRC Examination Scenario 4
Simulator Console Operators Instructions**

SIMULATOR INPUT SUMMARY							
Key	Description	Event	Delay	Ramp	Initial	Final	Value
hs-72-10a	CS Pump 1B-B		0:00:00	0:00:00	---	ptlock	nastop
hs-72-10a-1	HS-72-10A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-21a	FCV-72-21, RWST to CS Pump 1B-B		0:00:00	0:00:00	---	CLOSE	blank
hs-72-21a-2	HS-72-21A RED light		0:00:00	0:00:00	---	OFF	ON
hs-72-45a	FCV-72-45, Containment Sump to CS Pump 1B-B		0:00:00	0:00:00	---	CLOSE	blank
hs-72-45a-1	HS-72-45A GREEN light		0:00:00	0:00:00	---	OFF	ON
hs-72-45a-2	HS-72-45A RED light		0:00:00	0:00:00	---	OFF	OFF
hs-72-13a-1	HS-72-13A GREEN light		0:00:00	0:00:00	---	OFF	ON
nin136ds209-1	IR Channel II Non-Operate bistable light	24	0:00:00	0:00:00	---	ON	OFF
hs-62-70a-1	FCV-62-70 GREEN light	5	0:00:00	0:00:00	---	OFF	OFF
hs-62-70a-2	FCV-62-70 RED light	5	0:00:00	0:00:00	---	OFF	ON

SHIFT TURNOVER CHECKLIST			
<input type="checkbox"/>	SM		
<input checked="" type="checkbox"/>	US	Unit	<u>1</u>
<input checked="" type="checkbox"/>	UO	Unit	<u>2</u>
<input type="checkbox"/>	AUO	Station	<u>WBN</u>
<input type="checkbox"/>	STA		
		Off-going - Name	
		On-coming - Name	
Part 1 - Completed by off-going shift / Reviewed by on-coming shift:			
<ul style="list-style-type: none"> Abnormal equipment lineup / conditions: <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"> Containment Spray Pump 1B-B tagged 4 hours ago for scheduled component outage. LCO 3.6.6 Condition A entered. 12 hours of scheduled work remain. </div> 			
<ul style="list-style-type: none"> SI/Tests in progress / planned: (including need for conduct of evolution briefings) <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"> None </div> 			
<input type="checkbox"/> US/ SM review late SI report (SQN and WBN only)			
<ul style="list-style-type: none"> Major Activities / Procedures in progress or planned: <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"> Train B Channel II Work Week. 3% power. Raise Reactor Power from 3% to 15% to support rolling and testing the Main Turbine IAW 1-GO-3 Section 5.3 and Reactivity Control Plan. RCS Boron Concentration: 1400 ppm Control Rod Position: Bank D 126 Steps 1-GO-3, Attachment 1, Mode 2-to-Mode 1 Review and Approval, has been completed and signed by the Operations Superintendent Plant Risk: Green. Grid: Qualified. Unit 2 is in MODE 1 at 100% power. </div> 			
<ul style="list-style-type: none"> Radiological changes during the shift: <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"> None </div> 			
Part 2 - Completed by on-coming shift prior to assuming duties:			
<input type="checkbox"/> Review station rounds /Abnormal readings (AUOs only)			
<input type="checkbox"/> Review Narrative Logs (previous day and carry-over items)			
<input type="checkbox"/> Current qualification status			
<input type="checkbox"/> Leadership and Team Effectiveness applicability			
<input type="checkbox"/> Review the current controlling Reactivity Management Plans (N/A for AUOs)			
<input type="checkbox"/> Review current TS/TRM/ODCM/FPR Required Actions (N/A for AUOs)			
<input type="checkbox"/> Walk down MCR Control Boards with off-going Operator (N/A for AUOs, as applicable for SM /STA)			
<input type="checkbox"/> CR reviews complete for previous shift (SM/US/STA)			
Relief Time:		Relief Date: _____	
Part 3 - Completed by on-coming shift. These items may be reviewed after assuming duties:			
<input type="checkbox"/> Review Operator Workarounds, Burdens and Challenges (applicable Unit / Station)			
<input type="checkbox"/> Review applicable ODML actions (first shift of shift week)			
<input type="checkbox"/> Review changes in Standing / Shift Orders (since last shift worked)			
<input type="checkbox"/> Review changes to TACFs issued (since last shift worked) (N/A for AUOs)			
<input type="checkbox"/> Review Control Room Deficiencies (first shift of shift week) (N/A for AUOs)			
<input type="checkbox"/> Review Component Deviation Log (N/A for AUOs)			

Watts Bar Nuclear Plant

2019-301 NRC Exam

System JPM A

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

A

2019-301 NRC Exam

EVALUATION SHEET

Task: Align CBD to Misaligned M8 after Runback

Alternate Path: Yes

Facility JPM #: 3-OT-J8A-1-1SI-A2

Safety Function: 1 **Title:** Reactivity Control

K/A 001 A2.17 Rod mis-alignment alarm.

Rating(s): 3.3 / 3.8 **CFR:** 41.5 / 43.5 / 45.3

Evaluation Method: Simulator ☒ In-Plant Classroom _____

References: 1-AOI-2, Malfunction of Reactor Control System, R11

Task Number: RO-085-SOI-85-003 **Title:** Operate the control rods manually at power

Task Standard: Applicant returns CBD to the M8 position IAW 1-AOI-2 Section 3.4. Applicant trips the reactor manually IAW 1-AOI-2 Section 3.2.

Validation Time: 10 minutes **Time Critical:** Yes _____ No ☒ _____

=====

Applicant: _____ _____ Time Start: _____
 NAME Docket No. Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____ / _____
 NAME SIGNATURE DATE

=====

COMMENTS

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC Exam

SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. RESET simulator to IC 254.
3. PLACE the simulator in RUN momentarily, and ACKNOWLEDGE all alarms.
4. PLACE the simulator in FREEZE.
5. WHEN applicant indicates understanding of the task, THEN PLACE simulator to RUN.

NOTE: This JPM's initial conditions are saved to IC 254. IF IC 254 is unavailable or fails to perform as expected, THEN use the following instructions:

- a. INITIALIZE simulator to any 100% RTP IC.
- b. CREATE Event 1
 1. Description: CBD at 175 steps
 2. Code: pc_rdu0052 == 175
- c. INSERT malfunction:
 1. rd13cbdm8 (M8 fails to move)
 2. Value: 175
 3. Trigger: Event 1
- d. PLACE simulator in run and trip MFP 1A
- e. PERFORM actions of 1-AOI-16
- f. LOWER turbine load to approx. 70% to clear AFD alarms
- g. USE remote cvr27 to adjust boron concentration to 810 ppm over 10 minutes
- h. Remove all malfunctions
- i. EDIT Event 1
 1. Description: CBD at 150 steps
 2. Code: pc_rdu0052 == 150
- j. INSERT malfunctions:
 1. rd13cbdb8
 2. rd13cbdh2
 3. rd13cbdh14
 4. rd13cbdp8
 5. All Values: 0
 6. All Triggers: Event 1

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

A

2019-301 NRC Exam

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM. SIMULATE ALL MANIPULATIONS.

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- Maintenance has completed replacing a lift coil fuse following an unanticipated runback 30 minutes ago and a lift coil fuse failure.
- 1-AOI-2, Malfunction of Reactor Control System, Section 3.4, RCCA Misalignment, has already been completed through step [8].

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Complete 1-AOI-2 Section 3.4 starting with step [9].
- Notify US when task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

A

2019-301 NRC Exam

Required Materials:	JPM A Handout 1 – Marked up copy of 1-AOI-2, Malfunction of Reactor Control System, Rev 11
---------------------	--

IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

A

2019-301 NRC Exam

Step # 2.	Performance Step: 1-AOI-2 Section 3.4
<p>Critical Step?</p> <p style="text-align: center;">N</p>	<p>10. MONITOR core power distribution parameters:</p> <ul style="list-style-type: none"> • Power Range Channels • QPTR • Δ Flux Indicators • Tavg • Loop ΔT • Incore TCs • Feed Flow/Steam Flow • BEACON Power Margin (ICS pt. BEACCPM)
Standard:	Applicant identifies appropriate indicators for monitoring.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

WATTS BAR NUCLEAR PLANT JOB PERFORMANCE MEASURE

A

2019-301 NRC Exam

CAUTION Any rise in reactor power may adversely affect Xenon oscillations, flux tilts and local power peaking.

NOTE Thumb Rules section of Reactivity Briefing Sheet contains boron equivalents to support boration. A condition specific Reactivity Control Plan may also be available.

Step # 3.	Performance Step: 1-AOI-2 Section 3.4
<p>Critical Step?</p> <p style="text-align: center;">Y</p>	<p>11. CHECK affected RCCA(s) BELOW associated bank.</p> <p>MOVE BANK OUT to match affected RCCA:</p> <p>a. DISCONNECT lift coil (toggle up) to affected RCCA(s).</p> <p>b. WITHDRAW affected bank to match misaligned RCCA(s), WHILE BORATING RCS to MAINTAIN Tavg and Tref within 3°F.</p> <p>c. **GO TO Step 13.</p>
Standard:	<p>Applicant correctly identifies that M8 is ABOVE CBD and goes to the RNO. <u>Applicant DISCONNECTS the lift coil for M8. The applicant uses 1-RBSS to withdraw CBD in MANUAL</u> while monitoring Tavg-Tref mismatch.</p> <p>The first underlined portion of this step is critical to prevent M8 from withdrawing and maintaining the misalignment. The second underlined portion is critical to maintain correct bank overlap and to complete the task.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	CBD Rod Bank Step Counters may become unmatched during withdrawal.
Cue:	<p>If asked about RCS boration, state: "another operator will handle RCS boration as necessary"</p> <p>If CBD Rod Bank Step Counters become unmatched during withdrawal, state: "maintenance will troubleshoot the Rod Bank Step Counters, continue with your task"</p>
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

A

2019-301 NRC Exam

Step # 4.	Performance Step: 1-AOI-2 Section 3.2
Critical Step?	<p style="text-align: center;">NOTE Step 1 is an IMMEDIATE ACTION step.</p>
Y	<p>1. PERFORM the following:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>a. MONITOR ONLY ONE rod dropped</p> <p>b. PLACE control rods in MAN.</p> </div> <div style="width: 45%;"> <p>a. IF more than one rod dropped, THEN (p) TRIP reactor **GO TO 1-E-0, Reactor Trip or Safety Injection.</p> </div> </div>
Standard:	<p>Applicant determines that more than one control rod has dropped and trips the Reactor.</p> <p>This step is critical because rod motion without control is an unsafe condition and the reactor must be tripped manually.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	Maximum rod misalignment is an initial assumption in the safety analysis that directly affects core power distributions and assumptions of available Shutdown Margin. In this case, multiple rods are no longer aligned correctly.
Cue:	Role play as Unit Supervisor, when report made of uncontrolled rod motion and/or tripping the Reactor - acknowledge the report(s).
Comments:	

Termination Cue:	After the applicant has tripped the reactor, state "Another operator will take it from here."
------------------	---

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

A

2019-301 NRC Exam

**Handout Package for
Applicant**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

A

2019-301 NRC Exam

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- Maintenance has completed replacing a lift coil fuse following an unanticipated runback 30 minutes ago and a lift coil fuse failure.
- 1-AOI-2, Malfunction of Reactor Control System, Section 3.4, RCCA Misalignment, has already been completed through step [8].

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Complete 1-AOI-2 Section 3.4 starting with step [9].
- Notify US when task is complete.

Watts Bar Nuclear Plant

2019-301 NRC Exam

System JPM B

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

B

2019-301 NRC Exam

EVALUATION SHEET

Task: Add Water to Cold Leg Accumulator 2 (MODE 3)

Alternate Path: Yes

Facility JPM #: 3-OT-J1A-1-1SI-S63E0

Safety Function: 2 **Title:** RCS Inventory Control

K/A 006 A4.07 ECCS Pumps and Valves

Rating(s): 4.4 / 4.4 **CFR:** 41.7 / 45.5 to 45.8

Evaluation Method: Simulator ☒ In-Plant Classroom

References: 1-SOI-63.01, Safety Injection System, Section 8.3.2, Add Water to CLA 2, R18
1-AOI-6, Small RCS Leak, R6

Task Number: RO-063-SOI-63-004 **Title:** Fill the cold leg accumulators
RO-113-EOP-0-001 Respond to a reactor trip or safety injection

Task Standard: Applicant will add water to Cold Leg Accumulator 2 IAW 1-SOI-63.01 Section 8.3.2. Applicant initiate MANUAL Safety Injection in response to a small break LOCA that cannot be isolated prior to Pressurizer Level dropping below 5% (approx. 3 minutes from start of small break LOCA).

Validation Time: 15 minutes **Time Critical:** Yes No ☒

=====

Applicant: _____	Time Start: _____
NAME	Docket No.
	Time Finish: _____

Performance Rating: SAT ____ UNSAT ____ **Performance Time** ____

Examiner: _____ / _____

NAME	SIGNATURE	DATE
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=====

COMMENTS

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

B

2019-301 NRC Exam

SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. RESET simulator to IC 255.
3. PLACE the simulator in RUN momentarily, and ACKNOWLEDGE all alarms.
4. PLACE the simulator in FREEZE.
5. PLACE 1-HS-63-15A in PULL to LOCK
6. PLACE DANGER tags on 1-HS-63-15A and 1-HS-63-48A
7. WHEN applicant indicates understanding of the task, THEN PLACE simulator to RUN.

NOTE: This JPM's initial conditions are saved to IC 255. IF IC 255 is unavailable or fails to perform as expected, THEN use the following instructions:

- a. INITIALIZE simulator to any MODE 3 IC with Steam Dumps in service.
- b. ENSURE the following in MANUAL:
 1. 1-PIC-68-340A, -340B and -340D
 2. 1-HIC-62-93A
 3. 1-HIC-1-103A
- c. ADJUST RCS parameters to stabilize the plant at approx. 500 F, 1500 psig and 30% Pressurizer Level (Pressurizer Level is important to required action time for JPM).
- d. ENSURE CLA isolation valves are OPEN (use remote sir01 to restore power if necessary)
- e. INSERT malfunction si04b to drain CLA 2 until 132-B, CLA LO PRESS, and 132-A, CLA LO LEVEL, alarm. Remove malfunction si04b.
- f. ICS alarm Pocket Sump Rate of Rise will occur. Pump down Pocket Sump and wait for ICS alarm to clear.
- g. CREATE Event 1
 1. Description: CLA 2 Fill
 2. Code: zaoli63109(1) > 0.32
- e. INSERT malfunction:
 1. th03b (LOCA on Loop 2 Cold Leg)
 2. Trigger: Event 1
 3. Final Value: 70.0
1. INSERT malfunction rp02b (Auto SI initiation signal failure)
2. INSERT overrides (SIP 1B-B under clearance)
 1. hs-63-15a to ptlock
 2. hs-63-48a to CLOSE
 3. hs-63-48a-1 to OFF
 4. hs-63-48a-2 to OFF

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM. SIMULATE ALL MANIPULATIONS.

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- MODE 3
- During a Maintenance activity, Cold Leg Accumulator 2 was inadvertently drained
- SI Pump 1B-B is tagged for inspection
- You are the Operator at the Controls (OAC)

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Add water to CLA 2 IAW 1-SOI-63.01 Section 8.3.2 starting with step [2].
- Notify US when task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Required Materials:	JPM B Handout 1 – 1-SOI-63.01, Safety Injection System Section 8.3.2, Add Water to CLA 2, R18
---------------------	---

IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

CAUTION

Adding water to more than one CLA at a time while they are required to be operable places the plant outside design basis. This section is to be used to add water to any selected single CLA. If more than one CLA needs water, separate evolutions must be performed.

Step # 1.	Performance Step: 1-SOI-63.01 Section 8.3.2
Critical Step? N	[2] IF RCS pressure is \leq 1000 psig, THEN ENSURE 1-FCV-63-98, CL ACCUM 2 OUTLET, CLOSED.
Standard:	Applicant determines that RCS pressure is greater than 1000 psig and marks the step N/A.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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CAUTION

If RCS is 1650 psig or less, all SIP flow paths must be disabled to prevent inadvertent RCS injection. If 1-FCV-63-152 is closed, then SI Pump A is the only pump that can be used to fill CL

NOTE

Steps 8.3.2[3] through 8.3.2[9] may be NA'd if SI pump already in service for filling CLA's

Step # 2.	Performance Step: 1-SOI-63.01 Section 8.3.2
Critical Step? Y	[3] IF RCS 1650 psig or less, AND SIP A is to be used to fill CLA, THEN CLOSE 1-FCV-63-152, SI PMP A TO CL 1-2-3-4 [1-M-6].
Standard:	Applicant determines that RCS pressure is less than 1650 psig and CLOSES 1-FCV-63-152. Step is critical to ensure SI Pump 1A-A does not discharge to the RCS. SI Pump 1B-B is NOT available.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	131-F, ESF ABNORMAL, will alarm on repositioning of 1-FCV-63-152.

B

CAUTION

Step # 4.	Performance Step: 1-SOI-63.01 Section 8.3.2
Critical Step?	<p>[5] IF in Mode 4, 5, or 6 and SIP B is to be used with Rx Vessel Head ON, THEN</p> <p>[5.1] ENSURE 1-FCV-63-22, SI PUMPS CL Injection is CLOSED.</p> <p>[5.2] CHECK 1-BKR-63-22-B, (1B1-B, C/11D) Tagged OPEN with Hold Tag.</p> <p>[5.3] ENSURE 1-FCV-63-156, SI PUMP 1A HL injection CLOSED.</p> <p>[5.4] CHECK 1-BKR-63-156 (1A1-A, C13A) Tagged OPEN with Hold Tag.</p>
N	
Standard:	Applicant determines from JPM Initial Conditions or plant parameters that Unit is in MODE 3 and marks the step N/A.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

B

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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NOTE

PRT parameters should be monitored for indications of relief valve lifting, after starting pump.

Step # 7.	Performance Step: 1-SOI-63.01 Section 8.3.2															
Critical Step?	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">[8]</div> <div> PERFORM the following (N/A pump NOT selected): </div> </div> <table border="1" style="margin-left: 100px; width: 60%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">NOMENCLATURE</th><th style="text-align: center;">LOC</th><th style="text-align: center;">POSITION</th><th style="text-align: center;">UNID</th><th style="text-align: center;">INITIALS</th></tr> </thead> <tbody> <tr> <td>SI PMP A (ECCS)</td><td>1-M-6</td><td>START</td><td>1-HS-63-10A</td><td></td></tr> <tr> <td>SI PMP B (ECCS)</td><td>1-M-6</td><td>START</td><td>1-HS-63-15A</td><td></td></tr> </tbody> </table>	NOMENCLATURE	LOC	POSITION	UNID	INITIALS	SI PMP A (ECCS)	1-M-6	START	1-HS-63-10A		SI PMP B (ECCS)	1-M-6	START	1-HS-63-15A	
NOMENCLATURE	LOC	POSITION	UNID	INITIALS												
SI PMP A (ECCS)	1-M-6	START	1-HS-63-10A													
SI PMP B (ECCS)	1-M-6	START	1-HS-63-15A													
Y																
Standard:	<u>Applicant starts SI PMP A</u> and marks SI PMP B N/A. The underlined portion of the step is critical to accomplish the task. No flow path to CLA 2 is available from SI Pump 1B-B.															
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY															
Examiner Notes:	131-F, ESF COMPONENT NOT NORMAL, will alarm when SI Pump 1A-A is started.															
Cue:	If contacted as AUO, state "SI Pump 1A-A ready for a start. All personnel are clear."															
Comments:	None															

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 8.	Performance Step: 1-SOI-63.01 Section 8.3.2																													
Critical Step?	<p>[9] CHECK the started pumps' closing spring charged (N/A pump NOT started):</p> <table border="1"> <thead> <tr> <th>NOMENCLATURE</th><th>LOCATION</th><th>CLOSING SPRING</th><th>UNID</th><th>INITIALS</th></tr> </thead> <tbody> <tr> <td align="center" colspan="5">6.9 KV Shutdown Board 1A-A</td></tr> <tr> <td>SAFETY INJECTION PUMP 1A-A (1-PMP-63-10)</td><td align="center">C/15</td><td align="center">CHARGED</td><td align="center">1-BKR-63-10</td><td></td></tr> <tr> <td align="center" colspan="5">6.9 KV Shutdown Board 1B-B</td></tr> <tr> <td>SAFETY INJECTION PUMP 1B-B (1-PMP-63-15)</td><td align="center">C/15</td><td align="center">CHARGED</td><td align="center">1-BKR-63-15</td><td></td></tr> </tbody> </table>					NOMENCLATURE	LOCATION	CLOSING SPRING	UNID	INITIALS	6.9 KV Shutdown Board 1A-A					SAFETY INJECTION PUMP 1A-A (1-PMP-63-10)	C/15	CHARGED	1-BKR-63-10		6.9 KV Shutdown Board 1B-B					SAFETY INJECTION PUMP 1B-B (1-PMP-63-15)	C/15	CHARGED	1-BKR-63-15	
NOMENCLATURE	LOCATION	CLOSING SPRING	UNID	INITIALS																										
6.9 KV Shutdown Board 1A-A																														
SAFETY INJECTION PUMP 1A-A (1-PMP-63-10)	C/15	CHARGED	1-BKR-63-10																											
6.9 KV Shutdown Board 1B-B																														
SAFETY INJECTION PUMP 1B-B (1-PMP-63-15)	C/15	CHARGED	1-BKR-63-15																											
N																														
Standard:	Applicant directs AUO to check closing springs charged for SI Pump 1A-A.																													
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY																													
Examiner Notes:	None																													
Cue:	When contacted as AUO, state "SI Pump 1A-A closing springs are charged."																													
Comments:																														

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 9.	Performance Step: 1-SOI-63.01 Section 8.3.2
Critical Step? Y	[10] OPEN 1-FCV-63-95, SIS COLD LEG ACCUM 2 MAKEUP, [1-M-6].
Standard:	Applicant OPENS 1-FCV-63-95 Step is critical to establish fill path from SI Pump 1A-A to CLA 2.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	<p>When CLA 2 level rises for approx. 1 minute, Event 1 is triggered (small break LOCA). If Event 1 fails to trigger automatically it should be inserted manually by the console operator.</p> <p>Once the small break LOCA begins the applicant should begin diagnosing the problem. Several alarms will occur within the first 20 seconds of the transient:</p> <p>144-A ICE COND INLET DOOR OPEN</p> <p>173-B LWR CNTMT AIR 1-RM-106 RAD HI</p> <p>90-B PZR PRESS LO-DEVN BACKUP HTRS ON (PS-68-340G)</p> <p>The applicant should determine that Safety Injection conditions (MODE 3) will be met imminently and SI should be initiated. The applicant may consult 1-AOI-6 or may take action as a prudent action once SI conditions are met and the automatic actions failed.</p> <p>Low Pressurizer Pressure SI is blocked due to RCS pressure below P-11. Containment Hi Pressure SI is blocked (all (3) AUTO SIs are blocked).</p>
Cue:	None
Comments:	

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Terminating Cue:	Once SI is initiated, state: “Another operator will take it from here.”
------------------	--

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**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

B

2019-301 NRC Exam

**Handout Package for
Applicant**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

B

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APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- MODE 3
- During a Maintenance activity, Cold Leg Accumulator 2 was inadvertently drained
- SI Pump 1B-B is tagged for inspection
- You are the Operator at the Controls (OAC)

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Add water to CLA 2 IAW 1-SOI-63.01 Section 8.3.2 starting with step [2].
- Notify US when task is complete.

Watts Bar Nuclear Plant

2019-301 NRC Exam

System JPM C

C

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

C

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. RESET simulator to IC 256.
3. ENSURE the following item displayed on the Director Summary Page:

hs-74-33a	Hs-74-33a rhr heat exch a bypass sw to close	
------------------	--	--

4. PLACE the simulator in RUN momentarily, and ACKNOWLEDGE all alarms.
5. PLACE the simulator in FREEZE.
6. WHEN applicant indicates understanding of the task, THEN PLACE simulator to RUN.

NOTE: This JPM's initial conditions are saved to IC 256. IF IC 256 is unavailable or fails to perform as expected, THEN use the following instructions:

- a. INITIALIZE simulator to any MODE 1 IC.
- b. INSERT malfunction th01d (LOCA - Loop 4 Hot Leg)
- c. PERFORM required actions of 1-E-0, 1-E-1 and 1-ES-1.3 through step [27]
- d. INSERT the following remotes:
 1. chr20 (Hydrogen Analyzer Train A local alarm) to RESET
 2. chr21 (Hydrogen Analyzer Train B local alarm) to RESET
 3. sir14 (FCV-63-1 power) to ON
 4. sir06 (FCV-63-22 power) to ON
 5. sir01 (FCV-63-67, -80, -98 and -118) to ON
- e. INSERT the following override:
 1. hs-74-33a to CLOSE (prevents 1-FCV-74-33 from OPENING)

**WATTS BAR NUCLEAR PLANT
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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM. SIMULATE ALL MANIPULATIONS.

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- A Large Break LOCA has occurred
- You are the Operator at the Controls (OAC)

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Align RHR for hot leg recirculation IAW 1-ES-1.4.
- Notify US when task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Required Materials:	JPM C Handout 1 – 1-ES-1.4, Transfer to Hot Leg Recirculation, Rev 0
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IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

NOTE

If problems are encountered during transfer to hot leg, then cold leg recirc should be continued or restored during TSC evaluation of corrective actions.

Step # 1.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	1. ALIGN RHR Train A for hot leg recirc: a. CLOSE RHR Train A cold leg isolation valve 1-FCV-63-93.
Standard:	CLOSE RHR Train A cold leg isolation valve 1-FCV-63-93.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 2.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>1. ALIGN RHR Train A for hot leg recirc:</p> <p>b. ENSURE RHR Train B discharge cross-tie valve 1-FCV-74-35 CLOSED.</p>
Standard:	1-FCV-74-35 IS VERIFIED CLOSED by green light indication.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 3.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>1. ALIGN RHR Train A for hot leg recirc:</p> <p>c. ENSURE RHR Train A spray valve 1-FCV-72-40 CLOSED.</p>
Standard:	1-FCV-72-40 IS VERIFIED CLOSED by green light indication.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 4.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>1. ALIGN RHR Train A for hot leg recirc:</p> <p>d. ENSURE RHR Train B spray valve 1-FCV-72-41 CLOSED.</p>
Standard:	1-FCV-72-41 IS VERIFIED CLOSED by green light indication.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 5.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>1. ALIGN RHR Train A for hot leg recirc:</p> <p>e. OPEN RHR Train A discharge crosstie valve 1-FCV-74-33.</p>
Standard:	Applicant attempts to OPEN RHR Train A discharge crosstie valve 1-FCV-74-33, but realizes that the valve will not open takes action of the RNO column.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If asked as AUO to manually open 1-FCV-74-33, state that the handwheel cannot be rotated, the valve cannot be locally operated.
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 6.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? Y	1. ALIGN RHR Train A for hot leg recirc: IF Train A NOT available for hot leg recirc, THEN : 1) RETURN RHR Train A to cold leg recirc alignment. 2) ** GO TO Step 2.
Standard:	Performer Opens RHR Train A cold leg isolation valve 1-FCV-63-93. Then goes to step [2] of 1-ES-1.4. Step is critical since it will allow RHR flow to be directed back to the cold leg.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 7.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? Y	2. ALIGN RHR Train B for hot leg recirc: a. CLOSE RHR Train B cold leg isolation valve 1-FCV-63-94.
Standard:	CLOSE RHR Train B cold leg isolation valve 1-FCV-63-94. Step is critical since it will allow RHR flow to be directed later to the hot leg.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 8.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>b. ENSURE RHR Train A discharge crosstie valve 1-FCV-74-33 CLOSED.</p>
Standard:	1-FCV-74-33 IS VERIFIED CLOSED by green light indication.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 9.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>c. ENSURE RHR Train A spray valve 1-FCV-72-40 CLOSED.</p>
Standard:	1-FCV-72-40 IS VERIFIED CLOSED by green light indication.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 10.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>d. ENSURE RHR Train B spray valve 1-FCV-72-41 CLOSED.</p>
Standard:	1-FCV-72-41 IS VERIFIED CLOSED by green light indication.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 11.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? Y	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>e. OPEN RHR Train B discharge crosstie valve 1-FCV-74-35.</p>
Standard:	<p>OPENS RHR Train B discharge crosstie valve 1-FCV-74-35.</p> <p>Step is critical since it will allow RHR flow to be directed later to the hot leg.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 12.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? Y	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>f. OPEN RHR hot leg injection valve 1-FCV-63-172.</p>
Standard:	<p>Performer OPENS RHR HOT LEG INJECTION VALVE 1-FCV-63-172.</p> <p>Step is critical since it allows RHR flow to be directed to the hot leg.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 13.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>g. ENSURE RHR heat exchanger outlet 1-FCV-74-28 OPEN.</p>
Standard:	1-HS-74-28A is indicating open or 1-XI-74-28 RED light is LIT or by open indication for valve on ICS display.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 14.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>h. ENSURE RHR hot leg flow on 1-FI-63-173.</p>
Standard:	Flow is verified on 1-FI-63-173.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 15.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? Y	<p>2. ALIGN RHR Train B for hot leg recirc:</p> <p>i. CLOSE RHR Train A cold leg isolation 1-FCV-63-93.</p>
Standard:	<p>1-HS-63-93A has been placed in the CLOSE position.</p> <p>Step is critical since it removes RHR flow from Cold Leg recirculation with RHR Pump 1A-A flow supplying ECCS suction.</p>
Performance:	<div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY </div>
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 16.	Performance Step: 1-ES-1.4, Section 3.0
Critical Step? N	Notify the Unit Supervisor that B Train RHR has been aligned for Hot Leg Recirc.
Standard:	Unit Supervisor is notified that B Train RHR has been aligned for Hot Leg Recirc.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	When notified, acknowledge the report using repeat back. Provide the following cue if the performer continues on in the procedure to place Safety Injection Pumps in Hot leg Injection: "We will stop here."
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the JPM Briefing sheet to the examiner.
------------------	--

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

C

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Handout Package for Applicant

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

C

2019-301 NRC Exam

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- A Large Break LOCA has occurred
- You are the Operator at the Controls (OAC)

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Align RHR for hot leg recirculation IAW 1-ES-1.4.
- Notify US when task is complete.

Watts Bar Nuclear Plant

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System JPM D

D

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. RESET simulator to IC 257.
3. PLACE the simulator in RUN momentarily, and ACKNOWLEDGE all alarms.
4. PLACE the simulator in FREEZE.
5. WHEN applicant indicates understanding of the task, THEN PLACE simulator to RUN.

NOTE: This JPM's initial conditions are saved to IC 257. IF IC 257 is unavailable or fails to perform as expected, THEN use the following instructions:

- a. INITIALIZE simulator to either a MODE 1 IC (< 15% power) or MODE 2 IC.
- b. Adjust reactor power with control rods for 13% to 14%

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC Exam

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM. SIMULATE ALL MANIPULATIONS.

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- EHC placed in service IAW 1-SOI-47.02, Turbo-Generator Startup Operation, Section 5.1, Placing EHC in service
- Personnel are stationed locally at the U1 Main Turbine to monitor
- Reheat Stop and Intercept Valve testing was performed by the previous shift
- You are a Control Room Operator (CRO)

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 1-SOI-47.02 Section 5.2.
- Notify US when task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Required Materials:	D Handout 1 – 1-SOI-47.02, Turbo-Generator Startup Operation, Section 5.2, Latching Turbine, R12
---------------------	--

IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

Step # 1.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[1] ENSURE EHC System in service per Section 5.1.
Standard:	Applicant recognizes that completion of Section 5.1 was specified in JPM Initial Conditions.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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NOTE

Section 8.16 provides additional guidance for testing LAMPS.

Step # 2.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[2] IF a LAMP TEST has NOT previously been performed, THEN PERFORM EHC system LAMP TEST.
Standard:	Applicant will PRESS Lamp Test and CONFIRM that all indicators and buttons are illuminated. Applicant will then PRESS Lamp Test to return the control panel to normal.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	Section 8.16 is an INFORMATION USE section. It is not required to be used only available. It is not included in the guide, but the applicant will have access to it.
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 3.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[3] SELECT ALARM STATUS screen.
Standard:	Applicant will select alarm screen at a DCS workstation.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

D

NOTE

Step # 4.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step?	<p>[4] IF ALARM STATUS screen has any RED alarm conditions, THEN</p> <p>[4.1] CLICK the ALARM TRIP RESET button.</p> <p>[4.2] EVALUATE each RED alarmed condition as it pertains to latching of the turbine.</p> <p>[4.3] IF any PROTECH IOPS alarm conditions are RED, THEN</p> <p>NOTIFY I&C for assistance in resetting of alarms.</p>
N	
Standard:	Applicant determines that no present alarm conditions will prevent the turbine from being latched.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If applicant requests I&C assistance, acknowledge the request.
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 5.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[5] SELECT OPERATOR PANEL screen.
Standard:	Applicant will select Operator Panel screen at the DCS workstation.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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NOTE

Turbine controls & indications are located on 1-XX-47-1000 & 1-XX-47-2000.

Step # 6.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	<p>[6] ENSURE the following on EHC Control & Display panels:</p> <ul style="list-style-type: none">• Throttle valve and Governor Valve position indicators, zero.• OPER AUTO button, LIT.• Throttle, Governor, Reheat, and Intercept Valves position lights/indications, indicate CLOSED.
Standard:	Applicant will determine that Throttle and Governor valves indicate 0%, the OPER AUTO button is LIT and Throttle, Governor, Reheat and Intercept Valves indicate CLOSED.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 7.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[7] ENSURE reactor power STABLE at 13 to 15%.
Standard:	Applicant will determine that reactor power is STABLE at just above 13% using ΔT s and NIS.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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NOTE

Local operator can use 1-SI-47-53, Turbine Speed Indicator for monitoring turbine speed and if needed, 1-HS-47-117, Turbine Trip button for tripping the turbine. [1-L-713, Turbine Front Standard, JB-291-9545].

Step # 8.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	<p>[8] IF personnel will be monitoring/working around the turbine during the rolling OR latching process, THEN</p> <p>ENSURE personnel are stationed locally for monitoring and communications has been established with the MCR [T4J/755].</p>
Standard:	Applicant recognizes that JPM Initial Conditions specified personnel stationed to monitor U1 Main Turbine during latching.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If contacted as AUO, state: "Three of us are at the U1 Main Turbine ready for latching."
Comments:	

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Operable Reheat and Intercept valves will OPEN when the turbine is latched.

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**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 10.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[10] WHEN turbine is LATCHED, THEN CONFIRM REFERENCE and SETTER are displaying zero OR actual rpm.
Standard:	Applicant will verify that Reference and Setter both indicate 4 rpm (actual).
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 11.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[11] REFER TO Attachment 1 for proper operation of EHC equipment and system parameters.
Standard:	Applicant will verify that Reference and Setter both indicate 4 rpm (actual).
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	All Attachment 1 parameters for EHC are verified in the plant by AUOs.
Cue:	If contacted as AUO, state: "I have 1-SOI-47.02 Attachment 1 and I am monitoring EHC for proper operation. I will notify you of any problems."
Comments:	

WATTS BAR NUCLEAR PLANT JOB PERFORMANCE MEASURE

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NOTE

The following step ensures that the Reheat Stop (RHS) and Intercept Valves (IV) are positioned for testing. Any valve NOT opened should be noted here and in the Narrative Log to ensure testing is performed when valve is operable.

Step # 12.	Performance Step: 1-SOI-47.02 Section 5.2																																																						
Critical Step?	<div style="text-align: center;">[12] RECORD Reheat and Intercept Valve status. _____</div> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px auto;"> <thead> <tr> <th rowspan="2" style="width: 45%;">MSR REHEAT AND INTERCEPT VALVES</th><th rowspan="2" style="width: 15%;">1-XX-47-2000 or 1-XX-47-1000</th><th colspan="2">POSITION</th></tr> <tr> <th style="width: 20%;">Red Light (OPEN)</th><th style="width: 20%;">Green Light (CLOSED)</th></tr> </thead> <tbody> <tr><td>MSR A-1 TO LP TURB A STOP VLV</td><td>1RR</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR B-1 TO LP TURB B STOP VLV</td><td>2RR</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR C-1 TO LP TURB C STOP VLV</td><td>3RR</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR A-2 TO LP TURB A STOP VLV</td><td>1RL</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR B-2 TO LP TURB B STOP VLV</td><td>2RL</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR C-2 TO LP TURB C STOP VLV</td><td>3RL</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR A-1 TO LP TURB A INTERCEPT VLV</td><td>1IR</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR B-1 TO LP TURB B INTERCEPT VLV</td><td>2IR</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR C-1 TO LP TURB C INTERCEPT VLV</td><td>3IR</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR A-2 TO LP TURB A INTERCEPT VLV</td><td>1IL</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR B-2 TO LP TURB B INTERCEPT VLV</td><td>2IL</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>MSR C-2 TO LP TURB C INTERCEPT VLV</td><td>3IL</td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>	MSR REHEAT AND INTERCEPT VALVES	1-XX-47-2000 or 1-XX-47-1000	POSITION		Red Light (OPEN)	Green Light (CLOSED)	MSR A-1 TO LP TURB A STOP VLV	1RR	<input type="checkbox"/>	<input type="checkbox"/>	MSR B-1 TO LP TURB B STOP VLV	2RR	<input type="checkbox"/>	<input type="checkbox"/>	MSR C-1 TO LP TURB C STOP VLV	3RR	<input type="checkbox"/>	<input type="checkbox"/>	MSR A-2 TO LP TURB A STOP VLV	1RL	<input type="checkbox"/>	<input type="checkbox"/>	MSR B-2 TO LP TURB B STOP VLV	2RL	<input type="checkbox"/>	<input type="checkbox"/>	MSR C-2 TO LP TURB C STOP VLV	3RL	<input type="checkbox"/>	<input type="checkbox"/>	MSR A-1 TO LP TURB A INTERCEPT VLV	1IR	<input type="checkbox"/>	<input type="checkbox"/>	MSR B-1 TO LP TURB B INTERCEPT VLV	2IR	<input type="checkbox"/>	<input type="checkbox"/>	MSR C-1 TO LP TURB C INTERCEPT VLV	3IR	<input type="checkbox"/>	<input type="checkbox"/>	MSR A-2 TO LP TURB A INTERCEPT VLV	1IL	<input type="checkbox"/>	<input type="checkbox"/>	MSR B-2 TO LP TURB B INTERCEPT VLV	2IL	<input type="checkbox"/>	<input type="checkbox"/>	MSR C-2 TO LP TURB C INTERCEPT VLV	3IL	<input type="checkbox"/>	<input type="checkbox"/>
MSR REHEAT AND INTERCEPT VALVES	1-XX-47-2000 or 1-XX-47-1000			POSITION																																																			
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MSR A-1 TO LP TURB A STOP VLV	1RR	<input type="checkbox"/>	<input type="checkbox"/>																																																				
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MSR A-2 TO LP TURB A STOP VLV	1RL	<input type="checkbox"/>	<input type="checkbox"/>																																																				
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MSR C-2 TO LP TURB C STOP VLV	3RL	<input type="checkbox"/>	<input type="checkbox"/>																																																				
MSR A-1 TO LP TURB A INTERCEPT VLV	1IR	<input type="checkbox"/>	<input type="checkbox"/>																																																				
MSR B-1 TO LP TURB B INTERCEPT VLV	2IR	<input type="checkbox"/>	<input type="checkbox"/>																																																				
MSR C-1 TO LP TURB C INTERCEPT VLV	3IR	<input type="checkbox"/>	<input type="checkbox"/>																																																				
MSR A-2 TO LP TURB A INTERCEPT VLV	1IL	<input type="checkbox"/>	<input type="checkbox"/>																																																				
MSR B-2 TO LP TURB B INTERCEPT VLV	2IL	<input type="checkbox"/>	<input type="checkbox"/>																																																				
MSR C-2 TO LP TURB C INTERCEPT VLV	3IL	<input type="checkbox"/>	<input type="checkbox"/>																																																				
Standard:	Applicant records position of all Reheat Stop and Intercept valves.																																																						
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY																																																						
Examiner Notes:	None																																																						
Cue:	None																																																						
Comments:																																																							

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 13.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	<p>[13] IF any turbine valves from step 5.2[12] are NOT OPEN, THEN</p> <p>[13.1] INITIATE a Condition Report (CR) for turbine valves that are NOT OPEN.</p> <p>[13.2] RECORD CR# below.</p> <p>CR# _____</p>
Standard:	Applicant determines that all Reheat Stop and Intercept valves are OPEN and marks step N/A.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 14.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	<p>[14] CHECK ALL THROTTLE VALVES, CLOSED.</p>
Standard:	Applicant determines that all THROTTLE valves are CLOSED.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 15.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[15] CHECK ALL GOVERNOR VALVES, CLOSED.
Standard:	Applicant determines that all GOVERNOR valves are CLOSED.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

NOTES

Steps 5.2[17] through 5.2[25] are required only if the turbine is to be rolled and the RHS and IV valves have NOT been tested/performed within the previous 7 days.

Step # 16.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[16] IF Section 5.3, is NOT to be performed OR testing of the RHS and IV valves has been performed within the previous 7 days, THEN GO TO step 5.2[27].
Standard:	Applicant determines from JPM Initial Conditions that Reheat Stop and Intercept valve testing occurred within the previous 7 days, and proceeds to step [27].
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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NOTE

Section 8.17.2 provides additional guidance for adjusting the VALVE POSITION LIMIT.

Step # 17.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? Y	[27] IF turbine VALVE POSITION LIMIT is NOT at 100%, THEN ADJUST limit to 100%.
Standard:	Applicant raises VPL to 100%. Step is critical to accomplishing task to OPEN governor valves.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	All (4) Governor valves will travel full OPEN. Section 8.17.2 is an INFORMATION USE section. It is not required to be used only available. It is not included in the guide, but the applicant will have access to it.
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 18.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[28] CONFIRM ALL Governor Valves, OPEN.
Standard:	Applicant verifies that all Governor valves are OPEN.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	The applicant can notify the Unit Supervisor that the task is complete at this point. The next step is only included if the applicant proceeds to finish the section.
Cue:	None
Comments:	

Step # 19.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	[29] IF two EHC Pumps are running after the turbine has been latched, THEN PLACE one pump hand switch to STOP AND then to AUTO.
Standard:	Applicant contacts AUO to verify status of EHC pumps.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If contacted as AUO, state: "Only EHC Pump 1A is running. EHC Pump 1B is in standby."
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 20.	Performance Step: 1-SOI-47.02 Section 5.2
Critical Step? N	Notify the Unit Supervisor that U1 Main Turbine is LATCHED and all Governor valves are OPEN.
Standard:	Applicant notifies Unit Supervisor that U1 Main Turbine is LATCHED and all Governor valves are OPEN.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	When notified, acknowledge the report using repeat back. Provide the following cue if the performer continues on in the procedure: "Another operator will continue from here."
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the JPM Briefing sheet to the examiner.
------------------	--

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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**Handout Package for
Applicant**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- EHC placed in service IAW 1-SOI-47.02, Turbo-Generator Startup Operation, Section 5.1, Placing EHC in service
- Personnel are stationed locally at the U1 Main Turbine to monitor
- Reheat Stop and Intercept Valve testing was performed by the previous shift
- You are a Control Room Operator (CRO)

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 1-SOI-47.02 Section 5.2.
- Notify US when task is complete.

Watts Bar Nuclear Plant

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System JPM E

WATTS BAR NUCLEAR PLANT JOB PERFORMANCE MEASURE

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. RESET simulator to IC 258.
3. PLACE the simulator in RUN momentarily, and ACKNOWLEDGE all alarms.
4. PLACE the simulator in FREEZE.
5. WHEN applicant indicates understanding of the task, THEN PLACE simulator to RUN.

NOTE: This JPM's initial conditions are saved to IC 258. IF IC 258 is unavailable or fails to perform as expected, THEN use the following instructions:

- a. INITIALIZE simulator to any MODE 1 IC.
- b. INSERT malfunction th01d=1.0 (LOCA - Loop 4 Hot Leg)
- c. INSERT malfunction rp60b (failure of Phase A TrainB...this is a complete failure)
- d. INSERT malfunction mux_09c034 to OFF (keeps window 232-B dark) and remote 1-hs-65-74a to loss pwr (keeps Annulus Vacuum 1B from auto starting)
- e. INSERT the following overrides (simulates the actuation of K522B so only K502B valves remain unisolated)
 1. hs-1-7181 to CLOSE
 2. hs-1-25183 to CLOSE
 3. hs-68-308a to CLOSE
 4. hs-62-61a to CLOSE
 5. hs-30-101b to ACTUATE
 6. hs-61-97 to CLOSE
 7. hs-61-122 to CLOSE
 8. hs-30-134 to CLOSE
 9. hs-31-266a to PTLOCK
 10. 1-hs-65-74a to CLOSE
 11. hs-65-53 to CLOSE
 12. hs-65-42a to START
 13. hs-65-30 to OPEN
 14. hs-65-27 to OPEN
 15. 1-hs-64-74a-1 to ON
 16. hs-65-53-1 to ON
 17. hs-65-53-2 to OFF
- f. PERFORM required actions of 1-E-0 (silence alarms, adjust AFW, place MSIV handswitches to CLOSE, place Steam Dump handswitches to OFF, place 5084 and 5088 handswitches on 1-M-1 to OPEN)
- g. RESET Phase A and Phase B (both Trains).
- h. OPEN 1-FCV-32-80, -102 and -110.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM. SIMULATE ALL MANIPULATIONS.

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- A Large Break LOCA has occurred.
- 1-E-0, Reactor Trip or Safety Injection, is in progress

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 1-E-0 Attachment 10, Phase A Containment Isolation Valves (Train B)
- Notify US when task is complete.

WATTS BAR NUCLEAR PLANT JOB PERFORMANCE MEASURE

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Required Materials:	E Handout 1 – 1-E-0, Reactor Trip or Safety Injection, Attachment 10, Phase A Containment Isolation Valves (Train B), R16
---------------------	---

IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

NOTE

This Attachment may be used to close individual Phase A valves or entire train of valves as applicable. This Attachment should be performed as time permits if Train A valves are closed.

Step # 1.	Performance Step: 1-E-0 Attachment 10			
Critical Step?	1. CLOSE affected Phase A Valve(s):			
Y	VALVE NUMBER	FUNCTION	SWITCH LOCATION	CLOSED
Standard:	Applicant identifies and CLOSES appropriate valves from 1-E-0 Attachment 10. Step is critical to ensure containment integrity during a Loss of Coolant Accident.			
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
Examiner Notes:	Following pages show the table for each Main Control Room board. Examiner Notes section will state what valves require CLOSING. ALL specified valves must be CLOSED to meet the standard.			
Cue:	None			
Comments:				

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Step # 2.	Performance Step: 1-E-0 Attachment 10			
Critical Step?	1-M-4			
N	1-FCV-1-7	STEAM GENERATOR 1 BLOWDOWN ISOL	1-M-4	<input type="checkbox"/>
	1-FCV-1-25	STEAM GENERATOR 3 BLOWDOWN ISOL	1-M-4	<input type="checkbox"/>
	1-FCV-68-308	PRESSURIZER RELIEF TANK GAS ANALYZER SUPPLY	1-M-4	<input type="checkbox"/>
Standard:	Applicant recognizes that all Phase A Train B valves on 1-M-4 are CLOSED.			
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
Examiner Notes:	No manipulations are required on 1-M-4.			
Cue:	None			
Comments:				

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Step # 3.	Performance Step: 1-E-0 Attachment 10			
Critical Step?	1-M-5			
N	1-FCV-62-61	CVCS SEAL WATER RETURN HEADER ISOLATION	1-M-5	<input type="checkbox"/>
Standard:	Applicant recognizes that the Phase A Train B valve on 1-M-5 is CLOSED.			
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
Examiner Notes:	No manipulations are required on 1-M-5.			
Cue:	None			
Comments:				

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Step # 4.	Performance Step: 1-E-0 Attachment 10			
Critical Step?	1-M-6			
Y	1-FCV-62-77	CVCS LP LETDOWN ISOL	1-M-6	<input type="checkbox"/>
	1-FCV-63-84	SIS CHECK VLV LEAK TEST HOLDUP TANK ISOL	1-M-6	<input type="checkbox"/>
	1-FCV-63-23	COLD LEG ACCUMULATOR FILL FROM SIP 1A-A ISV	1-M-6	<input type="checkbox"/>
Standard:	Applicant must CLOSE 1-FCV-62-77 on 1-M-6. Step is critical to ensure containment integrity during a Loss of Coolant Accident.			
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
Examiner Notes:	None			
Cue:	None			
Comments:				

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Step # 5.	Performance Step: 1-E-0 Attachment 10																																								
Critical Step?	<div style="text-align: center; margin-bottom: 10px;">1-M-9</div> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 30%;">1-FSV-30-134</td><td style="width: 40%;">CONTAINMENT ANNULUS DIFF PRESSURE ISOLATION</td><td style="width: 20%;">1-M-9</td><td style="width: 10%; text-align: center;"><input type="checkbox"/></td></tr> <tr> <td>1-FCV-31-305</td><td>INCORE INSTR RM AHU 1A CWR ISOL</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr> <td>1-FCV-31-309</td><td>INCORE INSTR RM AHU 1A CWS ISOL</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr> <td>1-FCV-31-327</td><td>INCORE INSTR RM AHU 1B CWR ISOL</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr> <td>1-FCV-31-329</td><td>INCORE INSTR RM AHU 1B CWS ISOL</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> </table> <div style="text-align: center; margin-bottom: 10px;">Y</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">VALVE NUMBER</th><th style="width: 40%;">FUNCTION</th><th style="width: 20%;">SWITCH LOCATION</th><th style="width: 10%;">CLOSED</th></tr> </thead> <tbody> <tr> <td>1-FCV-61-97</td><td>GLYCOL COOLED FLOOR SUPPLY HEADER ISOL</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr> <td>1-FCV-61-122</td><td>GLYCOL COOLED FLOOR RETURN HEADER ISOL</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr> <td>1-FCV-61-192</td><td>GLYCOL SUPPLY TO AHUS CONTAINMENT ISOLATION</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr> <td>1-FCV-61-194</td><td>GLYCOL RETURN CONTAINMENT ISOLATION</td><td>1-M-9</td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>	1-FSV-30-134	CONTAINMENT ANNULUS DIFF PRESSURE ISOLATION	1-M-9	<input type="checkbox"/>	1-FCV-31-305	INCORE INSTR RM AHU 1A CWR ISOL	1-M-9	<input type="checkbox"/>	1-FCV-31-309	INCORE INSTR RM AHU 1A CWS ISOL	1-M-9	<input type="checkbox"/>	1-FCV-31-327	INCORE INSTR RM AHU 1B CWR ISOL	1-M-9	<input type="checkbox"/>	1-FCV-31-329	INCORE INSTR RM AHU 1B CWS ISOL	1-M-9	<input type="checkbox"/>	VALVE NUMBER	FUNCTION	SWITCH LOCATION	CLOSED	1-FCV-61-97	GLYCOL COOLED FLOOR SUPPLY HEADER ISOL	1-M-9	<input type="checkbox"/>	1-FCV-61-122	GLYCOL COOLED FLOOR RETURN HEADER ISOL	1-M-9	<input type="checkbox"/>	1-FCV-61-192	GLYCOL SUPPLY TO AHUS CONTAINMENT ISOLATION	1-M-9	<input type="checkbox"/>	1-FCV-61-194	GLYCOL RETURN CONTAINMENT ISOLATION	1-M-9	<input type="checkbox"/>
1-FSV-30-134	CONTAINMENT ANNULUS DIFF PRESSURE ISOLATION	1-M-9	<input type="checkbox"/>																																						
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1-FCV-31-327	INCORE INSTR RM AHU 1B CWR ISOL	1-M-9	<input type="checkbox"/>																																						
1-FCV-31-329	INCORE INSTR RM AHU 1B CWS ISOL	1-M-9	<input type="checkbox"/>																																						
VALVE NUMBER	FUNCTION	SWITCH LOCATION	CLOSED																																						
1-FCV-61-97	GLYCOL COOLED FLOOR SUPPLY HEADER ISOL	1-M-9	<input type="checkbox"/>																																						
1-FCV-61-122	GLYCOL COOLED FLOOR RETURN HEADER ISOL	1-M-9	<input type="checkbox"/>																																						
1-FCV-61-192	GLYCOL SUPPLY TO AHUS CONTAINMENT ISOLATION	1-M-9	<input type="checkbox"/>																																						
1-FCV-61-194	GLYCOL RETURN CONTAINMENT ISOLATION	1-M-9	<input type="checkbox"/>																																						
Standard:	<p>Applicant must CLOSE 1) 1-FCV-31-305, 2) 1-FCV-31-309, 3) 1-FCV-31-327, 4) 1-FCV-31-329, 5) 1-FCV-61-192, and 6) 1-FCV-61-194 on 1-M-9.</p> <p>Step is critical to ensure containment integrity during a Loss of Coolant Accident.</p>																																								
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY																																								
Examiner Notes:	None																																								
Cue:	None																																								
Comments:																																									

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Step # 6.	Performance Step: 1-E-0 Attachment 10			
Critical Step?	1-M-15			
Y	1-FCV-77-9	RCDT PUMP DISCHARGE FLOW CONTROL	1-M-15	<input type="checkbox"/>
	1-FCV-77-16	RCDT TO GAS ANALYZER FLOW CONTROL	1-M-15	<input type="checkbox"/>
	1-FCV-77-18	RCDT TO VENT HDR FLOW CONTROL	1-M-15	<input type="checkbox"/>
	1-FCV-77-127	RB SUMP DISCHARGE FLOW CONTROL	1-M-15	<input type="checkbox"/>
Standard:	<p>Applicant must CLOSE 1) 1-FCV-77-9, 2) 1-FCV-77-16, 3) 1-FCV-77-18, and 4) 1-FCV-77-127 on 1-M-15.</p> <p>Step is critical to ensure containment integrity during a Loss of Coolant Accident.</p>			
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
Examiner Notes:	None			
Cue:	None			
Comments:				

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Step # 7.	Performance Step: 1-E-0 Attachment 10			
Critical Step?	0-M-27B			
N	1-FCV-65-53	EGTS CNTMT ANN VAC FANS SUCT ISOL	0-M-27B	<input type="checkbox"/>
	1-FCV-70-85	EXCESS LETDOWN HX CCS OUTLET	0-M-27B	<input type="checkbox"/>
Standard:	Applicant recognizes that the Phase A Train B valve on 0-M-27B are CLOSED.			
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
Examiner Notes:	No manipulations are required on 0-M-27B.			
Cue:	None			
Comments:				

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Step # 8.	Performance Step: 1-E-0 Attachment 10			
Critical Step?	EL 713			
N	1-FCV-43-2	PRESSURIZER GAS SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-11	PRESSURIZER LIQUID SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-22	HOT LEGS 1/3 SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-34	ACCUM TANK SAMPLE HDR ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-54D	STEAM GEN 1 DRUM/BLDN SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-56D	STEAM GEN 2 DRUM/BLDN SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-59D	STEAM GEN 3 DRUM/BLDN SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-63D	STEAM GEN 4 DRUM/BLDN SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
	1-FCV-43-75	DS EXCESS LTDN HX SAMPLE ISOL	Hot Sample RM	<input type="checkbox"/>
Standard:	Applicant recognizes that the Phase A Train B valves are CLOSED from the Containment Isolation Status Panel. No notifications to an AUO are required.			
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
Examiner Notes:	Valve operating station is located outside the MCR in the Aux Building.			
Cue:	None			
Comments:				

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Step # 9.	Performance Step: 1-E-0 Attachment 10
Critical Step? N	Notify the Unit Supervisor that Phase A Train B valves are CLOSED IAW 1-E-0 Attachment 10.
Standard:	Unit Supervisor is notified that ALL Phase A Train B valves are CLOSED.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	When notified, acknowledge the report using repeat back. Provide the following cue if the performer continues on in the procedure to place Safety Injection Pumps in Hot leg Injection: "Another operator will continue from here."
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the JPM Briefing sheet to the examiner.
------------------	--

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
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**Handout Package for
Applicant**

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APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- A Large Break LOCA has occurred.
- 1-E-0, Reactor Trip or Safety Injection, is in progress

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 1-E-0 Attachment 10, Phase A Containment Isolation Valves (Train B)
- Notify US when task is complete.

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System JPM F

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. RESET simulator to IC 259.
3. PLACE the simulator in RUN momentarily, and ACKNOWLEDGE all alarms.
4. PLACE the simulator in FREEZE.
5. WHEN applicant indicates understanding of the task, THEN PLACE simulator to RUN.

NOTE: This JPM's initial conditions are saved to IC 259. IF IC 259 is unavailable or fails to perform as expected, THEN use the following instructions:

- a. INITIALIZE simulator to any MODE 1 IC.
- b. Normal START DG 1B-B
- c. ACKNOWLEDGE alarms
- d. CREATE Event 1
 1. Description: DG 1B-B Loading > 2MW
 2. Code: zaoei8240a > 0.275
- e. INSERT malfunction:
 1. mux_07C071
 2. Trigger: Event 1
 3. Final Value: ON

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM. SIMULATE ALL MANIPULATIONS.

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

- Testing is being conducted on Diesel Generator 1B-B. DG 1B-B will be paralleled with Offsite Power to check its voltage regulator
- The Load Dispatcher has been notified of WBN DG operations.
- DG 1B-B is running at rated speed from an idle start.
- You are an extra control room operator on shift.
- Your Pre-Job Briefing is complete.

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 0-SOI-82.02, DG 1B-B, Section 8.1.4, Manual-Remote Synchronizing DG, starting on Step [3].
- Notify US when task is complete.

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Required Materials:	JPM F Handout 1 – 0-SOI-82.02, DG 1B-B, R10, Section 8.1.4, Manual-Remote Synchronizing DG
---------------------	--

IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

Step # 1.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step?	8.1.4 Manual-Remote Synchronizing DG
N/A	[1] PLACE 1-RLY-82-LRX1B, DG 1B-B LOCAL/REMOTE CONTROL LOCKOUT, in REMOTE [1-ARB-82-B/1, Diesel Generator 1B-B Relay Board].
Standard:	N/A
Performance:	N/A
Examiner Notes:	Step is not evaluated as success/failure criteria for administration. Step retained for numbering purposes.
Cue:	N/A
Comments:	

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Step # 2.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? N/A	[2] ENSURE 1-RLY-82-86LOR2, DG 1B-B EMERGENCY START LOCKOUT, RESET [1-ARB-82-B/1, Diesel Generator 1B-B Relay Board].
Standard:	N/A
Performance:	N/A
Examiner Notes:	Step is not evaluated as success/failure criteria for administration. Step retained for numbering purposes.
Cue:	N/A
Comments:	

Step # 3.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? N	[3] NOTIFY the load dispatcher that a DG will be synchronized to the grid and that the WBN control room should be notified to remove the DG from service if the offsite power supply line protection is lost as detailed in 0-TI-12.15.
Standard:	Load Dispatcher notified.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	Role play as load dispatcher and acknowledge notification.
Comments:	

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Step # 4.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? Y	[4] PLACE 1-HS-82-48, DG MODE SELECTOR Switch, in PARALLEL [0-M-26].
Standard:	1-HS-82-48 in PARALLEL. Step is critical to be performed to remotely control the DG.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

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Step # 5.	Performance Step: 0-SOI-82.02, Section 8.1.4				
Critical Step?	[5] ENSURE the following sync switches for 1B-B D/G in OFF:				
N	NOMENCLATURE	LOCATION	POSITION	UNID	PERF INITIAL
	MAINTENANCE 6.9 UNIT BD 1C SYNC SWITCH	0-M-26	OFF	1-HS-57-69	
	ALTERNATE CSST C SYNC SWITCH	0-M-26	OFF	1-HS-57-115	
	DG SYNC SWITCH	0-M-26	OFF	1-HS-57-74	
	NORMAL - CSST D SYNC SWITCH	0-M-26	OFF	1-HS-57-72	
Standard:	Applicant determines that above listed sync switches are in off.				
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY				
Examiner Notes:	None				
Cue:	None				
Comments:					

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Step # 6.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? Y	[6] PLACE 1-HS-57-74, DG SYNC SWITCH, to SYN [0-M-26].
Standard:	1-HS-57-74 in SYN. Step is critical to be performed to provide permissive for DG breaker closure.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

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CAUTION

When adjusting speed and voltage, care must be taken to prevent overshooting desired values. Voltage control response is approximately five times faster than speed control response.

Step # 7.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? N	[7] MATCH generator Incoming Frequency (1-XI-82-32) with Running Frequency (1-XI-82-33) using 1-HS-82-43, SPEED CONTROL [0-M-26].
Standard:	1-XI-82-32 and 1-XI-82-33 matched. Incoming Frequency is under operator control and should be within ± 0.1 Hz of Running Frequency.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	DG 1B-B frequency will be adjusted in step [9] when setting synchroscope rotation.
Comments:	

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Step # 8.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? N	[8] MATCH generator Incoming Voltage (1-EI-82-34) with Running Voltage (1-EI-82-35) using 1-HS-82-42, VOLTAGE REGULATOR [0-M-26].
Standard:	1-EI-82-34 and 1-EI-82-35 matched. Incoming Voltage is under operator control and should be within $\pm 100V$ of Running Voltage.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

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NOTE

Steps 8.1.4[9], 8.1.4[10], and 8.1.4[11] should be read before performing.

Step # 9.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step?	<div style="display: flex; justify-content: space-between;"> <div> <p>[9] ENSURE DG Frequency and Voltage are MATCHED with 6.9 kV SD Bd, AND</p> <p>ADJUST 1-HS-82-43, SPEED CONTROL, [0-M-26] to obtain desired clockwise rotation (15 or more seconds) on 1-XI-82-31, TRAIN 1B-B SYNCHROSCOPE.</p> </div> <div style="text-align: right;"> <p>_____</p> <p>_____</p> <p>CV</p> </div> </div>
Standard:	<p>DG Frequency (± 0.1 Hz) and Voltage (± 100V) are MATCHED with Shutdown Board. DG Frequency is then adjusted to ensure Synhcroscope rotates in the CLOCKWISE direction</p> <p>Step is critical to remotely parallel DG.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If concurrent verification is requested, then state “Concurrent Verification is complete.”
Comments:	

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NOTES

- 1) Steps 8.1.4[10] through 8.1.4[11.3] may be signed off after completion of Step 8.1.4[11.3].
- 2) Peer checking required on next step.

Start of Critical Step(s)

Step # 10.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? Y	[10] WHEN TRAIN 1B-B SYNCHROSCOPE (1-XI-82-31) reaches 12 o'clock, THEN TURN 1-HS-57-73A, 1914 - DG TO SD BD 1B-B, to CLOSE.
Standard:	1-HS-57-73A, 1914 - DG TO SD BD 1B-B, to CLOSED Step is critical to be performed to remotely parallel DG.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

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Step # 11.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step?	<p>[11] PERFORM the following:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">NOTE</p> <p>Maintain outgoing VARs by periodically adjusting voltage regulator with 1-HS-82-42 while loading D/G. Controls should NOT be operated simultaneously.</p> </div> <p>[11.1] LOAD DG promptly using 1-HS-82-43, SPEED CONTROL to at least 1.1 Megawatts as indicated on 1-EI-82-40A, DG MEGAWATTS (0-M-26). _____</p>
N	
Standard:	LOAD DG promptly using 1-HS-82-43 to ≥ 1.1 MW.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	Assuming real LOAD will allow operator to adjust MVARs as necessary in following step.
Cue:	None
Comments:	

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NOTE

DG Megavars may "swing" when the 6.9kV automatic tap changers engage to stabilize voltage in the system.

Step # 12.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? N	[11.2] MAINTAIN DG MEGAVARS 0.75 to 1.25 OUTGOING on 1-EI-82-41A, with 1-HS-82-42, VOLTAGE REGULATOR.
Standard:	After initial assumption of minimum real loading, Adjust DG MVARs to between 0.75 MVAR and 1.25 MVAR OUTGOING.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

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CAUTION

Operation of the DG at load of 2.7 MW or less for extended period of time may lead to exhaust fire.

Step # 13.	Performance Step: 0-SOI-82.02, Section 8.1.4
Critical Step? N	[11.3] RAISE load to at least 3.3 Megawatts.
Standard:	Applicant raises load. At approx. 2.0 MW loading, annunciator 205-B will alarm.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	At approximately 2.0 MW DG loading, Event 1 will either be automatically inserted (as a backup the Simulator Console Operator can manually insert Event 1) to cause annunciator window 205-B, DG LUBE OIL PRESS LO, to alarm.
Cue:	None
Comments:	

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Step # 14.	Performance Step: 0-ARI-202-208
Critical Step? N	[1] DISPATCH Operator to check lube oil pressure indication at Diesel Generator Control Board, and local soakback oil pressure gauges.
Standard:	Applicant acknowledges alarm 205-B, references ARI-205-B, and directs AUO to check DG 1B-B lube oil pressure and local soak back oil pressure gauges.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	After AUO is notified, acknowledge the request. Then, report: " DG 1B-B lube oil pressure is 12 psig. "
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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CAUTION

If required to mitigate an accident condition the Shift manager may authorize continued DG operation at rated speed with lube oil pressure less than 20 psig.

Step # 15.	Performance Step: 0-ARI-202-208
Critical Step? N	[2] IF DG emergency started and is NOT being tested, THEN EVALUATE DG load and the need for continued operation.
Standard:	Applicant determines that DG was not emergency started and continues to the next step.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC Exam

Step # 16.	Performance Step: 0-ARI-202-208
Critical Step? Y	[3] IF DG is running for testing do NOT exceed the rated speed minimum lube oil pressure of 20 psig (if NOT emergency started, auto-shutdown should occur at less than or equal to 20 psig) AND NOTIFY System or Maintenance Engineer to evaluate continued operation between 20 psig and 40 psig.
Standard:	Applicant Emergency Stops DG 1B-B. This step is critical to protect the DG.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	Once DG 1B-B is tripped, state: "Another operator will take it from here."
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the Applicant Cue Sheet to the examiner
------------------	--

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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**Handout Package for
Applicant**

**WATTS BAR NUCLEAR PLANT
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APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- Testing is being conducted on Diesel Generator 1B-B. DG 1B-B will be paralleled with Offsite Power to check its voltage regulator
- The Load Dispatcher has been notified of WBN DG operations.
- DG 1B-B is running at rated speed from an idle start.
- You are an extra control room operator on shift.
- Your Pre-Job Briefing is complete.

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 0-SOI-82.02, DG 1B-B, Section 8.1.4, Manual-Remote Synchronizing DG, starting on Step [3].
- Notify US when task is complete.

Watts Bar Nuclear Plant

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System JPM G

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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SIMULATOR OPERATOR INSTRUCTIONS:

1. ENSURE NRC Examination Security has been established.
2. RESET simulator to IC 260.
3. PLACE the simulator in RUN momentarily, and ACKNOWLEDGE all alarms.
4. PLACE the simulator in FREEZE.
5. WHEN applicant indicates understanding of the task, THEN PLACE simulator to RUN.
6. WHEN power is requested for Appendix R valve, THEN INITIATE Event 2.

NOTE: This JPM's initial conditions are saved to IC 260. IF IC 260 is unavailable or fails to perform as expected, THEN use the following instructions:

- a. INITIALIZE simulator to any MODE 1 IC.
 1. ENSURE ERCW Pump G-B is running with Emergency Selector switch selected to ERCW Pump G-B
- b. CREATE Event 1
 1. Description: ERCW Pump E-B Start
 2. Code: zdihs6747a(5)==1
- c. INSERT malfunction:
 1. rw10c (ERCW Supply Header rupture 1B downstream of 1-FCV-67-82)
 2. Trigger: Event 1
 3. Final Value: 20.0
- d. INSERT remote:
 1. rwr09
 2. Trigger: Event 2
 3. Final Value: On

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM. SIMULATE ALL MANIPULATIONS.

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 and Unit 2 Conditions:

- G-B ERCW pump is currently running following the successful completion of a test.
- Pre-start checks for E-B ERCW pump have been completed.
- Performance of 0-SOI-67.01 Appendices A and B are NOT required.
- You are a Control Room Operator (CRO).

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Start E-B ERCW pump and secure G-B ERCW pump in accordance with 0-SOI-67.01 Section 8.1.
- Notify US when task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Required Materials:	JPM G Handout 1 – 0-SOI-67.01, ERCW, Rev 28 Section 8.1, Alternating ERCW Pumps
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IMPORTANT: Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.
--

Start Time: _____

Step # 1.	Performance Step: 0-SOI-67.01, Section 8.1
Critical Step? N	<div style="margin-bottom: 10px;"> 8.0 INFREQUENT OPERATIONS </div> <div style="margin-bottom: 10px;"> 8.1 Alternating ERCW Pumps </div> <div> [1] INITIATE APPENDIX A or APPENDIX B, Discharge Header Monitoring and Level Recovery as appropriate. </div>
Standard:	Performer determines this step is N/A
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

WATTS BAR NUCLEAR PLANT JOB PERFORMANCE MEASURE

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2019-301 NRC Exam

NOTE

0-GOI-7 contains motor starting and operating limits, along with pump motor pre-start and operating inspections.

Step # 2.	Performance Step: Performance Step: 0-SOI-67.01, Section 8.1																																													
Critical Step?	<p>[2] START selected ERCW pump (N/A pumps NOT started):</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>NOMENCLATURE</th><th>LOCATION</th><th>POSITION</th><th>UNID</th><th>INITIALS</th></tr> </thead> <tbody> <tr><td>ERCW PMP A-A</td><td>0-M-27A</td><td>START</td><td>0-HS-67-28A</td><td></td></tr> <tr><td>ERCW PMP B-A</td><td>0-M-27A</td><td>START</td><td>0-HS-67-32A</td><td></td></tr> <tr><td>ERCW PMP C-A</td><td>0-M-27A</td><td>START</td><td>0-HS-67-36A</td><td></td></tr> <tr><td>ERCW PMP D-A</td><td>0-M-27A</td><td>START</td><td>0-HS-67-40A</td><td></td></tr> <tr><td>ERCW PMP E-B</td><td>0-M-27A</td><td>START</td><td>0-HS-67-47A</td><td></td></tr> <tr><td>ERCW PMP F-B</td><td>0-M-27A</td><td>START</td><td>0-HS-67-51A</td><td></td></tr> <tr><td>ERCW PMP G-B</td><td>0-M-27A</td><td>START</td><td>0-HS-67-55A</td><td></td></tr> <tr><td>ERCW PMP H-B</td><td>0-M-27A</td><td>START</td><td>0-HS-67-59A</td><td></td></tr> </tbody> </table>	NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS	ERCW PMP A-A	0-M-27A	START	0-HS-67-28A		ERCW PMP B-A	0-M-27A	START	0-HS-67-32A		ERCW PMP C-A	0-M-27A	START	0-HS-67-36A		ERCW PMP D-A	0-M-27A	START	0-HS-67-40A		ERCW PMP E-B	0-M-27A	START	0-HS-67-47A		ERCW PMP F-B	0-M-27A	START	0-HS-67-51A		ERCW PMP G-B	0-M-27A	START	0-HS-67-55A		ERCW PMP H-B	0-M-27A	START	0-HS-67-59A	
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ERCW PMP H-B	0-M-27A	START	0-HS-67-59A																																											
Y																																														
Standard:	<p>Performer starts the E-B ERCW pump by placing 0-HS-67-47A to Start.</p> <p>This step is critical to start the E-B ERCW pump.</p>																																													
Performance:	<div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY </div>																																													
Examiner Notes:	<p>Expected Alarms due to starting E-B ERCW pump:</p> <p>227-A, ERCW PMP E-B DISCH PRESS LO</p> <p>225-E, TR-A/B ERCW TO C&SS COMPR FLOW HI</p> <p>Taking the E-B ERCW pump HS to START will trigger the 1B ERCW header rupture malfunction.</p> <p>Annunciator 167-D, TURB/AUX/RX BLDG FLOODED, will alarm</p>																																													
Cue:	If dispatched to look for leaks as Outside AUO and/or AB AUO, acknowledge the request.																																													
Comments:																																														

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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NOTE

Step 8.1[3] may be N/Ad for routine pump placement in service IF additional pump(s) of the same train are required to provide adequate header flow and pressure.

Step # 3.	Performance Step: 0-ARI-166-172, 167-D
Critical Step? N	<p>[1] DISPATCH Operator to perform the following:</p> <p>[1.1] DETERMINE location of alarm at Flood Alarm Pnl behind 6.9kV SD Bd 2A-A.</p> <p>[1.2] DETERMINE cause of hi water level.</p>
Standard:	CB AUO is dispatched to Flood Alarm Panel
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	<p>As CB AUO: After dispatched, state: "the Flooding Panel alarm for, Outside Unit 1 TDAFW Pump room, is alarming."</p> <p>As AB AUO: After dispatched, state: "The flooding is coming from the pipe tunnel above the Unit 1 TDAFW pump from the 1B ERCW Supply Header. I cannot get close enough to isolate the leak."</p>
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 4.	Performance Step: 0-ARI-166-172, 167-D
Critical Step? N	[2] IF ERCW header break has occurred, THEN GO TO 0-AOI-13.
Standard:	Performer enters 0-AOI-13, Section 3.3
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 5.	Performance Step: 0-AOI-13, Section 3.3
Critical Step? N	1. DISPATCH personnel to determine location of rupture
Standard:	Performer dispatches personnel to determine leak location
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If AUO is dispatched again, acknowledge request, and report: "The flooding is coming from the pipe tunnel above the Unit 1 TDAFW Pump Room from the 1B ERCW supply header."
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 6.	Performance Step: 0-AOI-13, Section 3.3
Critical Step? N	2. DISPATCH AUO, with a radio, to the Rx MOV Bds.
Standard:	Performer dispatches AUO to the Rx MOV Boards
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	After AUO is dispatched, acknowledge the request and state: "I am standing by at the Rx MOV BD's."
Comments:	

CAUTION MOVs with power normally removed may not travel to full closed position under high flow conditions, local verification of isolation may be required.

Step # 7.	Performance Step: 0-AOI-13, Section 3.3
Critical Step? N	3. CHECK Supply Header 1A flow at expected value for existing plant conditions.
Standard:	Operator determines the 1A supply header flows are normal
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 8.	Performance Step: 0-AOI-13, Section 3.3
Critical Step? Y	4. CHECK Supply Header 1B flow at expected value for existing plant conditions. PERFORM the following: a. UNLOCK , and CLOSE bkr on Rx MOV Bd 1B2-B, c/8B, 1-FCV-67-82.
Standard:	Performer determines that the 1B supply header flows are NOT normal and goes to the RNO AUO is dispatched to UNLOCK and CLOSE the breaker for 1-FCV-67-82. Step is critical to isolate the ERCW rupture.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	Booth Operator: After the AUO has been directed to close the breaker for 1-FCV-67-82, Insert Event 2 (or RWR09 to ON) to simulate closing breaker for 1-FCV-67-82.
Cue:	As AUO, when directed, acknowledge the request. As AUO, after the booth inserts Event 2, state: "The breaker for 1-FCV-67-82 has been unlocked and closed."
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 9.	Performance Step: 0-AOI-13, Section 3.3 RNO
Critical Step? Y	4. CHECK Supply Header 1B flow at expected value for existing plant conditions. b. CLOSE 1-FCV-67-82, AB Supply Hdr 1B.
Standard:	Performer closes 1-FCV-67-82 by taking 1-HS-67-82A to CLOSE. Step is critical to isolate the ERCW rupture.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If asked as AUO if leak stopped, state that the rate of the flow of water is slowing. State: "Another operator will continue from here."
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the JPM Briefing sheet to the examiner.
------------------	--

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Handout Package for Applicant

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC Exam

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 and Unit 2 Conditions:

- G-B ERCW pump is currently running following the successful completion of a test.
- Pre-start checks for E-B ERCW pump have been completed.
- Performance of 0-SOI-67.01 Appendices A and B are NOT required.
- You are a Control Room Operator (CRO).

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Start E-B ERCW pump and secure G-B ERCW pump in accordance with 0-SOI-67.01 Section 8.1.
- Notify US when task is complete.

Watts Bar Nuclear Plant

2019-301 NRC Exam

System JPM I

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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EVALUATION SHEET

Task: Perform Emergency Boration IAW 1-FR-S.1 (Unit 1)

Alternate Path: No

Facility JPM #: 3-OT-J1A-0-1AB-FRS1

Safety Function: 2 **Title:** Reactor Coolant System Inventory Control

K/A 004 A2.14 Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Emergency boration

Rating(s): 3.8 / 3.9 **CFR:** 41.5/ 43.5 / 45.3 / 45.5

Evaluation Method: Simulator In-Plant **X** Classroom

References: 1-FR-S.1, Nuclear Power Generation / ATWS R2

Task Number: RO-113-FR-S.1-001 **Title:** Respond to nuclear power generation/ATWS

Task Standard: Applicant aligns manual RCS boration IAW 1-FR-S.1, Step 4.g. RNO to establish RCS boration flow

Validation Time: 7 minutes **Time Critical:** Yes No **X**

=====

Applicant: NAME Docket No. Time Start: Time Finish: Performance Time

Performance Rating: SAT UNSAT Performance Time

Examiner: NAME SIGNATURE DATE

=====

COMMENTS

WATTS BAR NUCLEAR PLANT JOB PERFORMANCE MEASURE

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2019-301 NRC Exam

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

**NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM.
SIMULATE ALL MANIPULATIONS.**

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- You are the Unit 1 Aux Building AUO

INITIATING CUES:

The Unit 1 Unit Operator has directed you to:

- Perform 1-FR-S.1, Step 4.g RNO.
- Notify Unit Operator when the task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**



2019-301 NRC Exam

Required Materials:	JPM I Handout 1 - 1-FR-S.1, Nuclear Power Generation / ATWS, Page 4
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IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

Examiner Note (In-Plant JPMs):

- Remind the applicant **“ALL OPERATOR ACTIONS ARE TO BE SIMULATED UNLESS DIRECTED OTHERWISE.”**

WATTS BAR NUCLEAR PLANT

JOB PERFORMANCE MEASURE

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2019-301 NRC Exam

Step # 1.	Performance Step: 1-FR-S.1, Step 4.g RNO
Critical Step? <div style="text-align: center;">N</div>	g. IF BA flow less than or equal to 35 gpm, THEN: <ul style="list-style-type: none"> • Locally OPEN emergency borate valve 1-FCV-62-138 [blender station el 713], OR
Standard:	Examinee locates valve 1-FCV-62-138, simulates taking local control of the valve and attempts to manually open it by rotating the handwheel in the counter clockwise direction.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	Since there is no control power, if Examinee attempts to open 1-FCV-62-138 using local pushbuttons it does not operate. There are no local position indicating lights, therefore, valve position can only be determined locally by observing physical position of the valve stem. Examinee will have to use valve operator handwheel to attempt to operate valve.
Cue:	When Examinee attempts to open 1-FCV-62-138 by engaging clutch and rotating valve handwheel in the counter clockwise direction, inform Examinee the handwheel does not move. If examinee attempts to rotate the handwheel without engaging clutch, then state "the handwheel rotates freely". If Examinee attempts to operate valve by local pushbuttons, tell Examinee no valve motion is observed. If valve position based on the valve stem position is requested tell Examinee the valve stem position is down and indicates closed position. If asked for local Emergency flow rate indication, indicate 0 gpm on 1-FI-62-137B. If Examinee contacts the control room to report 1-FCV-62-138 will not open, acknowledge the report.
Comments:	

WATTS BAR NUCLEAR PLANT JOB PERFORMANCE MEASURE

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2019-301 NRC Exam

Step # 2.	Performance Step: 1-FR-S.1, Step 4.g RNO
Critical Step? Y	<ul style="list-style-type: none"> • ALIGN manual boration: 1) Locally OPEN alternate boration valve 1-ISV-62-929 [blender station el 713].
Standard:	Examinee locates valve 1-ISV-62-929 and manually opens it by rotating the valve local operator handwheel in the counter clockwise direction. This step is critical to establish RCS alternate boration flow path.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	Once Examinee indicates the correct valve and that they would rotate the handwheel counter clockwise, inform Examinee the valve handwheel rotates several times counter-clockwise and gets snug.
Comments:	

WATTS BAR NUCLEAR PLANT

JOB PERFORMANCE MEASURE

2019-301 NRC Exam

Step # 3.	Performance Step: 1-FR-S.1, Step 4.g RNO
Critical Step? <div style="text-align: center;">Y</div>	<ul style="list-style-type: none"> • ALIGN manual boration: 2) OPEN blender BA supply 1-FCV-62-140. 3) MONITOR BA flow.
Standard:	Examinee contacts control room and asks that 1-FCV-62-140 be opened. This step is critical to ensure boration flowpath.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	Examinee may also report that 1-FCV-62-138 could not be opened. 1-FCV-62-140 has position indicating lights in the MCR but has valve stem position indication only locally. Boration flow through 1-ISV-62-929 is indicated on 1-FI-62-139 on MCR panel 1-M-5
Cue:	If Examinee contacts control room to perform steps 2) and 3) acknowledge the request and if asked, report 1-FCV-62-140 was closed, but has now been opened and if 1-ISV-62-929 has been opened a boration flow rate of ~35 gpm is indicated in control room. If asked what the local indicated valve position of 1-FCV-62-140: <ul style="list-style-type: none"> • Before requesting 1-FCV-62-140 to be opened, local indications that it is shut should be given (valve stem down and indicator in the closed position) • After requesting 1-FCV-62-140 to be opened, local indications that it is open should be given (valve stem up and indicator in the open position) If asked what indication of 1-FCV-62-140 is in the Control Room: <ul style="list-style-type: none"> • Before requesting 1-FCV-62-140 to be opened, state that 1-FCV-62-140 indicates SHUT from the control room • After requesting 1-FCV-62-140 to be opened, state that 1-FCV-62-140 indicates OPEN from the control room
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC Exam

Step # 4.	Performance Step: This is not a procedure step
Critical Step? N	Inform the Unit 1 Unit Operator that 1-FR-S.1, Step 4.g RNO is complete.
Standard:	The performer notifies the Unit 1 Unit Operator that 1-FR-S.1, Step 4.g RNO is complete.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	State: "Another operator will continue from here."
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the Applicant Cue Sheet to the examiner.
------------------	---

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Handout Package for Applicant

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**



2019-301 NRC Exam

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- You are the Unit 1 Aux Building AUO

INITIATING CUES:

The Unit 1 Unit Operator has directed you to:

- Perform 1-FR-S.1, Step 4.g RNO.
- Notify Unit Operator when the task is complete.

Watts Bar Nuclear Plant

2019-301 NRC Exam

System JPM J

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

J

2019-301 NRC Exam

READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

**NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM.
SIMULATE ALL MANIPULATIONS.**

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- Unit 1 has experienced a loss of shutdown power and the operating crew is responding IAW 1-ECA-0.0, Loss of Shutdown Power
- You are the Unit 1 Turbine Building AUO

INITIATING CUES:

The Unit 1 Unit Operator has directed you to:

- Isolate CST A from the Unit 1 hotwell IAW 1-ECA-0.0 step [11]
- Notify Unit Operator when the task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

J

2019-301 NRC Exam

Required Materials:	JPM J Handout 1 - 1-ECA-0.0, Loss of Shutdown Power, Page 10, Rev 8
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IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

Examiner Note (In-Plant JPMs):

- Remind the applicant **“ALL OPERATOR ACTIONS ARE TO BE SIMULATED UNLESS DIRECTED OTHERWISE.”**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

J

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Step # 1.	Performance Step: 1-ECA-0.0
<p>Critical Step?</p> <p style="text-align: center;">Y</p>	<p>11. LOCALLY ISOLATE 1-LCV-2-9, Auto Makeup From CST, to isolate CST from hotwell:</p> <ul style="list-style-type: none"> • CLOSE auto makeup isolation 1-ISV-2-521 or 1-ISV-2-522 [T6J/708].
Standard:	<p>1-ISV-2-521 or 1-ISV-2-522 is turned in the clockwise direction until snug.</p> <p>This step is critical to ensure CST A inventory is reserved for AFW use.</p>
Performance:	<div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY </div>
Examiner Notes:	<p>Bulleted steps may be performed in any order.</p> <p>1-ISV-2-521 and 1-ISV-2-522 are OPEN</p>
Cue:	<p>If asked the condition of 1-ISV-2-521 or 1-ISV-2-522, state: "The valves appear as seen."</p> <p>Inform the performer that 1-ISV-2-522 or 1-ISV-2-521 moves in the clockwise direction several turns and becomes snug.</p>
Comments:	

JOB PERFORMANCE MEASURE

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Step # 2.	Performance Step: 1-ECA-0.0
Critical Step?	<p>11. LOCALLY ISOLATE 1-LCV-2-9, Auto Makeup From CST, to isolate CST from hotwell:</p> <ul style="list-style-type: none"> ENSURE auto makeup bypass 1-BYV-2-524 or 1-BYB-2-525 CLOSED [T6J/708].
Y	
Standard:	<p>1-BYV-2-524 or 1-BYV-2-525 is turned in the clockwise direction until snug.</p> <p>This step is critical to ensure CST A inventory is reserved for AFW use.</p>
Performance:	<p><input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY</p>
Examiner Notes:	<p>Bulleted steps may be performed in any order.</p> <p>Both 1-BYV-2-524 or 1-BYV-2-525 will be closed, but must be simulated to be partially open from the cue.</p>
Cue:	<p>If asked the condition of 1-BYV-2-524 or 1-BYV-2-525, state: "The valves appear in the same initial condition as 1-ISV-2-521 or 1-ISV-2-522."</p> <p>Inform the performer that moves in the clockwise direction several turns and becomes snug.</p>
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 3.	Performance Step: This is not a procedure step
Critical Step? N	Inform the Unit 1 Unit Operator that CST A is isolated from Unit 1 Hotwell.
Standard:	The performer notifies the Unit 1 Unit Operator that CST A is isolated from the Unit 1 Hotwell (OR 1-ECA-0.0 step [11] is complete).
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	Acknowledge completion by repeat back.
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the Applicant Cue Sheet to the examiner.
------------------	---

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
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Applicant**

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APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- Unit 1 has experienced a loss of shutdown power and the operating crew is responding IAW 1-ECA-0.0, Loss of Shutdown Power
- You are the Unit 1 Turbine Building AUO

INITIATING CUES:

The Unit 1 Unit Operator has directed you to:

- Isolate CST A from the Unit 1 hotwell IAW 1-ECA-0.0 step [11]
- Notify Unit Operator when the task is complete.

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System JPM K

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EVALUATION SHEET

Task: Transfer 250VDC Turbine Building Distribution Board 1 from Normal to Alternate IAW 0-SOI-239.01

Alternate Path: No

Facility JPM #: 3-OT-J1C-0-1TB-S239

Safety Function: 6 **Title:** Electrical

K/A 058 Ability to operate and/or monitor the following as they apply to the loss of
AA1.01 DC Power: Cross-tie of the affected dc bus with the alternate supply.

Rating(s): 3.4 / 3.5 **CFR:** 41.7 / 45.5 / 45.6

Evaluation Method: Simulator _____ In-Plant _____ **X** Classroom _____

References: 0-SOI-239.01, 250V Battery Board 1 0-BD-239-1, R4

Task Number: AUO-239-SOI-239.1-08 **Title:** Transfer 250 VDC Board from Normal to Alternate

Task Standard: Applicant simulates transferring 250VDC Turbine Building Distribution Board 1 to its Alternate supply IAW 0-SOI-239.01.

Validation Time: 10 minutes **Time Critical:** Yes _____ No **X** _____

=====

Applicant: _____ _____ Time Start: _____
NAME Docket No. Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

=====

COMMENTS

**WATTS BAR NUCLEAR PLANT
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READ TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions, which step(s) to simulate or discuss and provide initiating/operating cues.

**NO MANIPULATION OF PLANT EQUIPMENT SHALL OCCUR DURING THIS JPM.
SIMULATE ALL MANIPULATIONS.**

When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure that you indicate to me when you fully understand your task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 and Unit 2 Conditions:

- You are a support AUO on shift

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 0-SOI-239.01, 250V Battery Board 1, Section 8.7.1, Transfer 250VDC Turbine Building Distribution Board 1 from NORMAL to ALTERNATE.
- Notify US when task is complete.

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Required Materials:	JPM I Handout 1 - 0-SOI-239.01, 250V Battery Board 1, Section 8.7.1
---------------------	---

IMPORTANT:

Critical steps are marked with a “Y” below the Performance Step number field. Failure to meet the standard for any critical step shall result in failure of this JPM.

Start Time: _____

Examiner Note (In-Plant JPMs):

Remind the applicant **“ALL OPERATOR ACTIONS ARE TO BE SIMULATED UNLESS DIRECTED OTHERWISE.”**

8.7 250V DC Turb Bldg Dist Bd 1, 0-DPL-239-1, Transfer

NOTE

The Turbine Bldg Dist Bd will auto transfer NORMAL to ALTERNATE on a complete loss of DC with **NO** time delay, OR if voltage drops to 188 volts for 4 seconds. Return to NORMAL is manual only.

Step # 1.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	[1] OBTAIN SRO approval to perform this section.
Standard:	Performer acknowledges that the SRO directed them to perform the task from the cue sheet.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If asked, state: “SRO approval has been granted.”
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 2.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	[2] ENSURE 0-BKR-239-1A102, ALT SUPPLY FROM 250V BATTERY BD 2, closing spring CHARGED.
Standard:	Performer verifies closing spring charged
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If asked, state "0-BKR-239-1A102, is as seen"
Comments:	

Step # 3.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	[3] CHECK at least 267 volts indicated on 250V Battery Board 2 VOLTMETER on 250V DC Turb Bldg Dist Bd 1.
Standard:	Voltage is verified to be at least 267 volts using 250V Battery Board 2 voltmeter.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If asked, state "250V BATTERY BOARD 2 VOLTMETER is as seen".
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 4.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	<p>[4] IF voltage is NOT indicated on 250V BATTERY BOARD 2 VOLTMETER, THEN</p> <p>ENSURE 250V Battery Board 2, 0-BD-239-2 (ALTERNATE supply to 250V DC Turb Bldg Dist Bd 1) is ENERGIZED per 0-SOI-239.02, 250V Battery Board 2 0-BD-239-2.</p>
Standard:	This step is marked N/A because of the voltage indicated in previous step
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Step # 5.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	<p>[5] ENSURE 0-BKR-239-2/203, 250V DISTRIBUTION BOARD 1 ALTERNATE FEEDER [250V Battery Bd 2], in ON position.</p>
Standard:	0-BKR-239-2/203 verified in the ON position.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	<p>If asked, state "0-BKR-239-2/203 is as seen".</p> <p>If verification requested, then state, "Verification complete."</p>
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 6.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? Y	[6] PLACE AUTO/MANUAL SUPPLY XFER SWITCH CS-101, to the MAN position [250V DC Turb Bldg Dist Bd 1].
Standard:	CS-101 is simulated to be placed in manual to the 12 o'clock position. This step is critical to complete the transfer.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	After the performer demonstrates how they would operate the switch correctly, state "the CS-101 arrow is pointing in the 12 o'clock position". If verification requested, then state, " Verification complete. "
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 7.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? Y	[7] PLACE AND HOLD control switch ALT SUPPLY FROM 250V BATTERY BD 2 for 0-BKR-239-1A102, to CLOSE position UNTIL transfer is COMPLETE.
Standard:	Breaker 102 control switch is simulated to be positioned to the 2 o'clock position to CLOSE and held there until the normal supply switch is placed in the TRIP position. This step is critical to complete the transfer.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	After the performer demonstrates how they would operate the switch correctly, state "Breaker 102 control switch is in the 2 o'clock position". If verification requested, then state, " Verification complete. "
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 8.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? Y	[8] PLACE control switch, NORM SUPPLY FROM 250V BATTERY BD 1, for 0-BKR-239-1A103, in the TRIP position.
Standard:	Breaker 103 control switch is simulated to be positioned to the 10 o'clock position to TRIP. This step is critical to complete the transfer.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	After the performer demonstrates how they would operate the switch correctly, state "Breaker 103 control switch is in the 10 o'clock position". If verification requested, then state, " Verification complete. "
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 9.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	<p>[9] ENSURE transfer is COMPLETE:</p> <ul style="list-style-type: none"> 0-BKR-239-1A102, ALTERNATE SUPPLY FROM 250V BATTERY BD 2, is CLOSED 0-BKR-239-1A103, NORMAL SUPPLY FROM 250V BATTERY BD 1, is OPEN.
Standard:	Breaker 102 is checked to be closed and Breaker 103 is checked to be open.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	After checked, Breaker 102 has RED target and Breaker 103 has GREEN target.
Comments:	

Step # 10.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	<p>[10] RELEASE control switch, ALT SUPPLY FROM 250V BATTERY BD 2, for 0-BKR-239-1A102.</p>
Standard:	Breaker 102 control switch is simulated to be released.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	After the performer demonstrates how they would operate the switch correctly, state "Breaker 102 control switch is in the 12 o'clock position".
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 11.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	[11] CHECK between 267 and 283 volts on 250V BATTERY BOARD 2 VOLTMETER on 250V DC Turb Bldg Dist Bd 1.
Standard:	Voltage is verified to be normal (267-283 volts) using 250V Battery Board 2 voltmeter.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If asked, state "250V BATTERY BOARD 2 VOLTMETER is as seen".
Comments:	

Step # 12.	Performance Step: 0-SOI-239.01 Section 8.7.1
Critical Step? N	[12] ENSURE AUTO/MANUAL SUPPLY XFER SWITCH CS-101, in MAN position [250V DC Turb Bldg Dist Bd 1].
Standard:	CS-101 is left in MAN position
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	If verification requested, then state, " Verification complete. "
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 13.	Performance Step: Not a procedure step
Critical Step? N	Notify the Unit 1 Unit Operator that the transfer is complete.
Standard:	Unit 1 Unit Operator is notified that the transfer is complete
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	
Cue:	Acknowledge the report
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the Applicant Cue Sheet to the examiner.
------------------	---

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
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**Handout Package for
Applicant**

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APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 and Unit 2 Conditions:

- You are a support AUO on shift

INITIATING CUES:

The Unit 1 Unit Supervisor has directed you to:

- Perform 0-SOI-239.01, 250V Battery Board 1, Section 8.7.1, Transfer 250VDC Turbine Building Distribution Board 1 from NORMAL to ALTERNATE.
- Notify US when task is complete.

Watts Bar Nuclear Plant

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Administrative JPM 1S

**WATTS BAR NUCLEAR PLANT
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Task: Review Turbine Roll Limitations and Turbine Testing Results

Alternate Path: n/a

Facility JPM #: 3-OT-J1A-0-1AS-S4702

Safety Function: N/A **Title:** Conduct of Operations

K/A 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Rating(s): 4.3 / 4.4 **CFR:** 41.10 / 43.5 / 45.2 / 45.6

Evaluation Method: Simulator _____ In-Plant _____ **Classroom** X

References: 1-SOI-47.02, Turbo-Generator Startup Operation, R12
1-TRI-47-2, Main Turbine Overspeed Test, R11
U1 Technical Requirements Manual R64
Fire Protection Report Part II R55

Task Number: RO-047-SOI-47-003 **Title:** Roll the main turbine to rated speed

Task Standard: The applicant:

1. Reviews the minimum time to bring Main Turbine to synchronous speed and determines that the recommended time is insufficient.
2. Reviews selected Turbine Acceleration rate and hold times at specific rpm settings and determines that the AUTO acceleration rate will not meet the minimum time requirements
3. Evaluates a failure of 1-FCV-1-64, Turbine Stop Valve #2, to CLOSE during performance of 1-TRI-47-2, Main Turbine Overspeed Test.

Validation Time: 30 minutes **Time Critical:** Yes _____ No X

Applicant: _____ **Time Start:** _____
NAME Docket No. **Time Finish:** _____

Performance Rating: SAT _____ UNSAT _____ **Performance Time** _____

Examiner: _____ / _____
NAME SIGNATURE DATE

COMMENTS

**WATTS BAR NUCLEAR PLANT
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Tools/Equipment/Procedures Needed:

- Laptop Computer.
- ***NRC REFERENCE DISK.***

***NOTE:** This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the NRC REFERENCE DISK.

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE
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READ TO OPERATOR

DIRECTION TO APPLICANT:

I will explain the initial conditions and state the task to be performed. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- 1-TRI-47-2, Main Turbine Overspeed Test, recently completed during plant startup, and Unit 1 Main Turbine was shut down
- Unit 1 Main Turbine is now LATCHED and ready to roll IAW 1-SOI-47.02, Turbo-Generator Startup Operation, Section 5.3, Rolling Turbine
- Turbine IMPULSE CHAMBER METAL START TEMP [ICS point T2063A] is 175 °F
- The Unit 1 BOP has presented the following turbine rolling plan IAW 1-SOI-47.02, Turbo-Generator Startup Operation, for your approval
 - MINIMUM TIME to synchronous speed: 10 minutes
 - Selected acceleration rate(s): AUTO from 0 to 1800 rpm
- You are the Unit 1 Unit Supervisor

INITIATING CUES:

- Determine if the following comply with 1-SOI-47.02 requirements:
 - MINIMUM TIME to synchronous speed
 - Selected acceleration rate(s)
- Determine if 1-TRI-47-2 acceptance criteria are met.
 - If NOT, specify CONDITIONS and REQUIRED ACTIONS along with their COMPLETION TIMES and any other required actions.

WATTS BAR NUCLEAR PLANT
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Start Time: _____

Step # 1.	Performance Step: Determine whether 10 minutes is correct MINIMUM TIME
Critical Step? Y	Is the recommended MINIMUM TIME (10 minutes) to bring U1 Main Turbine to synchronous speed correct?
Standard:	<p>The applicant determines that the BOP MINIMUM TIME of 10 minutes is INCORRECT.</p> <p><u>The applicant determines that the MINIMUM TIME to synchronous speed, based on initial metal temperature of 175°F, is 0.5 hours ± 0.1 hour (24 to 36 minutes).</u> (See 1-SOI-47.02 Attachment 3 graph in Key.)</p> <p>Step is critical to ensure proper roll-up of the main turbine occurs.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	<p>Using Attachment 3 of 1-SOI-47.02 and IMPULSE CHAMBER METAL START TEMP [ICS point T20631A] of 175 °F, the applicant should determine the MINIMUM TIME allowed by procedure to bring the main turbine to synchronous speed to be 0.5 hours (or 30 minutes). (See Key.)</p> <p>Acceptable range: 0.5 ± 0.1 hours (or 30 ± 6 minutes)</p>
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 2.	Performance Step: Determine if acceleration specified in BOP's Turbine Rolling Plan meets requirements
Critical Step? Y	Is the recommended Acceleration Rate (AUTO) correct?
Standard:	<u>Applicant determines that AUTO acceleration rate will NOT meet the correct MINIMUM TIME determined in JPM step [1] (24 to 36 minutes).</u> Step is critical to ensure proper roll-up of the main turbine occurs.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	AUTO acceleration rate will bring the main turbine to synchronous speed in 14.75 minutes which is less than the 24 to 36 minutes determined in JPM step [1]. (See Key.) Even if the lowest acceleration rate, 80 rpm/min, is selected for the duration, ignoring resonant (critical) speed ranges, the time to synchronous speed is 22.5 minutes. Manual holds must be used.
Cue:	None
Comments:	

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Step # 3.	Performance Step: Determine if 1-TRI-47-2 acceptance criteria are met.
Critical Step? Y	Determine if 1-TRI-47-2 acceptance criteria are met. And if not, specify CONDITIONS and REQUIRED ACTIONS along with their COMPLETION TIMES and any other required actions.
Standard:	<p>1-FCV-1-64, HP TURBINE STOP VALVE #2, failed to CLOSE. It is required OPERABLE by TR 3.3.5, Turbine Overspeed Protection, AND the Fire Protection Report, Operating Requirement 14.10. Both documents are mentioned in Sections 1.2.1, 1.3, and 2.2.4 of 1-TRI-47-2.</p> <p><u>TR 3.3.5 Condition A, One high pressure turbine steam inlet valve inoperable.</u></p> <p><u>A.1</u> <u>Verify the two high pressure turbine steam inlet valves on the same steam chest which are opposite the inoperable valve are OPERABLE within 6 hours AND restore inoperable valve to OPERABLE status within 72 hours;</u></p> <p>OR</p> <p><u>A.2</u> <u>Verify the two high pressure turbine steam inlet valves on the same steam chest which are opposite the inoperable valve are OPERABLE within 6 hours AND remove the turbine from service by closing all the high pressure turbine steam inlet valves within 78 hours;</u></p> <p>OR</p> <p><u>A.3</u> <u>Close MSIVs with 78 hours.</u></p> <p>Only one of the actions underlined above is required to be specified to pass the JPM.</p> <p><u>OR 14.10.1, Fire Safe Shutdown Equipment. With one or more required equipment in Table 14.10 non-functional, restore to functional status (or its FSSD condition) within 30 days.</u></p> <p>Step is critical to ensure conditions that could cause the main turbine to become potential missile hazards or overcool the RCS are corrected or the turbine is placed in a safe condition.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the examinee returns the JPM Briefing sheet to the examiner.
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Stop Time: _____

WATTS BAR NUCLEAR PLANT
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1S
Key

**DO NOT HAND TO
APPLICANT**

WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE

1S

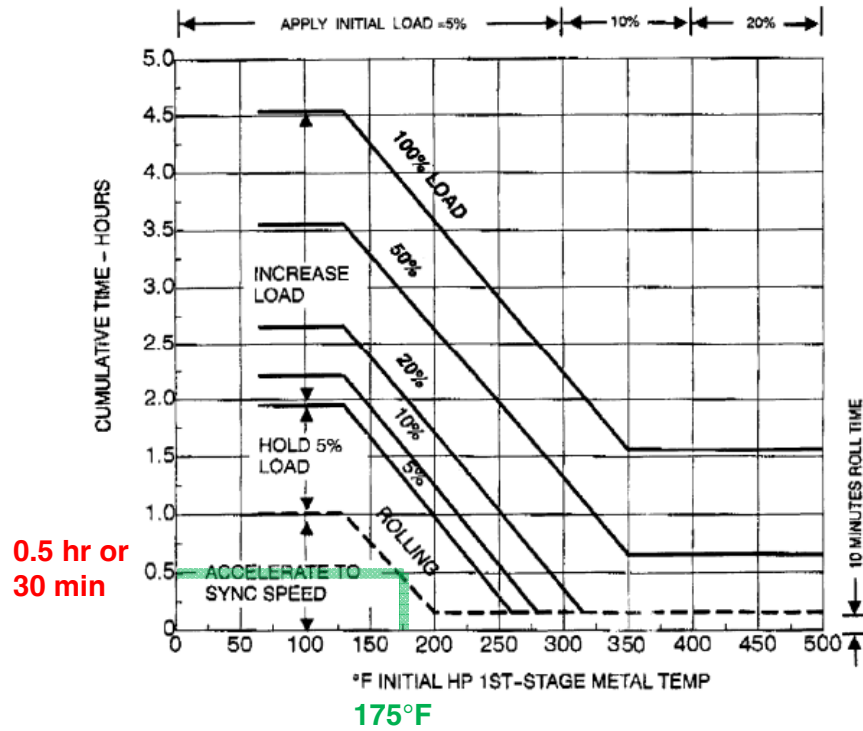
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Key

Attachment 3
(Page 1 of 1)

Turbine Startup Curve

1.0 STARTUP CURVE

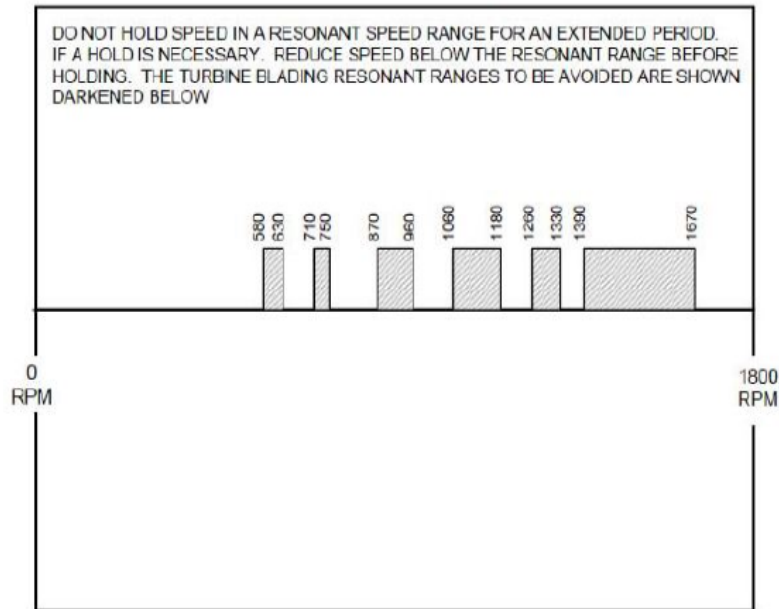


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From 1-SOI-47.02 Section 8.17.4, Turbine Acceleration Rate:

- **AUTO RATE - 100 RPM/MIN outside critical speed range, 200 RPM/MIN in a critical speed range**

From 1-SOI-47.02 Attachment 2, Turbine Resonant Speed Ranges:



With Turbine Acceleration Rate selected to AUTO, based on the above:

0 to 580 rpm @ 100 rpm/minute:	5.8 min
580 to 630 rpm @ 200 rpm/minute:	0.25 min
630 to 710 rpm @ 100 rpm/minute:	0.8 min
710 to 750 rpm @ 200 rpm/minute:	0.2 min
750 to 870 rpm @ 100 rpm/minute:	1.2 min
870 to 960 rpm @ 200 rpm/minute:	0.45 min
960 to 1060 rpm @ 100 rpm/minute:	1.0 min
1060 to 1180 rpm @ 200 rpm/minute:	0.6 min
1180 to 1260 rpm @ 100 rpm/minute:	0.8 min
1260 to 1330 rpm @ 200 rpm/minute:	0.35 min
1330 to 1390 rpm @ 100 rpm/minute:	0.6 min
1390 to 1670 rpm @ 200 rpm/minute:	1.4 min
1670 to 1800 rpm @ 100 rpm/minute:	1.3 min

$$5.8 + 0.25 + 0.8 + 0.2 + 1.2 + 0.45 + 1.0 + 0.6 + 0.8 + 0.35 + 0.6 + 1.4 + 1.3 = 14.75 \text{ minutes}$$

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TR 3.3.5 Turbine Overspeed Protection

TR 3.3.5 At least one Turbine Overspeed Protection System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

-----NOTE-----

Not applicable to MODES 2 and 3 when all main steam isolation valves are closed and all other steam flow paths to the turbine are isolated.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One high pressure turbine steam inlet valve inoperable.	A.1.1 Verify the two high pressure turbine steam inlet valves on the same steam chest which are opposite the inoperable valve are OPERABLE.	6 hours
	AND	
	A.1.2 Restore inoperable valve to OPERABLE status.	72 hours
	OR	
	A.2.1 Verify the two high pressure turbine steam inlet valves on the same steam chest which are opposite the inoperable valve are OPERABLE.	6 hours
	AND	
	A.2.2 Remove the turbine from service by closing all the high pressure turbine steam inlet valves.	78 hours
	OR	
	A.3 Close MSIVs.	78 hours

(continued)

TABLE 14.10 Fire Safe Shutdown Equipment
Page 1 of 9

1-FCV-1-36	MAIN FW PUMP TURBINE HP STOP VALVE	14.10.c
1-FCV-1-37	MAIN FW PUMP TURBINE HP CONTROL VALVE	14.10.c
1-FCV-1-43	MAIN FW PUMP TURBINE HP STOP VALVE	14.10.c
1-FCV-1-44	MAIN FW PUMP TURBINE HP CONTROL VALVE	14.10.c
1-FCV-1-61	MAIN TURBINE HP STOP VALVE - LINE 1	14.10.c
1-FCV-1-62	MAIN TURBINE HP CONTROL VALVE - LINE 1	14.10.c
1-FCV-1-64	MAIN TURBINE HP STOP VALVE - LINE 2	14.10.c
1-FCV-1-65	MAIN TURBINE HP CONTROL VALVE - LINE 2	14.10.c
1-FCV-1-67	MAIN TURBINE HP STOP VALVE - LINE 3	14.10.c
1-FCV-1-68	MAIN TURBINE HP CONTROL VALVE - LINE 3	14.10.c
1-FCV-1-70	MAIN TURBINE HP STOP VALVE - LINE 4	14.10.c
1-FCV-1-71	MAIN TURBINE HP CONTROL VALVE - LINE 4	14.10.c

14.10.1

With one or more required equipment in Table 14.10 non-functional (or not in its FSSD condition), restore to functional status (or its FSSD condition) within 30 days.

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(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- 1-TRI-47-2, Main Turbine Overspeed Test, recently completed during plant startup, and Unit 1 Main Turbine was shut down
- Unit 1 Main Turbine is now LATCHED and ready to roll IAW 1-SOI-47.02, Turbo-Generator Startup Operation, Section 5.3, Rolling Turbine
- Turbine IMPULSE CHAMBER METAL START TEMP [ICS point T2063A] is 175 °F
- The Unit 1 BOP has presented the following turbine rolling plan IAW 1-SOI-47.02, Turbo-Generator Startup Operation, for your approval
 - MINIMUM TIME to synchronous speed: **10 minutes**
 - Selected acceleration rate(s): **AUTO from 0 to 1800 rpm**
- You are the Unit 1 Unit Supervisor

INITIATING CUES:

- Determine if the following comply with 1-SOI-47.02 requirements:
 - MINIMUM TIME to synchronous speed
 - Selected acceleration rate(s)
- Determine if 1-TRI-47-2 acceptance criteria are met.
 - If NOT, specify CONDITIONS and REQUIRED ACTIONS along with their COMPLETION TIMES and any other required actions.

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Administrative JPM 2S

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<u>Task:</u>	Review Boration Calculation			
<u>Alternate Path:</u>	n/a			
<u>Facility JPM #:</u>	3-OT-J1A-0-2AS-S6202			
<u>Safety Function:</u>	N/A	<u>Title:</u>	Conduct of Operations	
<u>K/A</u>	2.1.25	Ability to interpret reference materials such as graphs, curves, tables, etc.		
<u>Rating(s):</u>	3.9 / 4.2	<u>CFR:</u>	41.10 / 43.2 / 43.5 / 45.12	
<u>Evaluation Method:</u>	Simulator	_____	In-Plant	_____
			Classroom	X
<u>References:</u>	2-SOI-62.02, Boron Concentration Control, R15 2-TI-59, Boron Tables, R1 U2 Technical Requirements Manual R10			

Task Standard: The applicant:

1. Reviews volume (gallons) of boric acid required to raise RCS boron concentration from 50 ppm to 700 ppm (P-11 block) and determines if it is correct.
2. Determines if BAT B will still meet requirement for OPERABILITY IAW U2 Technical Requirements Manual

Applicant: _____ **Time Start:** _____
 _____ **Docket No.** _____

Performance Rating: SAT _____ UNSAT _____ **Time Finish:** _____
 _____ **Performance Time** _____

Examiner: _____ / _____
NAME SIGNATURE DATE

[illegible]

**WATTS BAR NUCLEAR PLANT
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Tools/Equipment/Procedures Needed:

- Laptop Computer.
- ***NRC REFERENCE DISK.***

***NOTE:** This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the NRC REFERENCE DISK.

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READ TO OPERATOR

DIRECTION TO APPLICANT:

I will explain the initial conditions and state the task to be performed. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

- Unit 2 just entered MODE 3 to start U2R2.
- Current RCS boron concentration is 50 ppm. RCS temperature is 557°F. Pressurizer level is 25%.
- Target boron concentration is 700 ppm.
- Boric Acid Tank (BAT) B is currently available at 10900 gallons with a sampled boron concentration of 6820 ppm.
- Boric Acid Tank (BAT) B will be used for this evolution.
- A Unit 2 Control Room Operator has calculated that **5693 gallons of BAT B** is needed to achieve target boron concentration.
- 2-FCV-62-135, RWST TO CHARGING PMPS SUCTION, is tagged CLOSED in preparation for MOVATs.
- You are the Unit 2 Unit Supervisor.

INITIATING CUES:

- Review the calculated volume (gallons) from BAT B needed to achieve U2 RCS boron concentration of 700 ppm **AND** determine if amount is correct.
- Following boration from BAT B, determine any Technical Specifications (Requirements) Required Action(s) and Completion Time(s), if any.

**WATTS BAR NUCLEAR PLANT
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Start Time: _____

Step # 1.	Performance Step: Determine volume (gallons) of boric acid to be added and compare with CRO's results.
Critical Step? Y	Determine volume (gallons) of boric acid to be added.
Standard:	<p>Using 2-SOI-62.02 Appendix D and 2-TI-59, Boron Tables, at 557°F (Appendix J), applicant determines that 5942.4 gallons (± 1 gallon) of boric acid must be added to achieve 700 ppm.</p> <p>From 2-TI-59 Appendix J (see table in Examiner Notes on next page):</p> <p>To raise RCS boron from 50 ppm to 100 ppm (50 ppm increment): 436.4 gallons</p> <p>To raise RCS boron from 100 ppm to 200 ppm (100 ppm increment): 882.6 gallons</p> <p>To raise RCS boron from 200 ppm to 300 ppm (100 ppm increment): 896.1 gallons</p> <p>To raise RCS boron from 300 ppm to 400 ppm (100 ppm increment): 909.9 gallons</p> <p>To raise RCS boron from 400 ppm to 500 ppm (100 ppm increment): 924.2 gallons</p> <p>To raise RCS boron from 500 ppm to 600 ppm (100 ppm increment): 939.0 gallons</p> <p>To raise RCS boron from 600 ppm to 700 ppm (100 ppm increment): 954.2 gallons</p> <p>$436.4 + 882.6 + 896.1 + 909.9 + 924.2 + 939.0 + 954.2 = 5942.4$ gallons</p> <p>Alternately, the applicant could go in 50 ppm increments from 50 ppm to 700 ppm (not included in Examiner Notes):</p> <p>$436.4 + 439.7 + 443.0 + 446.3 + 449.7 + 453.2 + 456.7 + 460.3 + 463.9 + 467.6 + 471.3 + 475.2 + 479.0 = 5942.3$ gallons</p> <p>There is no interpolation required and using smaller ppm increments provides values within ± 1 gallon of the 100 ppm increments.</p> <p><u>The applicant determines that the CRO's methodology was incorrect and insufficient and states such on the Applicant Cue Sheet.</u></p> <p>Underlined is critical to ensure proper amount of boric acid is added to achieve specified U2 RCS boron concentration.</p>

**WATTS BAR NUCLEAR PLANT
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Step #1 cont.	Performance Step: Determine volume (gallons) of boric acid to be added and compare with CRO's results.																											
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY																											
Examiner Notes:	<p>Control Room Operator continued using the 50 ppm initial concentration row even though RCS boron concentration was going up 100 ppm each boration. This made the CROs number smaller than what was actually required.</p> <p>The CRO did the following INCORRECTLY:</p> <p>436.4 + 876.1 + 876.1 + 876.1 + 876.1 + 876.1 + 876.1 = 5693 gallons</p> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="3">Unit 2 Gallons of Acid for Boration from 2-TI-59, Boron Tables</th> </tr> <tr> <th style="width: 33%;">Boron PPM</th><th style="width: 33%;">50 PPM Borate</th><th style="width: 33%;">100 PPM Borate</th></tr> </thead> <tbody> <tr><td>50</td><td>436.4</td><td>876.1</td></tr> <tr><td>100</td><td>439.7</td><td>882.6</td></tr> <tr><td>200</td><td>446.3</td><td>896.1</td></tr> <tr><td>300</td><td>453.2</td><td>909.9</td></tr> <tr><td>400</td><td>460.3</td><td>924.2</td></tr> <tr><td>500</td><td>467.6</td><td>939</td></tr> <tr><td>600</td><td>475.2</td><td>954.2</td></tr> </tbody> </table>	Unit 2 Gallons of Acid for Boration from 2-TI-59, Boron Tables			Boron PPM	50 PPM Borate	100 PPM Borate	50	436.4	876.1	100	439.7	882.6	200	446.3	896.1	300	453.2	909.9	400	460.3	924.2	500	467.6	939	600	475.2	954.2
Unit 2 Gallons of Acid for Boration from 2-TI-59, Boron Tables																												
Boron PPM	50 PPM Borate	100 PPM Borate																										
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400	460.3	924.2																										
500	467.6	939																										
600	475.2	954.2																										
Cue:	None																											
Comments:																												

**WATTS BAR NUCLEAR PLANT
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Step # 2.	Performance Step: Determine if BAT B meets TR 3.1.6 requirements after completion of boration.
Critical Step? Y	Determine BAT B requirements and actual volume after completion of the RCS boration.
Standard:	<p><u>Applicant determines from specified conditions that BAT B must have a minimum of 9200 ± 125 gallons (see Key) to meet TR 3.1.6 requirements.</u></p> <p>10900 gallons - 5942.4 gallons = 4957.6 gallons</p> <p>Or, if the applicant used the Control Room Operator's incorrect value:</p> <p>10900 gallons - 5693 gallons = 5207 gallons</p> <p><u>Applicant determines that either value is significantly below the required 9200 gallons and circles NO.</u></p> <p><u>Applicant determines from TR 3.1.2, Boration Systems Flow Paths, that TR 3.1.6, Borated Water Sources, Operating, is NOT met and Condition A applies.</u></p> <p>Underlined is critical to ensure sufficient amount of boric acid is readily available to maintain the reactor subcritical and that the boration system is available for reactivity control in MODEs 1, 2 and 3.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the examinee returns the JPM Briefing sheet to the examiner.
------------------	---

Stop Time: _____

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2S
Key

**DO NOT HAND TO
APPLICANT**

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KEY

The amount of boric acid by volume provided by the Control Room Operator, 5693 gallons, is INCORRECT. The correct value is 5942.4 gallons (± 1 gallon).

TR 3.1.6, Borated Water Sources, Operating, is NOT met.

Condition A, Required Boric Acid Storage System inoperable, applies.

1) Restore Boric Acid Storage System to OPERABLE status within 72 hours;

OR

2) Be in MODE 3 (already there) within 78 hours AND Borate to a SDM equivalent to $\geq 1\% \Delta k/k$ at 200°F within 78 hours AND Restore Boric Acid Storage System to OPERABLE status within 246 hours.

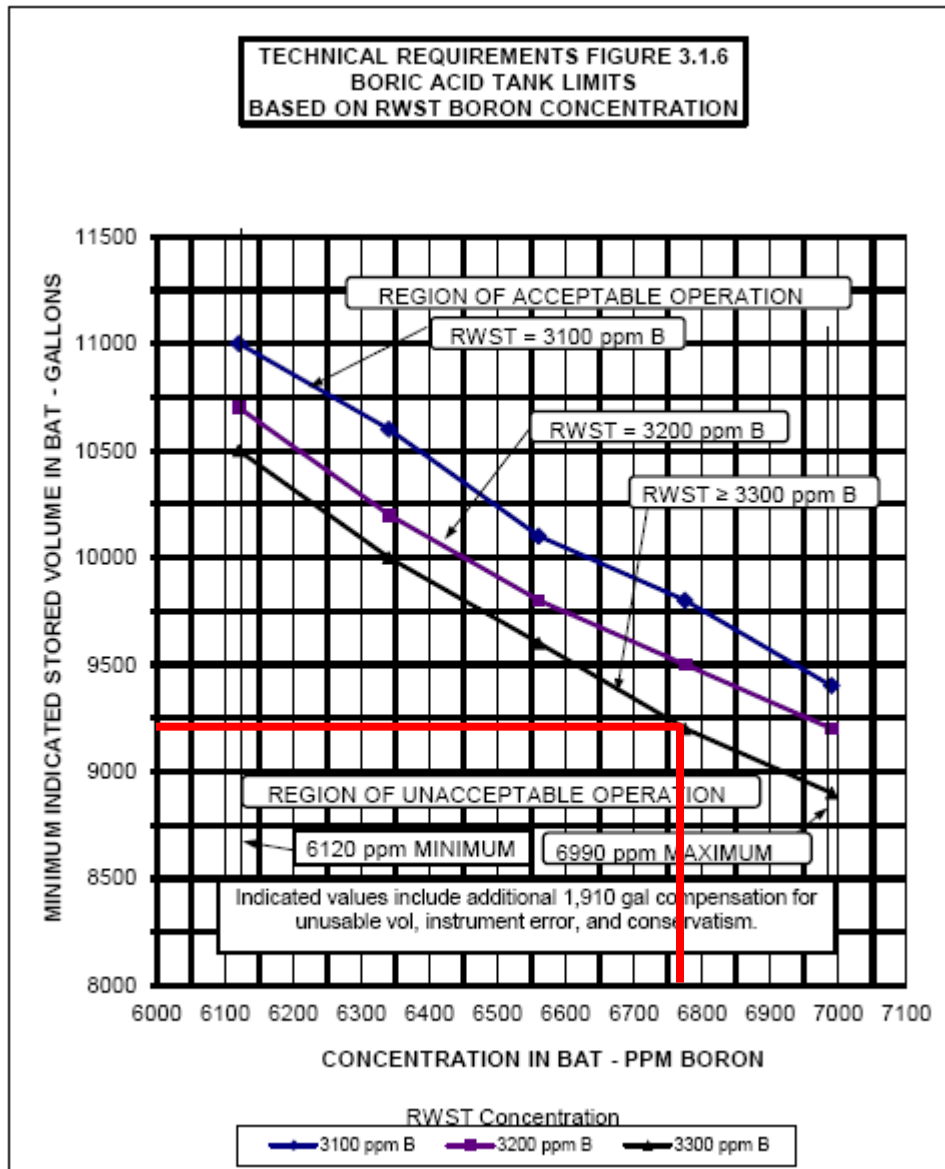
Only one of the two actions above is required to be listed to pass the JPM. If action (2) is stated, the MODE 3 action does NOT have to be stated, since U2 is currently in MODE 3.

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KEY



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KEY

TR 3.1.2 Boration Systems Flow Paths, Operating

- TR 3.1.2** Two of the following three boron injection flow paths shall be OPERABLE:
- a. One flow path from the boric acid tanks, through a boric acid transfer pump, through a charging pump to the Reactor Coolant System (RCS).
 - b. Two flow paths from the Refueling Water Storage Tank (RWST), through charging pumps to the RCS.

NOTE

In MODE 3, a charging pump may be made incapable of injecting to support transition into or from the Applicability of the TS LCO 3.4.12, "Cold Overpressure Mitigation System (COMS)," for up to four hours or until the temperature of all the RCS cold legs exceeds 375°F, whichever occurs first.

APPLICABILITY: MODES 1, 2, and 3.

TR 3.1.6 Borated Water Sources, Operating

- TR 3.1.6** The following borated water sources shall be OPERABLE as required by TR 3.1.2:
- a. A Boric Acid Storage System, and
 - b. The Refueling Water Storage Tank (RWST).

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required Boric Acid Storage System, inoperable.	A.1 Restore Boric Acid Storage System, to OPERABLE status.	72 hours
	<u>OR</u>	
	A.2.1 Be in MODE 3.	78 hours
	<u>AND</u>	
	A.2.2 Borate to a SDM equivalent to $\geq 1\% \Delta k/k$ at 200°F.	78 hours
	<u>AND</u>	
	A.2.3 Restore Boric Acid Storage System to OPERABLE status.	246 hours

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APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- Unit 2 just entered MODE 3 to start U2R2.
- Current RCS boron concentration is 50 ppm. RCS temperature is 557°F. Pressurizer level is 25%.
- Target boron concentration is 700 ppm.
- Boric Acid Tank (BAT) B is currently available at 10900 gallons with a sampled boron concentration of 6820 ppm.
- Boric Acid Tank (BAT) B will be used for this evolution.
- A Unit 2 Control Room Operator has calculated that **5693 gallons of BAT B** is needed to achieve target boron concentration.
- 2-FCV-62-135, RWST TO CHARGING PMPS SUCTION, is tagged CLOSED in preparation for MOVATs.
- You are the Unit 2 Unit Supervisor.

INITIATING CUES:

- Review the calculated volume (gallons) from BAT B needed to achieve U2 RCS boron concentration of 700 ppm **AND** determine if amount is correct.
- Following boration from BAT B, determine any Technical Specifications (Requirements) Required Action(s) and Completion Time(s), if any.

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Administrative JPM 3S

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EVALUATION SHEET

COMMENTS

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Tools/Equipment/Procedures Needed:

- Laptop Computer
- Frozen References Disk
- JPM 3S Handout 1 – Marked up 2-SI-72-901-B

***NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the Frozen References Disk.**

**WATTS BAR NUCLEAR PLANT
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**2019-301 NRC EXAM
DIRECTIONS TO APPLICANT**

DIRECTION TO APPLICANT:

I will explain the initial conditions and state the task to be performed. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 2 Conditions:

- 100% Power
- 2-SI-72-901-B, Containment Spray Pump 2B-B Quarterly Performance Test, has been completed
- You are the Work Control SRO

INITIATING CUES:

- Perform a review 2-SI-72-901-B, CS Pump 2B-B Quarterly Performance Test
- Determine if Acceptance Criteria is met for:
 - Differential Pressure,
 - Pump Vibration, and
 - Motor Vibration
- Determine any Technical Specifications Required Action(s) and Completion Time(s), if any

Acceptance Criteria:

- **Differential Pressure:**
- **Pump Vibration:**
- **Motor Vibration:**


Technical Specification Required Action(s) and Completion Time(s), if any:

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Start Time: _____

Step # 1.	Performance Step: 2-SI-72-901-B
Critical Step?	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px; text-align: center;">  </div> <div> <p>CALCULATE CSP 2B differential pressure using pressure readings recorded in Step 6.0[17] from the test gauges installed at 2-PI-72-15 and 2-PI-72-16.</p> <p>DP_{PUMP} = 2-PI-72-15 - 2-PI-72-16</p> <p>DP_{PUMP} = <u>210</u> - <u>32</u></p> <p>DP_{PUMP} = <u>188</u> psid.</p> </div> </div> <div style="text-align: right; margin-top: 20px;"> <u>DRJ</u> <u>TJG</u> <u>IV</u> </div>
Y	
Standard:	<p>Applicant performs a review of the Pump Differential Pressure calculation and determines the calculation was performed INCORRECTLY.</p> <p><u>The applicant determines Pump DP to be 178 psid.</u></p> <p>Step is critical to determine Pump Differential Pressure</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 2.	Performance Step: 2-SI-72-901-B																	
Critical Step?	<p>(20) COMPARE the results calculated in Step 6.0[18] with the acceptance criteria below, AND</p> <p>CHECK the appropriate box. (Acc Crit)</p> <table border="1"> <thead> <tr> <th colspan="5">PUMP FLOW ACCEPTANCE CRITERIA</th> </tr> <tr> <th rowspan="2">Test Quantity</th> <th rowspan="2">Units</th> <th rowspan="2">Acceptable Range</th> <th colspan="2">Required Action Range</th> </tr> <tr> <th>Low Values</th> <th>High Values</th> </tr> </thead> <tbody> <tr> <td>Differential Pressure</td> <td>psid</td> <td>179.28 - 212.75</td> <td>< 179.28</td> <td>> 212.75</td> </tr> </tbody> </table> <p> <input checked="" type="checkbox"/> Acceptable Range <input type="checkbox"/> Required Action Range </p> <p align="right">DRJ</p>	PUMP FLOW ACCEPTANCE CRITERIA					Test Quantity	Units	Acceptable Range	Required Action Range		Low Values	High Values	Differential Pressure	psid	179.28 - 212.75	< 179.28	> 212.75
PUMP FLOW ACCEPTANCE CRITERIA																		
Test Quantity	Units	Acceptable Range	Required Action Range															
			Low Values	High Values														
Differential Pressure	psid	179.28 - 212.75	< 179.28	> 212.75														
Standard:	<p><u>Applicant performs a review of Differential Pressure Acceptance Criteria and determines that Pump DP is less than the required value of 179.28 psid, and is in the Required Action Range.</u></p> <p>Applicant determines that the box for Acceptable Range was INCORRECTLY checked.</p> <p>Step is critical to determine if Pump Differential Pressure meets Acceptance Criteria</p>																	
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY																	
Examiner Notes:																		
Cue:	None																	
Comments:																		

**WATTS BAR NUCLEAR PLANT
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Step # 3.	Performance Step: 2-SI-72-901-B																																			
Critical Step?	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px; text-align: center;"> </div> <div> <p>COMPARE the vibration readings for CSP 2B Pump Points A and B recorded in Step 6.0[23] to the Pump Vibration Acceptance Criteria below, AND</p> <p>MARK the appropriate range (Acc Crit).</p> <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="5">PUMP VIBRATION ACCEPTANCE CRITERIA</th> </tr> <tr> <th>Test Point</th><th>Units</th><th>Acceptable Range</th><th>Alert Range</th><th>Required Action Range</th></tr> </thead> <tbody> <tr> <td>Horizontal (A) Inboard</td><td>ips</td><td>≤ 0.2670</td><td>$> 0.2670 \text{ \& } \leq 0.6408$</td><td>$> 0.6408$</td></tr> <tr> <td>Vertical (A) Inboard</td><td>ips</td><td>≤ 0.3075</td><td>$> 0.3075 \text{ \& } \leq 0.7000$</td><td>$> 0.7000$</td></tr> <tr> <td>Horizontal (B) Outboard</td><td>ips</td><td>≤ 0.3250</td><td>$> 0.3250 \text{ \& } \leq 0.7000$</td><td>$> 0.7000$</td></tr> <tr> <td>Vertical (B) Outboard</td><td>ips</td><td>≤ 0.3250</td><td>$> 0.3250 \text{ \& } \leq 0.7000$</td><td>$> 0.7000$</td></tr> <tr> <td>Axial (B) Outboard</td><td>ips</td><td>≤ 0.3250</td><td>$> 0.3250 \text{ \& } \leq 0.7000$</td><td>$> 0.7000$</td></tr> </tbody> </table> <div style="margin-top: 10px;"> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 15px; height: 15px; background-color: black; margin-right: 5px;"></div> Acceptable Range </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="width: 15px; height: 15px; border: 1px solid black; margin-right: 5px;"></div> Alert Range </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; border: 1px solid black; margin-right: 5px;"></div> Required Action Range </div> </div> </div> </div> <div style="margin-top: 20px; text-align: right;"> <u>DRJ</u> </div>	PUMP VIBRATION ACCEPTANCE CRITERIA					Test Point	Units	Acceptable Range	Alert Range	Required Action Range	Horizontal (A) Inboard	ips	≤ 0.2670	$> 0.2670 \text{ \& } \leq 0.6408$	> 0.6408	Vertical (A) Inboard	ips	≤ 0.3075	$> 0.3075 \text{ \& } \leq 0.7000$	> 0.7000	Horizontal (B) Outboard	ips	≤ 0.3250	$> 0.3250 \text{ \& } \leq 0.7000$	> 0.7000	Vertical (B) Outboard	ips	≤ 0.3250	$> 0.3250 \text{ \& } \leq 0.7000$	> 0.7000	Axial (B) Outboard	ips	≤ 0.3250	$> 0.3250 \text{ \& } \leq 0.7000$	> 0.7000
PUMP VIBRATION ACCEPTANCE CRITERIA																																				
Test Point	Units	Acceptable Range	Alert Range	Required Action Range																																
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Axial (B) Outboard	ips	≤ 0.3250	$> 0.3250 \text{ \& } \leq 0.7000$	> 0.7000																																

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Step # 5.	Performance Step: Not a procedure step
Critical Step? Y	Determine if Acceptance Criteria is met for Differential Pressure, Pump Vibration, and Motor Vibration
Standard:	<p>Acceptance Criteria:</p> <ul style="list-style-type: none"> • Differential Pressure: NOT MET. Required Action Range. • Pump Vibration: NOT MET. Alert Range. • Motor Vibration: MET. <p><u>Differential Pressure and Pump Vibration are the critical parts of this step.</u> Step is critical to determine if Acceptance Criteria is met for Differential Pressure, Pump Vibration, and Motor Vibration.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
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Step # 6.	Performance Step: Not a procedure step
Critical Step? Y	Determine any Technical Specifications Required Action(s) and Completion Time(s), if any
Standard:	<p>Technical Specification Required Action(s) and Completion Time(s), if any:</p> <p><u>LCO 3.6.6, Containment Spray System, is NOT met. Action A.1, Restore Containment Spray train to OPERABLE status within 72 hours.</u></p> <p><u>Required Action and Completion Time are the critical parts of this step.</u></p> <p>Step is critical to determine any Technical Specifications Required Action(s) and Completion Times(s)</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	
Cue:	None
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the JPM Briefing sheet to the examiner.
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Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

3S

2019-301 NRC EXAM

Handout Package for Applicant

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

3S

**2019-301 NRC EXAM
APPLICANT CUE SHEET**

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 2 Conditions:

- 100% Power
- 2-SI-72-901-B, Containment Spray Pump Quarterly Performance Test, has been completed
- You are the Work Control SRO

INITIATING CUES:

- Perform a review 2-SI-72-901-B, CS Pump 2B-B Quarterly Performance Test
- Determine if Acceptance Criteria is met for:
 - Differential Pressure,
 - Pump Vibration, and
 - Motor Vibration
- Determine any Technical Specifications Required Action(s) and Completion Time(s), if any

Acceptance Criteria:

- **Differential Pressure:**
- **Pump Vibration:**
- **Motor Vibration:**

Technical Specification Required Action(s) and Completion Time(s), if any:

Watts Bar Nuclear Plant

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Administrative JPM 4S

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

4S

2019-301 NRC EXAM

EVALUATION SHEET

Task: Calculate the Expected Dose and Determine if SED is permitted to authorize Emergency Dose Limits in excess of TVA Administrative Dose Limits

Alternate Path: No

Facility JPM #: 3-OT-J1A-0-1AS-R15

Safety Function: N/A **Title:** Radiation Control

K/A 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions

Rating(s): 3.2 / 3.7 **CFR:** 41.12 / 43.4 / 45.10

Evaluation Method: Simulator _____ In-Plant _____ Classroom X

References: EPIP-15, Emergency Exposure Guidelines, R19

Task Number: AUO-119-SSP-5.01-001 **Title:** Control personnel radiation exposure.

Task Standard: The applicant:

1. Calculates the total dose received performing the assigned tasks:
 - AUO 1 - Acceptable Range 17.00-17.50 rem
 - AUO 2 - Acceptable Range 9.00 rem to 9.42 rem
2. Determines if SED is permitted to authorize Emergency Dose Limits in excess of TVA Administrative Dose Limits to perform the task for both in accordance with EPIP-15

Validation Time: 10 minutes **Time Critical:** Yes _____ No X

Applicant: _____ **NAME** _____ **Docket No.** _____ **Time Start:** _____
_____ **Time Finish:** _____

Performance Rating: SAT _____ UNSAT _____ **Performance Time** _____

Examiner: _____ **NAME** _____ **SIGNATURE** _____ / **DATE** _____

COMMENTS

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

4S

2019-301 NRC EXAM

Tools/Equipment/Procedures Needed:

- Laptop Computer
- Frozen References Disk

***NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the Frozen References Disk.**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

4S

2019-301 NRC EXAM

DIRECTIONS TO APPLICANT

DIRECTION TO APPLICANT:

I will explain the initial conditions and state the task to be performed. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

- An ALERT has been declared on Unit 1 due to a Loss of RHR Shutdown Cooling during Midloop Operations. The TSC is manned.
- RHR Pump 1B-B is OOS. RHR Pump 1A-A is air bound and must be vented using 1-TV-74-543, RHR Suction Header Test Vent, and 1-TV-74-504, RHR Suction Header Test Vent, IAW appropriate procedures.
- You will brief the AUOs assigned to the task

NOTE: Disregard Transit Times

AUO	Time required to OPEN 1-TV-74-543 / Dose Rate	Time required to OPEN 1-TV-74-504 / Dose Rate	Time waiting to vent / Dose Rate	Time required to CLOSE 1-TV-74-543 / Dose Rate	Time required to CLOSE 1-TV-74-504 / Dose Rate	Total Expected Dose
AUO 1	3 minutes / 100 rem/hr		25 minutes / 10 rem/hr	5 minutes / 100 rem/hr		
AUO 2		3 minutes / 35 rem/hr	25 minutes / 10 rem/hr		6 minutes / 35 rem/hr	

INITIATING CUES:

- Calculate the expected dose for the task for AUOs 1 and 2. Document the results in the TABLE. *(Round to the nearest tenths)*

- Is the SED permitted to authorize the performance of this task?

Circle one:

SED Authorization Allowed: Yes / No

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

Start Time: _____

Step # 1.	Performance Step: 1
Critical Step? Y	Applicant calculates expected doses to OPEN test valves using provided information.
Standard:	<u>Applicant determines the following:</u> EXPECTED DOSE to OPEN 1-TV-74-543 <u>(3 minutes/60 minutes/hour) x 100 rem/hr = 5 rem</u> Underlined is critical to determine total dose of the venting operation.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

4S

2019-301 NRC EXAM

Step # 2.	Performance Step: 2
Critical Step? Y	Applicant calculates the expected doses to allow venting while waiting in a lower dose area using provided information.
Standard:	<p><u>Applicant determines the following:</u></p> <p>EXPECTED DOSE for waiting for RHR piping to vent</p> <p><u>(25 minutes/60 minutes/hr) x 10 rem/hr = 4.2 rem</u></p> <p>Underlined is critical to determine total dose of the venting operation.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

4S

2019-301 NRC EXAM

Step # 3.	Performance Step: 3
Critical Step? Y	Applicant calculates expected doses to OPEN test valves using provided information.
Standard:	<u>Applicant determines the following:</u> EXPECTED DOSE to OPEN 1-TV-74-543 <u>(5 minutes/60 minutes/hour) x 100 rem/hr = 8.3 rem</u> Underlined is critical to determine total dose of the venting operation.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

Step # 4.	Performance Step: 4
Critical Step? Y	Applicant calculates the total expected doses using provided information.
Standard:	<p><u>Applicant determines the following:</u></p> <p>EXPECTED DOSE to OPEN 1-TV-74-543 $(3 \text{ minutes}/60 \text{ minutes/hour}) \times 100 \text{ rem/hr} = 5 \text{ rem}$</p> <p>EXPECTED DOSE for waiting for RHR piping to vent $(25 \text{ minutes}/60 \text{ minutes/hr}) \times 10 \text{ rem/hr} = 4.2 \text{ rem}$</p> <p>EXPECTED DOSE to CLOSE 1-TV-74-543 $(5 \text{ minutes}/60 \text{ minutes/hour}) \times 100 \text{ rem/hr} = 8.3 \text{ rem}$</p> <p>$5 \text{ rem} + 4.2 \text{ rem} + 8.3 \text{ rem} = 17.5 \text{ rem}$</p> <p><u>TOTAL EXPECTED DOSE is 17.5 rem (17.5 rem (+/- 0.1) is acceptable)</u></p> <p>Underlined is critical to determine the total dose for the task.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

Step # 5.	Performance Step: 5
Critical Step? Y	Applicant calculates expected doses to OPEN test valves using provided information.
Standard:	<u>Applicant determines the following:</u> EXPECTED DOSE to OPEN 1-TV-74-504 <u>(3 minutes/60 minutes/hour) x 35 rem/hr = 1.8 rem</u> Underlined is critical to determine total dose of the venting operation.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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Step # 6.	Performance Step: 6
Critical Step? Y	Applicant calculates the expected doses to allow venting while waiting in a lower dose area using provided information.
Standard:	<u>Applicant determines the following:</u> EXPECTED DOSE for waiting for RHR piping to vent <u>(25 minutes/60 minutes/hr) x 10 rem/hr = 4.2 rem</u> Underlined is critical to determine total dose of the venting operation.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

Step # 7.	Performance Step: 7
Critical Step? Y	Applicant calculates expected doses to OPEN test valves using provided information.
Standard:	<u>Applicant determines the following:</u> EXPECTED DOSE to OPEN 1-TV-74-504 <u>(6 minutes/60 minutes/hour) x 35 rem/hr = 3.5 rem</u> Underlined is critical to determine total dose of the venting operation.
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

Step # 8.	Performance Step: 8
Critical Step? Y	Applicant calculates the total expected doses using provided information.
Standard:	<p><u>Applicant determines the following:</u></p> <p>EXPECTED DOSE to OPEN 1-TV-74-504 $(3 \text{ minutes}/60 \text{ minutes/hour}) \times 35 \text{ rem/hr} = 1.8 \text{ rem}$</p> <p>EXPECTED DOSE for waiting for RHR piping to vent $(25 \text{ minutes}/60 \text{ minutes/hr}) \times 10 \text{ rem/hr} = 4.2 \text{ rem}$</p> <p>EXPECTED DOSE to CLOSE 1-TV-74-504 $(6 \text{ minutes}/60 \text{ minutes/hour}) \times 35 \text{ rem/hr} = 3.5 \text{ rem}$</p> <p>$1.8 \text{ rem} + 4.2 \text{ rem} + 3.5 \text{ rem} = 9.5 \text{ rem}$</p> <p><u>TOTAL EXPECTED DOSE is 9.5 rem (9.5 rem (+/- 0.1) is acceptable)</u></p> <p>Underlined is critical to determine the total dose for the task.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

Step # 9.	Performance Step: 9
Critical Step? Y	Is the SED permitted to authorize the performance of this task?
Standard:	<p><u>Applicant circles YES</u></p> <p>From EPIP-15:</p> <p>3.1.1 ACTIONS FOR LIFE SAVING OR PROTECTION OF THE PUBLIC</p> <p>A. For immediate activities up to <u>25 Rem</u> which are necessary to:</p> <ol style="list-style-type: none"> 1. Save Human Life. For lifesaving operations situations may occur in which a dose in excess of <u>25 Rem</u> would be required. It is not possible to prejudge the risk that one person should be allowed to take to save the life of another. However, persons undertaking an emergency mission in which the dose would <u>exceed 25 Rem</u> to the whole body should do so only on a <u>voluntary basis</u> and with <u>full awareness of the risks involved</u>. 2. Restore equipment necessary to maintain critical safety functions or to establish and maintain a safe shutdown, 3. Prevent or Mitigate a release of radioactivity to the environment for which off-site protective measures may be required. For these activities, the TEDE of personnel directly involved shall <u>not</u> exceed <u>25 Rem</u>. This limit is applicable only if actions establishing adequate or equivalent protection, with less dose, are not readily available. <p>Underlined is critical to determine if the SED is permitted to authorize Emergency Dose Limits in excess of TVA Administrative Dose Limits to perform the task.</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	
Cue:	None
Comments:	

Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

4S

2019-301 NRC EXAM

Key

**DO NOT HAND TO
APPLICANT**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

KEY

- Calculate the expected dose for the task for AUOs 1 and 2. Document the results in the TABLE. *(Round to the nearest tenths)*

AUO	Time required to OPEN 1-TV-74-543 / Dose Rate	Time required to OPEN 1-TV-74-504 / Dose Rate	Time waiting to vent / Dose Rate	Time required to CLOSE 1-TV-74-543 / Dose Rate	Time required to CLOSE 1-TV-74-504 / Dose Rate	Total Expected Dose
AUO 1	3 minutes / 100 rem/hr		25 minutes / 10 rem/hr	5 minutes / 100 rem/hr		17.5 rem (+/- 0.1)
AUO 2		3 minutes / 35 rem/hr	25 minutes / 10 rem/hr		6 minutes / 35 rem/hr	9 - 9.42 rem (+/- 0.1)

- Is the SED permitted to authorize the performance of this task?

Circle one:

SED Authorization Allowed **Yes** / No

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

**Handout Package for
Applicant**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

APPLICANT CUE SHEET

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

- An ALERT has been declared on Unit 1 due to a Loss of RHR Shutdown Cooling during Midloop Operations. The TSC is manned.
- RHR Pump 1B-B is OOS. RHR Pump 1A-A is air bound and must be vented using 1-TV-74-543, RHR Suction Header Test Vent, and 1-TV-74-504, RHR Suction Header Test Vent, IAW appropriate procedures.
- You will brief the AUOs assigned to the task

NOTE: Disregard Transit Times

AUO	Time required to OPEN 1-TV-74-543 / Dose Rate	Time required to OPEN 1-TV-74-504 / Dose Rate	Time waiting to vent / Dose Rate	Time required to CLOSE 1-TV-74-543 / Dose Rate	Time required to CLOSE 1-TV-74-504 / Dose Rate	Total Expected Dose
AUO 1	3 minutes / 100 rem/hr		25 minutes / 10 rem/hr	5 minutes / 100 rem/hr		
AUO 2		3 minutes / 35 rem/hr	25 minutes / 10 rem/hr		6 minutes / 35 rem/hr	

INITIATING CUES:

- Calculate the expected dose for the task for AUOs 1 and 2. Document the results in the TABLE. *(Round to the nearest tenths)*
- Is the SED permitted to authorize the performance of this task?

Circle one:

SED Authorization Allowed: Yes / No

Watts Bar Nuclear Plant

2019-301 NRC EXAM

Administrative JPM 5S

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EVALUATION SHEET

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

5S

2019-301 NRC EXAM

Tools/Equipment/Procedures Needed:

- Laptop Computer
- Frozen References Disk
- Binder with REP EPIP series procedures

***NOTE: This JPM is designed to be performed in a classroom with procedures available to the applicant via a laptop computer loaded with the Frozen References Disk.**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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**2019-301 NRC EXAM
DIRECTIONS TO APPLICANT**

DIRECTION TO APPLICANT:

I will explain the initial conditions and state the task to be performed. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the cue sheet I provided you.

INITIAL CONDITIONS:

Unit 1 Conditions:

- Unit was in Mode 1, 100% Power
- National Weather Service provided wind direction is 270° with an average speed of 10 mph
- CCP 1B-B is tagged for maintenance
- 6.9kV Shutdown Boards 1A and 2B have been LOST with no expected time of recovery available
- An oil fire at the Power Stores loading dock has introduced a large amount of smoke into the Control Room
- The Operating crew has abandoned the Main Control Room
- 1-AOI-27 and 2-AOI-27, Main Control Room Inaccessibility, are being implemented
- When the Transfer Switch for CCP 1A-A is taken to AUX, CCP 1A-A breaker OPENS and CANNOT be RECLOSED
- There are NO impediments to evacuation
- You are the Shift Manager

INITIATING CUES:

- Identify the Initiating Condition and the required EPIP Appendix A, Initial Notification Form
- The current time is (CURRENT TIME)

Initiating Condition (IC): _____

EPIP Procedure: _____

THIS TASK IS TIME CRITICAL!

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Start Time: _____

Step # 1.	Performance Step: EPIP-1
Critical Step?	<p>HS6 - Inability to control a key safety function from outside the Control Room.</p> <p>The SED should declare the Site Area Emergency promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.</p> <p>(1) a. An event has resulted in plant control being transferred from the Control Room to the Auxiliary Control Room.</p> <p>AND</p> <p>b. Control of ANY of the following key safety functions is not reestablished within 15 minutes:</p> <ul style="list-style-type: none"> • Reactivity control • Core cooling • RCS heat removal
Y	
Standard:	<p><u>Applicant refers to EPIP-1 and declares an SITE AREA EMERGENCY based on Initiating Condition (IC) HS6, Inability to control a key safety function from outside the Control Room.</u></p> <p>Applicant determines that the inability to borate due to lack of a CCP prevents control of the key safety function of Reactivity Control.</p> <p>This must be completed within 15 minutes of task assignment.</p> <p>Underlined portion is critical to ensure proper activation of emergency resources for the event in progress</p>
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	RECORD time that declaration was made: _____
Cue:	None
Comments:	Fire Protection Report Part III Section 4.1 states: "Reactivity control for safe shutdown is provided by the control rods, with boron injection used to compensate for positive reactivity insertion due to cooldown and xenon decay...When the unit is at power, the concentration of boron in the RWST exceeds that quantity required to bring the reactor from an initial hot standby condition to hot shutdown and then to cold shutdown....For the assumed event, charging and boration are accomplished by operating a minimum of once CCP taking suction from the RWST..."

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

Step # 2.	Performance Step: EPIP-4
Critical Step? Y	EPIP-4, Site Area Emergency, selection and implementation.
Standard:	Applicant selects and implements EPIP-4, Site Area Emergency. Step is critical to ensure proper activation of emergency resources for the event in progress
Performance:	<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY
Examiner Notes:	None
Cue:	None
Comments:	

Terminating Cue:	Unless specified otherwise below, the JPM is terminated when the applicant returns the JPM Briefing sheet and completed Appendix A to the examiner.
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Stop Time: _____

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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2019-301 NRC EXAM

**Handout Package for
Applicant**

**WATTS BAR NUCLEAR PLANT
JOB PERFORMANCE MEASURE**

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**2019-301 NRC EXAM
APPLICANT CUE SHEET**

(RETURN TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 Conditions:

- Unit was in Mode 1, 100% Power
- National Weather Service provided wind direction is 270° with an average speed of 10 mph
- CCP 1B-B is tagged for maintenance
- 6.9kV Shutdown Boards 1A and 2B have been LOST with no expected time of recovery available
- An oil fire at the Power Stores loading dock has introduced a large amount of smoke into the Control Room
- The Operating crew has abandoned the Main Control Room
- 1-AOI-27 and 2-AOI-27, Main Control Room Inaccessibility, are being implemented
- When the Transfer Switch for CCP 1A-A is taken to AUX, CCP 1A-A breaker OPENS and CANNOT be RECLOSED
- There are NO impediments to evacuation
- You are the Shift Manager

INITIATING CUES:

- Identify the Initiating Condition and the required EPIP Appendix A, Initial Notification Form
- The current time is (CURRENT TIME)

Initiating Condition (IC): _____

EPIP Procedure: _____

THIS TASK IS TIME CRITICAL!