

Final Submittal
(Blue Paper)

FINAL SIMULATOR SCENARIOS

CATAWBA
2007-301

Facility: <u>Catawba Nuclear Station</u>		Scenario No.: <u>NRC-1</u>		Op-Test No.: <u>1</u>	
Examiners: _____		Operators: _____		_____	
_____		_____		_____	
_____		_____		_____	
Initial Conditions: 100% RTP EOL					
<p>Turnover: 1A CA Pump T/O for PM's expected return to service is 12 hours. 1A NS Pump T/O for PM's expected return to service is 14 hours. No other equipment inoperable. OP/1/A/6100/003, Controlling Procedure for Unit Operation, Enclosure 4.3 completed through step 2.9. Maintain 100% RTP Swap trains of NV (1B NV running with 1A S/D) per normal equipment rotation</p>					
Event No.	Malf. No.	Event Type*	Event Description		
1	BOP	N	Swap trains of NV per normal equipment rotation		
2	RO	I	Tref failure (low)		
3a	BOP	C	KC Pump Trip		
3b	SRO	TS			
4a	BOP	I	PZR Pressure Channel 1 failure (high)		
4b	SRO	TS			
5	RO	C	S/G 1B PORV fails open (must be isolated)		
6a	RO	R	Generator PCB opens causing runback to 48% with manual Rods. Boration for Rod Insertion Limits		
6b	BOP	R			
7	ALL	M	Large Break LOCA <u>Additional Failures:</u> 1NI-9A (high head injection valve) fails to open (must be opened manually) Failure to automatically swap to Cold Leg Recirculation (must be manually aligned) Failure of A train to manually align to Cold Leg Recirculation		
*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

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 Simulator Scenario #1

Op-Test No.: NRC Scenario No.: __1__ Event No.: __1__		Page 1 of 1
Event Description: Swap of the operating charging pump for normal equipment rotation		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: The Initial Conditions of this procedure and any prebriefings should have been completed during the crew prebrief prior to coming on the simulator. Below are the actions taken to actually perform the swap.
		The crew will use OP/1/A/6200/001 (Chemical Volume and Control System) Enclosure 4.13 (Shifting the Operating Charging Pump).
	BOP	<p>NOTE: This enclosure will affect reactivity of the core and is therefore designated important to Reactivity Management per the guidelines of NSD 304 (Reactivity Management). (R.M.)</p> <p>2.1 Shift the operating centrifugal charging pump by completing the following steps:</p> <p>CAUTION: If an NV Pump has been idle for an extended period of time, a boron transient may be initiated when it is placed in service. The volume of 1A NV Pump and associated piping is 103 gallons, the volume of 1B NV Pump and associated piping is 65 gallons; the magnitude of the transient should be minimal.</p> <p>NOTE: If in an emergency situation, the 30 second delay after starting the Aux Oil Pump is NOT required before starting the NV pump.</p> <p>2.1.1 Ensure VCT pressure is between 18-40 psig as read on 1NVP5500 (VCT Vent Press) (1MC5).</p> <p>2.1.2 30 seconds prior to starting the idle NV pump, place its associated aux oil pump in the "ON" position:</p> <ul style="list-style-type: none"> • "NV PUMP 1A AUX OIL PMP" • "NV PUMP 1B AUX OIL PMP" • <p>2.1.3 Start the idle NV pump. (R.M.)</p> <ul style="list-style-type: none"> • "NV PMP 1A" • "NV PMP 1B" • <p>2.1.4 Place the NV pump aux oil pump started in Step 2.1.2 in "AUTO".</p> <p>2.1.5 Stop the previously running NV pump:</p> <ul style="list-style-type: none"> • "NV PMP 1A" • "NV PMP 1B" • <p>2.1.6 Verify proper charging flow rate.</p>
		End Event

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Time	Position	Applicant's Actions or Behavior
Op-Test No.: NRC Scenario No.: __1__ Event No.: __2__		Page 1 of 1
Event Description: Tref failure		
		Enter AP/1/A/5500/015 (Rod Control Malfunction (Case II))
	RO	Ensure CRD Bank Select Switch in Manual
	RO	Verify all rod motion stops
	RO	EXAMINER NOTE: Tref values can be determined from the OAC or AP/1/A/5500/029 (Loss of Vital or Aux Control Power) Enclosure 29. Manually adjust control rods as necessary to maintain Tavg within 1°F of T-Ref.
	RO	Verify the parameters normal for existing plant conditions: Channel 1 Impulse pressure T-Ref.
	RO	When TAVE is ± 2 of Tref, then place Steam Dumps in Pressure Mode
	RO	Ensure "STM DUMP CTRL" pot- SET AT 8.43 (1090 PSIG STEAM HEADER PRESSURE).
	RO	Place "STM DUMP CTRL" in manual.
	RO	Adjust "STM DUMP CTRL" to 0% demand.
	RO	Place the steam dumps in pressure mode.
	RO	Place the "STM DUMP CTRL" in automatic.
	RO	IF Channel 1 Turbine Impulse Pressure failed, THEN (not applicable)
	RO	Verify Parameters normal for plant conditions. NC Tave loops A-D
	SRO	Determine and correct cause of continuous rod movement.
	SRO	Ensure compliance with appropriate Tech Specs. EXAMINER NOTE: No TS are affected. The next malfunction may be inserted anytime after this point.
	SRO	Determine required notifications. None
	RO	When the problem is repaired then return rod control to auto and steam dumps to mode required.
	SRO	Determine long term plant status.
		End Event

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Required Operator Actions

Form ES-D-2

Op-Test No.: NRC Scenario No.: <u> 1 </u> Event No.: <u> 3a </u>		Page 1 of 3
Event Description: KC Pump Trip		
Time	Position	Applicant's Actions or Behavior
		Recognize that the operating KC pump has tripped and that entry conditions for AP/1/A/5500/021, Loss of Component Cooling.
		Examiner Note: The crew may restore 1NV-153A to DEMIN position via annunciator response prior to the following AP addressing it.
		CAUTION: Failure to restore NC pump seal cooling via thermal barrier cooling or NV seal injection within 10 minutes will cause damage to the NC pump seals resulting in NC inventory loss
	ALL	Monitor Enclosure 1
	BOP	Verify at least one KC pump – ON
	BOP	Start at least one KC pump (If attempted, 1A2 KC pump will fail to start. 1B1 or 1B2 KC pump will have to be started.)
	BOP	IF no KC pump can be started, THEN perform the following: (not applicable.) IF AT ANY TIME all KC pumps are lost, THEN RETURN TO STEP 2.
		NOTE: Uncooled letdown may result in loss of NV pumps within a matter of minutes.
	BOP	Verify the following: 1AD-7, F/3 "LETDN HX OUTLET HI TEMP" – DARK and At least one KC pump – ON. Examiner Note: 1AD-7 F/3 was lit but should be dark by the time this step is read. SRO should determine that the RNO actions are not applicable.
	BOP	IF AT ANY TIME 1AD-7, F/3 "LETDN HX OUTLET HI TEMP" LIT, THEN perform Step 4 RNO.
	BOP	Verify both KC surge tank levels – 50%-90% AND STABLE.
	BOP	Start additional KC pump(s) as necessary to supply any KC loads presently in service.
		CAUTION: A loss of KC cooling to the NC pumps results in a gradual approach to an overheated condition in approximately 10 minutes which will result in shaft seizure.
	BOP	Verify KC flow to NC pumps 1AD-20, A/1 – DARK 1AD-21, A/1 – DARK
	BOP	Verify KC available as follows:

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	BOP	Verify the following Train A KC non-essential header isolation valves - OPEN: <ul style="list-style-type: none"> • 1KC-230A (Rx Bldg Non-Ess Hdr Isol) • 1KC-3A (Rx Bldg Non-Ess Hdr Isol) • 1KC-50A (Aux Bldg Non-Ess Hdr Isol) • 1KC-1A (Aux Bldg Non-Ess Ret Hdr "isol).
	BOP	Verify the following Train B KC non-essential header isolation valves - OPEN <ul style="list-style-type: none"> • 1KC-228B (Rx Bldg Non-Ess Hdr Isol) • 1KC-18B (Rx Bldg Non-Ess Ret Hdr Isol) • 1KC-53B (Aux Bldg Non-Ess Hdr Isol) • 1KC-2B (Aux Bldg Non-Ess Ret Hdr Isol).
	BOP	Start additional KC pump(s) as necessary to supply any KC loads.
	BOP	Verify KC surge tank levels normal 50%-90%
		Go to step 14
	BOP	Ensure KC heat exchanger outlet mode switches – PROPERLY ALIGNED A train mode select switch placed in mini-flow mode B train mode select switch placed in temp mode
	BOP	Determine and correct cause of loss of KC
	SRO	EXAMINER NOTE: This is the initiator for Event 3b which is shown in the next section. Ensure compliance with appropriate Tech Specs and SLCs. T.S. 3.7.7 condition A
	SRO	Determine required notifications: Determines event is not reportable
	BOP	If KC to RN leak in progress – No leak is suspected due to surge tank levels remaining stable.
	BOP	Verify KC Surge Tank Levels: <ul style="list-style-type: none"> • greater than 50% • stable or increasing
	BOP	When plant conditions permit, return equipment to normal alignment.
	BOP	Verify the following: Perform the following: <ul style="list-style-type: none"> • 1AD-7, F/3 "LETDN HX OUTLET HI TEMP" - DARK • 1AD-7, H/3 "VCT HI TEMP" - DARK • Normal letdown - IN SERVICE.
	BOP	Ensure VCT and letdown path aligned as follows: IF desired to align NV pump suction to VCT, then perform the following: (NA. suction is already aligned to the VCT)

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	BOP	b. WHEN NV suction aligned to VCT, THEN momentarily place 1NV-172A (3-Way Divert To VCT-RHT) to the "VCT" position and return to "AUTO".
	BOP	IF desired to restore letdown flow through the NV demineralizers, THEN momentarily place 1NV-153A (Letdn Hx Otlt 3-Way Vlv) to the "DEMIN" position and return to "AUTO".
	SRO	Determine long term plant status
		End Event

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Required Operator Actions

Form ES-D-2

Op-Test No.: NRC Scenario No.: __1__ Event No.: __3b__		Page 1 of 1
Event Description: KC Pump Trip		
Time	Position	Applicant's Actions or Behavior
Step 16		Per AP/1/A/5500/021 (Loss of KC) Ensure compliance with appropriate Tech Specs and SLCs.
	SRO	The SRO should determine one train of KC is inoperable. TS 3.7.7 Condition A applies with a 72 hour action to restore the train of KC to operable.

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Time	Position	Applicant's Actions or Behavior
Op-Test No.: NRC Scenario No.: <u> 1 </u> Event No.: <u> 4a </u>		Page 1 of 2
Event Description: PZR Pressure Channel Failure (High)		
		Crew enters AP/1/A/5500/011 (Pressurizer Pressure Anomalies) Case 1 (Press Decreasing)
	BOP	Verify all Pzr pressure channels – INDICATING THE SAME
	BOP	If either selected channel is failed high, THEN place "PZR PRESS CTRL SELECT" switch in any alternate operable channel position. Select switch is placed in the 3-2 position.
	BOP	Verify all Pzr PORVs – CLOSED
		NOTE Control rods may withdraw on decreasing NC pressure.
	BOP	Verify Pzr spray valve(s) – CLOSED
	BOP	Verify all heaters – ENERGIZED
	BOP	Ensure 1NV-37A (NV Supply To Pzr Aux Spray) – CLOSED.
		EXAMINER NOTE: The next malfunction may be entered anytime past this point.
		NOTE Positive reactivity is inserted during an increase in NC pressure which may cause auto rod insertion.
	BOP	Verify NC pressure – STABLE OR INCREASING.
	RO	When NC pressure is stable, THEN: b. Stabilize unit at appropriate power level. c. Adjust the following as required to maintain T-Avg within 1°F of T-Ref. <ul style="list-style-type: none"> • Turbine load • Control Rods • Boron Concentration
	BOP	Notifies IAE to fail bistables within 6 hours <ul style="list-style-type: none"> • Pzr low pressure S/I • OT Delta T • Pzr high pressure Reactor Trip • Pzr low pressure Reactor Trip
	SRO	EXAMINER NOTE: This is the initiator for Event 4b which is shown in the next section. Ensure compliance with appropriate Tech Specs: 3.3.1, function 6 & 8 condition E&L; 3.3.2 function 1D condition D

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	BOP	Ensure "PZR PRESS TO REC SELECT" is selected to an operable channel
	SRO	Determine long term plant status.
		End Event

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Op-Test No.: NRC Scenario No.: __1__ Event No.: __4b__		Page 1 of 1
Event Description: PZR Pressure Channel Failure (High)		
Time	Position	Applicant's Actions or Behavior
		AP/1/A/5500/011 (Pressurizer Pressure Anomalies) Case 1 (Press Decreasing)
step 9	SRO	<p>Ensure compliance with appropriate Tech Specs: 3.3.1, 3.3.2</p> <p>The SRO should determine the following: All Reactor Trip and ESF functions done by PZR Pressure Channel 1 are inoperable and 3.3.1, function 6 & 8 condition E&L; 3.3.2 function 1D condition D apply. All associated bistables must be placed in the trip condition in 6 hours.</p> <p>TS 3.3.4 is affected but no condition is applicable</p> <p>3.3.1 (Reactor Trip System (RTS) Instrumentation) 3.3.2 (Engineered Safety Features Actuation System (ESFAS) Instrumentation) 3.3.3 (Post Accident Monitoring (PAM) Instrumentation) n/a 3.3.4 (Remote Shutdown System) 3.4.1 (RCS Pressure, Temperature, and Flow Departure From Nucleate Boiling (DNB) Limits) n/a 3.4.4 (RCS Loops - MODES 1 and 2) n/a 3.4.5 (RCS Loops - MODE 3) n/a 3.4.6 (RCS Loops - MODE 4) n/a 3.4.9 (Pressurizer) n/a 3.4.10 (Pressurizer Safety Valves) n/a 3.4.11 (Pressurizer Power Operated Relief Valves (PORVs)) n/a 3.4.13 (RCS Operational Leakage). n/a</p>

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Op-Test No.: NRC Scenario No.: <u> 1 </u> Event No.: <u> 5 </u>		Page 1 of 2
Event Description: S/G 1B PORV fails open (must be isolated)		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: The crew may attempt to close the PORV and its isolation valve per OMP 1-7 (Emergency/Abnormal Procedure Implementation Guidelines) General Philosophy Statement #10.
		Enter AP/1/A/5500/028 (Secondary Steam Leak)
	ALL	Monitor Enclosure 1
	RO	Verify Turbine – ONLINE
	RO	Verify reactor power – Less than or equal to 100% power Select Manual on turbine control panel Depress "Control Valve Lower pushbutton and reduce turbine load to maintain: reactor power – Less than or equal to 100% power T-Ave – within 1.5°F of T-ref
	RO	Verify Reactor response <ul style="list-style-type: none"> • Control rods - IN "AUTO" AND STEPPING IN • P/R neutron flux - DECREASING. – rods are in manual due to earlier failure. Manually insert control rods as required to maintain T-Ave within 1.°F of T-ref
	All	If at any time reactor power is greater than 100%, then perform step 3 RNO.
	BOP	Verify Pzr level – STABLE OR INCREASING If at any time while in this procedure PZR level is decreasing in an uncontrolled manner, then return to step 6.
	BOP	IF AT ANY TIME VCT level goes below 23%, THEN align NV pump suction to FWST as follows: a. Open the following valves: <ul style="list-style-type: none"> • 1NV-252A (NV Pumps Suct From FWST) • 1NV-253B (NV Pumps Suct From FWST). b. Close the following valves: <ul style="list-style-type: none"> • 1NV-188A (VCT Otlt Isol) • 1NV-189B (VCT Otlt Isol).
	BOP	Attempt to identify and isolate leak as follows: Verify the following conditions – NORMAL <ul style="list-style-type: none"> • Containment temperature • Containment pressure • Containment humidity • Containment floor & equip. sump

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	BOP	Dispatch operators to locate and identify source of steam leak
	RO	Verify S/G PORVs – CLOSED. Determine the 1B S/G PORV is open.
	RO	IF S/G pressure is less than 1090 PSIG, THEN perform the following: <ul style="list-style-type: none"> • Close affected SG PORV
	RO	If PORV still open, close isolation valve
	RO	If isolation valve open, dispatch NLO to close SG PORV isolation valve.
	RO	Verify condenser dump valves - CLOSED
	RO	Verify atmospheric dump valves - CLOSED
	RO	Verify CA PMP #1 - OFF.
	BOP	If leak is suspected to be in a doghouse, THEN close the following valves: (This step is not required since location of steam leak is known and closing the valves would have no effect.)
	SRO	Determine required notifications
	SRO	Notify RP of leak
		Examiner Note: Depending on timing of the scenario, the leak may not yet be isolated. Steps are provided if the leak is not isolated.
	SRO	Verify – LEAK ISOLATED
	SRO	Determine long term plant status. RETURN TO procedure and step in effect.
		Examiner Note: Depending on timing of the scenario, the leak may not yet be isolated. Steps are provided if the leak is not isolated. Shortly after this flowpath split, the leak should be isolated. Steps are given for examiner convenience.
	RO	GO TO Step 14. Verify UST level - STABLE OR INCREASING. Verify - REACTOR CRITICAL.
	RO	Determine approximate steam leak size as follows: a. Verify - TURBINE ONLINE. b. Ensure stable plant conditions: <ul style="list-style-type: none"> • Stable T-Avg • Condenser dump valves closed.
	RO	NOTE Secondary plant configuration can affect Thermal Power Best Estimate. Diverse reactor power indications should be used to determine reactor power. c. Determine percent turbine power as follows: 1) Divide turbine impulse pressure by 100% power value for turbine impulse pressure. REFER TO OAC Data Book for 100 % power value for turbine impulse pressure. 2) Multiply result by 100.
	RO	d. Verify difference between reactor power and turbine power - LESS THAN 5%.
		End Event

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Op-Test No.: NRC Scenario No.: <u> 1 </u> Event No.: <u> 6a </u>		Page 1 of 3
Event Description: Generator PCB opens causing Turbine runback with Rods in manual		
Time	Position	Applicant's Actions or Behavior
		The crew will enter AP/1/A/5500/003 (Load Rejection) CASE I (Switchyard Available)
	RO	Verify turbine load – DECREASING IN AUTOMATIC.
	RO	Verify proper reactor response: Control rods – IN "AUTO" AND STEPPING IN P/R neutron flux – DECREASING.
	RO	IF T-Avg is greater than 1.5°F higher than T-Ref, THEN manually insert control rods as required to maintain T-Avg within 1°F of T-Ref.
	RO	Verify proper steam dump operation as follows: Verify T-Ref instrumentation – AVAILABLE.
	RO	IF T-Avg Coastdown is in progress, THEN determine T-Ref from table. REFER TO Enclosure 4 (T-Ref Value Following Runback/Power Reduction). (This step is not applicable)
	RO	"C-9 COND AVAILABLE FOR STM DUMP" status light (1SI-18) – LIT.
	RO	Verify the following: <ul style="list-style-type: none"> • "C-7A LOSS OF LOAD INTLK COND DUMP" status light (1SI-18) – LIT. • Steam dump valves – MODULATING.
	RO	<p>EXAMINER NOTE: The Steam Dumps are in Pressure Mode due to a previous event. Depending on timing, the crew may or may not have to operate the dumps at this step.</p> <p>If steam dumps are still closed the following steps will be read:</p> <p>If steam dump valves are closed AND T-Avg is 3°F greater than T-Ref, THEN:</p> <ol style="list-style-type: none"> 1) Place "STM DUMP CTRL" in manual. 2) Adjust "STM DUMP CTRL" to 0% demand. 3) Place the steam dumps in pressure mode. 4) Manually operate condenser steam dump valves to maintain T-Avg at T-Ref.
	RO	T-Avg – DECREASING TO T-REF.
	BOP	Verify Pzr PORV and Pzr spray valve status as follows: <ol style="list-style-type: none"> a. All Pzr PORVs – CLOSED.
	BOP	Normal Pzr spray valves – CLOSED.
	BOP	Verify proper CM System operation as follows: WHEN reactor power is less than 75%, THEN ensure both C-htr drain pumps – OFF. BOP should stop C heater drain pumps A & B.

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	RO	Verify reactor power – GREATER THAN 56% PRIOR TO THE EVENT.
	BOP	Verify standby hotwell pump(s) - ON.
		Manually start standby hotwell pump(s) as necessary. (Not required)
	BOP	Verify standby condensate booster pump(s) - ON.
		Manually start standby condensate booster pump(s) as necessary. (Not required)
	BOP	Verify the following generator alarms – DARK: 1AD-11, C/1 “GEN BKR A OVER CURRENT” 1AD-11, F/1 “GEN BKR B OVER CURRENT”.
	RO	Verify S/G levels are adequate as follows: All S/G low level alert alarms (1AD-4) – DARK All S/G low CF flow alarms (1AD-4) – DARK.
	RO	Verify reactor power – GREATER THAN 20%.
	RO	IF AT ANY TIME reactor power is less than or equal to 20%, THEN perform Step 8 RNO.
	BOP	Verify AS header pressure – GREATER THAN OR EQUAL TO 140 PSIG.
	BOP	Monitor Enclosure 3 (Rod Insertion Limit Boration). EXAMINER NOTE: <ul style="list-style-type: none"> • See Attachment 1 • This is the initiator of Event 6b shown in the next section
	RO	Verify reactor power – LESS THAN 30%.
	RO	Perform the following: 3) IF the runback target load is less than 30%, THEN: (This step is not applicable)
	RO	WHEN the appropriate runback target load is reached, THEN: 1) Stabilize unit at current power level. 2) Maintain control rods above insertion limits. 3) Adjust the following as required to maintain T-Avg within 1°F of T-Ref: <ul style="list-style-type: none"> • Turbine load • Control rods • Boron concentration.
	SRO	GO TO Step 14.
	BOP	Verify the following PCBs – CLOSED: Generator breaker 1A Generator breaker 1B PCB 14 PCB 15 PCB 17 PCB 18.
	RO	Adjust power factor as necessary. REFER TO Unit 1 Revised Data Book Figure 43.

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	RO	WHEN the appropriate runback target load is reached, THEN: Stabilize unit at appropriate power level. Maintain control rods above insertion limits. Adjust the following as required to maintain T-Avg within 1°F of T-Ref: Turbine load Control rods Boron concentration.
	RO	Notify System Operating Center (SOC) using the red dispatcher telephone of current unit status.
	SRO	Determine and correct cause of load rejection.
	RO	Shutdown unnecessary plant equipment
		End Event

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Op-Test No.: _NRC_ Scenario No.: __3__ Event No.: _6b__		Page 1 of 3
Event Description: Boration due to rods below insertion limits		
Time	Position	Applicant's Actions or Behavior
	BOP	Monitor Enclosure 3 (Rod Insertion Limit Boration). EXAMINER NOTE: See Attachment 1
	BOP	Refer to OP/1/A/6150/009, Boron Concentration Control. Enclosure 4.2
	BOP	Ensure the following valve control switches in "AUTO": 1NV-238A (B/A Xfer Pmp To Blender Ctrl) 1NV-186A (B/A Blender Otlt To VCT Otlt)
	BOP	Ensure 1NV-238A (B/A Xfer Pmp to Blender Ctrl) controller in "AUTO".
	BOP	Ensure at least one boric acid transfer pump in "AUTO" or "ON".
	BOP	Adjust the boric acid batch counter to the desired volume of boric acid to be added.
	BOP	Place the "NC MAKEUP MODE SELECT" switch in "BORATE".
	BOP	NOTE: Boric Acid flow rates > 32 gpm (controller pot setting of 8) may result in a boric acid flow deviation annunciator. Adjust the controller for 1NV-238A (B/A Xfer Pmp to Blender Ctrl) controller to the desired flow.
	BOP	NOTE: If necessary, boration can be manually secured at any time by placing the "NC MAKEUP CONTROL" switch to the "STOP" position. Place the "NC MAKEUP CONTROL" switch in "START" position.
	BOP	Verify the following valves open: 1NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv) 1NV-186A (B/A Blender Otlt To VCT Otlt)
	BOP	IF in "AUTO", verify the boric acid transfer pump starts.
	BOP	Verify proper flow by observing the boric acid flow totalizer.
	BOP	WHEN the desired volume of boric acid is reached on the boric acid batch counter, ensure the following valves close: 1NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv) 1NV-186A (B/A Blender Otlt To VCT Otlt)

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	BOP	<p>IF desired, flush the makeup line as follows:</p> <p>Open the following valves:</p> <p>1NV-242A (RMWST To B/A Blender Ctrl) 1NV-186A (B/A Blender Otlt To VCT Otlt)</p> <p>Ensure one reactor makeup water pump is in "ON".</p> <p>WHEN ~20 gallons of makeup water have been flushed through the makeup line, close the following valves:</p> <p>1NV-242A (RMWST To B/A Blender Ctrl) 1NV-186A (B/A Blender Otlt To VCT Otlt)</p> <p>Place the following valve control switches in "AUTO":</p> <p>1NV-242A (RMWST To B/A Blender Ctrl) 1NV-186A (B/A Blender Otlt To VCT Otlt)</p> <p>IF NOT required for current plant operation, place the reactor makeup water pump started in earlier step in "AUTO".</p>
	BOP	<p>IF automatic makeup is desired, refer to Enclosure 4.1 (Automatic Makeup).</p> <p>EXAMINER NOTE: The following steps are Enclosure 4.1 actions if the applicant returns makeup to automatic.</p>
	BOP	<p>Determine the boric acid flow rate (V_a) for the desired concentration by the following calculation:</p> $V_a = V_b (C_b - C_w) / (C_a - C_w)$ <p>where V_b is the blender outlet flow rate, C_b is the desired outlet boron concentration, C_w is the RMWST boron concentration and C_a is the BAT boron concentration</p>
	BOP	<p>IF previous makeups have demonstrated an inability to achieve the desired boric acid flow rate, determine the amount of correction needed.</p> <p>_____ gpm.</p>
	BOP	<p>Determine the setpoint for the boric acid controller as follows:</p> <p>Setpoint = V_a + correction from Step 2.3 / 4</p>
	BOP	<p>Adjust the controller for 1NV-238A (B/A Xfer Pmp To Blender Ctrl) to the value determined in Step 2.4.</p>

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	BOP	Ensure the following valve control switches in "AUTO": 1NV-181A (B/A Blender Otlt To VCT) 1NV-186A (B/A Blender Otlt To VCT Otlt) 1NV-238A (B/A Xfer Pmp To Blender Ctrl) 1NV-242A (RMWST To B/A Blender Ctrl)
	BOP	Ensure the following valve controllers in "AUTO": 1NV-242A (RMWST To B/A Blender Ctrl) 1NV-238A (B/A Xfer Pmp To Blender Ctrl)
	BOP	Ensure at least one reactor makeup water pump is in "AUTO" or "ON".
	BOP	Ensure at least one boric acid transfer pump is in "AUTO" or "ON".
	BOP	Place the "NC MAKEUP MODE SELECT" switch in "AUTO".
		End Event

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Appendix D, Rev. 9

Required Operator Actions

Form ES-D-2

Op-Test No.: <u> NRC </u> Scenario No.: <u> 3 </u> Event No.: <u> 7 </u>		Page 1 of 11
Event Description: Large Break LOCA		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: Steps 2 through 5 are Immediate Action steps and are required to be performed from memory.
	SRO	Enters EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection) and directs operators.
	ALL	Monitor Enclosure 1 (Foldout Page)
	RO	Verify Reactor Trip: <ul style="list-style-type: none"> • All rod bottom lights – LIT • All reactor trip and bypass breakers – OPEN • I/R amps – DECREASING
	RO	Verify Turbine Trip: <ul style="list-style-type: none"> • All turbine stop valves – CLOSED OR <ul style="list-style-type: none"> • Both of the following: <ul style="list-style-type: none"> • All MSIVs – CLOSED • All MSIV bypass valves – CLOSED.
	BOP	Verify 1ETA and 1ETB – ENERGIZED.
	BOP	Verify S/I is actuated: <ol style="list-style-type: none"> a. "SAFETY INJECTION ACTUATED" status light (1SI-13) – LIT. b. E/S load sequencer actuated status lights (1SI-14) – LIT.
	RO	Announce "Unit 1 Safety Injection".
	SRO	Implement RP/0/A/5000/01 (Classification Of Emergency) and RP/0/A/5000/13 (NRC Notifications)
	RO	Verify all Feedwater Isolation status lights (1SI-5) – LIT
	BOP	Verify Phase A Containment Isolation status as follows: <ol style="list-style-type: none"> a. Phase A "RESET" lights – DARK b. Monitor Light Panel Group 5 St lights – LIT

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	BOP	Verify proper Phase B actuation as follows: a. Containment pressure – HAS REMAINED LESS THAN 3 PSIG.
	BOP	a. Perform the following: NOTE This time may be used later to determine when to align ND Aux spray. 1) Record approximate time of reactor trip. 2) Verify NS pumps – INDICATING FLOW. 3) IF flow is not indicated, THEN manually initiate Phase B Isolation for affected train(s). 4) Verify Phase B Isolation has actuated as follows: a) Phase B Isolation “RESET” lights – DARK. b) IF Phase B Isolation “RESET” lights are lit, THEN manually initiate Phase B Isolation. c) Verify following monitor light panel lights – LIT: <ul style="list-style-type: none"> • Group 1 Sp lights • Group 5 Sp lights • Group 5 St lights L/11 and L/12. d) IF monitor light panel not in correct alignment, THEN ensure correct alignment. EXAMINER NOTE: 1A NS is tagged. The crew should reference the below RNO and determine to NOT take the action. e) IF NS pump(s) did not start, THEN perform the following for the affected train(s): <ol style="list-style-type: none"> (1) Reset ECCS. (2) Reset D/G load sequencer. (3) Manually start affected NS pump. (4) IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on. 5) Stop all NC pumps. 6) Maintain seal injection flow. EXAMINERS NOTE: See attachment 2 for the following enclosure. 7) WHEN 9 minutes has elapsed, THEN verify proper VX system operation. REFER TO Enclosure 7 (VX System Operation). 8) GO TO Step 11.

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	RO	Verify proper CA pump status as follows: a. Motor driven CA pumps – ON EXAMINER NOTE: 1A CA is tagged. The crew should reference the below RNO and determine to NOT take the action. RNO a. Perform the following for the affected train(s): 1) Reset ECCS. 2) Reset D/G load sequencer. 3) Manually start affected motor driven CA pump. 4) IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on.
	RO	3 S/G N/R levels – GREATER THAN 11%.
	BOP	Verify all of the following S/I pumps – ON: <ul style="list-style-type: none"> • NV pumps • ND pumps • NI pumps
	BOP	Verify all KC pumps – ON. Perform the following for the affected train(s): 1) Reset ECCS. 2) Reset D/G load sequencer. 3) Manually start affected pump. 4) If at any time a B/O occurs, THEN restart S/I equipment previously on.
	BOP	Verify all Unit 1 and Unit 2 RN pumps – ON.
	BOP	Verify proper ventilation systems operation as follows: <ul style="list-style-type: none"> • <u>REFER TO</u> Enclosure 2 (Ventilation System Verification) EXAMINER NOTE: See Attachment 3 <ul style="list-style-type: none"> • Notify Unit 2 operator to perform Enclosure 3 (Opposite Unit Ventilation Verification)
	RO	Verify all S/G pressures – GREATER THAN 775 PSIG.
	BOP	Verify proper S/I flow as follows: a. “NV S/I FLOW” – INDICATING FLOW
	BOP	b. NC Pressure – LESS THAN 1620 PSIG c. NI pumps – INDICATING FLOW. d. NC pressure – LESS THAN 285 psig. e. ND pumps – INDICATING FLOW TO C-LEGS.

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	RO	Control S/G levels as follows: a. Verify total CA flow – GREATER THAN 450 GPM. b. <u>WHEN</u> at least one S/G N/R level is greater than 11% (29% ACC), <u>THEN</u> throttle feed flow to maintain all S/G N/R levels between 11% (29% ACC) and 50%.
	RO	Verify all CA isolation valves – OPEN.
	BOP	Verify S/I equipment status based on monitor light panel – IN PROPER ALIGNMENT. EXAMINER NOTE: 1NI-9A failed to open. If the BOP hasn't opened the valve by this point, then it will be dark on the monitor light panel, and the BOP should open the valve.
	RO	NOTE: Enclosure 4 (NC Temperature Control) shall remain in effect until subsequent procedures provide alternative NC temperature control guidance. Control NC temperature. <u>REFER TO</u> Enclosure 4 (NC Temperature Control).
	BOP	Verify Pzr PORV and Pzr spray valve status as follows: All Pzr PORVs – CLOSED. Normal Pzr spray valves – CLOSED. At least one Pzr PORV isolation valve - OPEN.
	RO	Verify NC subcooling based on core exit T/Cs – GREATER THAN 0°F.
	RO	IF any NV OR NI pump is on, THEN: a. Ensure all NC pumps - OFF. b. Maintain seal injection flow.
	RO	Verify main steamlines are intact as follows: <ul style="list-style-type: none"> • All S/G pressures – STABLE OR INCREASING • All S/Gs – PRESSURIZED.
	BOP	Verify S/G tubes are intact as follows: <ul style="list-style-type: none"> • Verify the following EMF trip 1 lights - DARK: • 1EMF-33 (Condenser Air Ejector Exhaust) • 1EMF-26 (Steamline 1A) • 1EMF-27 (Steamline 1B) • 1EMF-28 (Steamline 1C) • 1EMF-29 (Steamline 1D). (all lights will be dark) <ul style="list-style-type: none"> • SG levels stable or increasing in controlled manner
	BOP	Verify NC System is intact as follows: Containment pressure - LESS THAN 1 PSIG.

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	BOP	Perform the following: a. IF both the following conditions exist, (This step is not applicable) <ul style="list-style-type: none"> • Containment pressure – GREATER THAN 1 PSIG • Containment pressure – HAS REMAINED LESS THAN 3 PSIG THEN manually start one VX fan. REFER TO Enclosure 5 (VX Fan Manual Start). b. Concurrently: <ul style="list-style-type: none"> • Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees). • GO TO EP/1/A/5000/E-1 (Loss Of Reactor Or Secondary Coolant).
		At this point an Orange Path will exist for NC Integrity causing the crew to enter EP/1/A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock Condition)
	BOP	Verify NC pressure - GREATER THAN 285 PSIG.
	BOP	IF ND flow to C-Legs is greater than 675 GPM, THEN RETURN TO procedure and step in effect.
		Crew will enter EP/1/A/5000/E-1 (Loss Of Reactor Or Secondary Coolant).
		EXAMINER NOTE: The crew will exit EP/1/A/5000/E-1 (Loss Of Reactor Or Secondary Coolant) and at some point will transition to EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirculation) on FWST Level from Enclosure 1 guidance of E-1. EP/ES-1.3 actions begin on page 9.
	ALL	Monitor Enclosure 1 (Foldout Page).
	RO	Verify main steamlines are intact. All S/G pressures - STABLE OR INCREASING All S/Gs - PRESSURIZED.
	RO	Control intact S/G levels Verify N/R level in all intact S/Gs GREATER THAN 11% (29% ACC). b. Throttle feed flow to maintain all intact S/G N/R levels between 11% (29% ACC) and 50%.

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BOP	<p>Verify Secondary Radiation is normal</p> <p>a. Ensure the following signals - RESET:</p> <ol style="list-style-type: none"> 1) Phase A Containment Isolations 2) CA System valve control 3) KC NC NI NM St signals. <p>b. Align all S/Gs for Chemistry sampling.</p> <p>c. Perform at least one of the following:</p> <ul style="list-style-type: none"> • Notify Chemistry to sample all S/Gs for activity. <p>OR</p> <ul style="list-style-type: none"> • Notify RP to frisk all cation columns for activity. <p>d. Verify the following EMF trip 1 lights - DARK:</p> <ul style="list-style-type: none"> • 1EMF-33 (Condenser Air Ejector Exhaust) • 1EMF-26 (Steamline 1A) • 1EMF-27 (Steamline 1B) • 1EMF-28 (Steamline 1C) • 1EMF-29 (Steamline 1D). <p>e. WHEN activity results are reported THEN verify all S/Gs indicate no activity.</p>	
BOP	<p>Verify PZR PORV normal</p> <p>a. Power to all Pzr PORV isolation valves - AVAILABLE.</p> <p>b. All Pzr PORVs - CLOSED.</p> <p>c. At least one Pzr PORV isolation valve - OPEN.</p> <p>d. IF AT ANY TIME a Pzr PORV opens due to high pressure, THEN, after Pzr pressure decreases to less than 2315 PSIG, ensure the valve closes or is isolated.</p>	
BOP	<p>Verify SI Termination Criteria</p> <p>a. NC subcooling based on core exit T/Cs - GREATER THAN 0°F. GO TO Step 6.f.</p> <p>Monitor S/I termination criteria. REFER TO Enclosure 2 (S/I Termination Criteria).</p> <p>IF AT ANY TIME S/I termination criteria is met while in this procedure, THEN RETURN TO Step 6.</p>	

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	BOP	Verify proper NS pump operation as follows: a. At least one NS pump - ON. b. Verify the following valves - OPEN: <ul style="list-style-type: none"> • 1FW-27A (ND Pump 1A Suct From FWST) • 1FW-55B (ND Pump 1B Suct From FWST). Containment pressure - LESS THAN 2.4 PSIG. Perform the following: 1) WHEN containment pressure is less than 2.4 PSIG, THEN perform Step 7. 2) GO TO Step 8.
	BOP	Verify criteria to stop operating ND pumps as follows: a. NC pressure - GREATER THAN 285 PSIG. GO TO Step 10
	RO	Verify NC and S/G pressures as follows: a. All S/G pressures - STABLE OR INCREASING. b. NC pressure - STABLE OR DECREASING.
	BOP	Verify conditions to stop operating D/Gs as follows: a. At least one D/G - ON. b. Verify 1ETA is energized by offsite power "D/G 1A BKR TO ETA" - OPEN 1ETA - ENERGIZED. c. WHEN S/I is reset, THEN dispatch operator to stop 1A D/G and place in standby readiness. REFER TO OP/1/A/6350/002 (Diesel Generator Operation). d. Verify 1ETB is energized by offsite <ul style="list-style-type: none"> • "D/G 1B BKR TO ETB" - OPEN • 1ETB - ENERGIZED. e. WHEN S/I is reset, THEN dispatch operator to stop 1B D/G and place in standby readiness. REFER TO OP/1/A/6350/002 (Diesel Generator Operation).
	BOP	Ensure S/I – RESET: <ul style="list-style-type: none"> • ECCS. • D/G load sequencers. IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on.

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	BOP	<p>Obtain Containment H2 concentration.</p> <p>Ensure operator has been dispatched to secure all ice condenser air handling units. REFER TO Enclosure 3 (Securing All Ice Condenser Air Handling Units).</p> <p>Verify containment H2 analyzers – IN SERVICE.</p> <p>1) Dispatch operator to place containment H2 analyzers in service. REFER TO OP/1/A/6450/010 (Containment Hydrogen Control System).</p> <p>2) WHEN H2 analyzers are in service, THEN perform Steps 11.c through 11.e.</p> <p>3) GO TO Step 12.</p>
	BOP	<p>Initiate evaluation of plant status as follows:</p> <p>a. Verify S/I systems – ALIGNED FOR INJECTION MODE.</p> <p>b. Verify Cold Leg Recirc capability as follows:</p> <p>1) At least one ND pump – on</p> <p>2) Verify power to all of the following AVAILABLE:</p> <ul style="list-style-type: none"> • 1FW-27A (ND Pump 1A Suct From FWST) • 1NI-185A (ND Pump 1A Cont Sump Suct) • 1ND-28A (ND Supply To NV & 1A containment sump NI Pmps) • 1FW-55B (ND Pump 1B Suct From FWST) • 1NI-184B (ND Pump 1B Cont Sump Suct) • 1NI-332A (NI Pump Suct X-From ND) • 1NI-333B (NI Pump Suct From Emergency Coolant Recirculation). • 1NI-334B (NI Pump Suct X-Over From ND) • 1NI-136B (ND Supply To NI Pump 1B).
	BOP	<p>Verify power to all of the following valves – AVAILABLE:</p> <ul style="list-style-type: none"> • 1NI-115A (NI Pump 1A Miniflow) • 1NI-144A (NI Pump 1B) • 1NI-147B (NI Pump Miniflow Hdr To FWST Isol).
	BOP	<p>Verify the “ENABLE” lights for the following switches – LIT</p> <ul style="list-style-type: none"> • “C-LEG RECIR FWST TO CONT SUMP SWAP TRN A” • “C-LEG RECIR FWST TO CONT SUMP SWAP TRN B”.
	BOP	<p>Verify auxiliary building radiation is normal as follows:</p> <ul style="list-style-type: none"> • EMF-41 (Aux Bldg Ventilation) trip 1 light – DARK • All area monitor EMF trip 1 lights – DARK.

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	BOP	<p>WHEN the TSC is activated AND staffed, THEN:</p> <ol style="list-style-type: none"> 1) Notify the Reactor Engineer to assess core damage. REFER TO RP/0/A/5000/015 (Core Damage Assessment). 2) Notify Chemistry to obtain current NC boron concentration. 3) WHEN ND is aligned for Cold Leg Recirc, THEN notify Chemistry to obtain current containment sump boron concentration. 4) Notify Operating Engineer of the following: <ol style="list-style-type: none"> a) VA is required to be aligned to normal within 72 hours of the event. b) Evaluate aligning VA to normal mode. REFER TO OP/0/A/6450/003 (Auxiliary Building Ventilation System). <p>Notify station management to evaluate starting additional plant equipment to assist in recovery.</p>
	RO	<p>Verify NC System cooldown and depressurization is required as follows:</p> <ol style="list-style-type: none"> a. NC pressure - GREATER THAN 285 PSIG. a. IF ND flow to C-Legs is greater than 675 GPM, THEN GO TO Step 14.
	BOP	<p>Verify transfer to Cold Leg Recirc as follows:</p> <ol style="list-style-type: none"> a. FWST level - LESS THAN 37% (1AD-9, D/8 "FWST 2/4 LO LEVEL" - LIT). <p>Verify CLR is required. Loop until get conditions.</p>
		<p>Crew will enter EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirculation) when 2/4 FWST Levels are < 37%.</p> <p>EXAMINER NOTE: The crew will exit E-1 and Enter ES-1.3 on FWST Level from Enclosure 1 guidance of E-1</p>
	ALL	<p>Monitor Enclosure 1 (Foldout Page).</p>
		<p>CAUTION S/I recirculation flow to NC System must be maintained at all times.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Steps 2 through 8 should be performed without delay. • CSF should not be implemented until directed by this procedure.
	BOP	<p>Verify at least one of the following annunciators - LIT:</p> <p>1AD-20, B/3 "CONT. SUMP LEVEL >3.3 ft"</p> <p>OR</p> <p>1AD-21, B/3 "CONT. SUMP LEVEL >3.3 ft".</p>
	BOP	<p>Verify KC flow to ND heat exchangers - GREATER THAN 5000 GPM.</p>
	BOP	<p>Ensure S/I - RESET:</p> <ol style="list-style-type: none"> a. ECCS. b. D/G load sequencers. c. IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on.

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	BOP	Align S/I system for recirc as follows: a. Verify following valves - OPEN: <ul style="list-style-type: none"> • 1NI-185A (ND Pump 1A Cont Sump Suct) • 1NI-184B (ND Pump 1B Cont Sump Suct).
	BOP	Perform the following: 1) Manually open affected valve(s). 2) IF valve(s) will not open, THEN: a) Stop the ND pump(s) associated with a closed containment sump suction valve(s). b) Close the associated ND pump(s) suction valve from the FWST: <ul style="list-style-type: none"> • 1FW-27A (ND Pump 1A Suct From FWST) • 1FW-55B (ND Pump 1B Suct From FWST).
	BOP	WHEN the ND pump(s) suction valve from the FWST is closed, THEN perform the following: (1) Attempt to manually open the affected containment pump suction valve(s). <ul style="list-style-type: none"> • 1NI-185A (ND Pump 1A Cont Sump Suct) • 1NI-184B (ND Pump 1B Cont Sump Suct). (2) IF affected containment sump suction valve will not open, THEN dispatch two operators to open the affected valve(s): <ul style="list-style-type: none"> • 1NI-185A (ND Pump 1A Cont Sump Suct) (AB-545, EE-FF, 52-53, Rm 217) • 1NI-184B (ND Pump 1B Cont Sump Suct) (AB-545, FF-GG, 52-53, Rm 217). 3) IF both containment sump suction valves are closed, THEN: (This step is not applicable)
	BOP	Verify following valves - CLOSED: <ul style="list-style-type: none"> • 1FW-27A (ND Pump 1A Suct From FWST) • 1FW-55B (ND Pump 1B Suct From FWST).
	BOP	Verify ND pumps - ON.
	BOP	Perform the following: 1) Start ND pump(s) with suction aligned to an open containment sump suction valve. 2) IF no ND pump can be started OR no ND train can be aligned for recirc, THEN: (This step is not applicable)

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	BOP	Isolate NI pump miniflow as follows: 1) Verify NC pressure - LESS THAN 1620 PSIG. 2) Close the following valves: <ul style="list-style-type: none"> • 1NI-115A (NI Pump 1A Miniflow Isol) • 1NI-144A (NI Pump 1B Miniflow Isol). 3) Place "PWR DISCON FOR 1NI-147B" switch in "ENABLE". 4) Close 1NI-147B (NI Pump Miniflow Hdr To FWST Isol).
	BOP	Close the following valves: <ul style="list-style-type: none"> • 1ND-32A (ND Train 1A Hot Leg Inj Isol) • 1ND-65B (ND Train 1B Hot Leg Inj Isol).
	BOP	Verify at least one of the following NV pumps miniflow valves - CLOSED: <ul style="list-style-type: none"> • 1NV-203A (NV Pumps A&B Recirc Isol) OR <ul style="list-style-type: none"> • 1NV-202B (NV Pmps A&B Recirc Isol).
	BOP	Align ND train discharges to NI and NV pump suctions as follows: 1) Open the following valves: <ul style="list-style-type: none"> • 1NI-332A (NI Pump Suct X-Over From ND) • 1NI-333B (NI Pump Suct From ND). 2) Ensure 1NI-334B (NI Pump Suct X-Over From ND) - OPEN. EXAMINER NOTE: In the following step 1ND-28A will not open due to interlock requirements. 3) Open the following valves: <ul style="list-style-type: none"> • 1ND-28A (ND Supply To NV & 1A NI Pmps) • 1NI-136B (ND Supply To NI Pump 1B).
	BOP	Isolate FWST from NV and NI pumps as follows: 1) Place "PWR DISCON FOR 1NI-100B" switch in "ENABLE". 2) Close 1NI-100B (NI Pmps Suct From FWST). 3) Close the following valves: <ul style="list-style-type: none"> • 1NV-252A (NV Pumps Suct From FWST) • 1NV-253B (NV Pumps Suct From FWST).
	BOP	i. Verify proper recirc flow as follows: <ul style="list-style-type: none"> • "NV S/I FLOW" - INDICATING FLOW • NI pumps - INDICATING FLOW • ND pumps - INDICATING FLOW.
		End Event

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Op-Test No.: NRC Scenario No.: __1__ Event No.: ____		Page 1 of 1
Event Description: Critical Task Summary Sheet		
Time	Event	Applicant's Actions or Behavior
	2	Place rods in manual to stop unwarranted rod insertion.
	3a	Start at least 1 KC Pump prior to any equipment cooled by KC being secured on high temperature.
	5	Reduce Turbine load to maintain reactor power \leq 100%
	6a	Manually operate the control rods to maintain Tave
	7	Align one train of ND and both trains of NV and NI for cold leg recirculation

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Attachment 1

CNS AP/1/A/5500/003	LOAD REJECTION Enclosure 3 - Page 1 of 1 Rod Insertion Limit Boration	PAGE NO. 35 of 36 Revision 33
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1. **IF the control rods cannot be maintained above the rod insertion limits, THEN:**

- a. Stop any dilutions in progress.

CAUTION Failure to initiate boration within one hour of exceeding rod insertion limits may violate Tech Spec 3.1.6.

NOTE OAC point C1L4409 (Ctrl Bank Tech Spec Insertion Lmt Reached) and R.O.D Book (Section 2.2) provide rod insertion limit indication.

- b. Borate NC system as required, to restore rods above insertion limits.
- c. Ensure compliance with Tech Spec 3.1.6 (Control Bank Insertion Limits).

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Attachment 2

CNS EP/1/A/5000/E-0	REACTOR TRIP OR SAFETY INJECTION Enclosure 7 - Page 1 of 1 VX System Operation	PAGE NO. 49 of 58 Revision 30
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ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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<p>1. Verify the following containment air return fan dampers - OPEN:</p> <ul style="list-style-type: none"> ___ • ARF-D-2 (ARF-1A Ret Fan Damper) (1MD-4, I/5) ___ • ARF-D-4 (ARF-1B Ret Fan Damper) (1MD-4, I/8). <p>2. Verify the following equipment alignment:</p> <ul style="list-style-type: none"> ___ • 1VX-1A (HSF-1A Inlt Isol) (1MD-4, I/6) - OPEN ___ • 1VX-2B (HSF-1B Inlt Isol) (1MD-4, I/7) - OPEN ___ • ARF-1A (Cont Air Return Fan) (1MD-4, I/3) - ON ___ • ARF-1B (Cont Air Return Fan) (1MD-4, I/10) - ON ___ • HSF-1A (H₂ Skimmer Fan) (1MD-4, I/4) - ON ___ • HSF-1B (H₂ Skimmer Fan) (1MD-4, I/9) - ON. <p>3. Verify containment air return fans operate as containment pressure changes as follows:</p> <ul style="list-style-type: none"> ___ • IF AT ANY TIME containment pressure is greater than 0.9 PSIG, THEN ensure containment air return fans are on. ___ • IF AT ANY TIME containment pressure is less than 0.3 PSIG, THEN ensure containment air return fans are off. 	<p>___ IF equipment is not in proper alignment, THEN manually align equipment.</p> <p>IF equipment is not in proper alignment, THEN perform the following:</p> <p>a. IF containment pressure is less than 0.3 PSIG, THEN verify the following Monitor Light Panel Group 1 Sp lights - DARK:</p> <ul style="list-style-type: none"> ___ • I/3 ___ • I/10. <p>___ b. Manually align or start affected component(s).</p> <p>___ c. IF any VX System equipment cannot be manually started, THEN REFER TO OP/1/A/6450/010 (Containment Hydrogen Control Systems), for further actions.</p>
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Simulator Scenario #1

Attachment 3

CNS EP/1/A/5000/E-0	REACTOR TRIP OR SAFETY INJECTION Enclosure 2 - Page 1 of 7 Ventilation System Verification	PAGE NO. 29 of 44 Revision 27
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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

<p>1. Verify proper VC/YC operation as follows:</p> <p>a. Verify one train of the following equipment is in operation:</p> <ul style="list-style-type: none"><input type="checkbox"/> • YC chiller<input type="checkbox"/> • CR AHU-1<input type="checkbox"/> • CRA AHU-1<input type="checkbox"/> • CRA PFT-1.	<p>a. Perform the following:</p> <ul style="list-style-type: none"><input type="checkbox"/> 1) Shift operating VC/YC trains. REFER TO Enclosure 5 (Shifting Operating VC/YC Train).<input type="checkbox"/> 2) IF no train can be properly aligned, THEN dispatch operator and IAE/Maintenance to restore at least one train of VC/YC. REFER TO the following:<ul style="list-style-type: none"><input type="checkbox"/> • OP/0/A/6450/011 (Control Room Area Ventilation/Chilled Water System)<input type="checkbox"/> • EM/0/A/5200/001 (Troubleshooting Cause For Improper Operation of VC/YC System).
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CNS EP/1/A/5000/E-0	REACTOR TRIP OR SAFETY INJECTION Enclosure 2 - Page 2 of 7 Ventilation System Verification	PAGE NO. 30 of 44 Revision 27
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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. (Continued)

b. Verify the following alarms - DARK:

- ___ • 1AD-18, A/8 "UNIT 1 INTAKE HI CHLORINE 1A"
- ___ • 1AD-18, B/8 "UNIT 1 INTAKE HI CHLORINE 1B"
- ___ • 1AD-18, D/8 "UNIT 2 INTAKE HI CHLORINE 2A"
- ___ • 1AD-18, E/8 "UNIT 2 INTAKE HI CHLORINE 2B".

b. **IF** chlorine odor is detected in the Control Room, **THEN** perform the following based on the status of given alarms:

1) **IF** detectors on both unit intakes are in alarm, **THEN**:

a) Ensure the following VC intake dampers - CLOSED:

- ___ • 1VC-5B (CRA Filtr Inlet)
- ___ • 1VC-6A (CRA Filtr Inlet)
- ___ • 2VC-5B (CRA Filtr Inlet)
- ___ • 2VC-6A (CRA Filtr Inlet).

___ b) **GO TO** Step 1.d.

2) **IF** Unit 1 intake HI chlorine detector(s) in alarm, **THEN**:

a) Ensure the following VC dampers - CLOSED:

- ___ • 1VC-5B (CRA Filtr Inlet)
- ___ • 1VC-6A (CRA Filtr Inlet).

b) Ensure the following dampers - OPEN:

- ___ • 2VC-5B (CRA Filtr Inlet)
- ___ • 2VC-6A (CRA Filtr Inlet).

___ c) **GO TO** Step 1.d.

(RNO continued on next page)

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Simulator Scenario #1

CNS EP/1/A/5000/E-0	REACTOR TRIP OR SAFETY INJECTION Enclosure 2 - Page 3 of 7 Ventilation System Verification	PAGE NO. 31 of 44 Revision 27
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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. (Continued)

3) **IF** Unit 2 intake Hi chlorine detector(s) in alarm, **THEN:**

a) Ensure the following VC dampers - CLOSED:

- 2VC-5B (CRA Filtr Inlet)
- 2VC-6A (CRA Filtr Inlet).

b) Ensure the following dampers - OPEN:

- 1VC-5B (CRA Filtr Inlet)
- 1VC-6A (CRA Filtr Inlet).

c) **GO TO** Step 1.d.

c. Ensure the following VC dampers - OPEN:

- 1VC-5B (CRA Filtr Inlet)
- 1VC-6A (CRA Filtr Inlet)
- 2VC-5B (CRA Filtr Inlet)
- 2VC-6A (CRA Filtr Inlet).

d. Repeat Step 1 of this enclosure until notified by station management as follows:

- At least once every 8 hours

OR

- **IF AT ANY TIME** 1AD-13, F/5 "HVAC PANEL TROUBLE"- LIT.

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

2. **Ensure proper VA System operation as follows:**

- Ensure the following fans - OFF:
 - ABUXF 1A
 - ABUXF 1B.
- Ensure VA System filter is in service as follows:
 - 1ABF-D-12 (VA Filt A Bypass Damper) - CLOSED
 - 1ABF-D-5 (VA Filt B Bypass Damper) - CLOSED.
- Ensure the following fans - ON:
 - ABFXF-1A
 - ABFXF 1B.

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3. Verify proper VE System operation as follows:

a. VE fans - ON.

b. Annulus pressure - BETWEEN -1.4 IN. WC AND -1.8 IN. WC.

a. Manually start fan(s).

b. Perform the following:

1) **IF** annulus pressure is more positive than -1.4 in. WC, **THEN**:

a) Verify flow indicated on the following indications:

- "VE 1A FLOW TO STACK"
- "VE 1B FLOW TO STACK".

b) **IF** flow is not indicated, **THEN** dispatch operator to verify status of the following dampers based on their local indication or their operating piston rods being extended 4" to 6":

- 1AVS-D-2 (VE A Trn Recirc Damp) (AB-603, JJ-51, Rm 500) - CLOSED
- 1AVS-D-7 (VE B Trn Recirc Damp) (AB-603, HH-52, Rm 500) - CLOSED
- 1AVS-D-3 (VE A Trn Exh Damp) (AB-603, JJ-52, Rm 500) - OPEN
- 1AVS-D-8 (VE B Trn Exh Damp) (AB-603, HH-52, Rm 500) - OPEN.

c) Consult plant engineering staff and notify IAE/Maintenance to troubleshoot and repair. **REFER TO EM/1/A/5200/002** (Troubleshooting Cause For VE System Hi/Lo Pressure).

d) **GO TO** Step 3.c.

(RNO continued on next page)

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3. (Continued)

2) IF annulus pressure is more negative than -1.8 in. WC, THEN:

- a) Determine which VE train indicates highest discharge flow to stack.
- b) Within 2 hours, ensure VE train that indicates highest discharge flow to stack is secured.
- c) Consult plant engineering staff and notify IAE/Maintenance to troubleshoot and repair. **REFER TO EM/1/A/5200/002** (Troubleshooting Cause For VE System Hi/Lo Pressure).

c. Repeat Step 3.b every 30 minutes until notified by station management.

Facility: <u>Catawba Nuclear Station</u> Scenario No.: <u>NRC-3</u>		Op-Test No.: <u>1</u>	
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: 100% RTP EOL			
<p>Turnover: 1A CA Pump T/O for PM's expected return to service is 12 hours. 1A NS Pump T/O for PM's expected return to service is 14 hours. No other equipment inoperable. OP/1/A/6100/003, Controlling Procedure for Unit Operation, Enclosure 4.3 completed through step 2.9. Maintain 100% RTP</p>			
Event No.	Malfunction No.	Event Type*	Event Description
1	ALL		Loss of a CFPT
1a	RO	RX	Failure of turbine to automatically runback
1b	BOP	RX	Boration due to being below Rod Insertion Limits
2a	RO	I	P/R N-41 failure
2b	SRO	TS	
3	BOP	I	VCT Level (5760) failure (high)
4a	BOP	I	RN loss of pit level instrument failure with failure to auto swap to pond
4b	SRO	TS	Pit Instrumentation
5	RO	C	Loss of vacuum requiring manual Turbine Trip
6	ALL	M	Non-isolable steam leak <u>Additional failures:</u> 1B MSIV fails to close A train Phase A fails to auto actuate
*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

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Simulator Scenario #3

Op-Test No.: NRC Scenario No.: 3 Event No.: 1a page 1 of 2
 Event Description: Loss of a CFPT with failure of the turbine to runback in auto.

Time	Position	Applicant's Actions or Behavior
		The crew will enter AP/1/A/5500/003 (Load Rejection) CASE I (Switchyard Available)
	RO	Verify turbine load - DECREASING IN AUTOMATIC. EXAMINER NOTE: The turbine will not respond in automatic.
	RO	Perform the following: a. Select "MANUAL" on turbine control panel. b. Depress "CONTROL VALVES LOWER" pushbutton and reduce turbine load as required.
	RO	Verify proper reactor response: <ul style="list-style-type: none"> • Control rods - IN "AUTO" AND STEPPING IN • P/R neutron flux - DECREASING.
	RO	Verify proper steam dump operation as follows: a) Verify T-Ref instrumentation - AVAILABLE.
	RO	b) "C-9 COND AVAILABLE FOR STM DUMP" status light (1SI-18) - LIT.
	RO	c) Verify the following: <ul style="list-style-type: none"> • "C-7A LOSS OF LOAD INTLK COND DUMP" status light (1SI-18) - LIT. • Steam dump valves - MODULATING.
	RO	d) T-Avg - DECREASING TO T-REF.
	BOP	Verify Pzr PORV and Pzr spray valve status as follows: a. All Pzr PORVs - CLOSED.
	BOP	b. Normal Pzr spray valves - CLOSED.
	BOP	Verify proper CM System operation as follows: a) WHEN reactor power is less than 75%, THEN ensure both C-htr drain pumps - OFF.
	RO	b) Verify reactor power - GREATER THAN 56% PRIOR TO THE EVENT.
	BOP	c) Verify standby hotwell pump(s) - ON.
	BOP	d) Verify standby condensate booster pump(s) - ON.
	BOP	Verify the following generator alarms - DARK: <ul style="list-style-type: none"> • 1AD-11, C/1 "GEN BKR A OVER CURRENT" • 1AD-11, F/1 "GEN BKR B OVER CURRENT"
	RO	Verify S/G levels are adequate as follows: <ul style="list-style-type: none"> • All S/G low level alert alarms (1AD-4) - DARK • All S/G low CF flow alarms (1AD-4) - DARK.
	RO	Verify reactor power - GREATER THAN 20%.

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	RO	IF AT ANY TIME reactor power is less than or equal to 20%, THEN perform Step 8 RNO.
	BOP	Verify AS header pressure - GREATER THAN OR EQUAL TO 140 PSIG.
	BOP	Monitor Enclosure 3 (Rod Insertion Limit Boration). EXAMINER NOTE: <ul style="list-style-type: none"> • See Attachment 1 • This is the initiator of Event 1b shown in the next section • The remainder of steps for this procedure are for examiner convenience.
	RO	Verify reactor power - LESS THAN 30%.
	RO	Perform the following: a. IF the runback target load is less than 30%, THEN: (This step is not applicable)
	RO	WHEN the appropriate runback target load is reached, THEN: 1) Stabilize unit at current power level. 2) Maintain control rods above insertion limits. 3) Adjust the following as required to maintain T-Avg within 1°F of T-Ref: <ul style="list-style-type: none"> • Turbine load • Control rods • Boron concentration.
	SRO	GO TO Step 14.
	BOP	Verify the following PCBs - CLOSED: <ul style="list-style-type: none"> • Generator breaker 1A • Generator breaker 1B • PCB 14 • PCB 15 • PCB 17 • PCB 18.
	RO	Adjust power factor as necessary. REFER TO Unit 1 Revised Data Book Figure 43.
	RO	WHEN the appropriate runback target load is reached, THEN: <ul style="list-style-type: none"> • Stabilize unit at appropriate power level. • Maintain control rods above insertion limits. • Adjust the following as required to maintain T-Avg within 1°F of T-Ref: <ul style="list-style-type: none"> ○ Turbine load ○ Control rods ○ Boron concentration.
		End of Event.

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 Simulator Scenario #3

Op-Test No.: <u> NRC </u> Scenario No.: <u> 3 </u> Event No.: <u> 1b </u>		Page 1 of 3
Event Description: Boration due to runback		
Time	Position	Applicant's Actions or Behavior
		Monitor Enclosure 3 (Rod Insertion Limit Boration). EXAMINER NOTE: See Attachment 1
	BOP	Refer to OP/1/A/6150/009, Boron Concentration Control. Enclosure 4.2
	BOP	EXAMINER NOTE: Initial Conditions given for examiner information. 1. Initial Conditions 1.1 Review the Limits and Precautions. 1.2 IF in Mode 1 or 2 AND boration is being performed for normal temperature control, ensure R3 reactivity management controls established per SOMP 01-02 (Reactivity Management). (R.M.) 1.3 IF in Mode 1 or 2 AND boration is being performed as part of a power change, ensure R2 reactivity management controls established per SOMP 01-02 (Reactivity Management). (R.M.) 1.4 Verify the NV System is in operation per OP/1/A/6200/001 (Chemical and Volume Control System). 1.5 Verify sufficient RHT volume is available to receive the reactor coolant displaced during the planned boration operation.
	BOP	NOTE: This enclosure will affect reactivity of the core and is therefore designated important to Reactivity Management per the guidelines of NSD 304 (Reactivity Management). (R.M.) Ensure valves are aligned per Enclosure 4.8 (Valve Checklist).
	BOP	Ensure the following valve control switches in "AUTO": <ul style="list-style-type: none"> • 1NV-238A (B/A Xfer Pmp To Blender Ctrl) • 1NV-186A (B/A Blender Otlt To VCT Otlt)
	BOP	Ensure 1NV-238A (B/A Xfer Pmp to Blender Ctrl) controller in "AUTO".
	BOP	Ensure at least one boric acid transfer pump in "AUTO" or "ON".
	BOP	Adjust the boric acid batch counter to the desired volume of boric acid to be added.
	BOP	IF the blender is set up for automatic makeup per Enclosure 4.1 (Automatic Makeup), record the setting of the controller for 1NV-238A (B/A Xfer Pmp To Blender Ctrl). _____

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	BOP	Place the "NC MAKEUP MODE SELECT" switch in "BORATE".
	BOP	<p>NOTE: Boric Acid flow rates > 32 gpm (controller pot setting of 8) may result in a boric acid flow deviation annunciator.</p> <p>Adjust the controller for 1NV-238A (B/A Xfer Pmp to Blender Ctrl) controller to the desired flow.</p>
	BOP	<p>NOTE: If necessary, boration can be manually secured at any time by placing the "NC MAKEUP CONTROL" switch to the "STOP" position.</p> <p>Place the "NC MAKEUP CONTROL" switch in "START" position.</p>
	BOP	<p>Verify the following valves open:</p> <ul style="list-style-type: none"> • 1NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv) • 1NV-186A (B/A Blender Otlt To VCT Otlt)
	BOP	IF in "AUTO", verify the boric acid transfer pump starts.
	BOP	Verify proper flow by observing the boric acid flow totalizer.
	BOP	<p>WHEN the desired volume of boric acid is reached on the boric acid batch counter, ensure the following valves close:</p> <ul style="list-style-type: none"> • 1NV-238A (B/A Xfer Pmp To Blender Ctrl Vlv) • 1NV-186A (B/A Blender Otlt To VCT Otlt)
	BOP	<p>IF desired, flush the makeup line as follows:</p> <p>2.13.1 Open the following valves:</p> <ul style="list-style-type: none"> • 1NV-242A (RMWST To B/A Blender Ctrl) • 1NV-186A (B/A Blender Otlt To VCT Otlt) <p>2.13.2 Ensure one reactor makeup water pump is in "ON".</p> <p>2.13.3 WHEN ~20 gallons of makeup water have been flushed through the makeup line, close the following valves:</p> <ul style="list-style-type: none"> • 1NV-242A (RMWST To B/A Blender Ctrl) • 1NV-186A (B/A Blender Otlt To VCT Otlt) <p>Place the following valve control switches in "AUTO":</p> <ul style="list-style-type: none"> • 1NV-242A (RMWST To B/A Blender Ctrl) • 1NV-186A (B/A Blender Otlt To VCT Otlt) <p>IF NOT required for current plant operation, place the reactor makeup water pump started in earlier step in "AUTO".</p>
	BOP	<p>IF automatic makeup is desired, refer to Enclosure 4.1 (Automatic Makeup).</p> <p>EXAMINER NOTE: The following steps are Enclosure 4.1 actions if the applicant returns makeup to automatic.</p>

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	BOP	<p>Determine the boric acid flow rate (Va) for the desired concentration by the following calculation: $Va = Vb (Cb - Cw) / (Ca - Cw)$ where Vb is the blender outlet flow rate, Cb is the desired outlet boron concentration, Cw is the RMWST boron concentration and Ca is the BAT boron concentration</p>
	BOP	<p>IF previous makeups have demonstrated an inability to achieve the desired boric acid flow rate, determine the amount of correction needed. _____ gpm.</p>
	BOP	<p>Determine the setpoint for the boric acid controller as follows: Setpoint = Va + correction from Step 2.3 / 4</p>
	BOP	<p>Adjust the controller for 1NV-238A (B/A Xfer Pmp To Blender Ctrl) to the value determined in Step 2.4.</p>
	BOP	<p>Ensure the following valve control switches in "AUTO":</p> <p>1NV-181A (B/A Blender Otlt To VCT) 1NV-186A (B/A Blender Otlt To VCT Otlt) 1NV-238A (B/A Xfer Pmp To Blender Ctrl) 1NV-242A (RMWST To B/A Blender Ctrl)</p>
	BOP	<p>Ensure the following valve controllers in "AUTO":</p> <p>1NV-242A (RMWST To B/A Blender Ctrl) 1NV-238A (B/A Xfer Pmp To Blender Ctrl)</p>
	BOP	<p>Ensure at least one reactor makeup water pump is in "AUTO" or "ON".</p>
	BOP	<p>Ensure at least one boric acid transfer pump is in "AUTO" or "ON".</p>
	BOP	<p>Place the "NC MAKEUP MODE SELECT" switch in "AUTO".</p>
		End of Event

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Time	Position	Applicant's Actions or Behavior	Page 1 of 2
Op-Test No.: _NRC_ Scenario No.: _3_ Event No.: _2a_ Event Description: Loss of P/R N-41			
		The crew will enter AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation)	
	RO	Verify all rod motion – STOPPED. IF unwarranted rod motion is occurring, THEN place “CRD BANK SELECT” to manual.	
	RO	Verify 1AD-2, E/8 “OVER POWER ROD STOP” – DARK. Adjust Turbine load to maintain T-Avg at T-Ref.	
	RO	Identify failed P/R channel: <ul style="list-style-type: none"> • N-41 OR <ul style="list-style-type: none"> • N-42 OR <ul style="list-style-type: none"> • N-43 OR <ul style="list-style-type: none"> • N-44. 	
	RO	Ensure unaffected channels – OPERABLE.	
	BOP	Request IAE to place the following bistables in the tripped condition. REFER TO Model W/O #91002943: <ul style="list-style-type: none"> • OT DELTA T • OP DELTA T. 	
	BOP	Perform the following actions at the Miscellaneous Control And Indication Panel: a. Place the appropriate “ROD STOP BYPASS” switch to the affected channel position. b. Verify the affected nuclear overpower rod stop channel bypassed status light (1SI-19) – LIT. c. Place “POWER MISMATCH BYPASS” switch to the affected channel position.	
	BOP	Perform the following actions at the Detector Current Comparator panel: a. Place “UPPER SECTION” channel defeat switch to the affected channel. b. Verify the “CHANNEL DEFEAT” light for the upper section – LIT. c. Place “LOWER SECTION” channel defeat switch to the affected channel. d. Verify the “CHANNEL DEFEAT” light for the lower section – LIT.	
	BOP	At the Comparator And Rate panel, place the “COMPARATOR CHANNEL DEFEAT” switch to the affected channel position.	

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	BOP	De-energize the affected channel as follows: Remove the control power fuses at Power Range A drawer.
		NOTE Replacement of the affected P/R control power fuses shall not occur without authorization of the Superintendent of Operations or his designee.
	SRO	Request the OSM to maintain the control power fuses under his control.
	BOP	Verify the affected Power Range cabinet shows no physical signs of damage.
	RO	<p>Ensure affected channel bistables are in the required state. REFER TO Enclosure 1 (P/R Bistables That Must Be Tripped).</p> <p>Enclosure 1 actions:</p> <ol style="list-style-type: none"> 1. Ensure the following reactor trip system interlocks in the required state (1SI-18) for existing unit conditions within 1 hour: <ul style="list-style-type: none"> • P-7 • P-8 • P-9 • P-10. 2. Ensure the following bistables for the affected channel are placed in the tripped condition within 6 hours: <ul style="list-style-type: none"> • NC loop OTDT reactor trip status light (1SI-7) - LIT • NC loop OPDT reactor trip status light (1SI-7) - LIT. <p>NOTE The following bistables can only be assured to stay in the tripped condition by the removal of the affected channel's control power fuses.</p> 3. Ensure the following bistables for the affected channel are in the tripped condition within 6 hours: <ul style="list-style-type: none"> • P/R high flux low setpoint status light (1SI-3) - LIT • P/R high flux high setpoint status light (1SI-3) - LIT • P/R high flux rate status light (1SI-3) - LIT.
	RO	Ensure "NIS RECORDER" – SELECTED TO AN OPERABLE P/R CHANNEL.
	SRO	Determine and correct cause of P/R malfunction.
	SRO	<p>Ensure compliance with appropriate Tech Specs:</p> <ul style="list-style-type: none"> • 3.2.4 (Quadrant Power Tilt Ratio (QPTR)) • 3.3.1 (Reactor Trip System (RTS) Instrumentation). <p>EXAMINER NOTE: Event initiator for Event 2b.</p>
	SRO	<p>Determine required notifications:</p> <ul style="list-style-type: none"> • REFER TO RP/0/A/5000/001 (Classification Of Emergency) • REFER TO RP/0/B/5000/013 (NRC Notification Requirements).
	BOP	Notify Reactor Group Engineer of occurrence.
	BOP	WHEN the affected P/R channel is repaired, THEN ensure IAE returns the channel to service.
	SRO	Determine long term plant status. RETURN TO procedure in effect.
		End Event

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 Simulator Scenario #3

Op-Test No.: _NRC_ Scenario No.: __3__ Event No.: _2b__ page 1 of 1		
Event Description: TS assessment for Loss of P/R N-41		
Time	Position	Applicant's Actions or Behavior
	SRO	<p>Will refer to TS 3.3.1 and determine Function 2a, 3, 6, 7, 16b, 16c, 16d and 16e are applicable.</p> <p>Functions 2a and 3 direct entry into Condition D. Condition D actions are to place the channel in trip condition in 6 hours and perform SR 3.2.4.2 once every 12 hours.</p> <p>Functions 6 and 7 direct entry into Condition E. Condition E actions are to place the channel in trip condition in 6 hours.</p> <p>Functions 16b, 16c and 16d direct entry into Condition S. Condition S actions are to verify interlock is in required state for existing unit conditions within 1 hour.</p> <p>Function 16e directs entry into Condition R. Condition R actions are to verify interlock is in required state for existing unit conditions within 1 hour.</p>

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Appendix D, Rev. 9

Required Operator Actions

Form ES-D-2

Op-Test No.: _NRC_ Scenario No.: __3__ Event No.: _3__ page 1 of 2		
Event Description: VCT Level (5760)failure (high)		
Time	Position	Applicant's Actions or Behavior
	BOP	<p>An OAC alarm and annunciator will be received to alert the operator to this failure. Diagnosis will be via OAC indication showing one channel of VCT level has failed high.</p> <p>EXAMINER NOTE: This event will be complicated by the failure of the VCT makeup valves, 1NV-181A and 1NV 186A, to operate in auto. The net effect for this event is that the VCT level will be decreasing due to letdown diverted to RHT. When automatic makeup attempts to restore VCT level the valves above will not open, causing the candidate to take manual action to open the one of the above valves.</p>
	BOP	Operator should refer to OP/1/B/6100/010H Annunciator Response For Panel 1AD-7 H/1.
	BOP	Ensure 1NV-172 (3-Way Divert to VCT-RHT) is correctly positioned for current level.
	BOP	Verify high level by: VCT level indication from both level channels:
	BOP	1NVLT5761 on 1MC5
	BOP	Computer Point - C1A0843 - NV Summary – from 1NVLT5761
	BOP	Computer Point C1A1524 from 1NVLT5760
	BOP	Dispatch operator to local gauge 1NVLT5760 (AB-560, MM-51) EXAMINER NOTE: This is not a required action as this is the failed channel.
	BOP	VCT pressure indication:
	BOP	Increasing or abnormally high pressure (normal pressure 30-40#)
		EXAMINER NOTE: The crew should determine a simple level instrument has failed and the following swap to the FWST is not required. If the crew does swap suction to the FWST, they will proceed to shutdown the unit per the annunciator response. This shutdown will have no impact on subsequent failures for this scenario.

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		Page 2 of 2
	BOP	IF charging > letdown AND actual HI LVL CANNOT be verified: 2.1 By OAC Points above or local indication in 4-5 minutes AND 2.2 Reactor Makeup Control System is secured, realign the charging pump suction to the FWST by: 2.2.1 Opening the following valves: <ul style="list-style-type: none"> • 1NV-252A (NV Pump Suction From FWST) • 1NV-253B (NV Pump Suction From FWST) 2.2.2 Closing the following valves: <ul style="list-style-type: none"> • 1NV-188A (VCT OTLT Isol) • 1NV-189B (VCT OTLT Isol) 2.2.3 Refer to AP/1/A/5500/09 (Rapid Downpower) or OP/1/A/6100/003 (Controlling Procedure For Unit Operation).
	BOP	Refer to AP/1/A/5500/09 (Rapid Downpower) or OP/1/A/6100/003 (Controlling Procedure For Unit Operation).
	BOP	When automatic makeup fails due to valves 1NV-186A and 1NV-181A not opening the candidate must open one of the valves to allow makeup.
		End of Event

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Appendix D, Rev. 9

Required Operator Actions

Form ES-D-2

Op-Test No.: _NRC_ Scenario No.: __3__ Event No.: _4a__		page 1 of 4
Event Description: Loss of RN Pit Level.		
Time	Position	Applicant's Actions or Behavior
	ALL	The following annunciators light: 1AD-12, E/2, "RN PIT A SWAP TO SNSWP" - LIT
	SRO	Enters AP/0/A/5500/020 Loss of Nuclear Service Water, Case 2, Loss of RN Pit Level.
	RO/BOP	Verify the following alarms - DARK: <ul style="list-style-type: none"> • 1AD-12, B/2 "RN PIT A SCREEN HI D/P" • 1AD-12, B/5 "RN PIT B SCREEN HI D/P".
	All	<p>NOTE: Isolating the Unit 1 or 2 non-essential header will result in loss of cooling supply to the following unit related equipment:</p> <ul style="list-style-type: none"> • VA Supply Vent Units • VF Supply Vent Unit. <p>Automatic swapover to the SNSWP on emergency-low RN pit level prevents Control Room operation of RN pumps and affected valves for 2 minutes following swapover.</p>
	BOP	Start idle RN pump(s) on the unaffected train.
	BOP	Verify affected pit level adequate as follows: 1AD-12, B/1, "RN PUMP INTAKE PIT A LEVEL-LO" - DARK 1AD-12, B/4, "RN PUMP INTAKE PIT B LEVEL-LO" - DARK 2AD-12, B/1, "RN PUMP INTAKE PIT A LEVEL-LO" - DARK 2AD-12, B/4, "RN PUMP INTAKE PIT B LEVEL-LO" - DARK Affected pit level indication - STABLE OR INCREASING.
	BOP	Align RN to the SNSWP. REFER TO Enclosure 2 (RN Valve Alignment for RN Swap to SNSWP).

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 Simulator Scenario #3

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BOP	<p>Examiner Note: The BOLD entries are the valves which failed to swap. Manual action is required to position these valves.</p> <p>Enclosure 2 actions.</p> <p>1. Ensure the following valves - OPEN:</p> <ul style="list-style-type: none"> • 1RN-3A (RN P/H Pit A Isol From SNSWP) • 1RN-4B (RN P/H Pit B Isol From SNSWP) • 1RN-58B (RN Hdr B Ret To SNSWP) • 1RN-63A (RN Hdr A Ret To SNSWP) • 1RN-846A (D/G 1A Hx Ret To SNSWP) • 1RN-848B (D/G 1B Hx Ret To SNSWP) • 2RN-846A (D/G 2A Hx Ret To SNSWP) • 2RN-848B (D/G 2B Hx Ret To SNSWP). <p>2. Ensure the following valves - CLOSED:</p> <ul style="list-style-type: none"> • 1RN-1A (RN P/H Pit A Isol From Lake) • 1RN-2B (RN P/H Pit A Isol From Lake) • 1RN-5A (RN P/H Pit B Isol From Lake) • 1RN-6B (RN P/H Pit B Isol From Lake) • 1RN-53B (Station RN Disch Hdr X-Over) • 1RN-54A (Station RN Disch Hdr X-Over) • 1RN-57A (Station RN Disch To RL Sys) • 1RN-843B (Station RN Disch To RL Sys) • 1RN-847A (D/G 1A Hx Ret To Lake) • 1RN-849B (D/G 1B Hx Ret To Lake) • 2RN-847A (D/G 2A Hx Ret To Lake) • 2RN-849B (D/G 2B Hx Ret To Lake). <p>3. IF RN Pit A initiated the auto or manual swap to the SNSWP, THEN ensure the following valves are closed:</p> <ul style="list-style-type: none"> • 1RN-48B (RN Supply X-Over Isol) • 2RN-48B (RN Supply X-Over Isol). <p>4. IF RN Pit B initiated the auto or manual swap to the SNSWP, THEN ensure the following valves are closed: (This step is not applicable)</p> <ul style="list-style-type: none"> • 1RN-47A (RN Supply X-Over Isol) • 2RN-47A (RN Supply X-Over Isol). 	
ALL	Verify each operating RN pump discharge flow - LESS THAN 23,000 GPM.	
ALL	NOTE: After automatic swaponer to the SNSWP on emergency-low RN pit level, the RN swap to the SNSWP annunciators will only be lit for 2 minutes following swaponer.	

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	BOP	<p>IF any of the following alarms are lit OR were previously lit:</p> <ul style="list-style-type: none"> • 1AD-12, E/2, "RN PIT A SWAP TO SNSWP" <p>OR</p> <ul style="list-style-type: none"> • 2AD-12, E/2, "RN PIT A SWAP TO SNSWP" <p>OR</p> <ul style="list-style-type: none"> • 1AD-12, E/5, "RN PIT B SWAP TO SNSWP" <p>OR</p> <ul style="list-style-type: none"> • 2AD-12, E/5, "RN PIT B SWAP TO SNSWP". <p>THEN perform the following:</p> <ol style="list-style-type: none"> a. Ensure all RN pumps - ON. b. Ensure correct RN valve alignment. REFER TO Enclosure 2 (RN Valve Alignment for RN Swap to SNSWP). c. IF WL discharge in progress, THEN coordinate with Radwaste Chemistry to secure all controlled WL discharges. d. IF any RN chemical addition is in progress, THEN have Chemistry secure it.
	BOP	<p>Verify SNSWP level adequate and stable as follows:</p> <ul style="list-style-type: none"> • 1AD-12, A/3 "SNSWP LEVEL LO" - DARK • SNSWP level indication - STABLE.
	BOP	<p>Ensure proper alignment of RN to KC Hxs as follows:</p> <ol style="list-style-type: none"> a. Verify RN - ALIGNED TO KC HX(S) IN SERVICE. b. Ensure KC Hx Oflt Mode switches - PROPERLY ALIGNED.
	All	<p>NOTE: To supply both trains of RN when the RN supply crossover isolations are closed, one RN pump on each train must be in service.</p>
	BOP	<p>Verify each operating RN pump discharge flow - GREATER THAN 8,600 GPM.</p> <p>Examiner Note: If any pump is less than 8600 gpm then the RNO listed below will be performed. Step 13 performs the "as needed" operations for the pumps and will also direct the crew to decide how many pumps to use.</p> <p>Stop any RN pump(s) not required to support system operation.</p>
	BOP	<p>Determine and correct cause of loss of RN pit level.</p>
	SRO	<p>Ensure compliance with appropriate Tech Specs and Selected Licensee Commitments Manual:</p> <ul style="list-style-type: none"> • SLC 16.7-6 (RN Discharge Instrumentation) • 3.3.2 (Engineered Safety Features Actuation System (ESFAS) Instrumentation). • 3.6.5 (Containment Air Temperature) • 3.7.8 (Nuclear Service Water System (NSWS)) • 3.7.9 (Standby Nuclear Service Water Pond (SNSWP)). <p>EXAMINER NOTE: This is the initiator for event 4b given in the next section.</p>
	SRO	<p>Determine required notifications:</p> <ul style="list-style-type: none"> • REFER TO RP/0/A/5000/001 (Classification Of Emergency) • REFER TO RP/0/B/5000/013 (NRC Notification Requirements).

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	BOP	WHEN corrective action for loss of pit level taken, THEN restore RN to normal alignment. REFER TO Enclosure 3 (Returning RN alignment To Normal After Transfer To SNSWP).
	BOP	Ensure RN pumps - IN OPERATION AS NEEDED.
	BOP	Verify each operating RN pump discharge flow - GREATER THAN 8,600 GPM.
	BOP	Notify Environmental Chemistry of any RN pump shifts that have occurred.
	SRO	Determine long term plant status. RETURN TO procedure in effect.
		End of Event

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Required Operator Actions

Form ES-D-2

Op-Test No.: _NRC_ Scenario No.: __3__ Event No.: _4b__ page 1 of 1

Event Description: TS for Pit Instrumentation

Time	Position	Applicant's Actions or Behavior
	SRO	Will refer to TS 3.3.2 and determine Function 10 is affected. Function 10 directs action per Conditions Q and R. Actions for Condition Q and R are to align the Nuclear Service Water System for Standby Nuclear Service Water Pond recirculation within 4 hours.

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Required Operator Actions

Form ES-D-2

Op-Test No.: _NRC_ Scenario No.: _3_ Event No.: _5_		page 1 of 2
Event Description: Loss of Condenser Vacuum.		
Time	Position	Applicant's Actions or Behavior
		<p>EXAMINER NOTE:</p> <p>This failure will require the manual trip of the turbine per the Enclosure 1 actions given below. Depending on timing, the crew may not enter the AP for loss of vacuum but trip the turbine and go to AP/02 Turbine Trip. The steps given are for any crew which enters the AP prior to trip of the Turbine.</p> <p>After the crew enters AP/02 (Turbine Trip) and begins to stabilize the plant, a large steam line break will occur and begin the next event. The steps given for AP/02 are for the time period prior to the steam break.</p> <p>When the crew enters AP/02 (Turbine Trip) the actions are given on the next page.</p>
	SRO	Enters AP/1/A/5500/023 (Loss of Condenser Vacuum).
	OATC	<p>1. Monitor Enclosure 1 (Foldout Page).</p> <p>Enclosure 1 actions</p> <p>2. Turbine Trip Criteria: IF reactor power less than 69% AND main condenser vacuum decrease to 21.8 in. Hg. In any condenser section imminent, THEN perform the following:</p> <ol style="list-style-type: none"> Trip the turbine. REFER TO AP/1/A/5500/02 (Turbine Generator Trip).
	OATC	<p>Decrease turbine load as required to stabilize vacuum as follows:</p> <ol style="list-style-type: none"> IF rapid power reduction required, THEN perform the following: <p>NOTE In "MANUAL" mode, the control valves are capable of full travel within 3 minutes.</p> <ol style="list-style-type: none"> Select "MANUAL" and "CONTROL VALVE LOWER" to reduce turbine load as required. REFER TO AP/1/A/5500/009 (Rapid Downpower). GO TO Step 3.
	BOP	<p>3. Verify proper RC System operation as follows:</p> <ol style="list-style-type: none"> Verify average condenser inlet temperature OAC point C1P1493 (Unit 1 C1 & C2 Average RC Inlet Temp) – LESS THAN 90°F. Verify 1AD-8, B/4 "COOLING TOWER BASIN HI/LO LEVEL" – DARK.
	BOP	4. Verify "STM PRESS TO CSAE" – GREATER THAN 110 PSIG.
	BOP	5. Verify steam seal header pressure – BETWEEN 3 PSIG – 5 PSIG.

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	SRO	Enter AP/1/A/5500/002 (Turbine Trip)
	OATC	Verify reactor power - LESS THAN 69%.
	OATC	Verify Turbine Trip: <ul style="list-style-type: none">• All turbine stop valves - CLOSED.
	OATC	Verify reactor response: <ul style="list-style-type: none">• Control rods - IN "AUTO" AND STEPPING IN• P/R neutron flux - DECREASING.
	BOP	Ensure C heater drain pumps - OFF.
	BOP	Monitor Enclosure 4 (Rod Insertion Limit Boration).
		End Event

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Op-Test No.: _NRC_ Scenario No.: __3__ Event No.: _6__		page 1 of 7
Event Description: Large Steam Leak		
Time	Position	Applicant's Actions or Behavior
		EXAMINER NOTE: Steps 2 through 5 are Immediate Action steps and are required to be performed from memory.
	SRO	Enters EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection) and directs operators.
	ALL	Monitor Enclosure 1 (Foldout Page)
	RO	Verify Reactor Trip: <ul style="list-style-type: none"> • All rod bottom lights – LIT • All reactor trip and bypass breakers – OPEN • I/R amps – DECREASING
	RO	Verify Turbine Trip: <ul style="list-style-type: none"> • All turbine stop valves – CLOSED OR <ul style="list-style-type: none"> • Both of the following: <ul style="list-style-type: none"> • All MSIVs – CLOSED • All MSIV bypass valves – CLOSED.
	BOP	Verify 1ETA and 1ETB – ENERGIZED.
	BOP	Verify S/I is actuated: <ul style="list-style-type: none"> a. "SAFETY INJECTION ACTUATED" status light (1SI-13) – LIT. b. E/S load sequencer actuated status lights (1SI-14) – LIT.
	RO	Announce "Unit 1 Safety Injection".
	SRO	Implement RP/0/A/5000/01 (Classification Of Emergency).
	RO	Verify all Feedwater Isolation status lights (1SI-5) – LIT
	BOP	Verify Phase A Containment Isolation status as follows: Examiner Note: If not done previously the BOP will actuate A Train St (Phase A) at this point. <ul style="list-style-type: none"> a. Phase A "RESET" lights – DARK b. Monitor Light Panel Group 5 St lights – LIT Examiner Note: Based scenario timing and when this step is reached, will determine if ALL valves have reached their ST position.

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	BOP	Verify proper Phase B actuation as follows: a. Containment pressure – HAS REMAINED LESS THAN 3 PSIG. b. IF AT ANY TIME containment pressure exceeds 3 PSIG while in this procedure, THEN perform Step 10.a.
	RO	Verify proper CA pump status as follows: a. Motor driven CA pumps – ON EXAMINER NOTE: 1A CA is tagged. The crew should reference the below RNO and determine to NOT take the action. RNO a. Perform the following for the affected train(s): 1) Reset ECCS. 2) Reset D/G load sequencer. 3) Manually start affected motor driven CA pump. 4) IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on. b. 3 S/G N/R levels – GREATER THAN 11%
	BOP	Verify all of the following S/I pumps – ON: <ul style="list-style-type: none"> • NV pumps • ND pumps • NI pumps
	BOP	Verify all KC pumps – ON.
	BOP	Verify all Unit 1 and Unit 2 RN pumps – ON.
	BOP	Verify proper ventilation systems operation as follows: <ul style="list-style-type: none"> • <u>REFER TO</u> Enclosure 2 (Ventilation System Verification) • Notify Unit 2 operator to perform Enclosure 3 (Opposite Unit Ventilation Verification)

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	RO	<p>Verify all S/G pressures – GREATER THAN 775 PSIG.</p> <p>Perform the following:</p> <p>a. Verify the following valves - CLOSED:</p> <ul style="list-style-type: none"> • All MSIVs • All MSIV bypass valves • All S/G PORVs. <p>b. IF any valve is open, THEN:</p> <p>1) Manually initiate Main Steam Isolation.</p> <p>2) IF any valve is still open, THEN manually close valve.</p> <p>EXAMINER NOTE: 1B MSIV will not close.</p>
	BOP	<p>Verify proper S/I flow as follows:</p> <p>a. "NV S/I FLOW" – INDICATING FLOW</p>
	BOP	<p>b. NC Pressure – LESS THAN 1620 PSIG</p> <p>c. NI pumps – INDICATING FLOW.</p> <p>d. NC pressure – LESS THAN 285 psig.</p>
	BOP	<p>Perform the following:</p> <p>1) Ensure ND pump miniflow valve on operating ND pump(s) - OPEN.</p> <p>2) IF the ND pump miniflow valve(s) cannot be opened, THEN perform the following for affected train(s):</p> <ul style="list-style-type: none"> a) Reset ECCS. b) Reset D/G load sequencer. c) Stop ND pump. d) IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on. e) IF AT ANY TIME NC pressure decreases to less than 285 PSIG in an uncontrolled manner, THEN restart the ND pump. <p>3) GO TO Step 18.</p>
	RO	<p>Control S/G levels as follows:</p> <p>a. Verify total CA flow – GREATER THAN 450 GPM.</p> <p>b. <u>WHEN</u> at least one S/G N/R level is greater than 11% (29% ACC), <u>THEN</u> throttle feed flow to maintain all S/G N/R levels between 11% (29% ACC) and 50%.</p>
	RO	<p>Verify all CA isolation valves – OPEN.</p>
	BOP	<p>Verify S/I equipment status based on monitor light panel – IN PROPER ALIGNMENT.</p>

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	RO	NOTE: Enclosure 4 (NC Temperature Control) shall remain in effect until subsequent procedures provide alternative NC temperature control guidance. Control NC temperature. <u>REFER TO</u> Enclosure 4 (NC Temperature Control).
	BOP	Verify Pzr PORV and Pzr spray valve status as follows: All Pzr PORVs – CLOSED. Normal Pzr spray valves – CLOSED. At least one Pzr PORV isolation valve – OPEN.
	RO	Verify NC subcooling based on core exit T/Cs – GREATER THAN 0°F.
	RO	Verify main steamlines are intact as follows: <ul style="list-style-type: none"> • All S/G pressures – STABLE OR INCREASING • All S/Gs – PRESSURIZED. IF pressure in any S/G is decreasing in an uncontrolled manner OR any S/G is depressurized, THEN perform the following: <ul style="list-style-type: none"> c. IF both the following conditions exist, <ul style="list-style-type: none"> • Containment pressure – GREATER THAN 1 PSIG • Containment pressure – HAS REMAINED LESS THAN 3 PSIG THEN manually start one VX fan. REFER TO Enclosure 5 (VX Fan Manual Start). d. Concurrently: <ul style="list-style-type: none"> • Implement EP/1/A/5000/F-0 (Critical Safety Function Status Trees). • GO TO EP/1/A/5000/E-2 (Faulted Steam Generator Isolation).
		The crew will now enter EP/1/A/5000/E-2 (Faulted S/G Isolation)
	ALL	Monitor Enclosure 1 (Foldout Page).
	RO	Maintain any faulted S/G or secondary break isolated during subsequent recovery actions unless needed for NC System cooldown.
	RO	Verify the following valves – CLOSED: <ul style="list-style-type: none"> • All MSIVs • All MSIV bypass valves. Manually close valve(s).
	RO	Verify at least one S/G pressure – STABLE OR INCREASING.
	RO	Identify faulted S/G(s) as follows: <ul style="list-style-type: none"> • Verify any S/G pressure – DECREASING IN AN UNCONTROLLED MANNER OR <ul style="list-style-type: none"> • Verify any S/G – DEPRESSURIZED.
	RO	Verify at least one intact S/G – AVAILABLE FOR NC SYSTEM COOLDOWN.

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	RO	Isolate all faulted S/G(s) as follows: <ul style="list-style-type: none"> • S/G 1B: <ul style="list-style-type: none"> a. Verify S/G 1B Feedwater Isolation status light (1SI-5) – LIT. b. Verify S/G 1B PORV – CLOSED. c. Close the following valves: <ul style="list-style-type: none"> 1) 1SM-76B (S/G 1B Otlt Hdr Bldwn C/V). 2) 1CA-58A (CA Pmp A Disch To S/G 1B Isol). 3) 1CA-54B (CA Pmp 1 Disch To S/G 1B Isol). d. Verify CA Pump 1A or 1B – AVAILABLE. e. Dispatch operator to unlock and close 1SA-1 (1B S/G Main Steam to CAPT Maintenance Isol) (DH-624, FF-53, Rm 572) (Breakaway lock installed). f. Verify the following Blowdown isolation valves – CLOSED: <ul style="list-style-type: none"> 1) 1BB-19A (S/G 1B Bldwn Cont Isol Insd). 2) 1BB-150B (S/G 1B Bldwn Cont Isol Byp). 3) 1BB-21B (S/G 1B Bldwn Cont Isol Otsd).
	RO	WHEN NC T-Hots start to increase, THEN dump steam from intact S/G PORVs to stabilize NC T-Hots.
	RO	Verify the following annunciators – DARK. <ul style="list-style-type: none"> • 1AD-5, H/4 “CACST LO LEVEL” • 1AD-8, B/1 “UST LO LEVEL”.
	BOP	Verify secondary radiation is normal as follows: <ul style="list-style-type: none"> a. Ensure the following signals – RESET: <ul style="list-style-type: none"> 1) Phase A Containment Isolations 2) CA System valve control 3) KC NC NI NM St signals. b. Align all S/Gs for chemistry sampling. e. Perform at least one of the following: <ul style="list-style-type: none"> • Notify Chemistry to periodically sample all S/Gs for activity. OR <ul style="list-style-type: none"> • Notify RP to periodically frisk all cation columns for activity. f. Verify the following EMF trip 1 lights – DARK: <ul style="list-style-type: none"> • 1EMF-26 (Steamline 1A) • 1EMF-27 (Steamline 1B) • 1EMF-28 (Steamline 1C) • 1EMF-29 (Steamline 1D).
	BOP	Verify the S/G(s) fault – INSIDE CONTAINMENT.

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	BOP	Request RP to perform the following: 1) Monitor the area of the steam fault for radiation. 2) Notify the control room of any abnormal radiation conditions.
	BOP	WHEN activity results reported, THEN verify all S/Gs indicate no activity.
	BOP	Verify S/I termination criteria as follows: a. NC subcooling based on core exit T/Cs - GREATER THAN 0°F. b. Verify secondary heat sink as follows: <ul style="list-style-type: none"> • N/R level in at least one intact S/G - GREATER THAN 11% (29% ACC) OR <ul style="list-style-type: none"> • Total feed flow to all intact S/Gs - GREATER THAN 450 GPM. c. NC pressure - STABLE OR INCREASING. d. Pzr level - GREATER THAN 11% (20% ACC). e. GO TO EP/1/A/5000/ES-1.1 (Safety Injection Termination).
		The crew will now enter EP/1/A/5000/ES-1.1 (Safety Injection Termination).
	ALL	Monitor Enclosure 1 (Foldout Page).
	BOP	Ensure S/I - RESET: a. ECCS. b. D/G load sequencers. c. IF AT ANY TIME a B/O occurs, THEN restart S/I equipment previously on.
	BOP	Ensure the following containment isolation signals - RESET: <ul style="list-style-type: none"> • Phase A • Phase B.
	BOP	Establish VI to containment as follows: <ul style="list-style-type: none"> • Ensure 1VI-77B (VI Cont Isol) - OPEN. • Verify VI pressure - GREATER THAN 85 PSIG.
	BOP	Verify proper NS pump operation as follows: a. Containment pressure – HAS EXCEEDED 3 PSIG. a. GO TO Step 6.
	BOP	Ensure only one NV pump - ON.
	BOP	Verify NC pressure - STABLE OR INCREASING.
	BOP	Verify VI pressure - GREATER THAN 50 PSIG.

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	BOP	Isolate NV S/I flowpath as follows: Verify the following valves - OPEN: <ul style="list-style-type: none">• 1NV-252A (NV Pumps Suct From FWST)• 1NV-253B (NV Pumps Suct From FWST).
	BOP	Verify the following valves - OPEN: <ul style="list-style-type: none">• 1NV-203A (NV Pumps A&B Recirc Isol)• 1NV-202B (NV Pmps A&B Recirc Isol).
	BOP	Close the following valves: <ul style="list-style-type: none">• 1NI-9A (NV Pmp C/L Inj Isol)• 1NI-10B (NV Pmp C/L Inj Isol).
		End Event

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Required Operator Actions

Form ES-D-2

Op-Test No.: _NRC_ Scenario No.: __3__ Event No.: __			page 1 of 1
Event Description: Critical Task Summary Sheet.			
Time	Event	Applicant's Actions or Behavior	
	1	Manually reduce turbine load to prevent reactor trip on lo-lo S/G level.	
	2a	Place control rods to manual to stop unwarranted rod insertion	
	6	Isolate CA Flow to the faulted S/G	
	6	Control NC Temperature when faulted S/G depressurization is complete.	

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Attachment 1

CNS AP/1/A/5500/003	LOAD REJECTION Enclosure 3 - Page 1 of 1 Rod Insertion Limit Boration	PAGE NO. 35 of 36 Revision 33
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1. **IF** the control rods cannot be maintained above the rod insertion limits, **THEN**:

a. Stop any dilutions in progress.

CAUTION Failure to initiate boration within one hour of exceeding rod insertion limits may violate Tech Spec 3.1.6.

NOTE OAC point C1L4409 (Ctrl Bank Tech Spec Insertion Lmt Reached) and R.O.D Book (Section 2.2) provide rod insertion limit indication.

b. Borate NC system as required, to restore rods above insertion limits.

c. Ensure compliance with Tech Spec 3.1.6 (Control Bank Insertion Limits).